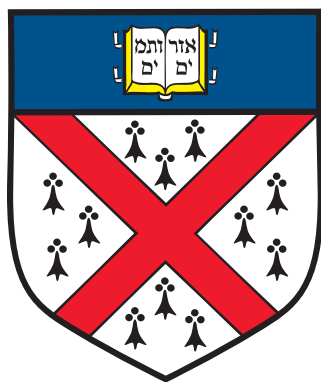


Yale College

Programs of Study

Fall and Spring Terms

2020—2021



BULLETIN OF YALE UNIVERSITY

Series 116 Number 2 June 15, 2020

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

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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	Foreign language courses are designated L1 (first term of language study), L2 (second term), L3 (third term), L4 (fourth term), or L5 (beyond the fourth term). Other distributional designations are QR, WR, HU, SC, and SO, representing quantitative reasoning, writing, humanities and arts, science, and social science, respectively. See “Distributional Requirements” under “Requirements for the B.A. or B.S. Degree” (http://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
BRW ₃₅	35 Broadway	MEC	Malone Engineering Center
C	Connecticut Hall	ML	Mason Laboratory
CCAM	Center for Collaborative Arts and Media	MY	Pauli Murray College
CO ₄₅₁	451 College Street	OML	Osborn Memorial Laboratories
CO ₄₉₃	493 College Street	PC	Pierson College
CRB	Class of 1954 Chemistry Research Building	PH	Phelps Hall
CSC	Child Study Center	PR ₇₇	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	SA ₁₀	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
HLH ₁₇	17 Hillhouse Avenue	STOECK	Stoeckel Hall
HLH ₂₈	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	TM ₄₃₂	432 Temple Street
		UT	University Theatre
		V	Vanderbilt Hall
		W	Welch Hall
		WALL ₅₃	53 Wall Street
		WALL ₈₁	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*.

FALL 2020

Additional information will be added as it becomes available.

Aug. 24	M	Move-in begins for students planning to be in residence, 9 a.m.
Aug. 28	F	Move-in ends
Aug. 31	M	Fall-term classes begin
Nov. 20	F	November recess begins after classes end
Nov. 30	M	Classes resume online
Dec. 4	F	Fall-term online classes end; online reading period begins
Dec. 10	Th	Online reading period ends; online final examinations begin, 7 p.m.
Dec. 11	F	Online final examinations continue
Dec. 14	M	Online final examinations continue
Dec. 18	F	Online final examination period ends; winter recess begins

SPRING 2021

Information forthcoming

SUMMER SESSION 2021

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

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

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

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

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

Ksenia Sidorenko, M.Phil., Title IX Coordinator

Emily Shandley, B.A., University Registrar

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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.

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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 2020–2021 are:

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

* Makeup final exams only

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
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 2019–2020 or are expected to be offered in 2020–2021. 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.

	Acceleration Credit Awarded for AP Scores	Acceleration Credit Awarded for First- Year Courses	Courses Resulting in the Forfeit of Acceleration Credit
Art	None.	None.	None.
Biology	None.	None.	None.
Chemistry	None.	1 credit for CHEM 167; 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; 1 lost by CHEM 167. If 1 acceleration credit awarded: 1 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	None.	None.	None.
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 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	1 credit for 5 on either AP Physics C test, with 5 on AP Calculus AB test or 4 or 5 on Calculus BC test. 2 credits for 5 on both parts of Physics C test with requisite score on Calculus AB or BC test. No credit for AP Physics 1 or 2 tests.	2 credits for PHYS 260, PHYS 261 or for course numbered PHYS 400 or higher.	If 1 acceleration credit awarded, 1 lost, and if 2 acceleration credits awarded, 2 lost, by any course numbered PHYS 201 or lower.
Political Science	None.	None.	None.
Psychology	None.	None.	None.
Statistics & Data Science	None.	None.	None.

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 2020–2021, 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.

Skills requirement in quantitative reasoning (two course credits) The application of quantitative methods are 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 signs 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 and have it signed by 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 one of the most rewarding and energizing of human experiences 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, that is, the 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 natural sciences or the humanities—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—beginning with a gateway course and culminating in a senior capstone project—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.

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 multidisciplinary academic 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 the 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 is designed for students interested in critically and analytically engaging in global health. The program supports students in developing and balancing an appreciation for biomedical and technical issues related to diseases and their treatment and prevention, with an understanding of the historical, social, economic, and political concerns that are implicated in how health is determined and experienced in the twenty-first century. Although most courses in global health are open to all undergraduates, students desiring greater depth in the field are encouraged to apply to become a Global Health Scholar, typically in the fall of their sophomore year. Students in the program complete an interdisciplinary course of study that includes required and elective course work across different global health competency areas. Moreover, in the summer after junior year, Global Health Scholars pursue an optional experiential learning project (e.g., internships with NGOs, archival research, field-based research with faculty, etc.), for which they can receive support in the form of designated funding and mentorship from a global health adviser. During their senior year, students enroll in a colloquium course in which they develop a capstone project that meaningfully integrates the skills and knowledge acquired through 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 in the field. 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.

International Experience

Experience abroad is an invaluable complement to academic training. Such experience may include course work at foreign universities, intensive language training, directed research, independent projects, internships, laboratory work, and volunteer service.

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 support students abroad, all of which augment students' education in a globalizing world. 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 Summer 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 the Yale College Committee on the Year or Term 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 Study Abroad office.

YALE IN LONDON

The Yale in London program offers spring-term courses in British art and culture 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 serves as a resource for Global Affairs majors contemplating careers in public service and other areas of global affairs. For further information, consult the Institute website.

Experiential Learning

Yale College recognizes that experiential learning is a valued and integral part of the Yale College academic experience, enabling students to make the transition from the classroom into their postgraduate professional careers. This experience can be acquired through a variety of means, including but not limited to summer internships, volunteer opportunities, independent projects, and research opportunities. Yale College has a number of resources available to help students identify the experiential opportunity that best complements and enhances their academic goals. The Office of Career Strategy and the Office of Fellowships are two helpful portals, available to all Yale College students. Students receiving financial aid may also be eligible for summer funding through the Domestic Summer Award (DSA) and the International Summer 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 of—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. The most important of these is the presence of a writing tutor in each residential college. Tutors meet with students on a one-to-one basis to discuss rough drafts of work in progress, research techniques, revision strategies, or other matters relevant to effective writing. Tutors can help with any writing project: senior essays, course papers, graduate school and fellowship applications, or anything intended for publication. The Writing Partners, another resource, are undergraduate and graduate students who offer drop-in help to students at any stage of writing. Finally, the Poorvu Center website offers information on using sources effectively and avoiding plagiarism.

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 students engaged in language study at Yale. The CLS also provides support for nonnative speakers of English through its English Language Program. Through the Shared Course Initiative, in collaboration with Columbia and Cornell, the CLS makes available an array of less commonly taught languages in its specialized videoconferencing rooms; these courses are credit-bearing and may count toward the language requirement. 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 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. The SAS also provides information to any member of the Yale community. Services include, but are not limited to, classroom and academic accommodations, visual materials in alternative formats, and loans of special equipment. The required first step for a student with a disability is to contact the SAS office to initiate the process of obtaining disability-related accommodations. Registration with the SAS is confidential.

Generally, a student requiring academic accommodations needs to let the SAS know at the start of each term. Students 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 the SAS. More information can be found on the SAS website, including instructions for requesting or renewing accommodations. The SAS can also be reached 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 2020–2021 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, 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. 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 2020–2021 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. The grade point average (GPA) is not a factor. 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. 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. 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 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 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 director of undergraduate studies 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 director of undergraduate studies 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 director of undergraduate studies 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.

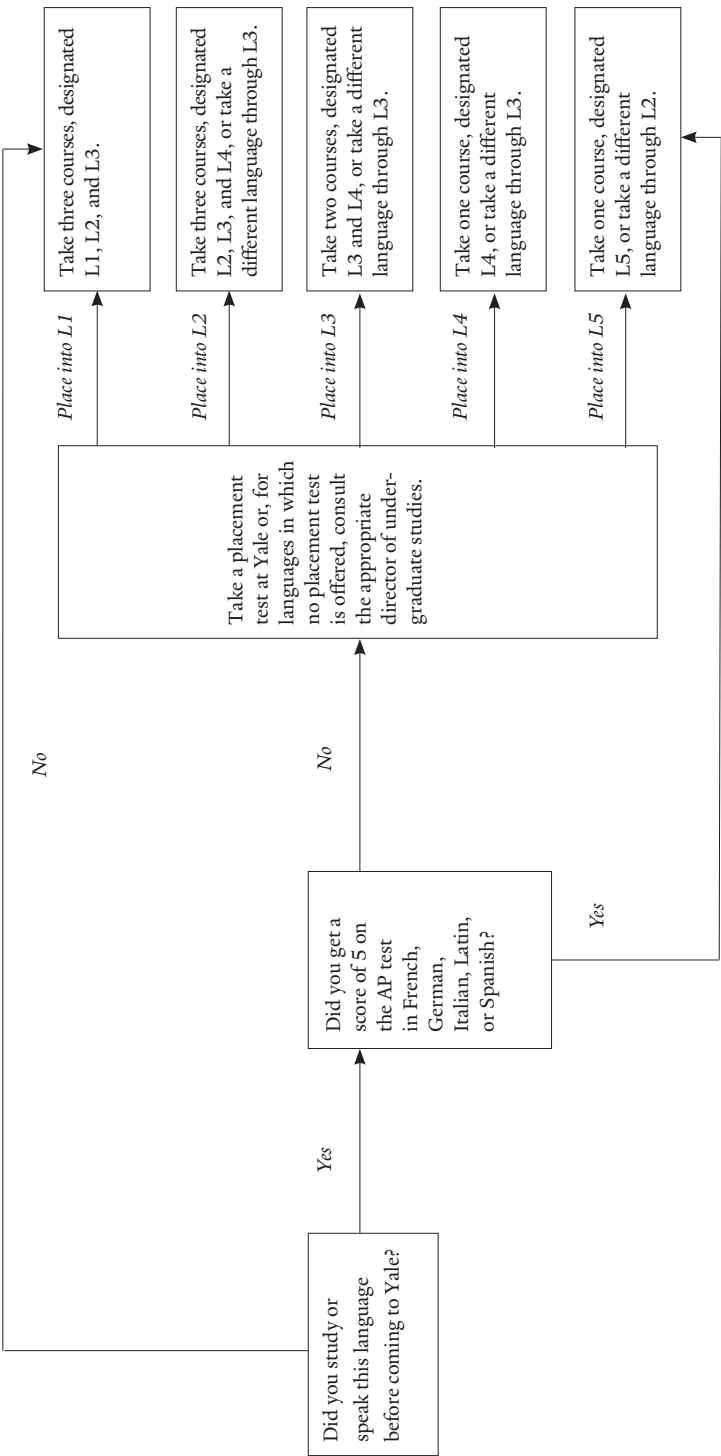
EIGHT TERMS OF ENROLLMENT

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 director of undergraduate studies 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 Aid" 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** At the start of each term, 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 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. 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 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 director of undergraduate studies 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 (Withdrew) for the course. In credit/year course sequences in which a student receives the mark of SAT or NSAT for the first term and a letter grade for the second, a student who completes the first term but does not subsequently enroll in the second term, or who subsequently withdraws from the second term before the second term is completed, will have the designation W (Withdrew) recorded for the first term of the sequence.

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

The mark of W is a neutral designation indicating simply that the student has been enrolled in, but has withdrawn from, a course; while the course 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 "Withdrew" together with the date of the withdrawal. When a student is withdrawn for disciplinary reasons, the entry placed on the student's transcript is the word "Suspended" together with the date of the suspension.
7. **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 year-long 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 year-long 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. 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 (Withdrawn) 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 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. Registration and Enrollment in Courses

REGISTRATION

All students are required to register, and to create a preliminary online course schedule as described under "Enrollment in Courses," below, at the beginning of each term in which they are to be enrolled in courses at Yale College.

1. **Fall-term registration** To register for the fall term, all first-year students must attend a registration meeting with their residential college dean and first-year counselor on the Friday before classes begin, as published in the Yale College Calendar with Pertinent Deadlines. Upper-level students must attend the registration meeting conducted by the office of the residential college dean on the day before classes begin, as published in the Yale College Calendar with Pertinent Deadlines. Students whose registration is being temporarily withheld by the Office of Student Financial Services or by any other administrative office of the University are nonetheless required to attend the appropriate registration meeting.
2. **Spring-term registration** To register for the spring term, first-year students are required to attend a registration meeting in their residential college on the day before classes begin, as specified in the Yale College Calendar with Pertinent Deadlines. Sophomores, juniors, and seniors are required to pick up registration materials from the office of the residential college dean on the first day of classes, as specified in the Yale College Calendar with Pertinent Deadlines. Students

whose registration is being temporarily withheld by an administrative office of the University are nonetheless required to report for spring-term registration as indicated immediately above.

3. **Late registration** A student who, for reasons other than an incapacitating illness or incapacitating condition of any kind, the death of a family member, or a comparable emergency, fails to follow the registration procedures in paragraph 1 or 2 above may register for the term only by exceptional action of the Committee on Honors and Academic Standing and will be liable for a fine of \$50.

ENROLLMENT IN COURSES

Students may enroll in courses only by submitting an approved course schedule or, if amending the course schedule, by submitting an approved course change notice. Attendance at a class does not constitute enrollment. The course schedule is an important document. A student is responsible for the timely submission of the course schedule and for the accuracy of all the information that the student enters upon it. 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. **Preliminary online course schedule** In both fall and spring terms, all students must create a preliminary course schedule in Online Course Selection (OCS) by 11:59 p.m. on the day before classes begin. Students who fail to submit a preliminary schedule by the deadline will be charged a fine of \$50. The preliminary course schedule must contain at least three course credits. Students are expected to edit their online course schedules regularly during the course selection period, retaining courses they are actively considering and removing courses in which they do not plan to enroll.
2. **Deadline for submitting final schedules** Every student must submit a final course schedule for each term at the office of the residential college dean by 5 p.m. on the deadline indicated on the student's course schedule and listed in the Yale College Calendar with Pertinent Deadlines. Students whose registration has been withheld by the Office of Student Financial Services or any other administrative office of the University must nonetheless submit their course schedules by these same deadlines.

It is the student's responsibility to obtain all necessary signatures, except that of the residential college dean, before the schedule is due. In the rare instance that the student's adviser is unavailable before the deadline, the student should nonetheless submit the schedule on time, and take a copy to be signed by the adviser and submitted to the dean as soon as possible. If the student does not submit a copy of the schedule signed by the adviser within one week of the deadline, the student will be subject to the fines and restrictions described under paragraphs 4 and 5 below.

3. **Addition of a new course after the deadline** The election of a new course after the deadline for submitting a course schedule will not be permitted save by exceptional action of the Committee on Honors and Academic Standing. Students who seek such an exception should consult immediately with the residential college

dean. Permission to elect a new course 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 during the course selection 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 late schedules** Students who submit their schedules after the deadlines will be fined at least \$50. Additional fines, increased \$5 daily according to lateness, will be imposed for schedules submitted more than one week after the deadlines. A schedule received more than two weeks after it is due will be accepted only by exceptional action of the Committee on Honors and Academic Standing and will be subject to an increased fine or other penalty.
5. **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.
6. **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, 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.
7. **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.
8. **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.
9. **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.
10. **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.
 11. **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.
 12. **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.
 13. **Placement in language courses** Students placed by a language program or by their score on the Advanced Placement examination into a particular level of a language may not earn course credit for the completion of a course in that language at a level lower than the placement. For example, a student placed into the third term (L3) of a language earns no course credit for the completion of an L1 or L2 course in that language. Should a student complete a language course at a level lower than the placement, the lower-level course with its grade appears on the transcript but earns no credit toward graduation.
 14. **Use of vertebrate animals** If the satisfactory completion of a course will require the use of vertebrate animals in experiments, the student must be notified of that requirement at the first meeting of the course. If a student objects on ethical grounds to participating in the animal usage in question, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged.

15. **Field trips** If the satisfactory completion of a course will require participation in a field trip, students should understand that there are inherent risks, including the risks of travel, involved in such an activity. If a student objects to assuming these risks, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged. Yale College's policies regarding field trips can be found at the Yale College Academic Field Trip Policies website.
16. **Fieldwork** If a student is conducting fieldwork away from the Yale campus, under the supervision of a faculty member, 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. 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 at 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. on the last day of classes before the reading period, the transcript will record the course and show the neutral designation W (Withdrew) for the course. If a student enrolled in a half-term course formally withdraws from it after the deadline for the course to be removed from the transcript, but by the last date a withdrawal is permitted from the course, the student's transcript will record the neutral designation W (Withdrew) for the course. See the Yale College Calendar with Pertinent Deadlines for both dates in each term. The deadlines apply to all courses, whether or not a particular course observes the reading period.

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

After these deadlines, withdrawal from a course is not permitted. An exception will be made only for a student who 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.

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. 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 the term in the spring.

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. 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 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 in person or by mail by June 1. For reinstatement to a spring term, applications must be submitted in person or by mail by November 1. These deadlines are strictly enforced.

Frequently Asked Questions are available online to provide additional information about reinstatement procedures as well as contact information for the chair of the Committee on Reinstatement for reinstatement inquiries.

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 Income Contribution (SIC) for the subsequent summer. Students may apply for a waiver of the SIC 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. Students on disciplinary probation and leave of absence are not eligible to participate in a Year or Term Abroad.

Students in any major may apply. 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. Students are limited to a total of two terms abroad for Yale graduation credit transfer and financial aid transfer.

Students must be in academic good standing as second-term sophomore or junior 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 towards raising the GPA in the semesters 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, Spanish, Portuguese, or Russian are generally expected to take all of their courses in the language of the host country and should have completed 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 completed, 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 the committee for an exception to language eligibility requirements if the program’s theme and core courses align with their major.

The Application for Credit for a Year or Term Abroad is available on the 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 Abroad Budget for Financial Aid application to Student Financial Services. Approval

from the Yale College Committee on the Year or Term Abroad is contingent upon the student's acceptance into a program or university abroad and the Yale Travel Policy. Students must complete additional pre-departure requirements before departure.

The Application for Credit to study abroad in the spring term of the academic year 2020–2021 is due on October 15, 2020. 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.

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 Study Abroad website. Note that application deadlines differ from program to program and usually also differ from the Yale College committee's 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 College committee's deadline.

When selecting programs abroad in which to enroll, students should be aware that such programs vary in quality, and some may not be approved for a Year or Term Abroad. At a minimum, approved programs must involve full-time work at the university level and must be undertaken during the regular academic year at an institution outside the United States. Students should note that programs in the Southern Hemisphere are subject to a different academic calendar, one which extends into the months of June, July, and August. With this exception, summer terms do not qualify as part of a Year or Term Abroad.

Students should choose from the list of designated programs available on the 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 by the stated deadlines. The Yale College Committee on the Year or Term Abroad evaluates programs primarily on the quality and structure of their academic offerings. Study abroad advisers are available in the Center for International and Professional Experience 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 (5 credits for Cambridge or Oxford). What the committee considers a full program of study varies from program to program due to differences in academic credit systems. Students should consult with the Study Abroad office to ensure that they are enrolled in a full program abroad.

Usually, if the student has consulted with the director of undergraduate studies and a Study Abroad adviser before going abroad, the award of credit upon return from a Year or Term Abroad is routine.

2. **Other course credit from outside Yale** Enrollment in the Year or Term Abroad program 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 towards major and distributional requirements.

3. **Evidence of course work** The approved study abroad program or university must submit to the Study Abroad office such evidence of their 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 one or two 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. Students should also notify the Study Abroad office. 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 by the committee 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."

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.

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.

Courses in performance in the School of Music may be taken only after completion of MUSI 363, Performance: Fourth Term, or MUSI 463, Advanced Performance: Fourth Term, in the Department of Music. Performance courses in the School of Music may not be counted toward the 36-course-credit requirement for the bachelor's degree. Such courses will be included on the student's transcript, but must be offered in excess

of the thirty-six credits required for graduation. For further information, see under Music. Nonperformance courses in the School of Music may be taken for credit without previous completion of MUSI 363 or 463; such courses are also included in the limit of four credits that may be earned in professional schools of the University.

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.

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; 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, 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.

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 must 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.

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, Forestry & Environmental

Studies, 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, only four online courses may be applied towards 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 towards 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 successfully completed in Yale Summer Session may be counted toward the requirements of the student's major program. 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 (in a language other than English). 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 towards 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.

Those in Categories 1 and 2 should contact the instructor of the course directly; those in Categories 3, 4, and 5 must complete an auditing form, available at the Yale Affiliate 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. Information is available at the Yale Alumni Auditing Program website.

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.

Persons interested in auditing a course should contact the Yale College Dean's Office, 1 Prospect Street, Academic Affairs suite (lower level).

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 more than 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.
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 and complete the requirements of a major program in Yale College. See *Majors in Yale College* and *The Undergraduate Curriculum under Major Programs*. 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 foreign language requirement.
5. **Credit/D/Fail** Eli Whitney students have up to four opportunities to convert a course to 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 submission deadline for seniors. 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 not eligible to enroll in Directed Studies or first-year seminars, even during their first year in the program.
7. **Tuition and financial aid** Tuition for the 2020–2021 academic year for Eli Whitney students is \$6,370 per course credit, and Eli Whitney students are not to be charged in excess of the maximum full tuition rate of \$28,850 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. **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.
12. **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.
13. **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, 1 Prospect St., Academic Affairs suite (lower level). 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 2020–2021 is \$6,370 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: (a) 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; (b) 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; (c) 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, Registration and Enrollment in Courses. Late tuition payments will be accepted no later than September 16, 2020, for fall 2020, and January 29, 2021, for spring 2021. Any student who has not completed payment in full for courses by these dates 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 or university 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 the Study Abroad office (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. 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** Students receiving credit for study on a Year Abroad are not eligible to apply additional credit from outside Yale toward the 36-course-credit requirement. Students receiving such credit on a Term Abroad may apply up to two course credits from outside Yale toward the 36-course-credit requirement.

By contrast, students receiving credit for study on a Year or Term Abroad may 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).

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 towards major and distributional requirements.

9. **Non-Yale Summer Abroad** Students who wish to receive credit for summer study abroad with non-Yale programs must apply for approval through the Study Abroad office. The deadline to apply for 2021 non-Yale Summer Abroad credit is March 1, 2021. Information about the application process, including a list of eligible non-Yale programs, is available on the 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, unless such programs include as a component a full, regular, academic course of instruction, and are 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") and may not be applied toward a distribution 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 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 First-Year Student Handbook website. 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 of classes in the sixth term of enrollment. The absolute and final deadline for applying for acceleration by two terms is the last day of classes in the fifth 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. 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 director of undergraduate studies, 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.)	Engineering Sciences (Mechanical) (B.A. or B.S.)
African Studies (B.A.)	English (B.A.)
American Studies (B.A.)	Environmental Engineering (B.S.)
Anthropology (B.A.)	Environmental Studies (B.A. or B.S.)
Applied Mathematics (B.A. or B.S.)	Ethics, Politics, and Economics (B.A.)
Applied Physics (B.S.)	Ethnicity, Race, and Migration (B.A.)
Archaeological Studies (B.A.)	Film and Media Studies (B.A.)
Architecture (B.A.)	French (B.A.)
Art (B.A.)	German Studies (B.A.)
Astronomy (B.A.)	Global Affairs (B.A.)
Astrophysics (B.S.)	Greek, Ancient and Modern (B.A.)
Biomedical Engineering (B.S.)	History (B.A.)
Chemical Engineering (B.S.)	History of Art (B.A.)
Chemistry (B.A. or B.S.)	History of Science, Medicine, and Public Health (B.A.)
Classical Civilization (B.A.)	Humanities (B.A.)
Classics (B.A.)	Italian (B.A.)
Cognitive Science (B.A. or B.S.)	Judaic Studies (B.A.)
Comparative Literature (B.A.)	Latin American Studies (B.A.)
Computer Science (B.A. or B.S.)	Linguistics (B.A.)
Computer Science and Economics (B.S.)	Mathematics (B.A. or B.S.)
Computer Science and Mathematics (B.S.)	Mathematics and Philosophy (B.A.)
Computer Science and Psychology (B.A.)	Mathematics and Physics (B.S.)
Computing and the Arts (B.A.)	Mechanical Engineering (B.S.)
Earth and Planetary Sciences (B.A. or B.S.)	Modern Middle East Studies (B.A.)
East Asian Languages and Literatures (B.A.)	Molecular Biophysics and Biochemistry (B.A. or B.S.)
East Asian Studies (B.A.)	Molecular, Cellular, and Developmental Biology (B.A. or B.S.)
Ecology and Evolutionary Biology (B.A. or B.S.)	Music (B.A.)
Economics (B.A.)	Near Eastern Languages and Civilizations (B.A.)
Economics and Mathematics (B.A.)	Neuroscience (B.A. or B.S.)
Electrical Engineering (B.S.)	Philosophy (B.A.)
Electrical Engineering and Computer Science (B.S.)	Physics (B.S.)
Engineering Sciences (Chemical) (B.S.)	Physics and Geosciences (B.S.)
Engineering Sciences (Electrical) (B.A. or B.S.)	Physics and Philosophy (B.A. or B.S.)
Engineering Sciences (Environmental) (B.A.)	Political Science (B.A.)
	Portuguese (B.A.)
	Psychology (B.A. or B.S.)
	Religious Studies (B.A.)

Russian (B.A.)
Russian and East European 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.)

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 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 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 Holly Hermes. (holly.hermes@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 first term of the 200-level AFROTC requirement 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 Thomas McCarthy, USAF (*Adjunct*)

Lecturers Captain Estelle Baik, USAF, Lieutenant Colonel Holly Hermes, USAF, Lieutenant Colonel Kristen Snow, USANG

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, 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, Jacqueline Goldsby, Emily Greenwood, Matthew Jacobson, Gerald Jaynes, Kobena Mercer, Christopher Miller, Claudia Rankine, Robert Stepto (*Emeritus*), Michael Veal

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

Assistant Professors Carolyn Roberts

Lecturers Aaron Carico, Thomas Allen Harris

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), 309B LUCE, 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, 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 four major languages from sub-Saharan Africa: Kiswahili (eastern and central Africa), Yorùbá (western Africa), Wolof (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 double 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

Senior requirement Senior essay (AFST 491)

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

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 (*Forestry & Environmental Studies*), 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 ANTH 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 Sachem 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 Vaggia, David Watts

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

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

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 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 is a core of essential concepts and techniques used in addressing most problems. The Applied Mathematics major provides a foundation in these mathematical techniques and trains 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, Chemical, Electrical, Environmental, 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.

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 equivalents. 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, 260, 300, 301, 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 462, CPSC 662, ENAS 962;
 - (f) mathematical economics: ECON 125, 126, 350, 351, 417, 433, 460, 471;
 - (g) electrical engineering: EENG 397, 436, EENG 442, 455, S&DS 364;
 - (h) data mining and machine learning: S&DS 262, 365, 669, 671, CPSC 445, 453, 470, 474, 477, 663, 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 277, LING 380.

*CHEM courses with number 410 and above may count as a breadth requirement with permission of the DUS.

Because departmental curricula from which the program draws regularly change, the DUS maintains a more exhaustive list of courses satisfying this particular requirement.

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 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); the course selected may not be counted toward the area requirement for the major (see 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 the list in 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 seminar and project (AMTH 490), or a special project completed during senior year (AMTH 491).

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120 or ENAS 151, and MATH 222 or 225, 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 or 301 (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 sem (AMTH 490) or special project (AMTH 491)

FACULTY ASSOCIATED WITH THE PROGRAM OF APPLIED MATHEMATICS

Professors Andrew Barron (*Statistics & Data Science*), David Bercovici (*Geology & Geophysics*), Donald Brown (*Emeritus*) (*Economics, Mathematics*), Joseph Chang (*Statistics & Data Science*), Ronald Coifman (*Mathematics*), Stanley Eisenstat (*Computer Science*), Michael Fischer (*Computer Science*), Igor Frenkel (*Mathematics*), Roger Howe (*Emeritus*) (*Mathematics*), Peter Jones (*Mathematics*), John Lafferty (*Statistics & Data Science*), A. Stephen Morse (*Electrical Engineering*), David Pollard (*Statistics & Data Science*), Nicholas Read (*Physics, Applied Physics*), Vladimir Rokhlin (*Computer Science*,

Mathematics), Peter Schultheiss (*Emeritus*) (*Electrical Engineering*), Martin Schultz (*Emeritus*) (*Computer Science*), Mitchell Smooke (*Mechanical Engineering, Applied Physics*), Daniel Spielman (*Computer Science, Statistics & Data Science*), Mary-Louise Timmermans (*Geology & Geophysics*), Van Vu (*Mathematics*), Günter Wagner (*Ecology & Evolutionary Biology*), John Wettlaufer (*Geology & Geophysics, 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*), Sekhar Tatikonda (*Electrical Engineering, Statistics & Data Science*)

J. W. Gibbs Assistant Professors Asher Auel, Ross Berkowitz, Ariel Jaffe, Gal Mishne

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; see the First-Year Student Handbook for more information.

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 prerequisite requirements for the Class of 2021 Students who declared their major under previous requirements must follow the prerequisite requirements as indicated when they declared.

The prerequisite requirements for the Class of 2022 and subsequent classes 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).

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, 450, 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)

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, Richard Chang (*Emeritus*), 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, Owen Miller

†A joint appointment with primary affiliation in another department.

Archaeological Studies

Director of undergraduate studies: Oswaldo Chinchilla, 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, 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

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, Environmental Studies, Earth and Planetary Sciences, 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

Geology & Geophysics 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: digital media 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 (Elementary calculus is strongly recommended as preparation for graduate studies in architecture.)
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 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 For the Class of 2022 and subsequent classes the Urban Studies concentration will be called Urbanism. 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, 380, 431 or other relevant courses approved by the DUS in History of Art; History. 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, 324, 341, 344, 345, 347, 385, or other relevant courses in American Studies; Ethics, Politics, and Economics; Environmental Studies; or Political Science approved by the DUS. Examples include: AFAM 358, AFAM 450, AMST 331, ANTH 414, ENAS 425, ER&M 293, EVST 196, 227, 255, 292, 403, F&ES 573, G&G 212, SOCY 341 and 584.

Materials and design Electives can be chosen from ARCH 162, 330 or another relevant course approved by the DUS. Examples of approved courses include 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. Examples of approved courses include 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 director of undergraduate studies (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 offer no 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 April 9, 2021. 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 April 30, 2021. 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 no later than 4 p.m. on March 26, 2021, in 328 Rudolph (third floor), 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, by April 30, 2021 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 by May 31, 2021.

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*), Alan Plattus, Alexander Purves (*Emeritus*)

Associate Professor Eeva-Liisa Pelkonen

Assistant Professors Sunil Bald (*Adjunct*), Jesse LeCavalier (*Visiting*), Bimal Mendis (*Adjunct*), Kyoung Sun Moon, Elihu Rubin

Lecturers Victor Agran, Erleen Hatfield

Critics Marta Justo Caldeira, Katherine Davies, Kyle Dugdale, Andrei Harwell, Adam Hopfner, Joyce Hsiang, Timothy Newton

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/undergraduate

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 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 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 programs 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 will be present on the first day of classes for counseling at lunchtime on September 2, 2020, from 11:30 a.m. to 1:30 p.m. adjacent to the School of Art Gallery at Holcombe T. Green Jr. Hall, 1156 Chapel St. Students seeking advice about course selection or the program in Art should come at that time. Others wishing to elect Art courses should go to the first meeting of the class, where each instructor determines the class enrollment. Most studio art courses have a course fee requirement for materials and guest speakers in addition to individual course materials that must be purchased from a supply list. For courses beginning in the spring term, counseling will be held on January 19, 2021, from 11:30 a.m. to 1:30 p.m. adjacent to the School of Art Gallery at Holcombe T. Green Jr. Hall, 1156 Chapel St. All Art majors are required to register with the DUS at the beginning of each term at the time and place listed above or during office hours 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 (100-level) 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 100 level (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. 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* include ART 132; 264 and 265; 368 or 369; and 468 or 469. Students in the *photography concentration* take ART 136 and/or ART 138; 237; 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 241; 142; 341; 342; and 442 or 443. Students in the filmmaking concentration may substitute two courses in Film and Media Studies for the history of art requirement.

Requirements of the *painting/printmaking concentration* for the Class of 2021 and 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 prereqs, 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 100-level courses

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

Specific course required *All concentrations*—ART 395 or 301; *Graphic design*—ART 132, 264, 265; 368 or 369; 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; 337 or 338; 379, 401; *Sculpture*—ART 110; 120 or 121; 345, 346, 445; *Filmmaking*—ART 241, 142, 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 Faruquee, 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; 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: Samantha Lin (samantha.lin@yale.edu) and Leah Hartmann (amaleah.hartman@yale.edu)

Yale offers four biological science majors: Ecology and Evolutionary Biology (E&EB); Molecular Biophysics and Biochemistry (MB&B); Molecular, Cellular, and Developmental Biology (MCDB); and Neuroscience (NSCI). The distinctions between these majors reflect the types of biological systems analysis each represents: the analysis of whole organisms, populations, and ecosystems (E&EB); the analysis of life at the molecular level using tools of chemistry and physics (MB&B); the analysis of molecular, cellular, and developmental biology, genetics, neurobiology, and quantitative biology (MCDB); and the analysis of neurons, neural circuits, brains, and behavior, using a wide range of approaches (NSCI).

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.

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; 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 twelve 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, and 356L.

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 both 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.

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; MATH 120 or ENAS 151; PHYS 180, 181, and 205L, 206L (or 165L, 166L with DUS permission)

Number of courses 12 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; *Bioimaging track*—3 from BENG 404, 406, 410, 444, 445, 475, 476, 485; *Biomechanics and Mechanobiology track*—3 from MENG 185, 280, 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 101/102 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 Richard Carson, †Nicholas Christakis, †Robin de Graaf, James Duncan, Jay Humphrey, Fahmeed Hyder, Themis Kyriakides, Andre Levchenko, †Evan Morris, †Laura Niklason, †Xenophon Papademetris, Douglas Rothman, Mark Saltzman, †Martin Schwartz, †Frederick Sigworth, †Brian Smith, Lawrence Staib, †Hemant Tagare, †Paul Van Tassel, Steven Zucker

Associate Professors †Joerg Bewersdorf, Stuart Campbell, Tarek Famy, Rong Fan, Anjelica Gonzalez, †Chi Liu, Kathryn Miller-Jensen, †Corey Wilson

Assistant Professors Michael Mak, Michael Murrell, †Steven Tommasini, †Jiangbing Zhou

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)

During the spring term, and the summer break, the Yale in London program at the Paul Mellon Centre for Studies in British Art, located in central London, offers courses in British studies generally including British history, history of art or architecture, literature, and drama. 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 must be taken for a letter grade. Further information is available on the program's website. Inquiries may also be directed to yaleinlondon@yale.edu. The application deadline for the spring term 2021 is Thursday, October 15, 2020. Students will be notified of acceptance within one month of the application deadline. Inquiries about the summer program, described in The Undergraduate Curriculum, should be directed to the same address. Applications for summer 2021 are due Monday, February 15, 2021.

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.

The educational objectives of the Chemical Engineering program are the following. Graduating students will achieve positions of leadership within academia, industry, and government; excel in top graduate programs in chemical, biomedical, environmental, and related engineering fields; excel in top professional schools in fields such as law, medicine, or management; join and rise in the ranks of large and small corporations; become successful entrepreneurs; and practice engineering toward the benefit of humankind.

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; ENAS 130; PHYS 180, 181. Students with advanced high school preparation may reduce the number of prerequisites by placing out of certain courses.

REQUIREMENTS OF THE MAJOR

All students majoring in Chemical Engineering and Engineering Sciences (Chemical) must follow the requirements listed below as approved by the program's faculty. 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).

B.S. degree program in Chemical Engineering The curriculum for the ABET-accredited B.S. degree in Chemical Engineering requires nineteen courses, totaling eighteen credits, including the senior requirement, CENG 416, and the following courses beyond the prerequisites:

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

B.S. degree program in Engineering Sciences (Chemical) The B.S. degree in Engineering Sciences (Chemical) requires eleven 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. Mathematics: ENAS 194
2. 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
3. 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; ENAS 130

Number of courses 19 courses, totaling 18 credits, beyond prereqs (incl senior req)

Specific courses required 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; ENAS 130

Number of courses 11 term courses beyond prereqs (incl senior req), chosen in consultation with DUS

Specific courses required 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, Jachong 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 †Anikò 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, 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 taking chemistry for the first time, perhaps took chemistry as a high school sophomore, or even may have taken 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. Students who have done well in an advanced placement chemistry course or show other evidence of high achievement in science and mathematics may be given permission to start in CHEM 167. 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. Lists of times and places for the fall-term placement examination and counseling sessions also are available on the department website.

Permission keys Enrollment in CHEM 163 or CHEM 174 through the Yale Online Course System requires an electronic permission key. Keys are issued automatically after placement has been completed by the department for entering first-year students and are displayed as green key-shaped icons next to the appropriate courses on the online registration page. Students experiencing problems with permission keys should email chemistry.dus@yale.edu

Upper 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 keys are needed, upper-level students should obtain them by inquiring at the department office, 249 SCL. 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. Due to the nature of laboratory exercises, it is impractical to preview laboratory courses during the course selection period.

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 take 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 410 or higher 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. In most instances students with advanced placement taking only CHEM 167 may complete this requirement by taking a course in biochemistry, inorganic chemistry, or 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: a B.A., a B.S., an intensive major leading to a B.S., and a 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, the environment, or medicine. The B.S. degree is intended to prepare students for graduate study while permitting extensive exploration of other disciplines. 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. Students electing this major program also can satisfy the requirements for a certified degree in chemistry as set forth by the American Chemical Society. 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 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 little 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 the 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 kept on file in the department office. Majors who have a current course of study (COS) form on file may have their schedules signed by the DUS or by any of the advisers to the major. A current list of advisers to the major may be obtained in the department office.

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 175, 221, or 230; and CHEM 332 or 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 unless the assigned initial placement of a student is 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 also must drop the laboratory course.

REQUIREMENTS OF THE MAJOR

Prerequisites CHEM 161 and 165 or 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 addtl course credits in advanced lectures or labs, incl at least 1 lecture and 1 lab; *B.S., intensive major* — 5 addtl 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 depts for advanced chem courses with DUS permission

Senior requirement *B.A.* — CHEM 400; *B.S.* — 2 terms of CHEM 490, or CHEM 400 and 1 addtl 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 †Sidney Altman (*Emeritus*), Victor Batista, Gary Brudvig, Robert Crabtree, †Craig Crews, R. James Cross, Jr. (*Emeritus*), Jonathan Ellman, John Faller (*Emeritus*),

†Gary Haller (*Emeritus*), Sharon Hammes-Schiffer, Nilay Hazari, Seth Herzon, Patrick Holland, †Francesco Iachello (*Emeritus*), Mark Johnson, William Jorgensen, J. Patrick Loria, James Mayer, J. Michael McBride (*Emeritus*), Scott Miller, Peter Moore (*Emeritus*), †Anna Pyle, †Lynne Regan (*Emeritus*), †James Rothman, Martin Saunders, Charles Schmuttenmaer, †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, Hailiang Wang

Assistant Professors Caitlin Davis, Ziad Ganim, †Stavroula Hatzios, Sarah Slavoff, †Mingjiang Zhong

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

Preceptors Mioy Huynh, Jenny Martinez

†A joint appointment with primary affiliation in another department.

Child Study Center

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's 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, or ancient philosophy. 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 17 (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 17 (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 4 courses with the designation CLCV at the 100- or 200-level, including at least 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, a survey of the literature and culture of ancient Athens, 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), and one term course in ancient Greek history. The language courses should

include GREK 403. 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, 140) or above, as well as 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.

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 17 (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 2 term courses in ancient Greek numbered 390 or higher; 1 course that covers broadly the literature and/or culture of ancient Greece, and 1 course that covers broadly the literature and/or culture of ancient Rome; 1 term course in ancient Greek hist; 1 term course in postclassical Greek hist or culture

Senior requirement Senior dept exam

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

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 student transcripts.

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 transcript.

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, Emily Greenwood, Verity Harte, Brad Inwood, Diana Kleiner, Christina Kraus, Noel Lenski, Joseph Manning

Associate Professors Milette Gaifman, Andrew Johnston, Pauline LeVen, Irene Peirano Garrison

Assistant Professor Jessica Lamont

Lecturers Francoise Gerardin, Ann Ellis Hanson, 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 139, 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 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. Residential college seminars for the fall and spring terms are described on the Residential College Seminar Program website and 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 ordinarily enroll in no more than four college seminars total during their time at Yale. Auditing is not permitted in college seminars.

Comparative Literature

Directors of undergraduate studies: Moira Fradinger (moira.fradinger@yale.edu)r, 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, while providing opportunity for students to explore their particular interests within the study of literature. 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 major for the Class of 2021 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 2022 and subsequent classes The Comparative Literature major requires twelve term courses, including the senior requirement. Prospective majors must take 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.

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 elective course that involves a significant component of literary or cultural theory. Students who wish to know if a particular 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, and three elective courses. One of the electives must involve a significant element of literary or cultural theory. All three elective courses 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 All majors are required to take at least three courses, one of which may award the language distributional requirement (L5), in an ancient or modern foreign literature, in which the literature is read in the original language. 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 elective 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 (rather than three, though neither course may be substituted with an advanced language course). In addition, students in the film concentration must take one course in film theory and 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 must be an L5 course); and must also choose two of their three electives from courses that engage with some aspect of translation studies; the office of the DUS maintains 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 to the DUS 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.

ADVISING AND COURSE SUBSTITUTIONS

A literature course 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. This form is available in the department office in Rm. 102, 451 College St.; 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 foreign language distributional requirement by taking ENGL 114, 115, 120, 121, or 450 may take three additional English literature courses to fulfill the foreign literature requirement of this concentration, or they may fulfill the major requirements in a third language.

STUDY ABROAD

Comparative Literature majors are encouraged to consider spending a summer, a term, or a year abroad. One course taken through international programs 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 *Literature and Comparative Cultures*—3 courses in a foreign lit, as specified; 3 period courses, as specified; 3 elective courses, 1 of which must involve a significant element of literary or cultural theory; *Intensive Language*—2 courses in a second foreign lit; *Film*—2 courses in 1 foreign lit, as specified; 1 course in film theory; 3 electives in Film and Media Studies; *Literary Translation*—2 of 3 electives 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

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*), Wai Chee Dimock (*English*), 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 surveys the field of computer science, including systems (computers and their languages) and theory (algorithms, 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, six additional 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, four additional intermediate or advanced course 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, 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, CPSC 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, Stanley Eisenstat, 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, Sahand Negahban,* Ruzica Piskac

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

Senior Research Scientists Robert Bjornson, Andrew Sherman

Senior Lecturers James Glenn, Kyle Jensen,* Stephen Slade

Lecturers Andrew Bridy,† Benedict Brown, Cody Murphey, Scott Petersen, Brad Rosen, Andrew Sherman, Cecillia 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, or ECON 433). 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, and ECON 433 in the intersection of computer science and economics that count as electives in CPSC or ECON or both. At least one such course is required for CSEC, and students may not count the same course as an elective for CSEC. At least two electives must be taken in the CPSC department, and at least one must be taken in

the ECON 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 CPSC or ECON.

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 CSEC 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 first week of the term to ensure that their proposed course schedules are appropriate. Similarly, declared majors should meet with their academic advisers during the first week of the term 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, 323, 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 indicated; 5 electives as indicated

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; Yifeng Liu (yifeng.liu@yale.edu) (Mathematics) DL 410; 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 from CPSC 440, 460, 463, 464, 465, 466, 467, 468, or 469; and one additional advanced term course other than CPSC 280 or 490. The remaining eight courses must be in mathematics: MATH 120, either 222 or 225, 244, and five additional term courses numbered above MATH 200 other than MATH 470. MATH 230 and 231 may replace (but do not count in addition to) MATH 120 and 222 or 225.

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 (not incl senior req)

Specific courses required CPSC 201, 223, 323; 365 or 366; one from CPSC 440, 460, 463, 464, 465, 466, 467, 468, or 469; MATH 120; 222 or 225; 244

Distribution of courses 5 addtl courses in math numbered above 200 (may not be MATH 470); 1 addtl advanced course in comp sci (may not be CPSC 280 or 490)

Substitution permitted MATH 230, 231 for MATH 120 and 222 or 225

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

The major for the Class of 2021 With approval from 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.

The major for the Class of 2022 and subsequent classes 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 through 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 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 Comp Sci, 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 For CPSC 202, MATH 244; for 1 course in AI, 1 course in cognitive psychology or cognitive science; for PSYC 200, 1 addtl course in PSYC and exam arranged with instructor

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, History of Art track, or the Music track. Additional prerequisites for the Theater and Performance Studies track are THST 110 and 111. 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.

Students in the Class of 2020 and 2021 With DUS approval, students may follow the requirements listed here that include a larger selection of computer science courses or they may follow the course requirements that were in place when they declared their major.

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, 261, 360, and 362; (3) two elective courses from any of the three concentrations: Design; History, Theory, and Criticism; Urbanism; (4) two courses from CPSC 475,

478, or 479; 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 475, 478, and 479; (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, S290, MUSI 316, 320, 321, 409, 414, 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 210; (2) three courses in dramatic literature, theater history, or performance theory; (3) two Theater and Performance Studies seminars in design, directing, or playwriting; (4) CPSC 431 or 432; (5) CPSC 478 or 479; (6) 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; *Theater and Performance Studies track*—THST 110, 111

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, 261, 360, 362; 2 courses from CPSC 475, 478, or 479; *Art track*—ART 395 or 301; 2 from CPSC 475, 478, 479; *History of Art track*—2 from CPSC 437, 475, 478, 479, including 1 of CPSC 478, 479; 1 intro, 100-level course; HSAR 401; *Music track*—CPSC 431, 432; MUSI 315; *Theater and Performance Studies track*—CPSC 431 or 432; CPSC 478 or 479; THST 210

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 at 200 or 300 level, and 1 at 400 level as specified; *History of Art track*—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, S290, MUSI 316, 320, 321, 409, 414, 420, 421, 425, 481, 495; *Theater and Performance Studies track*—3 courses in dramatic literature, theater history, or performance theory; 2 seminars, 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), Whitney Humanities Center 321 (53 Wall 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. (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 sixteen 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 Earth and other planets, the environment, and life on a regional and a planetary scale. 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 theory, observation, and prediction of the atmosphere-ocean-climate system. Topics range from past climate changes, including the ice ages, to present-day storms and weather, to forecasting climate change and global warming. 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).

For students in the Class of 2021 With approval from the DUS, the following changes to the requirements of the major may be fulfilled by students who declared their major under previous requirements.

For students in the Class of 2022 and subsequent classes 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 EPS 111L, or EPS 125 and EPS 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, 140, or 125 and 126L. 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 EPS 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 manifestation 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, 125 and 126L, or 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), 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 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, EPS 126L, 4 from EPS 232, 225 255, 310, 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*—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 (*Chair*), David Bercovici, 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, James Saiers, Ronald Smith, Mary-Louise Timmermans (*DUS*), John Wettlaufer

Associate Professor Noah Planavsky

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

Lecturers Marilyn Fox, Michael Oristaglio, Frank Robinson, Ellen Thomas

East Asian Languages and Literatures

Director of undergraduate studies: Luke Bender, (luke.bender@yale.edu) 143 Elm St., Rm. 201, 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 at the beginning of the academic year. The times and places of the examinations are listed on the department website in August. The Chinese and Japanese examinations have online components accessed through the same site. 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 student transcripts.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. 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

Assistant Professors Lucas Bender, Michael Hunter

Senior Lecturer Pauline Lin

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, Jianhua Shen, Mari Stever, Wei Su, Chuanmei Sun, Haiwen Wang, Yu-lin Wang Saussy, Peisong Xu, 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) 308 RKZ, 432-5256; 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*), Kang-i Sun Chang (*East Asian Languages & Literatures*), 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*), Peter Perdue (*History*), 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, Garrett Bredell, Russell Burge, Paula Curtis, Philip Gant, Jooyeon Hahm, Alex Finn Macartney, David Porter, Kyle Shernuk, Tomonori Sugimoto

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: Stephen Stearns
(stephen.stearns@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 tracks. *Track 1* emphasizes courses appropriate for careers in ecology, evolutionary biology, and environmental science; *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, 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 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 calculus 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 *track 1*, 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 *track 2* 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 either *track 1* or *track 2*. 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.

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 for Class of 2021 With DUS approval, students may follow the senior requirements in place when they declared their major or they may complete two terms of original research in E&EB 475, 476, 495, or 496.

B.S. degree program for the Class of 2022 and subsequent classes 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: Adalgisa Caccone and Rick Prum

Class of 2022: Martha Munoz and David Vasseur

Class of 2023: Marta Wells and David Post

Class of 2024: Stephen Stearns

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 *Track 1* – E&EB 220, 225; 1 from E&EB 246–272, with lab or E&EB 326 and 327L; *Track 2* – 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.

Because of its emphasis on data manipulation, 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. Three of these are the introductory courses, one in microeconomics, one in macroeconomics, and one in data analysis and econometrics. All majors must take the following courses: one term of intermediate microeconomics (ECON 121 or 125) and one term of intermediate macroeconomics (ECON 122 or 126); 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. 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) 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.) Prospective majors are urged to start their econometrics sequence by the fall of sophomore year. Students are required to take two semesters of econometrics in order to write a senior essay.

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 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.

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 policy and the public sector; health; labor; poverty; 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 two of intermediate microeconomics, intermediate macroeconomics, and econometrics or a mathematics course such as MATH 120. Advanced lecture courses may be applied toward the senior requirement. 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.

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 preregister; 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 preregister.

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

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. Senior essays that are not submitted on time will receive a grade of Incomplete. Senior essays with grades of Incomplete without permission of the residential college dean are subject to grade penalties when submitted.

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.

Meetings for seniors to discuss the senior essay guidelines and requirements will be held on Tuesday, September 1, 2020 at 12:15 p.m. and Wednesday, September 2, 2020, at 4:00 p.m. in Rm. 106, 28 Hillhouse Ave. Senior essay prospectus forms are due Monday, October 5, 2020.

ADVISING

The Economics department has faculty representatives/advisers for each residential college, typically fellows of that college. Students majoring in economics should consult with and secure written approval of their course selection from one of their college representatives. 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, or econometrics. 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)

Specific courses required ECON 121 or 125; and ECON 122 or 126; and 1 course from ECON 117, 131, 123, 132 or 136 (or equivalents with DUS permission)

Distribution of courses 3 introductory classes (or equivalents with DUS permission); 2 core courses (intermediate micro and intermediate macro); 1 math course; 4 electives

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

Senior requirement 2 courses 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 Timothy Armstrong, Mitsuru Igami, Michael Peters, Philipp Strack

Assistant Professors Eduardo Dávila, Jose-Antonio Espin-Sanchez, Mira Frick, Charles Hodgson, John Eric Humphries, Zhen Huo, Ryota Iijima, Ilse Lindenlaub, 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

Lecturer 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; Qazi Azam (qazi.azam@yale.edu) (registrar); Yifeng Liu

(yifeng.liu@yale.edu) (Mathematics), DL 410; associate director of undergraduate

studies: Miki Havlickova (miki.havlickova@yale.edu) (Mathematics), DL 446

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. 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).
4. **Students in the Class of 2021 and the Class of 2022** are required to take one course in linear algebra, MATH 222 or 225 (or 230 and 231, for two course credits). **Students in the Class of 2023 and beyond** must take an additional course in vector analysis, MATH 250 (or 230 and 231 for two course credits).
5. An introductory course in analysis, MATH 300 or 301.

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 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. 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, 136;

ECON 350, 417 or 433; ECON 351; MATH 222 or 225 (or MATH 230 and 231);

MATH 300 or 301; MATH 250 for students in the Class of 2023 and beyond

Substitution permitted S&DS 241 and 242 for ECON 135, with permission of DUS in Econ; MATH 230 and 231 may substitute for MATH 222 or 225, and MATH 250

Senior requirement Senior sem in math (MATH 480); 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/>

EDUCATION STUDIES MULTIDISCIPLINARY ACADEMIC PROGRAM

Education Studies is a multidisciplinary academic program in Yale College that provides a structure for students interested in educational institutions, policy, teaching, and learning. The program promotes a multidisciplinary understanding of the role of education historically, socially, politically, and economically, and it offers courses in two concentration areas: 1) Social Context and Policy and 2) Individuals and Society.

Any Yale College student interested in education studies may take the introductory survey course, EDST 110, Foundations in Education Studies. This 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.

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 25 undergraduate peers who study education together over two-and-a-half years through course work, weekly dinners, 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, a field experience, three or four electives (depending on senior requirement), and one or two senior capstone courses including EDST 400 alone or in combination with EDST 410 or 490.

The curricular changes to the Education Studies MAP are applicable to the class of 2023 and subsequent classes. The classes of 2021 and 2022 are permitted to opt in to these changes.

REQUIREMENTS OF THE PROGRAM

Prerequisite EDST 110

Number of courses 6 courses (incl prereq and senior req)

Distribution of courses 3 or 4 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

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 250. 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 225; 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 that 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 225; ENAS 194; EENG 200, 201, 202, 203; EENG 471 or 472 (the senior requirement), or with permission of the instructor and the DUS, 481; and six electives 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 EENG 472, and 3 electives

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 that 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, 225, or ENAS 194; EENG 200, 201, 202, and 471 and/or 472 (the senior requirement); and 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, 472, or 481, present a written report, and make an oral presentation. Arrangements to undertake a project in fulfillment of the senior requirement must be made by the end of shopping 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 225; 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 225; EENG 200, 201, 202, 203; *B.A.*—1 from ENAS 194, MATH 222, or 225; EENG 200, 201, 202

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

Senior requirement *B.S.* – one-term research or design project (EENG 471 or 472 or, with permission of DUS, 481); *B.A.* – one-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. Rimas Vaišnys, Y. Richard Yang[†]

Associate Professors Richard Lethin (*Adjunct, Lecturer*), Jakub Szefer, Sekhar Tatikonda[†], Fengnian Xia

Assistant Professors Wenjun Hu, Amin Karbasi, Priyadarshini Panda

[†]A joint appointment with primary affiliation in another department.

Electrical Engineering and Computer Science

Directors of undergraduate studies: 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, and ENAS 151 or MATH 120; 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.) For the Class of 2022 and subsequent classes, acceleration credits may not be used to satisfy prerequisites. For the Class of 2021 and previous classes, acceleration credits may be used to satisfy some of these requirements. However, 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, 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 EENG 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 (PHYS 170, 171 are acceptable for students who need to take MATH 112)

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 or 225 or S&DS 241

Distribution of courses 4 addtl 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 six term courses covering 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, 432-4221

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 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 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 470), 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 requirements 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, Michael Denning, Wai Chee Dimock, Anne Fadiman (*Adjunct*), Paul Fry (*Emeritus*), Louise Glück (*Adjunct*), Jacqueline Goldsby, Langdon Hammer, Margaret Homans, Amy Hungerford, David Scott Kastan, Jonathan Kramnick, Lawrence Manley, Donald Margulies (*Adjunct*), Stefanie Markovits, Stephanie Newell, John Durham Peters, Caryl Phillips, David Quint, Claudia Rankine, Marc Robinson, Caleb Smith, Robert Stepto (*Emeritus*), Katie Trumpener, Michael Warner, Ruth Yeazell

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

Assistant Professors Anastasia Eccles, Ben Glaser, Alanna Hickey, Cajetan Iheka, Naomi Levine, Priyasha Mukhopadhyay, Joseph North, Jill Richards, Sunny Xiang

Senior Lecturers James Berger, Michael Cunningham, Richard Deming, Shifra Sharlin, Cynthia Zarin

Lecturers Felisa Baynes-Ross, Steven Brill, Danielle Chapman, Susan Choi, Andrew Ehrgood, Greg Ellermann, Joseph Gordon, Rona Johnston Gordon, Karin Gosselink, Derek Greene, Rosemary Jones, Heather Klemann, Verlyn Klinkenborg, Timothy

Kreiner, Katja Lindskog, Sarah Mahurin, Pamela Newton, Mark Oppenheimer, Timothy Robinson, Karin Roffman, Pamela Schirmeister, Adam Sexton, Kim Shirkhani, Margaret Spillane, Michele Stepto, Sarah Stillman, Barbara Stuart, Rasheed Tazudeen, 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 Forestry and 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 embraces broad environmental concerns, including the safety of drinking water, groundwater protection and remediation, wastewater treatment, indoor and outdoor air pollution, 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, 315 or 448, EVST 444 or ENVE 438, and MENG 361 or F&ES 714. 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 F&ES 714

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 G&G 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. 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 AND APPLICATION TO THE MAJOR

Students typically apply to enter the major during their sophomore year. Applications are accepted throughout the year; details can be found on the program website. Juniors who have already completed considerable course work toward the major may also apply.

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 G&G 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 (Forestry & Environmental Studies), Michelle Bell (*Forestry & Environmental Studies*), Gaboury Benoit (*Forestry & Environmental Studies*), Graeme Berlyn (*Forestry & Environmental Studies*), Ned Blackhawk (*History and American Studies*), Mark Bradford (*Forestry & Environmental Studies*), Derek Briggs (*Geology & Geophysics*), Gary Brudvig (*Chemistry, Molecular Biophysics & Biochemistry*), Benjamin Cashore (*Forestry & Environmental Studies*), Susan Clark (*Adjunct*) (*Forestry & Environmental Studies*), Deborah Coen (*History*), Michael Donoghue (*Ecology & Evolutionary Biology, Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies, Anthropology*), Menachem Elimelech (*Chemical & Environmental Engineering*), Daniel Esty (*Forestry & Environmental Studies*), Eduardo Fernandez-Duque (*Forestry & Environmental Studies*), Walter Jetz (*Ecology and Evolutionary Biology, Forestry and Environmental Studies*), Ben Kiernan (*History*), Matthew Kotchen (*Forestry & Environmental Studies, Economics*), William Lauenroth (*Forestry & Environmental Studies*), Xuhui Lee (*Forestry & Environmental Studies*), Robert Mendelsohn (*Forestry & Environmental Studies, Economics*), Alan Mikhail (*History*), Jeffrey Park (*Geology & Geophysics*), Peter Perdue (*History*), Stephen Pitti (*History and of American Studies*), Alan Plattus (*Architecture*), David Post (*Ecology & Evolutionary Biology*), Jeffrey Powell (*Ecology & Evolutionary Biology, Forestry & Environmental Studies*), Daniel Prober (*Physics, Physics & Electrical Engineering*), Peter Raymond (*Forestry & Environmental Studies*), Susan Rose-Ackerman (*Law*), Paul Sabin (*History*), James Saiers (*Forestry & Environmental Studies*), Oswald Schmitz (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), James Scott (*Political Science, Anthropology*), Karen Seto (*Forestry & Environmental Studies*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, Forestry & Environmental Studies*), David Skelly (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), Brian Skinner (*Geology & Geophysics*), Ronald Smith (*Geology & Geophysics, Forestry & Environmental Studies*), Stephen Stearns (*Ecology & Evolutionary Biology*), Peter Swenson (*Political Science, Institution for Social and Policy Studies*), Charles Tomlin (*Forestry & Environmental Studies*) (*Visiting*), John Wargo (*Forestry &*

Environmental Studies, 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 (*Forestry & Environmental Studies*), Marian Chertow (*Forestry & Environmental Studies*), Elihu Rubin (*Architecture*), Carla Staver (*Ecology and Evolutionary Biology*), David Vasseur (*Ecology & Evolutionary Biology*)

Assistant Professors Anjelica Gonzalez (*Biomedical Engineering*), William Rankin (*History, History of Science*)

Senior Lecturers Shimon Anisfeld, Carol Carpenter, Amity Doolittle, John Grim, Mary Evelyn Tucker, Marta Wells

Lecturers Alan Burdick, Surjit Chandhoke, Ian Cheney, Mary Beth Decker, Marlyse Duguid, Michael Fotos, Kealoha Freidenburg, Gordon Geballe, 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 Political Science department's five fields: international relations, comparative politics, or American government (not 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 director of undergraduate studies (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 on Monday, November 30, 2020. Senior essays written in the spring term and yearlong essays are due on Monday, April 12, 2021. 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 advanced sem); 3 courses, incl course for senior req, 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, 300

Distribution of courses 6 courses in 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 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 Laura Barraclough (*American Studies*), 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: Katerina Clark (katerina.clark@yale.edu), 451 College Street, Rm. 203 (Fall 2020); TBD (Spring 2021)

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 11, 2020; those graduating in May, by Friday, April 30, 2021. 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 course work 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*), *Brigitte Peucker (*German, Film*

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

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

Assistant Professors Marijeta Bozovic (*Slavic Languages & Literatures, Film & Media Studies, Women's Gender & Sexuality Studies*), Marta Figlerowicz (*Comparative Literature, English*)

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

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

Critic Sandra Luckow (*Art*)

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 and preregister 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 preregister 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.

Forestry and Environmental Studies

Program adviser: John Wargo (john.wargo@yale.edu), 124 KRN, 432-5123

The School of the Environment trains primarily graduate and professional school students to solve worldwide environmental problems and to provide new understanding of local and global environments through interdisciplinary research in the natural and social sciences. The School offers numerous courses to undergraduates in Environmental Studies, and undergraduates from any major can take courses in the School. Those undergraduates with significant interest should contact the School's undergraduate program adviser to discuss a joint degree program that allows Yale College students to earn both a bachelor's degree from Yale College and an M.E.M. from the School of the Environment in five years. For more information on the joint program, see the School website. Most graduate-level courses are open to qualified undergraduates. Listings and detailed descriptions of these courses are available in the bulletin of the School of the Environment, and most also appear in the online bulletin of the Graduate School of Arts and Sciences. Information about the programs of the School of the Environment may be found on the School website. Most lectures and symposia are open to undergraduates, and a calendar of events is also posted on the School website.

French

Director of undergraduate studies: Thomas Connolly (thomas.c.connolly@yale.edu), 82-90 Wall St., Rm. 424; language program director: Ruth Koizim (ruth.koizim@yale.edu), Rm. 378, 320 York St., 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, religion, politics, 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, 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 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 only offered 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 over the summer. 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.

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.

Students who wish to begin taking French in the spring are advised to take the placement exam over the summer. Placement exam results remain valid for one year.

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 17, 2020 (fall-term essay), or November 6, 2020 (spring-term essay). A one-page prospectus and bibliography are due September 18, 2020 (fall term), or January 22, 2021 (spring term). A rough draft must be submitted to the adviser by October 30, 2020 (fall term), or March 26, 2021 (spring term). Two copies of the final essay are due in the department by December 1, 2020 (fall term), or April 19, 2021 (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 17, 2020. A one-page prospectus and bibliography are due September 18, 2020. Students must submit an initial rough draft to their adviser by January 22, 2021, and a complete draft by March 26, 2021. Two copies of the final essay are due in the department by April 19, 2021.

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, 495, or 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 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, 2020. 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, 2020. 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, 2020; 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, 2020, 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 20, 2020. The student must submit a draft of at least fifteen pages of the essay by December 1, 2020, 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, 2021. 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 student transcripts.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. 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 transcript.

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 course work 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 ECON 121 or 125. All majors must take the core courses GLBL 225 and 275, and three courses in quantitative and other methods, including GLBL 121 and GLBL 122. Majors also take four electives chosen from an approved group of courses in 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 requirements 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 125; GLBL 225; GLBL 275

Distribution of courses 3 quantitative and other methods courses, incl GLBL 121 and 122; 4 approved electives

Language requirement Advanced ability (L5) in 1 modern lang other than English

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 Wrytzen (*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

Issues related to health are among the most important challenges facing societies, both domestically and globally. Finding solutions to health-related problems requires multidisciplinary comprehension of all dimensions of health, including biological and social determinants, economics and politics of health care systems and health care delivery, and ways in which health is understood by individuals, societies, and cultures.

The Global Health Studies program facilitates global health education for undergraduates at Yale, offering interdisciplinary courses that bring together the natural sciences, social sciences, and the humanities. The GHS program is designed for students interested in critically and analytically engaging in global health. The program supports students in developing and balancing an appreciation for biomedical and technical issues related to diseases and their treatment and prevention, with an understanding of the historical, social, economic, and political concerns that are implicated in how health is determined and experienced in the twenty-first century. Students choose a major in another department or program and expand their education with courses offered by Global Health Studies.

Although most courses in global health are open to all undergraduates, students desiring greater depth in the field are encouraged to apply to become a Global Health Scholar, typically in the fall of their sophomore year. Global Health Scholars complete an interdisciplinary course of study that includes required and elective course work that supports students in achieving six global health competencies: 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, Global Health Scholars pursue an optional experiential learning project (e.g., internships with NGOs, archival research, field-based projects with faculty, etc.), for which they can receive support in the form of designated funding and mentorship from a global health adviser. During their senior year, students enroll in a colloquium course which serves as a capstone project that meaningfully integrates the skills and knowledge acquired through the GHS program.

To assist students in connecting classroom knowledge and skills with practical work in global health, the Global Health Studies program supports fellowships such as the Global Health Field Experience Award and the Yale College Fellowships for Research in Global Health Studies.

Qualified students 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, “Courses in the Yale Graduate and Professional Schools.” Further information about these courses and other graduate offerings can be found in the School of Public Health 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 (inc 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.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 course work 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, Edyta Bojanowska, Ned Blackhawk, David Blight, 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 Lamoaux, 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 Wyrzten

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), Loria 752, 432-2666; 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 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 (*Chair*), Edward S. Cooke, Jr., Milette Gaifman, Pamela Lee, Kobena Mercer, Robert Nelson, 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 Rizvana Bradley, Joanna Fiduccia, Subhashini Kaligotla, Quincy Ngan

Lecturers Cecile Bushidi (*African Studies*), Nenagh Hathaway, 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, including the two-term senior requirement. Students select a pathway of seven courses that guides them through an area of specialization. The seven pathway 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 science course; and three electives chosen from relevant courses in any department.

Pathways The five standard pathways 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 pathways 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 pathway or indicate that they wish to design their own.

Electives Beyond the seven pathway 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 pathway 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 pathway, 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 pathway

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 career guidance in the field. Students apply to the Multidisciplinary Academic Program in Human Rights Studies during the fall term of the sophomore year. They 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 advanced issues in international human rights law and advocacy and complete a supervised research project that is informed by extracurricular experience and developed in consultation with the program director and other program advisers.

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, and 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

Ned Blackhawk (*History*), Amity Doolittle (*School of Forestry, Environmental Studies*), Crystal Feimster (*African American Studies, American Studies*), Moira Fradinger (*Comparative Literature*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), 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*), Jonathan Wyrzten (*Sociology*)

Humanities

Director of undergraduate studies: Paul Grimstad, (paul.grimstad@yale.edu)
Whitney Humanities Center, 53 Wall St., 432-7658; chair: Bryan Garsten
(bryan.garsten@yale.edu), 320 York Street; 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 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, usually co-taught by two faculty members from different, complementary fields of study. After taking these core seminars, students in the major share a broad grounding in several cultural traditions, the experience of having grappled with the question of what “modernity” is, and the experience of having spent a term interpreting a single work (or small corpus of works) in great depth. Students then craft an area of concentration according to their interests and with the help of appropriate faculty members. The major offers breadth and interdisciplinary scope even as it encourages depth and intellectual coherence.

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 extra-curricular 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

Intellectual journal A minimum of one journal entry every term

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)

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, Science and 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 Truestedt (*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, Brienne 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

Director of undergraduate studies: Simona Lorenzin (simona.lorenzini@yale.edu)i, 82-90 Wall St., 432-0508; Language Program Director: Anna Iacovella (anna.iacovella@yale.edu), 82-90 Wall St., 432-8299; italian.yale.edu

The major in Italian 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 double 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 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 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 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, and 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 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 literature, 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, 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 media, at least 5 of these conducted in Italian; 2 courses in other langs or lits, hist of art, hist, or phil 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 student official transcripts.

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 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 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

Director of undergraduate studies: Paul Franks, (paul.franks@yale.edu) 406B Connecticut Hall [F]; David Sorkin (david.sorkin@yale.edu), 212 McClellan Hall [Sp]; 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*), Ivan Marcus (*History, Religious Studies*), Steven Smith (*Political Science, Philosophy*), David Sorkin (*History*), 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 Lector II Shiri Goren

Senior Lectors Dina Roginsky, Orit Yeret

Lector Joshua Price

Latin American Studies

Director of undergraduate studies: Ana De La O (ana.delao@yale.edu), Room 327, 115 Prospect St.; (203) 432-5234; 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 Bovern, 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*)

Assistant Professors Jason Shaw, Natalie Weber, Jim Wood

Lector Michael Barrett

Lecturer Chelsea Sanker

†A joint appointment with primary affiliation in another department.

Mathematics

See also Applied Mathematics.

Director of undergraduate studies: Yifeng Liu (yifeng.liu@yale.edu), DL 410; associate director of undergraduate studies: Miki Havlickova (miki.havlickova@yale.edu), DL 446; Math DUS site, Math department site

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 calculus through the level of multivariable calculus, by completion of MATH 120 or the equivalent.

Completion of MATH 230 and 231 waives all prerequisite requirements.

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; a link to the online examination and additional information are available on the department website. A calculus advising session will be held at the beginning of the fall term to answer student questions about placement.

MATH 112 is an introductory course that presupposes basic skills in high school algebra, geometry, and trigonometry. Enrolling students are expected to know the basic definitions of the trigonometric functions, synthetic division, factorization, and elementary area and volume formulas of plane and solid geometry. MATH 115 presupposes familiarity with the topics covered in MATH 112. MATH 120 presupposes familiarity with the topics covered in MATH 115.

MATH 230, 231 is an advanced course sequence in linear algebra and introductory analysis for students with exceptionally strong backgrounds in mathematics. Students who wish to enroll in MATH 230 should consult with the instructor of the course. After MATH 115, students with a strong interest in abstract mathematics should consider taking MATH 230, 231.

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); excluding, however, MATH 470. At most two courses from the introductory sequences (MATH 222, 225, 230, 231, 250) can be counted toward the major. Each student is expected to take vector calculus and linear algebra: either MATH 230 and 231, or either one of MATH 222 or 225 with MATH 250. MATH 225 is strongly recommended over MATH 222, for providing an introduction to proof writing, which is an essential skill in upper level mathematics courses. 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.

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 CHEM 333, 470, or PHYS 401, 402, 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*: two courses between 350 and 399; *analysis*: MATH 301, 305, 310; *algebraic topology*: MATH 301, 350; *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.

Roadmap See visual roadmap of the requirements.

SENIOR REQUIREMENT

During the senior year students majoring in Mathematics normally take the senior seminar (MATH 480). Alternatively, with the consent of the DUS, highly qualified 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 early in the fall term.

ADVISING

Students interested in pursuing further study in pure mathematics should include MATH 301, 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 300 or 301, 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 a very few 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 submit a proposal that foresees this level of achievement to the DUS no later than the last day of classes in their fifth term of enrollment in Yale College. If approved by the department, the proposal is forwarded to the Yale College Dean's Office. Students' status and progress are reviewed before they are permitted to continue in the program in the senior year. 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.

Students take at least two graduate term courses in the junior year (normally courses in algebra or analysis are the first graduate courses taken). The general oral examination covers a list of topics available from the director of graduate studies and is accepted in lieu of the usual senior oral presentation. Details concerning the requirements for the master's degree may be obtained from the director of graduate studies.

REQUIREMENTS OF THE MAJOR

Prerequisite MATH 120 or equivalent; **completion of MATH 230 and 231 waive all prerequisite requirements**

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 230 and 231; or MATH 222 or 225 with MATH 250

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, 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*), Alexander Goncharov, Roger Howe (*Emeritus*), Peter Jones, Richard Kenyon, Yifeng Liu, 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, †John S. Wettlaufer, Gregg Zuckerman

J. W. Gibbs Assistant Professors Yariv Aizenbud, Paul Apisa, Subhadip Dey, Gurbir Dhillon, Samuel Edwards, Ariel Jaffe, Boris Landa, Or Landesberg, Arie Levit, Ofir Lindenbaum, Gal Mishne, Franco Vargas Pallete, Cosmin Pohoata, Fei Qi, Congling Qiu, Kirill Serkh, Caglar Uyanik, Tom VandenBoom, Anibal Velozo

Adjunct Professors Michael Goldstein, Gil Kalai, Alex Lubotzky, Jacques Peyriere, Mathias Schacht

Senior Lecturers John Hall, Miki Havlickova

Lecturers Ian Adelstein, Asher Auel, James Barnes, Robert McDonald, Itziar Ochoa de Alaiza Gracia, Erik Rosenthal, Brett Smith, Sarah Vigliotta

†A joint appointment with primary affiliation in another department.

Mathematics and Philosophy

Directors of undergraduate studies: Yifeng Liu (yifeng.liu@yale.edu) (Mathematics), DL 410; 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.

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 seminar MATH 480, Senior Seminar: Mathematical Topics, fulfills 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, 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

Senior requirement Senior sem

Mathematics and Physics

Adviser for the major: Vincent Moncrief (vincent.moncrief@yale.edu), 64 SPL, 432-6930

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.

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 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.

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 21 courses and 19.5 credits beyond the prerequisites as follows:

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, and at least one lecture course in chemistry numbered CHEM 161 or higher
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, 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 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 (half-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; 487L and 488L; 489; or another upper-level design course (taken during the senior year) chosen in consultation with the DUS.

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.

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)

Number of courses 21 term courses 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); 1 term course in chemistry numbered CHEM 161 or higher

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; 487L and 488L; 489; 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

Modern Middle East Studies

Director of undergraduate studies: Jonathan Wyrzten (jonathan.wyrzten@yale.edu), 493 College St., Rm. 307, 432-5172 [F]; Kaveh Khoshnood (kaveh.khoshnood@yale.edu), Laboratory of Epidemiology and Public Health, 60 College St., Ste. 826, 785-2920 [Sp]; 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, Judaica 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 distrib 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*), Gerhard Böwering (*Religious Studies*), John Darnell (*Near Eastern Languages & Civilizations*), Stephen Davis (*Religious Studies*), 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*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

Associate Professors Zareena Grewal (*American Studies*), Kaveh Khoshnood (*Public Health*), Mark Lazenby (*School of Nursing*), Eliyahu Stern (*Religious Studies*), Jonathan Wrytzen (*Sociology*), Travis Zadeh (*Religious Studies*)

Assistant Professors Thomas Connolly (*French*), Robyn Creswell (*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 Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Supriya Gandhi (*Religious Studies*), Tolga Köker (*Economics*), Kathryn Slanski (*Near Eastern Languages & Civilizations*)

Lecturers Karla Britton (*Architecture*), 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). The prerequisites in biology, chemistry, and mathematics 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.

REQUIREMENTS OF THE MAJOR

B.S. degree program Thirteen courses are required beyond the prerequisites: a second term of organic chemistry with its associated laboratory; two term courses in physics numbered PHYS 170 or higher; one term of physical chemistry; MB&B 251L, 300, 301, 302, 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); and one elective in the natural sciences at a level higher than required in the prerequisites. Students choose the elective courses in consultation with a faculty adviser (see below). Only two course credits of MB&B 470, 471, and 478, 479 may count toward these electives. Students may substitute CHEM 333 for MB&B 302. The physics requirement may be satisfied by an Advanced Placement test score sufficient to earn acceleration credit in that subject. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

B.A. degree program Eleven courses are required beyond the prerequisites: a second term of organic chemistry with its associated laboratory; two term courses in physics numbered PHYS 170 or higher; one term of physical chemistry; MB&B 251L, 300, 301, 302, and 490; one additional upper-level MB&B elective; and 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). Students choose the elective courses in consultation with a faculty adviser (see below). Students may substitute CHEM 333 for MB&B 302. The physics requirement may be satisfied by an Advanced Placement test score sufficient to

earn acceleration credit in that subject. 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 328 or 332, and 333). In place of one term of biophysics (MB&B 302) they may elect a full year of upper-level biophysics (MB&B 420 and graduate courses in optical spectroscopy and macromolecular interactions). Such revisions to the basic curriculum must be made in consultation with the faculty adviser.

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 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 Programs with the minimal number of science courses required of B.A. and B.S. majors are shown below. Students whose scores on the Advanced Placement tests make them eligible for advanced courses are urged to replace the elementary science courses with more advanced ones in their first year, and to complete the required biochemistry and physics courses by the end of their sophomore and junior years, respectively. Students are permitted to take the biochemistry sequence (MB&B 300, 301) after one term of organic chemistry (CHEM 220).

First-Year	Sophomore	Junior	Senior
BIOL 101, 102, 103, 104	CHEM 220, 221, 222L, 223L	MB&B 300, 301, 251L	CHEM 328
CHEM 161, 165, 134L, 136L	MATH 112, 116	One quantitative reasoning elective PHYS 180, 181	MB&B 302 One MB&B elective And, for B.S. major: One science elective and a second MB&B elective MB&B 490

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 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 and are authorized to sign schedules. Members acting as faculty advisers are:

Class of 2021:

W. Gilbert, C-127 SHM (785-4857)

A. Miranker, 313 BASS (432-8954)

Class of 2022:

C. Paulsen, 234 BASS (432-5342)

M. Koelle, CE28A SHM (737-5808)

Class of 2023:

L. Kabeche, TBD

M. Simon, 220 BASS (737-3274)

Class of 2024:

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 courses beyond prereqs, incl senior req; *B.A.* — 11 term courses beyond prereqs, incl senior req

Specific courses required *B.S.* and *B.A.* — MB&B 251L, 300, 301, 302

Distribution of courses *B.S.* — a second term of organic chem with lab; 1 term of physical chem; 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 with lab; 1 term of physical chem; 2 terms of PHYS 170 or above; 1 addtl upper-level MB&B elective and 1 quantitative reasoning elective, as specified

Substitution permitted CHEM 333 for MB&B 302

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, Peter Lengyel (*Emeritus*), †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, Lilian Kabeche, †Erdem Karatekin, 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: Douglas Kankel (douglas.kankel@yale.edu), 111 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), described below

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 laboratory 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 laboratory 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

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 standard major, 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 standard major. 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 standard major, 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, CENG 412, CPSC 437, 445, 470, or 475. The laboratory requirement and the senior requirement are the same as those for the standard major. 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 standard major, 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. Two laboratories numbered MCDB 201L or above are also required. 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 with 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	M. Acar	SY	S. Lin
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: (a) 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; (b) 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, two labs numbered MCDB 201L or above

Distribution of courses *Standard track* — *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 standard track, 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 Murat Acar, Damon Clark, Joshua Gendron, †Megan King, Farren Isaacs, †Kathryn Miller-Jensen, Weimin Zhong

Assistant Professors Shirin Bahmanyar, David Breslow, Nadya Dimitrova, Stavroula Hatziotis, Yannick Jacob, Sigrid Nachtergaele, Josien van Wolfswinkel, Jing Yan

Professor Adjunct Robert Bazell

Lecturers †Alexia Belperron, †Surjit Chandhoke, Iain Dawson, †Seth Guller, Amaleah Hartman, Ronit Kaufman, Samantha Lin, Maria Moreno, Kenneth Nelson, †Aruna Pawashe, John Wertz, 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

Students must take the Music Department's music theory placement test to determine their placement in the theory/musicianship sequences. Advanced Placement test scores do not satisfy the music theory prerequisites for performance instruction. Although the faculty of the School of Music attempts to accommodate those who qualify for

credit instruction, it cannot guarantee that they will be enrolled with the teacher of their choice.

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 Bulletin.

Students cannot accelerate the undergraduate program in the B.A./M.M. program. Students in the Class of 2022 and prior class years 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, Michael Friedmann (*Adjunct*), Daniel Harrison, Paul Hawkshaw (*Adjunct*), James Hepokoski, Gundula Kreuzer, Richard Lalli (*Adjunct*), Patrick McCreless, Leon Plantinga (*Emeritus*), Ian Quinn (*Chair*), Ellen Rosand (*Emeritus*), Gary Tomlinson, Michael Veal

Associate Professors Roger Grant (*Visiting*), Robert Holzer (*Adjunct*), Brian Kane, Henry Parkes, Markus Rathey (*Adjunct*), Anna Zayaruznaya

Assistant Professors Konrad Kaczmarek, Maria-Christina Oliveras (*Visiting*), Jessica Peritz

Lecturers Nathaniel Adam, Trevor Bača, Angharad Davis, 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 Wayne Grasdock, USN (*Adjunct*)

Lecturers Captain Timothy Brunstetter, USMC; Lieutenant Quinlan Melvin, USN; Lieutenant Brandon Ordway, USN; Commander Adam Schlismann, 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; nclc.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 tracks from which students may choose. In track A, students focus in depth on a particular language, civilization, period, or region. In track B, 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 tracks:

Track A, 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.

Track B, 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 & Public Health, Judaic Studies, Comparative Literature, Philosophy, and Religious Studies. Such courses, including 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 & 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 track A (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 track B (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 student transcripts.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. 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 Wagensohnner, 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, 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, 442, 445

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, 230, 231, 244, 246, 247; 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, 355, 361

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, 479; BENG 485; MCDB 250; CGSC 110; PSYC 110; one additional lab course from the Basic Allied Core 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. 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 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 courses (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*), †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*), †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*), Thierry Emonet (*Molecular, Cellular, and Developmental Biology*), Avram Holmes (*Psychology*), †Hedy Kober (*School of Medicine, Psychology*), †Ifat Levy (*School of Medicine, Psychology*), †James McPartland (*School of Medicine, Psychology*), Weimin Zhong (*Molecular, Cellular, and Developmental Biology*)

Assistant Professors Molly Crockett (*Psychology*), Dylan Gee (*Psychology*), Maria Gendron (*Psychology*), Samuel McDougale (*Psychology*), †John Murray (*School of Medicine, Physics*), Robb Rutledge (*Psychology*), Ilker Yildirim (*Psychology*)

Philosophy

Director of undergraduate studies: Daniel Greco (daniel.greco@yale.edu), 106A C, 432-1687; (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 100–199, are open to all students and have no prerequisites.

COURSE NUMBERING

Courses numbered 100–199 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

Standard track Prerequisite to the standard major are two introductory or intermediate philosophy courses.

Psychology track Prerequisite to the major in the psychology track are two courses in philosophy or psychology.

REQUIREMENTS OF THE MAJOR

The standard track The major requires twelve term courses (including the prerequisites and the senior requirement) that collectively expose students to a wide range of philosophy and philosophers. The Philosophy curriculum is divided into three broad groups: history of philosophy; metaphysics and epistemology; and ethics and value theory. In history of philosophy, majors are required to take (a) either PHIL 125 and 126 or both terms of Directed Studies (DRST 003, 004), and (b) 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. Other courses count toward a group requirement unless they are otherwise designated.
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 single 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 track The psychology track is designed for students interested in both philosophy and psychology. Majors in the track 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 (a) two courses in the history of philosophy, usually PHIL 125 and 126 or DRST 003 and 004, (b) a course in logic, such as PHIL 115, preferably by the fall of the junior year, (c) two seminars, one of which may be in the Psychology department, with the approval of the DUS, and (d) 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 (d) 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 (a) additional readings, (b) submission of a complete draft of the final paper by the eighth week of the term that will then be significantly revised, and (c) 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 track* – any 2 intro or intermediate phil courses; *Psychology track* – any 2 courses in phil or psych

Number of courses *Both tracks* – 12 term courses, incl prereqs and senior req

Specific courses required *Standard track* – PHIL 125 and 126, or DRST 003 and 004; *Psychology track* – PSYC 110 or equivalent

Distribution of courses *Standard track* – 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 track* – 7 courses in phil, as specified; 5 courses in psych

Substitution permitted *Standard track* – 2 related courses in other depts, with DUS permission

Senior requirement *Both tracks* – a third sem in phil, or a one- or two-term independent project (PHIL 490, 491)

FACULTY OF THE DEPARTMENT OF PHILOSOPHY

Professors Seyla Benhabib, 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

Assistant Professors Robin Dembroff, Daniel Greco, John Pittard

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.
2. 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.
 3. 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 two-course sequence MATH 230, 231, 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.

1. 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.
2. 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). The offerings for 2020–2021 include PHYS 341, PHYS 343, and PHYS 344.

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 PHYS 260, 261 with MATH 120, ENAS 151, PHYS 301, or MATH 230, 231 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 include the PHYS 340-level electives, an advanced laboratory such as 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 440 must precede PHYS 441, 420, and 430; and PHYS 430 must precede PHYS 441.

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 include the PHYS 340-level electives 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 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 anytime 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 anytime 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 301 or other advanced math course; PHYS 401, 402, and either PHYS 439 or 440, as indicated

Distribution of courses 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; PHYS 205L, 206L or PHYS 165L, 166L

Number of courses 10 term courses beyond prereqs (incl senior req)

Specific courses required PHYS 301 or other advanced math course; PHYS 410, 440, 441, 420, 430, as indicated; PHYS 382L or equivalent

Distribution of courses 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, †Hui Cao, Richard Casten (*Emeritus*), †Paolo Coppi, Sarah Demers, David DeMille, †Michel Devoret, †Debra Fischer, Bonnie Fleming, †Marla Geha, Steven Girvin, Larry Gladney, Leonid Glazman, John Harris, Karsten Heeger, †Victor Henrich, †Jonathon Howard, Francesco Iachello (*Emeritus*), †Sohrab Ismail-Beigi, Steven Lamoreaux, Simon Mochrie, Vincent Moncrief, †Priyamvada Natarajan, †Corey O'Hern, Peter Parker (*Emeritus*), †Daniel Prober, Nicholas Read, Jack Sandweiss (*Emeritus*), †Peter Schiffer, †Robert Schoelkopf, Ramamurti Shankar, Witold Skiba, †A. Douglas Stone, †Hong Tang, Paul Tipton (*Chair*), C. Megan Urry, †Pieter van Dokkum, †John Wettlaufer, Michael Zeller (*Emeritus*)

Associate Professors †Murat Acar, Helen Caines, †Damon Clark, †Thierry Emonet, Walter Goldberger, Jack Harris, Reina Maruyama, Daisuke Nagai, Nikhil Padmanabhan, David Poland, †Peter Rakich

Assistant Professors †Eric Michael Brown, Meng Cheng, Benjamin Machta, David Moore, †John Murray, †Michael Murrell, Nir Navon, Laura Newburgh

Senior Lecturer Sidney Cahn

Lecturers Stephen Irons, Rona Ramos, Adriane Steinacker

†A joint appointment with primary affiliation in another department.

Physics and Geosciences

Directors of undergraduate studies: Simon Mochrie (dus.physics@yale.edu) (Physics), 68C SPL, 436-4809; 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 Earth and other planetary bodies at a level that is more intensive than in the Physics or Earth and Planetary Sciences majors individually. Topics of interest range from atmosphere, ocean, and climate dynamics to physics of the solid Earth or of other planetary bodies.

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 a minimum of twelve term courses, 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 320 or above. Required courses in Earth and Planetary Sciences include one introductory course numbered EPS 100–150, with any accompanying laboratory; one elective numbered EPS 200 or above; and four advanced electives from one of two Earth and Planetary Sciences tracks: the Atmosphere, Ocean, and Climate track or the Solid Earth Science track. A list of suggested electives is available from the office of the director of undergraduate studies (DUS) in Earth and Planetary Sciences or on the EPS department website. 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 Earth and Planetary Sciences departments. The project is undertaken in either PHYS 471, 472 or EPS 490, EPS 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 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 320 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

Senior requirement Senior project in PHYS 471, 472 or EPS 490, EPS 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; and one introductory Philosophy course.

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; 1 intro PHIL course

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 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 course work 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 by November 20, 2020. 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 preregistration Each term, the department provides all declared Political Science majors the opportunity to apply for preregistration to its seminars. Instructors of seminars may preregister up to twelve students per course, or up to eight students for multiple-titled courses. As the maximum enrollment for each seminar is eighteen, some spots remain open until filled at the instructor's discretion during shopping period. Students may be preregistered in up to two seminars per term, although they may enroll in others if they obtain instructor permission during shopping week.

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. Seminars taken Credit/D/F will not count toward the major requirements, but will count as non-A grades for purposes of calculating distinction.

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. Senior essays written in the fall term are due on December 8, 2020. Spring-term and yearlong essays are due on April 27, 2021. 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. For the Class of 2022, the deadline for applying to the Spring 2021 offering of PLSC 490 is December 4, 2020, and the deadline for the applying to the Fall 2021 offering of PLSC 490 is April 2, 2021. 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, Paul Bracken, David Cameron, Benjamin Cashore, Bryan Garsten, Alan Gerber, Jacob Hacker, Oona Hathaway, Gregory Huber, Joseph LaPalombara (*Emeritus*), Isabela Mares, David Mayhew (*Emeritus*), Gerard Padro, Thomas Pogge, John Roemer, Frances McCall Rosenbluth, Bruce Russett (*Emeritus*), James Scott, Jas Sekhon, Ian Shapiro, Stephen Skowronek, Steven Smith, Jonny Steinberg (Visiting Professor), Milan Svolik, Peter Swenson, John Wargo, Ebonya Washington, Steven Wilkinson, Elisabeth Wood

Associate Professors Peter Aronow, Deborah Beim, Sarah Bush, Ana De La O, Alexandre Debs, Hélène Landemore, Nuno Monteiro, Kelly Rader

Assistant Professors Katharine Baldwin, Daniela Cammack, Alexander Coppock, Allison Harris, John Henderson, Joshua Kalla, Sarah Khan, Christina Kinane, Egor Lazarev, Daniel Mattingly, Elizabeth Nugent, Giulia Oskian, Tyler Pratt, Didac Queralt, Thania Sanchez, Fredrik Savje, Emily Sellars, Ian Turner

Senior Lecturers Boris Kapustin, Steven Latham, David Simon

Lecturers Andrea Aldrich, Paris Aslanidis, Leanna Barlow, Steven Calabresi, John DeStefano, Amir Fairdosi, Michael Fotos, Thomas Graham, Maria Jose Hierro, Brian Libgober, Nicholas Lotito, Nilakshi Parndigamage, Alexander Rosas, Bonnie Weir

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. The placement test will be given at the beginning of the fall and spring terms; see the department website for 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 student transcripts.

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 transcript.

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

Director of undergraduate studies: Jutta Joormann (jutta.joormann@yale.edu), 205 K, 432-0699; psychology.yale.edu

Psychology is the scientific study of the mind, the brain, and human behavior. The Psychology department offers course work 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 term courses beyond PSYC 110, including the senior requirement.

1. Because psychology is so diverse a subject, every student is required to take four courses from the list below. Two of these courses must be from the social science point of view in psychology and two must be from the natural science point of view. At least one from each group must be a course designated as Core in the course listings. 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: 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: PSYC 120, 130, 135, 160, 161, 171, 179, 229L, 260, 303, 307, 316, 317, 318, 321, 322, 327, 331, 335, 350, 352, 371, 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 after 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 following additional requirements:

1. Two terms of introductory biology are required for the major, BIOL 101 through 104. 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 chosen from PSYC 229L or 260. 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 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. 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 or 260

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 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, Paul Bloom, Thomas Brown, Tyrone Cannon, B. J. Casey, Marvin Chun, Margaret Clark, John Dovidio, Jutta Joormann, Frank Keil, Joshua Knobe, Marianne LaFrance, Gregory McCarthy, Jennifer Richeson, Peter Salovey, Laurie Santos, Brian Scholl, Nick Turk-Browne

Assistant Professors Arielle Baskin-Sommers, Steve Wohn Chang, Molly Crockett, Yarrow Dunham, Dylan Gee, Maria Gendron, Avram Holmes, Julian Jara-Ettinger, 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: BIS 505, Biostatistics in Public Health II; CDE 505, Social and Behavioral Foundations of Health; CDE 508, Principles of Epidemiology I; EPH 515, Ethics and Public Health: An Introduction; either HPM 510, Introduction to Health Policy and Health Systems, or HPM 560, Health Economics and U.S. Health Policy; and either EHS 510, Introduction to Environmental Health, or EHS 503, Public Health Toxicology.

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 course work 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) 451 College St., Rm. 308, 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 features general and comparative courses that engage more than one tradition, concept, or text. Group B includes survey courses that provide a broad introduction to a particular religious tradition or scripture in historical context. Group C includes courses on specialized topics in religious studies, both introductory and intermediate. Group D 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, 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 Gerhard Böwering, 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, Harry Stout, 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 and East European Studies

Director of undergraduate studies: Jinyi Chu (jinyi.chu@yale.edu), Arnold Hall A33, 304 Elm St., 432-1302; language coordinator: Irina Dolgova (irina.dolgova@yale.edu), Arnold Hall A36, 432-1307; slavic.yale.edu

The major in Russian and East European 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. The program is appropriate for students considering careers in international public policy, diplomacy, or business, and is also suited to students wishing to continue academic work.

REQUIREMENTS OF THE MAJOR

Thirteen term courses taken for a letter grade are required for the major. Students must take one course in Russian or East European history selected in consultation with the director of undergraduate studies (DUS). If Russian is presented as the primary language to satisfy the requirements of the major, then all East European language courses and third- and fourth-year Russian courses count toward the major. If an East European language other than Russian is presented as the primary language, then all courses in that language designated L3 or higher count toward the major. Electives are chosen in consultation with the DUS from an annual list of offerings. Electives must include at least one course in a social science. Other undergraduate courses relevant to Russian and East European Studies, including residential college seminars, may also count toward the major if approved by the DUS.

Languages A full understanding of the area demands knowledge of its languages. Students must demonstrate either proficiency in Russian or intermediate-level ability in an East European language. Students may demonstrate proficiency in Russian by (1) completing fourth-year Russian (RUSS 160, 161); (2) passing a written examination to demonstrate equivalent ability; or (3) completing a literature course taught in Russian and approved by the DUS. Students may demonstrate intermediate-level ability in an East European language by (1) completing a two-year sequence in an East European language (currently Czech, Polish, Romanian, or Ukrainian; students interested in studying other East European languages should contact the DUS); or (2) passing a language examination demonstrating equivalent ability. Students are encouraged to learn more than one language.

SENIOR REQUIREMENT

Every major must write a senior essay in RSEE 490, 491. At the beginning of the senior year, students enroll in RSEE 490 and arrange for a faculty member to serve as senior adviser. 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 student provides the adviser with a form that the adviser signs to notify the DUS that the first-term requirements for the senior essay have been met. Failure to meet these requirements results in loss of credit for RSEE 490. The senior essay takes the form of a substantial article, no longer than

13,000 words, excluding footnotes and bibliography. Three copies of the essay are due in the Slavic departmental office by April 9, 2021. A member of the faculty other than the adviser grades the essay.

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 and eastern Europe. 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

Prerequisite None

Number of courses 13 term courses (incl senior essay and specified lang courses)

Distribution of courses Demonstrated proficiency in Russian or intermediate-level ability in an East European lang; 1 course in Russian or East European hist approved by DUS; at least 1 course in social science

Senior requirement Senior essay (RSEE 490, 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*), Harvey Goldblatt (*Slavic Languages & Literatures*), 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*), Marta Figlerowicz (*Comparative Literature, English*)

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. Application information is available on the First-Year Seminar website.

Slavic Languages and Literatures

Director of undergraduate studies: Jinyi Chu, (jinyi.chu@yale.edu) Arnold Hall A33, 304 Elm St., 432-1302; language coordinator: Irina Dolgova, (irina.dolgova@yale.edu) Arnold Hall A36, 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 and East European Studies, an interdisciplinary program administered by the Department of Slavic Languages and Literatures.

Students majoring in Russian may concentrate exclusively on Russian language and literature (Program I), or they may elect to study Russian literature in the context of comparative studies of literature (Program II). For Program II, credit is given for work done in other departments. Specific courses in each program must be arranged with the director of undergraduate studies (DUS). Students interested in specializing in Russian or Slavic linguistics may arrange a special concentration in linguistics with the DUS.

PREREQUISITES

Prerequisite to the major in both programs is RUSS 151. The department offers two sequences of language courses to fulfill the prerequisite: either (1) RUSS 110, 120, 130, 140, 150, and 151 or (2) RUSS 125, 145, 150, and 151. Prospective majors should complete RUSS 140 or 145 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.

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.

REQUIREMENTS OF THE MAJOR

In addition to the prerequisite, the major in Russian requires at least eleven term courses, which must include the following (some courses may fulfill more than one requirement):

1. Fourth-year Russian: RUSS 160 and 161.
2. Two terms of Russian literature in translation: RUSS 250 and 253.
3. Two terms of Russian literature read and discussed in the original language, typically selected from Group A courses numbered 170 or above.

4. At least two term courses in Russian literature of the nineteenth century and two in Russian literature of the twentieth century. Students should select courses from Group A and from the 250 series with this requirement in mind.
5. 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.

In addition to the requirements above, each program requires the following:

Program I One term course in the history or culture of Russia, selected in consultation with the DUS; three additional term courses in the Department of Slavic Languages and Literatures above RUSS 151. These may include literature courses taught either in translation or in the original, advanced language training courses, or graduate courses.

Program II Four term courses outside the Department of Slavic Languages and Literatures that are relevant to the major in the context of comparative studies of literature, selected in consultation with the DUS.

SENIOR REQUIREMENT

All majors write a senior essay (RUSS 490), an independent project carried out under the guidance of a faculty member. Three copies of the essay are due in the Slavic departmental office on April 9, 2021.

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 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.

REQUIREMENTS OF THE MAJOR

Prerequisite RUSS 151

Number of courses 11 term courses beyond prereq (incl senior essay)

Specific courses required *Both programs*—RUSS 160, 161, 250, 253

Distribution of courses *Both programs*—2 terms of 19th-century Russian lit; 2 terms of 20th-century Russian lit; 2 Russian lit courses from Group A numbered 170 or above; *Program I*—1 course in hist or culture of Russia; 3 courses in dept of Slavic Langs and Lits above level of RUSS 151; *Program II*—4 courses relevant to major in other depts, with DUS approval

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 student transcripts.

REQUIREMENTS

Students seeking to earn the certificate are required to take four courses beyond the L4 level in their chosen language, at least two of which must be Yale courses designated as L5. Students should take L5 content courses only after they have completed RUSS 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*), Harvey Goldblatt (*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*)

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*)

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 standard program focuses on sociological concepts, theories, and methods; (2) a combined program allows students to combine sociology with a concentration in another field; (3) a concentration in markets and society focuses on the cultural frameworks, social ties, and social institutions that give rise to markets and that shape economic behavior; (4) a concentration in health and society emphasizes social processes as they affect health and medicine. 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 course work in sociology.

REQUIREMENTS OF THE MAJOR

Program I. The standard major The requirements for the standard major are:

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.

Program II. Sociology with another subject The combined program allows students to unite 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 Program II 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 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 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, integrating sociology and the other subject chosen.

Program III. Concentration in markets and society Students in the markets 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.

Students in the Class of 2021 With DUS approval, the following changes to the concentration in markets and society may be fulfilled by students who declared their major under previous requirements.

Students in the Class of 2022 and subsequent classes The requirements for the concentration in markets and society 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. SOCY 321 and one additional intermediate or advanced course in economic sociology.
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.

Program IV. Concentration in 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). Up to five course credits may be drawn from outside the Sociology department, with approval from the DUS.
2. SOCY 127, the gateway course for the concentration (or other similar course, with approval of DUS).
3. SOCY 151
4. A course in statistics: SOCY 162, S&DS 103, 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. 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.

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 nonintensive major Students electing the nonintensive 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 nonintensive 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 nonintensive 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. Nonintensive 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 subfield. 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—see The Undergraduate Curriculum, Honors—and submit a senior essay written in SOCY 493, 494.

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 apply 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 end of registration period in the first term of the senior year. Applications should include a one-page statement of interest that includes a list of relevant courses taken and identifies a prospective senior essay adviser. Admission is based on performance and promise. 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 *Programs I and II*—SOCY 151, 152, 160, 1 addtl course from SOCY 161–169; *Program III*—SOCY 151 or 152, SOCY 160, SOCY 321; *Program IV*—SOCY 127, SOCY 151, SOCY 160, or a comparable course approved by the DUS

Distribution of courses *Programs I, II, and III*—at least 1, but no more than 2 intro courses; *Program I*—1 sem from SOCY 300–399; *Program II*—9 or 10 courses in sociology; 3 or 4 courses from another dept; 1 sem from SOCY 300–399; *Program III*—at least 1 intermed or adv course in economic sociology and 1 in microecon; *Program IV*—1 course in stat, as specified; 2 upper-level sems, as specified

Substitution permitted *Program I*—up to 2 courses from other depts; *Program III*—up to 4 courses from other depts, with DUS approval; *Program IV*—up to 5 courses from other depts, with DUS approval

Senior requirement *Nonintensive 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, †Olav Sorensen

Associate Professors Rene Almeling, †Monica Bell, Emily Erikson, †Justin Farrell, †Marissa King, †Issa Kohler-Hausmann, Jonathan Wyrzten

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 online Graduate School 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*), 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 Subhashini Kaligotla (*History of Art*), Sarah Khan (*Political Science*), Priyasha Mukhopadhyay (*English*)

Senior Lecturer Carol Carpenter (*Anthropology, Forestry & Environmental Studies*)

Lecturers Hugh Flick, Jr. (*Religious Studies*), Supriya Gandhi (*Religious Studies*)

Senior Lectors Seema Khurana, Swapna Sharma

Lector Aleksandar Uskokov

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; 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*)

Spanish

Director of undergraduate studies: Rolena Aldorno

(rolena.aldorno@yale.edu) [F]; Noël Valis (noel.valis@yale.edu) [Sp]; language program director: Ame Civdanes (ame.civdanes@yale.edu), Rm. 210, 82-90 Wall 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 at 82–90 Wall Street by 4 p.m. on December 7 in the fall term, or by 4 p.m. on April 16 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 student transcripts.

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 transcript.

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, 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, 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) 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 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, course 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. 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, 244, 250, 260, 300, or 301

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 Starting with the Class of 2022, courses taken Credit/D/Fail may not be counted toward the requirements of the major. The Class of 2021 may take at most one course Credit/D/Fail with permission of the DUS.

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.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 Statistics and Data Science.

REQUIREMENTS OF THE MAJOR

Prerequisites *Both degrees* – MATH 120, ENAS 151, MATH 230, 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; *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, 101–106, 123 or 220.

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.

Statistical Methodology and Data Analysis Two from S&DS 230, 242, 312, 361, 363. ECON 136 may be substituted for S&DS 242.

Computation & Machine Learning One from S&DS 262, 355, 365, CPSC 223, 477. 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, 101–106, 123 or 220

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*), †Theodore Holford, †Edward Kaplan, †Harlan Krumholz, John Lafferty, †Peter Phillips, 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, 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, Winston Lin

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

Study of the City

Please see Yale Course Search for information about STCY, Introduction to the Study of the City.

Theater and Performance Studies

Director of undergraduate studies: Shilarna Stokes (shilarna.stokes@yale.edu), Rm. 102C, 220 York St., 432-1310; theaterstudies.yale.edu; theaterstudies.yale.edu/dance-studies-yale

As a branch of the humanities and as a complex cultural practice, theater claims a rich history and literature and an equally rich repertoire of embodied knowledge and theory. Theater and Performance Studies emphasizes the reciprocal relationship between practice and scholarly study. The major combines practical training with theory and history, while stressing creative critical thinking. Students are encouraged to engage intellectual and embodied approaches to explore diverse cultural forms, historical traditions, and contemporary life. As the study of theater 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 foreign languages. 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 reflective of their developing interests.

Special features of the program are its production seminars, guided independent study projects, and senior projects. Each production seminar concentrates on study, through practice, of one aspect of performance; examples are approaches to acting, directing, writing, dance, design, or digital media in performance. Independent study projects give the student freedom to pursue individual and group-generated projects under the guidance of a Theater and Performance Studies faculty member. All production seminars require permission of the instructor (by application or audition). Independent study project courses are open only to majors.

PREREQUISITES

The prerequisites for the major are THST 110 and THST 111.

REQUIREMENTS OF THE MAJOR

The major consists of ten term courses beyond the introductory prerequisites (THST 110, 111), one of which must be THST 210, Introduction to Performance Concepts. Students are encouraged to enroll in a balanced combination of courses involving studio work and courses in literature, history, and theory. Of the ten required term courses, four must focus on dramatic literature, performance history, or performance theory. At least one of the four courses should include dramatic literature originating in a language other than English. Students are urged to read plays in the original languages whenever possible.

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 director of undergraduate studies (DUS), take one of the dramatic literature, performance history, or performance theory courses, or a production seminar, as a senior seminar. In such cases, the expectations for the final term paper will be substantially higher for students using the course to fulfill their senior requirement.

Or, a student may undertake a one-term senior project (THST 491). Senior projects may take the form of directing, designing, writing a play or musical, performing a role, choreographing a dance piece, or writing a critical essay, among other possibilities. Performance-oriented projects are in addition to a senior essay, which is an integral requirement of THST 491, the senior seminar. For students interested in mounting a production as part of their senior project, collaboration with fellow seniors is strongly encouraged, and collaborative projects will be given preference in the selection process. While collaboration is an important criterion considered by the faculty, it does not guarantee that a project will be selected for inclusion in the curricular season. Proposals for senior project productions will normally be approved only for students who have previously served as producers of other students' senior projects.

Students wishing to undertake a senior project must submit a proposal before the deadline announced by the DUS. This deadline typically falls before spring break of the junior year; students in the junior year will be provided with information and guidance towards the preparation of this proposal in the months leading up to the deadline. Each proposal is submitted to a faculty committee for approval.

ADVISING

Courses in the School of Drama Majors in Theater and Performance Studies are encouraged to consider taking selected 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 the 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.

REQUIREMENTS OF THE MAJOR

Prerequisites THST 110, 111

Number of courses 10 term courses beyond prerequisites (including senior req)

Specific course required THST 210

Distribution of courses 4 courses in dramatic literature, performance history, or performance theory, 1 with dramatic literature originating in a language other than English

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 Rossmey, Brian Seibert, Shilarna Stokes, Daniel Ulbricht

*Member of the Executive Committee for the program.

Urban Studies

Director of undergraduate studies: Elihu Rubin, (elihi.rubin@yale.edu) RDH, 180 York St., 436-4641 [F]; Joyce Hsiang (joyce.hsiang@yale.edu), 327 RDH, 180 York St., 432-2288 [Sp]; 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, law, nonprofit management, public policy, real estate development, and architecture; as well as research-oriented fields such as geography, sociology, anthropology, urban planning, and architecture. For additional information visit the Urban Studies website.

REQUIREMENTS OF THE MAJOR

Students in the Class of 2021 Students interested in pursuing a major in Urban Studies should consult with the director of undergraduate studies (DUS) early in the fall 2020 term. Upon approved fulfillment of the requirements indicated below, seniors may earn a B.A. degree in Urban Studies.

Students in the Class of 2022 and subsequent classes Students majoring in Urban Studies must take thirteen course credits approved by the DUS. The major is organized around survey courses, methods courses, related electives, and a one- or-two term senior requirement.

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, one of which must be Urban Lab 360, or 362; 4, 5, or 6 electives (depending on the senior requirement); and a one- or two-term senior requirement.

Students in the Class of 2021 With DUS permission, URBN 353 may be substituted for one of the Urban Labs (360 or 362).

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 200, 280, 341, 345, AMST 163, AMST 196, ANTH 414, ARCH 385, EVST 226, HSHM 211

Methods Courses Students choose URBN 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 230, 345, 353, 360, 362, AMST 348, ANTH 303, EVST 290, F&ES 755, F&ES 756, F&ES 959, HSHM 422, SOCY 160

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 the 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 360 or URBN 362

Distribution of courses 3 surveys, inc 1 URBN course (to be completed by second year); 3 methods courses, one of which is URBN 360 or 362; 4–6 electives as specified

Substitution permitted URBN 353 for URBN 360 or 362 with DUS permission

Senior requirement URBN 490 and URBN 491; or adv seminar (URBN 400–490) and an addtl elective

FACULTY ASSOCIATED WITH URBAN STUDIES

Professors Keller Easterling (*School of Architecture*), Alexander Garvin (*Adjunct*)(*School of Architecture*), Jennifer Klein (*History*), Alan Plattus (*School of Architecture*), Helen Siu (*Anthropology*)

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 Acciavati (*Visiting*) (*School of Architecture*), Joyce Hsiang (*School of Architecture*), Albert Laguna (*American Studies*), Bimal Mendis (*Adjunct*) (*School of Architecture*), Elihu Rubin (*School of Architecture*)

Lecturers Riché Barnes (*Anthropology*), Alexander Garvin (*School of Architecture*), Jay Gitlin (*History*)

Critics Marta Caldeira (*School of Architecture*), Andrei Harwell (*School of Architecture*), Surry Schlabs (*School of Architecture*)

Women's, Gender, and Sexuality Studies

Director of undergraduate studies: Andrew Dowe (andrew.dowe@yale.edu); wgss.yale.edu

Genders and sexualities are powerful organizing forces: they shape identities and institutions, nations and economies, cultures and political systems. Careful study of gender and sexuality thus explains crucial aspects of our everyday lives on both intimate and global scales. Scholarship in Women's, Gender, and Sexuality Studies is interdisciplinary and wide ranging, drawing on history, literature, cultural studies, social sciences, and natural science to study genders and sexualities as they intersect with race, ethnicity, class, nationality, transnational processes, disability, and religion.

Students majoring in Women's, Gender, and Sexuality Studies take a series of core courses, develop an individual area of 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*), Inderpal Grewal (*American Studies*), Margaret Homans (*English*), Regina Kunzel (*History*), Marianne LaFrance (*Psychology*), Ana Ramos-Zayas (*American Studies, Ethnicity, Race & Migration*), Dara Strolovitch, Laura Wexler (*American Studies*)

Associate Professor Joseph Fischel

Assistant Professors Eda Pepi, Evren Savci

Senior Lecturer Maria Trumpler

Lecturers Melanie Boyd, Andrew Dowe, Graeme Reid

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*), 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*), Hélène Landemore-Jelaca (*Political Science*), Kathryn Lofton (*American Studies, History, Religious Studies*), 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*), Tavia Nyong'o (*Theater Studies, American Studies*), John Pachankis (*Public Health*), Sally Promey (*American Studies, Institute of Sacred Music*), 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, composition, and conducting. 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 [formerly School of Forestry & Environmental Studies; name change effective July 1, 2020]. 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, 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 (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 & East Europe Studies (RSEE)
- Russian (RUSS)

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 or b, 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.

African American Studies (AFAM)

* AFAM 011a / ENGL 007a, *Literature of the Black South* Staff

This course examines the enduring and often unanticipated connections between African American and Southern literature, and considers the ways in which the American South remains a space that simultaneously represents and repels an African American ethos. Through topics and lenses as varied as the Black church, the Great Migration, the Civil Rights Movement, and the rural/urban divide, we consider the ways in which Black culture and Southern culture continue to intersect and interact—even when the natal (Southern) place has ostensibly been rejected or abandoned. HU

* AFAM 016a / AFST 015a / ENGL 015a, *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 060a / AMST 060a / HIST 016a, *Significance of American Slavery* Edward

Rugemer

This first-year seminar explores the significance of racial slavery in the history of the Americas during the eighteenth and nineteenth centuries. We read the work of historians and we explore archival approaches to the study of history. Taught in the Beinecke Library with the assistance of curators and librarians, each week is organized around an archival collection that sheds light on the history of slavery. The course also includes visits to the Department of Manuscripts and Archives in the Sterling Library, the British Art Center, and the Yale University Art Gallery. Each student writes a research paper grounded in archival research in one of the Yale Libraries. Topics include slavery and slaveholding, the transatlantic slave trade, resistance to slavery, the abolitionist movement, the coming of the American Civil War, the process of emancipation, and post-emancipation experiences. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

* AFAM 095a / AFAM 163 / AMST 001a / HIST 001a, *African American Freedom*

Movements in the Twentieth Century Crystal Feimster

Introduction to the study and writing of history, focusing on how African Americans fought for civil rights throughout the twentieth century. The civil rights movement placed in its historical context; African American freedom struggles placed in the larger narrative of U.S. history. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

AFAM 115a / WGSS 125a, *"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 125a / AMST 125a / EDST 130a / HIST 136a, The Long Civil Rights Movement

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis. HU

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 160a / AFST 184a / AMST 160a / HIST 184a, The Rise and Fall of Atlantic Slavery Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

AFAM 162b / AMST 162b / HIST 187b, African American History from Emancipation to the Present Staff

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 202a / HIST 103Ja, Life and Writings of Frederick Douglass** David Blight

The life, times, and works of Frederick Douglass, African American abolitionist and leader of the nineteenth century. Douglass's writings, including autobiographies, oratory, and editorials, and his role as a historical actor in the antislavery and early civil rights movements. Deep inquiry into the craft of biography. WR, HU

*** AFAM 212b / ENGL 221b, African American Literature in the Archives** Melissa Barton

Examination of African American literary texts within their archival context; how texts were planned, composed, revised, and received in their time. Students pair texts with

archival materials from Beinecke Library, including manuscripts, correspondence, photographs, and ephemera. Readings include Lorraine Hansberry, Langston Hughes, Zora Neale Hurston, James Weldon Johnson, and Richard Wright. 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 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

*** AFAM 248b / FILM 430b, Golden Age of Television** Nicholas Forster

Less than a century old, television is one of the youngest but most influential mediums to shape politics, pop culture, and American society. For years, scholars, critics, and fans looked back at the sitcoms and dramas made between 1947-1960 as representative of a “Golden Age of Television” that engaged with a changing society that followed the trauma of World War II. Decades later, in the early 2000s, premium cable shows like *The Sopranos*, *The Wire*, *Breaking Bad*, and *Oz* suggested that a new Golden Age of Television had arrived. This course pairs these two eras of television to ask: Are there similarities between these two eras of television? How do these stories, represented visually on television, relate to the world outside of the screen? How has the rise of streaming reconfigured our viewing habits and the ways that we understand the world? By looking at two eras of television we work to see what some of the major tropes or threads are, and understand how certain shows that are considered a part of either “Golden Age of Television” create meaning and interest in viewers. Programs include: *I Love Lucy*, *Roots*, *The Twilight Zone*, *The Wire*, *Deadwood*, and *How to Get Away with Murder*. HU TR

*** 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 287b / AFST 412b / AMST 465b / FREN 412b / LITR 250b, Postcolonial Theory and Literature** Fadila Habchi

A survey of the principal modes of thought that have animated decolonization and life after colonialism, as seen in both theoretical and literary texts. Concentration on the British and French imperial and postcolonial contexts. Readings in negritude, orientalism, psychoanalysis, poststructuralism, and novels. Lectures in English; readings available both in French and in English translation. HU RP

*** AFAM 291b / HSAR 470b, Pop Art and Black Culture** Kobena Mercer

Pop art strategies among African American artists who contributed a critique of the modernist canon from the 1950s to present. Critical uses of vernacular materials are studied in view of postmodern theories of art and popular culture. HU

*** AFAM 297b / HIST 162Jb, Urban Inequality after Civil Rights** Elizabeth Hinton

By examining the impact of social, political, and economic changes in the decades after the civil rights movement, this course addresses historical developments that functioned to increase segregation and income stratification in the United States as a whole, and in African American communities in particular. Topics include radical social movements and urban unrest, the rise of black mayors, the critical withdrawal of federal resources and public services in cities, and mass criminalization. HU

*** AFAM 306a / HIST 175Ja, Movements for Black Freedom in the Nineteenth-Century Americas** Bianca Dang

This seminar examines Black freedom in the Americas both as a lived experience and as an idea that moved throughout the region during the long nineteenth century. This course explores the hemispheric impacts and reverberations of multiple, yet connected, movements for Black freedom in the nineteenth-century Americas. It begins with the Haitian Revolution, a revolution enacted and won by enslaved African and Afro-descended people that fundamentally transformed the hemisphere. It concludes with Black people's resistance to Jim Crow policies in the post-American Civil War era, emphasizing the enduring strength of Black freedom movements. Organized in a series of themes, such as the Law, the Environment, and Indigeneity and Blackness, this seminar highlights the transnational dimensions of movements for Black freedom in the nineteenth century. At the same time, it traces the distinctiveness of each of these movements to provide a broad, yet nuanced, account of the hemispheric and global dynamics of slavery, freedom, race, and gender from the Age of Revolutions to the turn of the twentieth century. WR, HU

*** AFAM 313a / THST 319a, Embodying Story** Renee Robinson

The intersection of storytelling and movement as seen through historical case studies, cross-disciplinary inquiry, and studio practice. Drawing on eclectic source materials from different artistic disciplines, ranging from the repertory of Alvin Ailey to journalism, architectural studies, cartoon animation, and creative processes, students develop the critical, creative, and technical skills through which to tell their own stories in movement. No prior dance experience necessary. HU

*** AFAM 315a / WGSS 305a, Black Feminist Theory** Roderick Ferguson

This course is designed to introduce you to some of the major themes in black feminist theory. The course does so by presenting classic texts with more recent ones to give you a sense of the vibrancy of black feminist theory for addressing past and present concerns. Rather than interpret black feminist theory as a critical formation that simply puts race, gender, sexuality, and class into conversation with one another, the course apprehends that formation as one that produced epistemic shifts in how we understand politics, empire, history, the law, and literature. This is by no means an exhaustive list of the areas into which black feminism intervened. It is merely a sample of some of the most vibrant ideological and discursive contexts in which black feminism caused certain epistemic transformations. SO

*** AFAM 320a / CLCV 338a / LITR 153a, Classics in Africa and the Black Diaspora**

Emily Greenwood Milne

The reception and appropriation of Greco-Roman classics in Africa and the black diaspora during the twentieth century. The same classical canon that had been used to furnish arguments for colonialism, imperialism, and racism read by black writers and artists in ways that subverted those arguments. Works include drama from Nigeria and South Africa, Caribbean poetry and autobiography, novels by Ralph Ellison and Toni Morrison, and the Odysseus collages of Romare Bearden. WR, HU

*** AFAM 335a / FILM 335a, Black Experimental and Independent Film** Nicholas Forster

Since the birth of cinema over a century ago, black filmmakers have carved out alternative spaces for the production and distribution of cinema. This seminar examines the radical and experimental visions of post war black directors who have queered

the screen, developed new modes of representation, and repeatedly challenged the accepted conventions of Hollywood. Frequently weaving documentary with the fictional, the films selected develop a new language of cinema. The seminar begins with William Greaves' 1968 psychodrama *Symbiopsychotaxiplasm: Take One*, a personal film that unsettles as it refuses to clarify whether what we are watching is real or a performance. Together, we examine Melvin Van Peebles' *Sweet Sweetback's Baadasssss Song* (1971), which revolutionized independent cinema and made an explicit political call for action. The black feminist visions of Madeline Anderson, a documentarian, and Jessie Maple, the first black woman in the cinematographer's union guide us, before we turn to the work of the L.A. Rebellion. The course finishes in dialogue with the interconnected zones between Hollywood and independent film, focusing on work like *Love and Basketball* (Gina Prince-Bythewood, 2000), *Pariah* (Dee Rees, 2011), and *An Oversimplification of Her Beauty* (Terrence Nance, 2012). Though most films are feature length works, we also turn to shorts and excerpts from television. Inhabiting his cinematic space of the undercommons, where artists have forged new visions of the world, we ask: what makes a work independent? What are the terms of experimental film? How can cinema create the cultural and political conditions for change? How have directors rewritten the possibilities of what it means to be, see, and feel in the world?

WR, 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 357a / FILM 357a, Anatomy of an Actor: Performance on Film** Nicholas Forster

We are struck by performances on film. Perhaps more present than anything else, what moves us about the movies are the actors: their movements, their speech, their gestures. This course delves into the difficulties of writing about acting and provides a schematic history of methods and techniques in American cinema over the last century. What defines good acting? Is it something akin to authenticity, where an actor becomes the character, or is it in the expressive moments where we understand some emotion we hadn't felt before? What conventions have changed over time and how do those conventions clarify or complicate our understanding of acting? Must we like the character to understand the actor's performance? This course probes into the complicated performances from classical Hollywood artists (i.e. Bette Davis, Cary Grant) and the "method" school represented by James Dean and Al Pacino to recent performances by Denzel Washington and Alfre Woodard. Along the way we look at the portrayals in indie films and the special effects influence on blockbusters. By understanding historical context and the political possibilities of performance, students develop skills like close reading and learn to describe and make meaning out of the choices actors make. Students leave the class with a set of skills to help write about one of the most challenging and understudied aspects of cinema. HU

*** AFAM 361b / THST 360b / WGSS 341b, Black Queer Performance Studies** Tav Nyong'o

How do race, gender, and sexuality intersect in performance? How have gender nonconformity and sexual dissidence been enacted in African American and black diasporic aesthetic forms? What theories and methods have been developed within black studies, queer studies, and performance studies for approaching these questions politically, historically, and artistically? This course draws primarily on post-1945 American and British theater and performance history. HU

*** AFAM 390a / ER&M 419a / SOCY 319a, Ethnography of the African American Community** Elijah Anderson

An ethnographic study of the African American community. Analysis of ethnographic and historical literature, with attention to substantive, conceptual, and methodological issues. Topics include the significance of slavery, the racial ghetto, structural poverty, the middle class, the color line, racial etiquette, and social identity. SO

*** AFAM 395b / ENGL 296b / ER&M 294b, Auto-Criticism: Writing the Self in the World** Claudia Rankine

This course brings together a group of contemporary cultural critics who examine the intersections of aesthetics and politics across visual and literary forms. Our discussions focus on the different formal techniques and practices regarding archive driven scholarly works, public essays, memoirs, and reviews. We discuss different approaches toward interdisciplinary writing and criticism, the public humanities, and engaging

scholarly expertise with a broader audience. In preparation for meetings, participants read selections of works from guest scholars and cultural critics. Our hope is to build a discussion about writing across different disciplinary background and domains and engage with how these practices might contribute to our works as scholars, writers, and activists. Workshops with critics are twice a month. WR, HU

*** AFAM 408b / AMST 460b / ENGL 343b, African American Poets of the Modern Era**

Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

*** 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, 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 422b / HIST 132Jb, Plantation Societies in the Greater British Caribbean 1627-1761** Staff

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 449a / AFST 449a / ENGL 378a, 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 451b / ANTH 445b / THST 450b / WGSS 442b, Black Women Moving and the Ethnography of Embodiment** Aimee Cox

In this course we explore the theory and methods employed by Black women ethnographers, artists, and activists invested in transforming the traditional norms of the academic disciplines and creative contexts in which they operate. These boundary erasing, rule breaking women challenge us to think expansively and act courageously in our efforts to not only dream a new world but bring that world into fruition. The

life and work of anthropologist/dancer/choreographer/activist Katherine Dunham (1909–2006) provides the framework through which we think through the strategies contemporary scholar-artists employ in their social justice practices, while the concept of movement is our theoretical and methodological foundation for engaging with the work of historical and contemporary Black women change agents. We ask how movement functions in the work of Dunham and these contemporary scholar-artists in terms of: the moving and/or dancing body; movement and migration across geographic territories and imagined space; and participation in social movements. Inspired by the techniques these women have developed for re-imagining the possibilities for moving as an act of social change, we experiment with creating our own embodied artistic practices and research methods. Students should anticipate a holistic experience that requires an openness to physical activity and choreography (accessible to all) as one of our primary tools for both analyzing the multi-media course texts, as well as constructing our own boundary crossing projects. SO

*** 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 480a, Senior Colloquium: African American Studies** Aimee Cox

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 015a / AFAM 016a / ENGL 015a, 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 092b / THST 092b, African Rhythm in Motion** Staff

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

*** AFST 128a / ARCG 128a / EGYPT 128a / NELC 129a / RLST 251a, Magic and Ritual in Ancient Egypt and the Near East** John Darnell

Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

*** AFST 135b / PLSC 135b, Media and Conflict** Staff

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 184a / AFAM 160a / AMST 160a / HIST 184a, The Rise and Fall of Atlantic Slavery Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

AFST 220a / HIST 417a / HSHM 220a, Histories of Confinement: From Atlantic Slavery to Social Distancing Nana Osei Quarshie

This course looks closely at the history of asylums, hospitals, prisons, and schools. It seeks to understand their workings and the interplay between bureaucratic forms, spatial and material organization, and modes of discipline, control, and remediation. It asks, how is institutional power organized, displayed, deployed, and disputed, and what are the limits and contradictions inherent in these efforts? Our readings draw from a range of contexts and disciplines to consider the relationship between the built environment and institutional life. HU

AFST 272b / ANTH 272b / ARCG 272b, African Prehistory Jessica Thompson and Roderick McIntosh

Survey of archaeological evidence for the original contributions of the African continent to the human condition. The unresolved issues of African prehistory, from the time of the first hominids, through development of food production and metallurgy, to the rise of states and cities. SO

*** AFST 304a / MMES 304a / PLSC 458a, Modern North Africa in Flux** Staff
Study of the politics of modern North Africa (Morocco, Algeria, Tunisia, and to a limited degree, Libya and Mauritania), including colonialism; state-formation and early nationalism; the cultivation of authoritarian regimes; modern authoritarian politics; civil-military relations; democratization; civil society; protest, dissent, social and movement mobilization; oil and rentierism; Islamism and the politics of religion; linkages to the Mashreq; and the dynamics of foreign intervention. Readings and approach to politics are cross-disciplinary, integrating political science, anthropological, historical, religious, as well as gender/race studies Prerequisite: MMES 191 or permission of the instructor.

*** AFST 306a / GLBL 306a, Social Enterprise in Developing Economies II** Bo Hopkins

Summer research developed into a case-study project on a topic related to the use of social enterprise in regional economic development. GLBL 305

AFST 335b / ER&M 325b / HIST 335b, A History of South Africa Daniel Magaziner
An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique. HU

*** AFST 355b / ANTH 355b / EAST 351b, China-Africa Encounters** Helen Siu
The history, effects, and implications of Chinese involvement in and with African countries over the past century. Diasporic experiences, with attention to informal economies, cultural strategies, and ethnic and religious tensions; land, finance, and infrastructure; Chinese aid and development in Africa since the late 1960s, including medical aid and charitable groups. SO

*** AFST 368a / EVST 369a / HIST 366Ja, Commodities of Colonialism in Africa**
Robert Harms

This course examines historical case studies of several significant global commodities produced in Africa to explore interactions between world market forces and African resources and societies. Through the lens of four specific commodities—ivory, rubber, cotton, and diamonds—this course evaluates diverse industries and their historical trajectories in sub-Saharan Africa within a global context from ~1870–1990s. Students become acquainted with the historical method by developing their own research paper on a commodity using both primary and secondary sources. WR, HU

*** AFST 396b / HIST 396Jb, Revolutions and Socialist Experiments in Africa**
Benedito Machava

This seminar explores the contours of Africa's embrace and engagement with the most influential ideology of the twentieth-century. Why, and through which channels, were Africans attracted to socialism? Did particular forms of colonialism and decolonization push African political actors towards revolution and socialist experiments? Is it legitimate, as some scholars have suggested, to speak of genuinely African socialisms? If so, what was the nature of these socialisms and how did they differ from the versions of socialism around the world? What political, social, economic, and cultural ends did socialism serve in Africa? And what were the consequences and legacies of African socialist experiments? The seminar addresses these questions. Our goal is to

place Africa in the mainstream of conversations about socialism. We begin with the assumption that, like any doctrine, socialism was the object of multiple interpretations, modification, and appropriation from its inception. In so doing, we challenge orthodox understandings of socialism, which hold the European versions as the pure models and the rest as diluted if not populist façades of the 'true' doctrine. We begin with theoretical readings that help us situate the major debates about socialism in general and socialism in Africa. We then proceed to examine the overall historical context in which African nationalists adopted socialism. We differentiate the first branch of "African Socialism" from the second wave of "Afro-Marxism." We also pay close attention to issues of decolonization and political imagination; ideas and experiments of development; gender, morality, and social engineering. WR, HU

*** AFST 412b / AFAM 287b / AMST 465b / FREN 412b / LITR 250b, Postcolonial Theory and Literature** Fadila Habchi

A survey of the principal modes of thought that have animated decolonization and life after colonialism, as seen in both theoretical and literary texts. Concentration on the British and French imperial and postcolonial contexts. Readings in negritude, orientalism, psychoanalysis, poststructuralism, and novels. Lectures in English; readings available both in French and in English translation. HU TR RP

*** AFST 435b / THST 335b, West African Dance: Traditional to Contemporary** Staff
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 449a / AFAM 449a / ENGL 378a, 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 486a / HIST 374Ja / HSHM 486a, 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

*** AFST 491a or b, The Senior Essay** Veronica Waweru

Independent research on the senior essay. By the end of the sixth week of classes, a rough draft of the entire essay should be completed. By the end of the last week of classes (fall term) or three weeks before the end of classes (spring term), two copies of the final essay must be submitted.

Akkadian (AKKD)

AKKD 110a, Elementary Akkadian I Eli Tadmor

Introduction to the language of ancient Babylonia and its cuneiform writing system, with exercises in reading, translation, and composition. L1

AKKD 120b, Elementary Akkadian II Eli Tadmor

Continuation of AKKD 110. Prerequisite: AKKD 110. L2 RP

AKKD 350b / HIST 350b, Culture and Politics in Lusophone Africa, 1885-1992

Benedito Machava

The peculiar nature of Portugal as a colonial power produced a very distinct history in the five Portuguese-speaking African countries, namely Angola, Guiné-Bissau (Guinea-Bissau), Moçambique (Mozambique), and the Atlantic islands of Cabo-Verde (Cape Verde) and São Tomé e Príncipe. Lusophone Africa is a loose term that refers to the world created by Portugal's colonialism in Africa. This course explores this distinct history through the lens of culture and politics. Focusing on the long twentieth-century, we consider Lusophone Africa as a study unit, dissecting its disparate societies, cultures, and political trajectories, while remaining anchored in the general context of Africa. Military conquest, colonial rule, race/Lusotropicalism, nationalism, and liberation struggle are some of the core themes of the course. We begin with a brief assessment of Portugal's efforts to retain its colonial enclaves amid the voracious expansion of British, French, Belgian, and German presence in Africa in the late 19th century. But our focus is on the twentieth-century, from the establishment of the colonial administration in the early 1900s to the fall of the Portuguese empire in 1974. We dedicate a good portion of the term to exploring the multiple ways (cultural and political) in which Africans responded to Portugal's encroachment and how they navigated the color bar that came to dictate their social mobility under colonial rule. We end with the multifaceted longings for self-determination that led to the longest and bloodiest liberation wars in Africa. Our readings include scholarly essays (old and recent), primary sources, literary works (novels, poetry and short stories), photographs, music and films. We become acquainted with Portuguese-speaking African voices, faces, and places. Luís Bernardo Honwana's collection of short stories in *We Killed Mangy Dog and Other Stories* (1964) and Zézé Gamboa's film *The Great Kilapy* (2012) carry us through the important theme of race and race relations. While cautious in situating the discussion of race in its historical context, these and other materials challenge us to think about race relations and emancipation in our time. HU

American Studies (AMST)

*** AMST 001a / AFAM 095a / AFAM 163 / HIST 001a, African American Freedom Movements in the Twentieth Century** Crystal Feimster

Introduction to the study and writing of history, focusing on how African Americans fought for civil rights throughout the twentieth century. The civil rights movement

placed in its historical context; African American freedom struggles placed in the larger narrative of U.S. history. Enrollment limited to freshmen. Preregistration required; see under Freshman 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. 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 034b, Country Music in America** Staff

Country music is a distinctly American music. The genre blossomed from its vernacular Southern roots during the twentieth century and grew in scope and popularity with the rise the recording industry in the United States. Populated by guitars and fiddles, heroes and outlaws, country music gave the world Jimmie Rodgers, Hank Williams, Elvis Presley, Patsy Cline, Johnny Cash, Dolly Parton, and Willie Nelson. Why have these artists achieved iconic status in America? What meaning can we cull about life in the United States from their musical legacies? This interdisciplinary course considers

the major trends, influential artists, and varied influences affecting country music through time. More broadly, the genre is used as a vehicle for understanding shifting socio-cultural, political, and economic phenomena in the United States from 1927 to the present. The readings cover a broad range of issues and perspectives that have come to define country music historiography. Race, culture, commercialization, notions of authenticity, and the assertion proposed by country music's senior authority, Bill C. Malone, "that the music emerged from southern working-class culture" are all used as frames for understanding the genre. This First-Year Seminar meets twice a week. The first meeting will include a discussion of that week's readings which represent important texts in Country Music scholarship. The second meeting will emphasize sound recordings as primary sources and cultural texts. The class begins with an examination of the 1927 "Bristol Sessions," which effectively created a country music market and launched the careers of the Carter Family and Jimmie Rodgers—country music's first stars. These early recordings, however, raise a number of questions about the very definition of "country" music. The course also delves into subgenres and regional difference as heard in styles such as bluegrass, Cajun music, and western swing. These regional variants raise questions about a "mainstream" repertoire and an identifiable country sound. The rise of nationally syndicated radio emissions, particularly Nashville's "The Grand Ole Opry," are prompts for a broader conversation about commercialization, marketing, and mass media's role in shaping the genre's aesthetic and popularity. Later meetings examine the shifting socio-cultural mores in the U.S. and their relationship to the rise of honky tonk, rockabilly, the Nashville Sound and Outlaw movement. The last half of the course explicitly considers the salient themes influencing the genre, from race and gender, to media. The sound recordings selected for this course are equally as important as the readings. Regular listening exercises will introduce students to the sounds and voices that defined country music at various moments in time. By the end of the term, students should be able to identify the fidelity of both historic and contemporary recordings while distinguishing various artists and instrumentation. The recordings will be made available through the Yale Music Library. Students should listen to the assigned recordings in preparation for each class. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** AMST 060a / AFAM 060a / HIST 016a, Significance of American Slavery** Edward Rugemer

This first-year seminar explores the significance of racial slavery in the history of the Americas during the eighteenth and nineteenth centuries. We read the work of historians and we explore archival approaches to the study of history. Taught in the Beinecke Library with the assistance of curators and librarians, each week is organized around an archival collection that sheds light on the history of slavery. The course also includes visits to the Department of Manuscripts and Archives in the Sterling Library, the British Art Center, and the Yale University Art Gallery. Each student writes a research paper grounded in archival research in one of the Yale Libraries. Topics include slavery and slaveholding, the transatlantic slave trade, resistance to slavery, the abolitionist movement, the coming of the American Civil War, the process of emancipation, and post-emancipation experiences. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, 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 125a / AFAM 125a / EDST 130a / HIST 136a, The Long Civil Rights Movement

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis. 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 160a / AFAM 160a / AFST 184a / HIST 184a, The Rise and Fall of Atlantic Slavery Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

AMST 162b / AFAM 162b / HIST 187b, African American History from Emancipation to the Present Staff

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 199b / HIST 165b, 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 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 228b / GLBL 201b / HIST 128b, Origins of U.S. Global Power David Engerman

This course examines the causes and the consequences of American global power in the “long 20th century,” peeking back briefly into the 19th century as well as forward into the present one. The focus is on foreign relations, which includes but is not limited to foreign policy; indeed, America’s global role was rooted as much in its economic and cultural power as it was in diplomacy and military strength. We study events like wars, crises, treaties, and summits—but also trade shows and movie openings. Our principal subjects include plenty of State Department officials, but also missionaries, business people, and journalists. We pay close attention also to conceptions of American power; how did observers in and beyond the United States understand the nature, origins, and operations of American power? HU

*** AMST 235b / ENGL 354b, Language, Disability, Fiction** Jim Berger

Portrayals of cognitive and linguistic impairment in modern fiction. Characters with limited capacities for language as figures of ‘otherness.’ Contemporaneous discourses of science, sociology, ethics, politics, and aesthetics. The ethics of speaking about or for subjects at the margins of discourse. 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 239a / ENGL 187a, Love and Hate in the American South Caleb Smith

An introduction to the literature and culture of the American South, a region of the mind identified with the former Confederate States of America and fabricated from a mix of beautiful dreams and violent nightmares, including: histories of slavery and settler colonialism, gothic fiction, the Delta blues, Hollywood movies, evangelical sermons, *The Confessions of Nat Turner*, love poems, protest poems, prison songs, *The Adventures of Huckleberry Finn*, country music, photographs, “Strange Fruit,” folk tales, memoirs, cookbook recipes, and other fantasies. Close reading, cultural analysis, and

historical context. Literary works by Capote, Faulkner, Hurston, Jacobs, O'Connor, Poe, Twain, Toomer, Walker, Welty, Wright. Music, film, and other media. HU

*** AMST 257b / ENGL 325b, Modern Apocalyptic Narratives** Jim Berger

The persistent impulse in Western culture to imagine the end of the world and what might follow. Social and psychological factors that motivate apocalyptic representations. Differences and constant features in apocalyptic representations from the Hebrew Bible to contemporary science fiction. Attitudes toward history, politics, sexuality, social class, and the process of representation in apocalyptic texts. HU

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 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 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 317a / ER&M 353a / HIST 323Ja, Race, Radicalism, and Migration in Latinx History** Stephen Pitti

Histories of Mexican American, Puerto Rican, Central American, Dominican, and Cuban American communities in the United States, with a focus on transnational and labor politics, cultural expression, print culture, and social movements. Readings and films locate Latinx experiences alongside African American and Asian American histories, and within broader patterns of U.S. and Latin American history. HU

*** AMST 318a / HIST 415Ja, The Problem of Global Poverty** Joanne Meyerowitz

Study of the programs and policies that aimed to end global poverty from 1960 to the present, from modernization to microcredit to universal basic income. Topics include the green revolution, population control, the 'women in development' movement, and the New International Economic Order. Extensive work with primary sources. May count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. WR, HU

*** AMST 321a / ENGL 285a / FILM 334a / RLST 333a, Mormonism** Kathryn Lofton and John Peters

For some observers, Mormonism is an epithet, a poison, a problem; for others, Mormonism is a practice, a purpose, the bread of life. It's both wave and particle. It's radical and conservative. It's insane and mundane. It's deeply weird and definitionally conventional. This is not a course that decides where one ought to sit on these oppositional terms. We ask instead what makes a subject so inspiring to opposition. We do not consider Mormonism a subject of study as much as a prompt to ask what it is to study anything. This course, the first of its kind at Yale, does not reflect the recent efflorescence of Mormon Studies as an academic subfield as much as it reacts to that intellectual excitement. We consider Mormonism as an indicative problem in the history of interpretation. WR, HU

*** AMST 330a / ENGL 236a, Dystopic and Utopian Fictions** Jim Berger

Attempts since the late nineteenth century to imagine, in literature, cinema, and social theory, a world different from the existing world. The merging of political critique with desire and anxiety; the nature and effects of social power; forms of authority, submission, and resistance. HU

*** AMST 348a / ER&M 381a / EVST 304a, 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 353b / HIST 196Jb, 21st-Century US History: The First Decade** Joanne Meyerowitz

Students conduct collaborative primary source research on the first ten years of the 21st century. Topics include September 11th, the wars in Iraq and Afghanistan, Hurricane Katrina, the financial crisis of 2008, the election of Barack Obama, and battles over domestic surveillance, immigration, policing, gun control, same-sex marriage, and reproductive rights. HU

*** AMST 358b / ENGL 281b, Animals in Modern American Fiction** Jim Berger

Literary portrayals of animals are used to examine the relations between literature, science, and social and political thought since the late nineteenth century. Topics include Darwinist thought, socialism, fascism, gender and race relations, new thinking about ecology, and issues in neuroscience. HU RP

*** AMST 370b / THST 380b, The History of Dance** 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. WR, HU

*** AMST 377b / HSAR 377b, Ahab, Ishmael and the Visual World of Moby Dick** Bryan Wolf

This class reads Herman Melville's *Moby Dick* over the course of a semester, pairing weekly readings of *Moby Dick* with discussions of the social, cultural,

and *visual* histories that the readings engage. Focusing on painting, sculpture and vernacular art, we recreate the visual environment that undergirds Melville's epic, from tavern signs and scrimshaw to images of slavery, the landscape, and everyday life in America. In addition to *Moby Dick* and several short stories by Melville, we study: nineteenth-century landscape and genre painting; slavery and race in antebellum society; commerce, industry and early 'globalism'; and gender and class. We conclude with another voyage into the mysteries of art, language and history: Art Spiegelman's *Maus*. HU

*** 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, WGGS, ERM, and American Studies. Previous readings of James Baldwin's works recommended but not required. HU

*** AMST 390a / ENGL 280a / HUMS 319a, Poetry, Film, Music and Art: John Ashbery's Work** Karin Roffman

A study of the poetry of John Ashbery (1927-2017) through examining the films, music, and art that provoked his imagination and structured and inhabited his poems. In the course, we study his original paintings and collages, read from his published art criticism, film and music reviews, and explore his off-the-cuff reactions to contemporary work in correspondence with friends. In short, we consider how he practiced and extended the art of American poetry through a vivid, lively, and continuous conversation with other arts. We also discuss critiques of the interdisciplinarity of Ashbery's poetics in work by second generation New York School poets. WR, HU

*** AMST 395b / FILM 327b, Studies in Documentary Film** Charles Musser

This course examines key works, crucial texts, and fundamental concepts in the critical study of non-fiction cinema, exploring the participant-observer dialectic, the performative, and changing ideas of truth in documentary forms. HU RP

*** AMST 398b / ER&M 308b / HIST 158Jb, American Indian Law and Policy** Ned Blackhawk

Survey of the origins, history, and legacies of federal Indian law and policy during two hundred years of United States history. The evolution of U.S. constitutional law and political achievements of American Indian communities over the past four decades.

WR, HU

*** AMST 408a / AFAM 412a / 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

*** AMST 414a / ENGL 440a, Poetry and Debates on the Value of Arts and Humanities** Jim Berger

Attacks on and defenses of poetry in the broadest sense (as culture, the aesthetic, the humanities) from Plato to contemporary debates over the proper focus of education. The value of poetry in terms of knowledge claims, moral impact, economic utility, and other categories particular to artistic production and reception. WR, HU

*** AMST 421b, Transformations in Hawaiian Studies** Gary Okihiro

Over the past decade, there has been a transformation in the field of Hawaiian studies led mainly by Hawaiian (kanaka maoli) scholars. In addition to their subject-positions unlike the extant scholarship produced by non-Hawaiian scholars, those kanaka maoli intellectuals have benefited from archives in the Hawaiian language. The purpose of this seminar is to explore that dramatic change, described by some as a process of decolonization, from the standard ideas of Hawai'i as represented by historians, anthropologists, and sociologists to the new works in Hawaiian history, anthropology, and cultural studies. HU

*** AMST 428b / AMST 888b / ENGL 383b / ENGL 832 / EVST 284b, Food in Literature, Culture, and Science** Wai Chee Dimock

From the global histories of sugar and salt to the latest research on chicken and antibiotics, this course explores some key texts – by Gabriel Garcia Marquez, Sinclair Lewis, Ruth Ozeki, Monique Truong, Jonathan Safran Foer, Octavia Butler, and Margaret Atwood – both as works of luminous imagination and as entry points to deeper scientific knowledge, encouraging cross-pollination among disciplines. Formerly ENGL 283. WR, HU

*** AMST 435a / ANTH 366a, 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 436a / ER&M 440a, Antiracism, Racial Justice, and Freedom** Daniel HoSang

Examination of competing conceptualizations of anti-racism and racial justice within a range of historical, theoretical, and practical sites. Consideration of how the resurgence of collective and popular mobilizations against racial and colonial domination in the last ten years, witnessed in the struggles against the police and prison violence, immigrant detention and deportation, and indigenous-led campaigns against fossil fuel extraction, raise profound questions about the meaning, politics, and vision of racial justice. HU

*** 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 442a, Religion and U.S. Empire** Tisa Wenger and Zareena Grewal

Interrogation of the multiple intersections between religion and U.S. empire. How Christianity and other religious traditions have facilitated and enabled empire, and how they have served as resources for resistance, but also how the categories of 'religion' and the 'secular' were assembled as imperial products alongside modern formations of race, class, gender, and sexuality. HU

*** AMST 451a / HIST 174Ja / RLST 260a, Religion, War, and the Meaning of America** Harry Stout

The relationship between religion and war in American history from colonial beginnings through Vietnam. The religious meanings of Americans at war; the mutually reinforcing influences of nationalism and religion; war as the norm of American national life; the concept of civil religion; biblical and messianic contexts of key U.S. conflicts. HU

*** AMST 452b / AMST 628 / 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 453b / HIST 119Jb, The United States Constitution of 1787** Staff

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 458b / WGSS 469, Racial and Economic Justice in Transgender Health**

Greta LaFleur and Ronica Mukerjee

What kind of access and exposure do transgender people have to healthcare services, policing, mental health, education, and public spaces and what kind of access *should* trans people have? How do we work to close the gap between what is available, and what should be? This course considers the diverse range of healthcare and other basic needs of transgender and nonbinary people in a number of different institutional settings and medical contexts—prisons to K-12 public schools, gender-affirming surgeries to fertility support—with a twinned focus on how institutions render trans people and their bodies illegible or even illegal, on the one hand, and what kind of knowledge, best practices, and interventions might be implemented to remove obstacles for trans and nonbinary people seeking the care that they need, on the other. At the heart of the course is the role of racial and economic justice—in healthcare, and in the world more broadly—in mitigating the health and healthcare disparities between transgender and non-transgender patients. This course is co-taught by Greta LaFleur (American Studies) and Ronica Mukerjee (School of Nursing). Course will be capped at 25. HU

*** AMST 459b / ANTH 465b, Multispecies Worlds** Kathryn Dudley

This seminar explores the relational and material worlds that humans create in concert with other-than-human species. Through an interdisciplinary analysis of the problematic subject of anthropology—Anthropos—we seek to pose new questions about the fate of life worlds in the present epoch of anthropogenic climate change. Our readings track circuits of knowledge from anthropology and philosophy to geological history, literary criticism, and environmental studies as we come to terms with the loss of biodiversity, impending wildlife extinctions, and political-economic havoc wrought by global warming associated with the Anthropocene. A persistent provocation guides our inquiry: What multispecies worldings become possible to recognize and cultivate when we dare to decenter the human in our politics, passions, and aspirations for life on a shared planet? SO

*** AMST 460b / AFAM 408b / ENGL 343b, African American Poets of the Modern Era**

Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

*** AMST 463a and AMST 464b / EVST 463a and EVST 464b / FILM 455a and FILM 456b, 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 465b / AFAM 287b / AFST 412b / FREN 412b / LITR 250b, Postcolonial Theory and Literature** Fadila Habchi

A survey of the principal modes of thought that have animated decolonization and life after colonialism, as seen in both theoretical and literary texts. Concentration on the British and French imperial and postcolonial contexts. Readings in negritude, orientalism, psychoanalysis, poststructuralism, and novels. Lectures in English; readings available both in French and in English translation. HU RP

*** AMST 468b / PLSC 261b, American Political Development** Stephen Skowronek

This course examines patterns of political change and institutional development in the United States. It looks to the past for leverage on thinking about the problems of government and politics today. Students examine issues of political culture like racism and liberalism, as well as standard developmental themes like party building, state building, social movement effects, and constitutional change. SO

*** AMST 469a / EP&E 396a / PLSC 251a, American Progressivism and Its Critics** Stephen Skowronek

The progressive reform tradition in American politics. The tradition's conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

*** AMST 471a and AMST 472b, Individual Reading and Research for Juniors and Seniors** Staff

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 475b / ENGL 277b, Performing American Literature** Wai Chee Dimock

A broad selection of short stories, poems, and novels, accompanied by class performances, and culminating in a term project with a significant writing component. "Performance" includes a wide range of activities including: staging; making digital films and videos; building websites; book illustration; game design; and creative use of social media. Readings include poetry by Walt Whitman and Emily Dickinson; plays by Suzan-lori Parks; and fiction by F. Scott Fitzgerald, Ray Bradbury, Walter Mosley, Jhumpa Lahiri, and Junot Diaz. Formerly ENGL 438. WR, HU

*** AMST 477b / MUSI 492b, The Beach Boys in American Culture and Counterculture** Daniel Harrison

The sixty-year career of the Beach Boys is an armature to study a variety of topics of interest to musicologists, American cultural historians, and students of media. The group's musical production is notably large and stylistically varied, its complex history

(and mythology) is well documented in print and on film, and recent scholarship about the group is sophisticated and suggestive. Starting with close listening of a large set of songs, readings from both academic and popular sources, and discussions with expert guests in cultural studies, rock journalism, biography, and music analysis, students identify and work on an original research project related to the group, broadly conceived. HU

*** 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

*** AMST 486b / ER&M 425b, Asian American Studies of Race, Colonialism, and Empire** Lisa Lowe

This interdisciplinary course examines three periods of Asian American history that are paradigmatic within Asian American Studies of race, colonialism, and empire: 19th century Chinese immigrant labor, the internment of Japanese and Japanese Americans during World War II, and Korean Americans in 1992 Los Angeles. Studying these three examples in their national and global contexts, we consider Chinese immigrant railroad workers in relation to both conditions for emigration from China, and to Native American responses to U.S. settlement and expansion into the western frontier; the dispossession and incarceration of Japanese Americans in relation to wartime racialization of Mexican Americans, Blacks, and the longer history of U.S. war in Asia; and finally, we seek to understand the positioning of Korean Americans as 'middlemen' in post-Civil Rights multiracial Los Angeles in relation to Korean War, and U.S. development and investment in the industrialization of South Korea. We explore how Asian American histories of racialized labor and citizenship in the U.S. are better understood in comparative relation to the histories of other groups, and with consideration of the longer histories of U.S. interventions in Asian countries of origin.

HU

*** AMST 491a or b, Senior Project** Staff

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** Staff
Independent research and proseminar on a two-term senior project. For requirements see under 'Senior requirement' in the American Studies program description.

Applied Mathematics (AMTH)

AMTH 160b / MATH 160b / S&DS 160b, The Structure of Networks Ronald Coifman

Network structures and network dynamics described through examples and applications ranging from marketing to epidemics and the world climate. Study of social and biological networks as well as networks in the humanities. Mathematical graphs provide a simple common language to describe the variety of networks and their properties. QR

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. After MATH 115 or equivalent. May not be taken after MATH 225. QR

AMTH 244a or b / MATH 244a or b, Discrete Mathematics
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 262b / S&DS 262b, 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 principle 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 361b / S&DS 361b, Data Analysis Elena Khusainova
Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood,

resampling methods, curve estimation, model selection, classification, and clustering. After S&DS 242 and MATH 222 or 225, or equivalents. 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 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

Anthropology (ANTH)

*** 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 030b / ARCG 030b / LAST 030b, Inca Culture and Society** Richard Burger
History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

ANTH 110b, An Introduction to Cultural Anthropology Erik Harms
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 116b, 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 140a / ER&M 241a / SOCY 138a, The Corporation Douglas Rogers

Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO

ANTH 171a / ARCG 171a, Great Civilizations of the Ancient World Staff

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 203a, Primate Conservation David Watts

A study of nonhuman primates threatened by deforestation, habitat disturbance, hunting, and other human activities; the future of primate habitats, especially tropical rainforests, as they are affected by local and global economic and political forces. Examination of issues in primate conservation, from the principles of conservation biology and rainforest ecology to the emergence of diseases such as AIDS and Ebola and the extraction of tropical resources by local people and by transnational corporations. SO

ANTH 204a, Molecular Anthropology

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 213a / EAST 313a, Postwar Japan: Ghosts of Modernity**

This course introduces students to contemporary Japan, examining how its defeat in the Second World War and loss of empire in 1945 continue to shape Japanese culture and society. Looking especially at the sphere of cultural production, it focuses on the question of what it means to be modern as expressed through the tension between resurgent neo-nationalism and the aspiration to internationalize. The course charts how the legacy of Japan's imperial failure plays a significant role in its search for renewal and

identity since 1945. How, it asks, does the experience of catastrophic failure—and failure to account for that failure—play into continued aspirations for modernity today? How does Japanese society wrestle with modernity's two faces: its promise for progress and its history of catastrophic violence? The course follows the trajectory of Japan's postwar nation-state development after the dissolution of empire, from its resurrection from the ashes after defeat, to its identity as a US ally and economic superpower during the Cold War, to decades of recession since the 1990s and the search for new relations with its neighbors and new reckonings with its own imperial violence and postwar inactions against the background of rising neonationalism. HU, SO

ANTH 223b / ARCG 228b, The Anthropology of War Louisa Lombard, David Watts, and William Honeychurch

An integrated anthropological perspective on human conflict and organized violence. Questions include the definition of war, the inevitability of war, lessons to be learned from archaeological evidence, and the effects of war on individuals and groups. Source material includes the study of human evolution and nonhuman primates, the archeological record, and ethnography of the contemporary world. SO

*** ANTH 230b / WGSS 230b, 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 232a / ARCG 232a / LAST 232a, Ancient Civilizations of the Andes Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

ANTH 242a, Human Evolutionary Biology and Life History Claudia Valeggia

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, Social Change in Contemporary Southeast Asia Erik Harms

This course examines a number of significant forms of social change occurring in Southeast Asia in recent years. Fueled by new digital technologies; environmental change; globalized economies, politics, human rights, and religion—Southeast Asia is experiencing a rapid transformation. Some of these changes are visible such as the ubiquitous use of mobile phones, transformed city skylines, rampant deforestation, and changing infrastructure. However, some are less visible such as the forced evacuations of the poor from urban centers, increasing state surveillance, and new forms of relationships between people and places enabled through digital communications. Topics include migration, politics and political activism, urban development, environmentalism, labor, violence, religion, popular culture, gender, and relationships. Principle readings include key works from a range of disciplines and represent a number of Southeast Asian nations. The course includes a visual component through a number of in class film screenings. SO

*** ANTH 253b / ARCG 253b, Introduction to Experimental Archaeology** Roderick McIntosh and Ellery Frahm

Experimental archaeology is one of the most important tools to develop and test models which link human behaviors and natural forces to the archaeological record. This class explores the elements of good experimental design and procedures. ANTH 316L, ARCG 316L recommended. so

ANTH 267a / ARCG 267a, Human Evolution Jessica Thompson

Examination of the fossil record of human evolution, including both paleontological and archaeological evidence for changes in hominid behavior during the Pleistocene. Prerequisite: Introductory course in biological anthropology or biology. so

ANTH 272b / AFST 272b / ARCG 272b, African Prehistory Jessica Thompson and Roderick McIntosh

Survey of archaeological evidence for the original contributions of the African continent to the human condition. The unresolved issues of African prehistory, from the time of the first hominids, through development of food production and metallurgy, to the rise of states and cities. so

ANTH 280b, Evolution of Primate Intelligence David Watts

Discussion of the extent and evolutionary origins of cognitive abilities in primates (prosimians, monkeys, apes, and humans). Topics include the role of ecological and social factors as evolutionary forces; 'ape language' studies; and whether any nonhuman primates possess a 'theory of mind.' so

ANTH 294b / ARCG 294b, The Ancient Maya Oswaldo Chinchilla Mazariegos

Introduction to the archaeological study of ancient Maya civilization in southern Mexico and northern Central America. Maya origins and modes of adaptation to a tropical forest environment; political history of the Classic Maya and competing theories about their collapse; overviews of Maya art, calendar, and writing. so

ANTH 316La / ARCG 316La, Introduction to Archaeological Laboratory Sciences

Roderick McIntosh and 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 324a / ANTH 824a, Politics of Memory**

This course explores the role of memory as a social, cultural, and political force in contemporary society. How societies remember difficult pasts has become a contested site for negotiating the present. Through the lens of memory, we examine complex roles that our relationships to difficult pasts play in navigating issues we face today. This course explores this politics of memory that takes place in the realm of popular

culture and public space. The class asks such questions as: How do you represent difficult and contested pasts? What does it mean to enable long-silenced victims' voices to be heard? What are the consequences of re-narrating the past by highlighting past injuries and trauma? Does memory work heal or open wounds of a society and a nation? Through examples drawn from the Holocaust, the atomic bombing in Hiroshima, the Vietnam War, genocide in Indonesia and massacres in Lebanon, to debates on confederacy statues, slavery, and lynching in the US, this course approaches these questions through an anthropological exploration of concepts such as memory, trauma, mourning, silence, voice, testimony, and victimhood. HU, SO

*** ANTH 336b / ARCG 336b / EPS 336b, Geoarchaeology** Ellery Frahm

A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

*** ANTH 342a, Cultures and Markets in Asia** Helen Siu

Historical and contemporary movements of people, goods, and cultural meanings that have defined Asia as a region. Reexamination of state-centered conceptualizations of Asia and of established boundaries in regional studies. The intersections of transregional institutions and local societies and their effects on trading empires, religious traditions, colonial encounters, and cultural fusion. Finance flows that connect East Asia and the Indian Ocean to the Middle East and Africa. The cultures of capital and market in the neoliberal and postsocialist world. SO

*** ANTH 355b / AFST 355b / EAST 351b, China-Africa Encounters** Helen Siu

The history, effects, and implications of Chinese involvement in and with African countries over the past century. Diasporic experiences, with attention to informal economies, cultural strategies, and ethnic and religious tensions; land, finance, and infrastructure; Chinese aid and development in Africa since the late 1960s, including medical aid and charitable groups. SO

*** ANTH 362b, Unity and Diversity in Chinese Culture** Helen Siu

An exploration of the Chinese identity as it has been reworked over the centuries. Major works in Chinese anthropology and their intellectual connections with general anthropology and historical studies. Topics include kinship and marriage, marketing systems, rituals and popular religion, ethnicity and state making, and the cultural nexus of power.

*** ANTH 366a / AMST 435a, 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 368b, Language, Culture, and Identity** J Joseph Errington

Introduction to the role of language in the constitution of gendered, class, ethnic, and national identities. Ethnographic and linguistic case studies are combined with theoretical and comparative approaches. Enrollment limited to 40. This course was formerly ANTH 205. SO

*** ANTH 372a / ARCG 372a, The Archaeology of Urbanism** Anne Underhill and Oswaldo Chinchilla Mazariegos

Archaeological studies of ancient cities and urbanism. Topics include the origin and growth of cities; the economic, social, and political implications of urban life; and archaeological methods and theories for the study of ancient urbanism. Case studies include ancient cities around the world. SO

*** ANTH 375b / ARCG 379b, Anthropology of Mobile Societies** William Honeychurch

The social and cultural significance of the ways that hunter-gatherers, pastoral nomads, maritime traders, and members of our own society traverse space. The impact of mobility and transport technologies on subsistence, trade, interaction, and warfare from the first horse riders of five thousand years ago to jet-propulsion tourists of today. SO

*** ANTH 378a, Postwar Vietnam** Erik Harms

An introduction to the study of Vietnamese society since the end of the Vietnam War in 1975, with a focus on how economic and political changes intersect with cultural and social life. The historical challenges of postwar socialism, economic renovation, and the intersection of 'market-oriented socialism' with class dynamics, urbanization, gender, health care, and ritual life. SO

*** ANTH 381b / WGSS 378b, 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 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 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 410a / ARCG 410a, Ethnohistory and Archaeology** Roderick McIntosh

Review of the major problems and methodologies associated with the use of ethnohistory by archaeologists. The construction of a historical imagination. Sources include colonial and “visitor” documents, peoples’ written descriptions of themselves, oral traditions, classic ethnographies, and writings in art history. SO

*** ANTH 415a, Culture, History, Power, and Representation** Helen Siu

A critical introduction to anthropological formulations of the junctures of meaning, interest, and power. Readings include classical and contemporary ethnographies that are theoretically informed and historically situated. SO RP

*** ANTH 432b, Politics of Language** J Joseph Errington

Language difference and language inequality as symbols and shapers of political dynamics and social change in plural societies. Comparative, theoretical, and ethnographic approaches to the politics of sociolinguistic difference, with case studies focused on specific issues. Topics include “problems” of substandard languages, bilingual identities, ethnic and national identity, and globalization and language shift. SO RP

*** ANTH 441b / MMES 399b / MMES 430b / WGSS 430b, 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

*** ANTH 445b / AFAM 451b / THST 450b / WGSS 442b, Black Women Moving and the Ethnography of Embodiment** Aimee Cox

In this course we explore the theory and methods employed by Black women ethnographers, artists, and activists invested in transforming the traditional norms of the academic disciplines and creative contexts in which they operate. These boundary erasing, rule breaking women challenge us to think expansively and act courageously in our efforts to not only dream a new world but bring that world into fruition. The life and work of anthropologist/dancer/choreographer/activist Katherine Dunham (1909–2006) provides the framework through which we think through the strategies contemporary scholar-artists employ in their social justice practices, while the concept of movement is our theoretical and methodological foundation for engaging with the work of historical and contemporary Black women change agents. We ask how movement functions in the work of Dunham and these contemporary scholar-artists in terms of: the moving and/or dancing body; movement and migration across geographic territories and imagined space; and participation in social movements. Inspired by the techniques these women have developed for re-imagining the possibilities for moving as an act of social change, we experiment with creating our own

embodied artistic practices and research methods. Students should anticipate a holistic experience that requires an openness to physical activity and choreography (accessible to all) as one of our primary tools for both analyzing the multi-media course texts, as well as constructing our own boundary crossing projects. so

*** ANTH 450a / ARCG 450a, Analysis of Lithic Technology** Oswaldo Chinchilla Mazariegos

Introduction to the analysis of chipped and ground stone tools, including instruction in manufacturing chipped stone tools from obsidian. Review of the development of stone tool technology from earliest tools to those of historical periods; relevance of this technology to subsistence, craft specialization, and trade. Discussion of the recording, analysis, and drawing of artifacts, and of related studies such as sourcing and use-wear analysis. so

*** ANTH 451a / WGSS 431a, 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 457a / EPS 457a, Topics in Evolutionary Theory** Eric Sargis and Jacques Gauthier

Classic and current literature in theoretical evolutionary biology. Intensive training in critical analysis of theoretical concepts and in scientific writing. Recommended preparation: ANTH 267. so

ANTH 464a or b / ARCG 464a or b / E&EB 464a or b, Human Osteology Eric Sargis

A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions. SC, so

*** ANTH 465b / AMST 459b, Multispecies Worlds** Kathryn Dudley

This seminar explores the relational and material worlds that humans create in concert with other-than-human species. Through an interdisciplinary analysis of the problematic subject of anthropology—Anthropos—we seek to pose new questions about the fate of life worlds in the present epoch of anthropogenic climate change. Our readings track circuits of knowledge from anthropology and philosophy to geological history, literary criticism, and environmental studies as we come to terms with the loss of biodiversity, impending wildlife extinctions, and political-economic havoc wrought by global warming associated with the Anthropocene. A persistent provocation guides our inquiry: What multispecies worldings become possible to recognize and cultivate when we dare to decenter the human in our politics, passions, and aspirations for life on a shared planet? so

*** ANTH 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 478b / ARCG 399b / EVST 399b / NELC 399b, Agriculture: Origins, Evolution, Crises** Harvey Weiss

Analysis of the societal and environmental drivers and effects of plant and animal domestication, the intensification of agroproduction, and the crises of agroproduction: land degradation, societal collapses, sociopolitical transformation, sustainability, and biodiversity. SO

*** ANTH 482a / ARCG 482a, Advanced Archaeological Theory** Roderick McIntosh
Review of the intellectual history of archaeology, with readings from the Enlightenment to the present. Emphasis on the tension between science, mysticism, and nationalism in the interpretation of prehistoric processes. SO RP

*** 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 Physics (APHY)

*** APHY 050a / ENAS 050a / PHYS 050a, 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 RP

*** APHY 100b / ENAS 100b / EVST 100b / G&G 105 / PHYS 100b, Energy Technology and Society** Daniel Prober

The technology and use of energy. Impacts on the environment, climate, security, and economy. Application of scientific reasoning and quantitative analysis. Intended for non-science majors with strong backgrounds in math and science. QR, SC RP

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 Hongxing 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 321b / EENG 403b, Semiconductor Silicon Devices and Technology Tso-Ping Ma

Introduction to integrated circuit technology, theory of semiconductor devices, and principles of device design and fabrication. Laboratory involves the fabrication and analysis of semiconductor devices, including Ohmic contacts, Schottky diodes, p-n junctions, solar cells, MOS capacitors, MOSFETs, and integrated circuits. Formerly EENG 401. Prerequisite: EENG 320 or equivalent 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 Mark Reed

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 Peter Rakich

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 Staff

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 450b / ENAS 450b / MENG 450b, Advanced Synchrotron Techniques and Electron Spectroscopy of Materials** Charles Ahn

Introduction to concepts of advanced x-ray and electron-based techniques used for understanding the electronic, structural, and chemical behavior of materials. Students learn from world-leading experts on fundamentals and practical applications of various diffraction, spectroscopy, and microscopy methods. Course highlights the use of synchrotrons in practical experiments. Prerequisites: physics and quantum

mechanics/physical chemistry courses for physical science and engineering majors, or by permission of instructor. 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 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 Staff

Development of a basic knowledge of Modern Standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the growth of skills in speaking, listening, reading, and writing. L1 1½ Course cr

ARBC 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** Sarab Al Ani

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 131a / MMES 140a, Intermediate Levantine Arabic I** Sarab Al Ani

This course develops and enhances Arabic language skills using Levantine Arabic. By implementing an interactive student-centered approach, students attain mastery of the essential modes of communicative (interpersonal, interpretive, and presentational). Relevant cultural aspects and values in the Arab world are introduced and discussed using multi-modal authentic materials, especially but not limited to those that are reflected in the usage and structure of the language. Grammar is viewed from a functionality perspective as a tool that serves the main objective of the course.

Prerequisites: ARBC 110, ARBC 120, equivalent or permission of instructor. L3
1½ Course cr

ARBC 136a, Intermediate Classical Arabic I Kevin Butts

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 Sarab Al Ani

Continuation of ARBC 130. Prerequisite: ARBC 130 or requisite score on a placement test. L4 RP 1½ Course cr

*** ARBC 141b / MMES 141b, Intermediate Levantine Arabic II** Sarab Al Ani

Continuation of ARBC 131. This course develops and enhances Arabic language skills using Levantine Arabic in the intermediate level with the goal of reaching Intermediate High to Advanced Low Level (ACTFL standards). By implementing an interactive student-centered approach, students attain mastery of the essential modes of communicative (interpersonal, interpretive, and presentational). Relevant cultural aspects and values in the Arab world are introduced and discussed using multi-modal authentic materials, especially but not limited to those that are reflected in the usage and structure of the language. Grammar is viewed from a functionality perspective as a tool that serves the main objective of the course. Prerequisites: at least 3 Arabic courses, ARBC 110, 120, 130, 131, or equivalent or permission of instructor. L4 1½ Course cr

ARBC 146b, Intermediate Classical Arabic II Kevin Butts

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** Muhammad Aziz

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** Muhammad Aziz

Continuation of ARBC 150. Prerequisite: ARBC 150 or requisite score on a placement test. L5 RP

*** ARBC 161a, Arabic Narrative Prose** Muhammad Aziz

Close reading of selected novels by Naguib Mahfouz. Attention to idiomatic expressions, structural patterns, and literary analysis. Prerequisite: ARBC 151 or requisite score on a placement test. May be repeated for credit. L5

*** ARBC 168b / MMES 170b, Modern Arab Writers** Muhammad Aziz

Study of novels and poetry written by modern Arab writers. Such writers include Taha Hussein, Zaid Damraj, Huda Barakat, Nizar Qabbani, al-Maqalih, and Mostaghanimi. Prerequisite: ARBC 140 or permission of instructor. L5

Archaeological Studies (ARCG)

*** ARCG 030b / ANTH 030b / LAST 030b, Inca Culture and Society** Richard Burger

History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political

organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

*** 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 128a / AFST 128a / EGYPT 128a / NELC 129a / RLST 251a, Magic and Ritual in Ancient Egypt and the Near East** John Darnell

Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

ARCG 161a / CLCV 161a / HSAR 247a, Art and Myth in Greek Antiquity Milette Gaifman

Visual exploration of Greek mythology through the study of ancient Greek art and architecture. Greek gods, heroes, and mythological scenes foundational to Western culture; the complex nature of Greek mythology; how art and architecture rendered myths ever present in ancient Greek daily experience; ways in which visual representations can articulate stories. Use of collections in the Yale University Art Gallery. HU

ARCG 171a / ANTH 171a, Great Civilizations of the Ancient World Staff

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 228b / ANTH 223b, The Anthropology of War Louisa Lombard, David Watts, and William Honeychurch

An integrated anthropological perspective on human conflict and organized violence. Questions include the definition of war, the inevitability of war, lessons to be learned from archaeological evidence, and the effects of war on individuals and groups. Source material includes the study of human evolution and nonhuman primates, the archeological record, and ethnography of the contemporary world. SO

ARCG 232a / ANTH 232a / LAST 232a, Ancient Civilizations of the Andes Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

*** ARCG 253b / ANTH 253b, Introduction to Experimental Archaeology** Roderick McIntosh and Ellery Frahm

Experimental archaeology is one of the most important tools to develop and test models which link human behaviors and natural forces to the archaeological record. This class explores the elements of good experimental design and procedures. ANTH 316L, ARCG 316L recommended. SO

ARCG 267a / ANTH 267a, Human Evolution Jessica Thompson

Examination of the fossil record of human evolution, including both paleontological and archaeological evidence for changes in hominid behavior during the Pleistocene. Prerequisite: Introductory course in biological anthropology or biology. SO

ARCG 272b / AFST 272b / ANTH 272b, African Prehistory Jessica Thompson and Roderick McIntosh

Survey of archaeological evidence for the original contributions of the African continent to the human condition. The unresolved issues of African prehistory, from the time of the first hominids, through development of food production and metallurgy, to the rise of states and cities. SO

ARCG 294b / ANTH 294b, The Ancient Maya Oswaldo Chinchilla Mazariegos

Introduction to the archaeological study of ancient Maya civilization in southern Mexico and northern Central America. Maya origins and modes of adaptation to a tropical forest environment; political history of the Classic Maya and competing theories about their collapse; overviews of Maya art, calendar, and writing. SO

ARCG 316La / ANTH 316La, Introduction to Archaeological Laboratory Sciences

Roderick McIntosh and 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 336b / ANTH 336b / EPS 336b, Geoarchaeology** Ellery Frahm

A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

*** ARCG 372a / ANTH 372a, The Archaeology of Urbanism** Anne Underhill and Oswaldo Chinchilla Mazariegos

Archaeological studies of ancient cities and urbanism. Topics include the origin and growth of cities; the economic, social, and political implications of urban life; and archaeological methods and theories for the study of ancient urbanism. Case studies include ancient cities around the world. SO

* **ARCG 379b / ANTH 375b, Anthropology of Mobile Societies** William Honeychurch
The social and cultural significance of the ways that hunter-gatherers, pastoral nomads, maritime traders, and members of our own society traverse space. The impact of mobility and transport technologies on subsistence, trade, interaction, and warfare from the first horse riders of five thousand years ago to jet-propulsion tourists of today.
SO

* **ARCG 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 399b / ANTH 478b / EVST 399b / NELC 399b, Agriculture: Origins, Evolution, Crises** Harvey Weiss
Analysis of the societal and environmental drivers and effects of plant and animal domestication, the intensification of agroproduction, and the crises of agroproduction: land degradation, societal collapses, sociopolitical transformation, sustainability, and biodiversity. SO

* **ARCG 410a / ANTH 410a, Ethnohistory and Archaeology** Roderick McIntosh
Review of the major problems and methodologies associated with the use of ethnohistory by archaeologists. The construction of a historical imagination. Sources include colonial and “visitor” documents, peoples’ written descriptions of themselves, oral traditions, classic ethnographies, and writings in art history. SO

* **ARCG 450a / ANTH 450a, Analysis of Lithic Technology** Oswaldo Chinchilla Mazariegos
Introduction to the analysis of chipped and ground stone tools, including instruction in manufacturing chipped stone tools from obsidian. Review of the development of stone tool technology from earliest tools to those of historical periods; relevance of this technology to subsistence, craft specialization, and trade. Discussion of the recording, analysis, and drawing of artifacts, and of related studies such as sourcing and use-wear analysis. SO

ARCG 464a or b / ANTH 464a or b / E&EB 464a or b, Human Osteology Eric Sargis
A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions.
SC, SO

* **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

* **ARCG 482a / ANTH 482a, Advanced Archaeological Theory** Roderick McIntosh
Review of the intellectual history of archaeology, with readings from the Enlightenment to the present. Emphasis on the tension between science, mysticism, and nationalism in the interpretation of prehistoric processes. SO RP

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 154a or b, Drawing Architecture Staff

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 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 230b / STCY 176b / URBN 230b, Introduction to the Study of the City**

Alexander Garvin

An examination of forces shaping American cities and strategies for dealing with them. Topics include housing, commercial development, parks, zoning, urban renewal, landmark preservation, new towns, and suburbs. The course includes games, simulated problems, fieldwork, lectures, and discussion. SO

*** ARCH 250a, Methods and Form in Architecture I** Anne Barrett

Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. Enrollment limited to 25. Open only to Architecture majors. 1½ Course cr

*** ARCH 251b, Methods and Form in Architecture II** Staff

Continuation of ARCH 250. Analysis of architectural design of specific places and structures. Analysis is governed by principles of form in landscape, program, ornament, and space, and includes design methods and techniques. Readings and studio exercises required. 1½ Course cr

ARCH 260a / HSAR 326a, History of Architecture: Antiquity to the Baroque Kyle

Dugdale

The first half of a two-term sequence in the history of architecture. Architecture and urbanism from ancient Egypt through Greek and Roman classical traditions to the Enlightenment. The formal expression—organizational, structural, and ornamental—and social context of specific buildings and urban areas. Architecture as a form of social expression that builds on its own stylistic development, articulating a response to changes in history and culture. Emphasis on Western architecture, with selections from other parts of the world. HU

*** ARCH 271b / HSAR 266b / MMES 126b / SAST 266b, 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. Field trip to the Metropolitan Museum of Art in New York. HU

ARCH 312a / HSAR 312a, Modern Architecture in a Global Context, 1750-present

Craig Buckley

Architects, movements, and buildings central to the development of modern architecture from the mid eighteenth century through to the present. Common threads and differing conceptions of modern architecture around the globe. The relationship of architecture to urban transformation; the formulation of new typologies; architects' responses to new technologies and materials; changes in regimes of representation and media. Architects include Claude Nicolas Ledoux, Giovanni Battista Piranesi, John Soane, Frank Lloyd Wright, Le Corbusier, Ludwig Mies van der Rohe, Lina Bo Bardi, Louis Kahn, and Kenzo Tange. 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 324b / SAST 384b / URBN 324b, The City Before and After the Tubewell** Anthony Acciavatti

What do such disparate cities as New Delhi, Jakarta, Mexico City, and Phoenix all have in common? In short, each city relies on a fantastic technology that few people know anything about but has transformed the shape and life of cities and their hinterlands: the tubewell. Technologies for drawing up groundwater, tubewells are used in places where municipal water supply is non-existent, unreliable, or often polluted. A minor technology with a global reach, the tubewell is to the city what the elevator was to the skyscraper in the booming American metropolis of the early twentieth century. In this course we look at how tubewells and other decentralized technologies have radically transformed urban and agricultural spaces across the globe since the nineteenth century to the present. We watch how people exult before these technologies; we witness how governments and philanthropies as well as farmers and townspeople appropriate them for radically different ends. And we consider why. HU

*** ARCH 330b, Creativity, Innovation, and “The New”** Mark Gage

This seminar explores the role of “The New” in the design of our world. Through exploring the history of newness as an idea, its current understanding within philosophy, and examining its understanding in multiple creative fields today including art, architecture, product design, social microcultures, cars, food, fashion, and toys, students gain both knowledge about the role of “The New” in human society and are exposed to cutting-edge ideas in multiple disciplines. Through the study of emerging creative trends, detailed historic case studies, both philosophical and popular readings, and engaged group discussion we examine the very concept of “The New” from all possible angles—what it is, its history, why it is desired, the motivations of those that produce and promote it, who profits from it, and the morality of its continued rehearsal in a world with evolving ethics regarding the use of human labor and natural resources in the production of things. This course encourages students to consider these positions through not only research, presentations and discussion, but also speculative ‘making’ that challenges students to address the subject of “The New” themselves—through the very process of design. No particular skills or previous exposure to the design world is required. HU

*** ARCH 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 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** Anne Barrett
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 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 004a, Words and Pictures** Halsey Rodman

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** Richard Rose

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 012b, On Activism: The Visual Representation of Protest and Disruption**

Pamela Hovland

An introduction to the visual representations of protest, struggle, and revolution in this country from the Vietnam War to the present moment. The course explores a range of historically significant social and political movements, visual (communication) and dissemination strategies, and working methods. The primary goal of this studio-based course is to investigate and expand the designer/artist's ability to express a point of view, transform contemporary understanding of local and national issues through a series of exercises, iterative making and experiments in distribution methods via solo and collaborative work. The students' practice is supported by close readings, independent research, case studies, field trips, and presentations from a diverse collection of people directly involved in activism. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** ART 014a, Research in the Making** Karin Schneider

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 110a or b / ART S110, Sculpture Basics** Staff

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. Materials fee: \$150. Enrollment limited to 12. Recommended to be taken before ART 120–125. HU RP

*** ART 111b, Visual Thinking** Anahita Vossoughi

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). Materials fee: \$25. 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. Materials fee: \$25. Open to all undergraduates. Required for Art majors. HU RP

*** ART 116a, Color Practice** Anoka Faruquee

Study of the interactions of color, ranging from fundamental problem solving to individually initiated expression. The collage process is used for most class assignments. Materials fee: \$75. HU RP

ART 120a, Introduction to Sculpture: Wood Elizabeth Tubergen

Introduction to wood and woodworking technology through the use of hand tools and woodworking machines. The construction of singular objects; strategies for installing those objects in order to heighten the aesthetic properties of each work. How an object works in space and how space works upon an object. Materials fee: \$75. Prerequisite: ART 110. HU

ART 121b, Introduction to Sculpture: Metal Brent Howard

Introduction to working with metal through examination of the framework of cultural and architectural forms. Focus on the comprehensive application of construction in relation to concept. Instruction in welding and general metal fabrication. Ways in which the meaning of work derives from materials and the form those materials take. Materials fee: \$75.00. Prerequisite: ART 110. HU

*** 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. Materials fee: \$75. 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. Materials fee: \$150. HU RP

*** ART 136b, Black & White Photography Capturing Light** Benjamin Donaldson

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. Materials fee: \$150. HU RP

*** ART 138a or b, Digital Photography Seeing in Color** Theodore Partin

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. Materials fee: \$150. 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.' Materials fee: \$150. 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. Materials fee: \$150. RP

*** ART 184a or b, 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. Materials fee: \$150. RP

ART 185a, Principles of Animation Staff

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. Materials fee: \$150. 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. Prerequisite: ART 111

*** ART 235b / THST 235b, Dance Theater** Emily Coates

A studio-based introduction to movement vocabularies, physical techniques, and choreographic repertoire from post-1950 modern and postmodern dance theater to the present. Through a historical survey of major aesthetic shifts in dance, the course focuses on building the essential skills of a dance artist: the heightened awareness of time and space, the ability to read and translate diverse choreographic ideas, and the ability to question in motion. Open to students of all levels and majors. HU

*** ART 237b, Intermediate Black & White Photography Visual Voice** Lisa Kereszi

A class in black-and-white photography extending the concerns of ART 136 in which students learn to define and refine their own particular photographic voice through regular critiques. Introduction to the use of loaned medium-format cameras. Specialized topics include long-exposure photography, the use of flash, and intermediate-level printing techniques, including an increase in scale. Survey of the rich tradition of higher-resolution analog photography and the production of artists such as Brassäi, Diane Arbus, Lee Friedlander, Carrie Mae Weems and Robert Adams as well as contemporary new voices. Pre req: Art 136 or 138. Materials fee: \$150. Prerequisite: ART 136 or equivalent. HU RP

*** 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. Prerequisite: ART 138 or ART 136.

*** 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. Materials fee: \$150. Prerequisite for all majors: ART 142; additional prerequisite for Film & Media Studies majors: FILM 150. 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. Materials fee: \$150. Enrollment limited. Prerequisite: ART 111 or 114 or permission of instructor.

*** 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. Materials fee: \$150. 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. Materials fee: \$150. 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. Materials fee: \$150. HU

*** ART 285b, Digital Animation** Staff
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. Materials fee: \$150. Prerequisites: ART 111, 114, or 145, and familiarity with Macintosh-based platforms. RP

*** ART 301b, Critical Theory in and Out of the Studio** A.L. Steiner
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. Materials fee: \$25. HU RP

*** ART 331b, Intermediate Painting** Matthew Keegan
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. Materials fee: \$150 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. Materials fee: \$75. Prerequisite: ART 130, 230, or 231, or with permission of instructor. HU RP

*** ART 338b, 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. Materials fee: \$150. Prerequisite: ART 138 or permission of the instructor. RP

*** ART 339b, Narrative Forms and Documentary Style In Photography after 1967**

John Pilson

Artistic approaches to photography, ranging from documentary to studio, and appropriation as they converge on the current 'digital' moment. Lectures, readings, and assignments are designed to develop and challenge critical, historical, and visual thought while providing creative inspiration for individual projects. Lab/Materials fee: \$150.

Prerequisites: ART 136, ART 138, or equivalent. 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. Materials fee: \$150. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

*** ART 348b, Body, Space, and Time** Martin Kersels

Exploration of time-based art mediums such as moving-image work, performance, sound, and installation, with emphasis on the integration and manipulation of different mediums and materials. Ways in which the history of time-based works informs contemporary practice. Individual studio projects as well as workshops in the use of various processes, practices, and techniques. Materials fee: \$75. Enrollment limited to 12. Prerequisite: ART 122 or permission of instructor. HU RP

ART 356a, Printmaking I Alexander Valentine

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. Materials fee: \$150. Prerequisite: ART 114 or equivalent. RP

*** 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. Materials fee: \$150. Prerequisites: ART 132 and 264, or permission of instructor.

RP

*** ART 369b, Interactive Design and the Internet** 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. No prior programming experience required. Materials fee: \$150. Prerequisite: ART 132 or permission of instructor. RP

ART 370a, Motion Design 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. Materials fee: \$150. ART 265; ART 368 recommended. RP

*** ART 395a, Junior Seminar** Corey McCorkle

Ongoing visual projects addressed in relation to historical and contemporary issues. Readings, slide presentations, critiques by School of Art faculty, and gallery and museum visits. Critiques address all four areas of study in the Art major. Prerequisite: at least four courses in Art. HU RP

*** ART 401a, Advanced Project in Photography** 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 237, 338 or 379, or permission of the instructor. Required of art majors concentrating in photography. Materials fee: \$150. Prerequisites: ART 379 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. Materials fee: \$150 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. Materials fee: \$150. 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. Materials fee: \$150. Recommended for Art majors to be taken concurrently with ART 324 or 433. at least one term of printmaking. RP

ART 468a, Advanced Graphic Design: 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. Materials fee: \$150 per term. Prerequisites: ART 264 or 265, and 367 or 368, or permission of instructor. RP

*** ART 469b, Advanced Graphic Design: History, Editing, and Interpretation** 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. Materials fee: \$150 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. RP

*** 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.

American Sign Language (ASL)

ASL 110a, American Sign Language I Michael Barrett

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 Michael Barrett

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** Michael Barrett

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** Michael Barrett

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

Astronomy (ASTR)

*** ASTR 030b, Search for Extraterrestrial Life** Debra Fischer

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 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 Robert Zinn

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 135b, Archaeoastronomy Michael Faison

An introduction to how celestial patterns and events were observed and interpreted up to the Copernican revolution. Ancient observatories, calendar systems, records of astronomical events, and the role of astronomical knowledge in culture. Exercises in naked-eye observation of the sky. No prerequisites. 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 160b, Frontiers and Controversies in Astrophysics Marla Geha

A detailed study of three fundamental areas in astrophysics that are currently subjects of intense research and debate: planetary systems around stars other than the sun; pulsars, black holes, and the relativistic effects associated with them; and the age and ultimate fate of the universe. No prerequisite other than a working knowledge of elementary algebra. QR, SC

ASTR 180a, Introduction to Relativity and Black Holes Charles Bailyn

Introduction to the theories of special and general relativity, and to relativistic astronomy and astrophysics. Topics include time dilation and length contraction; mass-energy equivalence; space-time curvature; black holes; wormholes; pulsars; quasars; gravitational waves; Hawking radiation. For students not majoring in the physical sciences; some previous acquaintance with high-school physics and/or calculus may be helpful, but is not required. QR, SC

ASTR 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 Marla Geha

An introduction to research methods in astronomy and astrophysics. The acquisition and analysis of astrophysical data, including the design and use of ground- and space-based telescopes, computational manipulation of digitized images and spectra, and confrontation of data with theoretical models. Examples taken from current research at Yale and elsewhere. Use of the Python programming language. Prerequisite: background in high school calculus and physics. No previous programming experience required. QR, SC RP

ASTR 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 Gregory Laughlin

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 343b / PHYS 343b, Gravity, Astrophysics, and Cosmology Staff

Introduction to frontier areas of research in astrophysics and cosmology exploring ideas and methods. In-depth discussion of the physics underlying several recent discoveries including extrasolar planets—their discovery, properties, and issues of habitability; black holes—prediction of their properties from GR, observational signatures, and detection; and the accelerating universe—introduction to cosmological models and the discovery of dark energy. Prerequisites: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

ASTR 360b, Interstellar Matter and Star Formation Hector Arce

The composition, extent, temperature, and density structure of the interstellar medium (ISM). Excitation and radiative processes; the properties of dust; the cold and hot ISM in the Milky Way and other galaxies. Dynamics and evolution of the ISM, including interactions between stars and interstellar matter. Physics and chemistry of molecular clouds and the process of star formation. Prerequisites: MATH 120 and PHYS 201 or equivalents. Taught in alternate years. QR, SC RP

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 450a, Stellar Astrophysics Sarbani Basu

The physics of stellar atmospheres and interiors. Topics include the basic equations of stellar structure, nuclear processes, stellar evolution, white dwarfs, and neutron stars. Prerequisites: PHYS 201 and MATH 120. Taught in alternate years. QR, SC

ASTR 465b, The Evolving Universe Pieter van Dokkum

Overview of cosmic history from the formation of the first star to the present day, focusing on direct observations of the high-redshift universe. Prerequisites: MATH 120, PHYS 201, and one astronomy course numbered above 200. Taught in alternate years. QR, SC RP

Biomedical Engineering (BENG)

*** BENG 205a, Discovery and Design in Biomedical Research** Jay Humphrey

Multi-disciplinary and team-based research approach to the study of clinical dilemma. Focus on an important health care problem, bringing to bear concepts and principles from diverse areas to identify possible solutions. Study of precision regenerative medicine as it involves aspects of bioengineering, materials science, immunobiology, mechanobiology, computational modeling, and experimental design, as well as hands-on fabrication and materials testing (i.e., data collection and analysis). Prerequisites: MATH 115 and MATH 120 or ENAS 151. SC

BENG 230a / MB&B 330a / MCDB 330a / NSCI 324a, Modeling Biological Systems I

Thierry Emonet, Damon Clark, and Joe Howard

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** Kathryn Miller-Jensen

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 351b / CENG 351b, 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 353a / PHYS 353a, 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 dialysis. 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** Jiangbing Zhou, Nicha Dvornek, and Daniel Coman

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 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.

*** 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** Richard Carson, Douglas Rothman, and Fahmeed Hyder

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 434a, Biomaterials Anjelica Gonzalez

Introduction to the major classes of biomedical materials: ceramics, metals, and polymers. Their structure, properties, and fabrication connected to biological applications, from implants to tissue-engineered devices and drug delivery systems. Prerequisite: CHEM 165 (or CHEM 113 or 115); organic chemistry recommended. 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 445a / EENG 445a, Biomedical Image Processing and Analysis James Duncan and Lawrence Staib

A study of the basic computational principles related to processing and analysis of biomedical images (e.g., magnetic resonance, computed X-ray tomography, fluorescence microscopy). Basic concepts and techniques related to discrete image representation, multidimensional frequency transforms, image enhancement, motion analysis, image segmentation, and image registration. Prerequisite: BENG 352 or EENG 310 or permission of instructors. Recommended preparation: familiarity with probability theory.

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 455b, Vascular Mechanics Jay Humphrey

Methods of continuum biomechanics used to study diverse vascular conditions and treatments from an engineering perspective. Topics include hypertension, atherosclerosis, aneurysms, vein grafts, and tissue engineered constructs. Emphasis on mechanics driven by advances in vascular mechanobiology. Prerequisite: BENG 353. QR

*** BENG 456b, Molecular and Cellular Biomechanics** Michael Murrell

The basic mechanical principles at the molecular and cellular level that underlie the major physical behaviors of the cell, from cell division to cell migration. Basic cellular physiology, methodology for studying cell mechanical behaviors, models for understanding the cellular response under mechanical stimulation, and the mechanical impact on cell differentiation and proliferation. Prerequisites: MENG 211 and 280 or equivalents, and experience with MATLAB. Recommended preparation: BENG 353 and MCDB 205. QR, SC

BENG 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

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. QR, SC

BENG 465b / MB&B 361b / MCDB 361b / NSCI 325b, Modeling Biological Systems II

Thierry Emonet, Joe Howard, and Jing Yan

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

Biology (BIOL)

BIOL 101a or b, Biochemistry and Biophysics Staff

The study of life at the molecular level. Topics include the three-dimensional structures and function of large biological molecules, the human genome, and the design of antiviral drugs to treat HIV/AIDS. The first of four modules in a yearlong foundational biology sequence; meets for the first half of the term. SC ½ Course cr

BIOL 102a or b, Principles of Cell Biology Mark Mooseker 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 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

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 120b / ENAS 120b / ENVE 120b, Introduction to Environmental Engineering

John Fortner

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 S150E, Engineering Improv: An Introduction to Engineering Analysis Michael Loewenberg

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 S300, Chemical Engineering Thermodynamics

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 345b / ENAS 345b, Principles and Applications of Interfacial Phenomena Kyle Vanderlick

This course covers the nature and consequences of both flexible and rigid interfaces, such as those associated with liquids and solids respectively. We examine the properties of interfaces as they exist alone, as a collective (e.g., colloids), and also as they interact demonstrably with one another. Examples of the latter include thin films, confined fluids and biological membranes. An integral part of this course is the introduction and application of engineering analysis (e.g., finite element analysis) to calculate and predict behaviors central to technological applications. SC

CENG 351b / BENG 351b, 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, electrodialysis, 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 Michael Loewenberg

Transient regime modeling and simulations of chemical processes. Conventional and state-space methods of analysis and control design. Applications of modern control methods in chemical engineering. Course work includes a design project. Prerequisite: ENAS 194 or permission of instructor. QR, SC 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.

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 282a / PHIL 182a / PSYC 182a, 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 300a / LING 300a / LING 700a / PSYC 309 / PSYC 332a / PSYC 632a, The Cognitive Science of Sign Languages** Maria Pinango and Muye Zhang

Natural sign languages like American Sign Language have all of the structure and complexity of spoken languages. They are learned and processed like spoken languages, and activate neural structures that maximally overlap with those activated by spoken languages. These findings have not only had important implications for the sociopolitical status of Deaf people, as a native, American minority community but also have caused linguists and psychologists to re-evaluate their most fundamental theories of language representation and processing in the mind and brain. The course introduces you to the analysis of sign languages at different levels of linguistic structure and related aspects of cognition in the visual modality. The primary goal is to encourage you as linguists, psychologists, and cognitive scientists to consider how natural sign languages can and must inform your linguistic theories (linguistics), models of language and cognition (psychology), and technological applications of language processing (computer science/artificial intelligence). We also consider the ways in which signing communities/Deaf culture interact with the hearing world often as marginalized minority groups and reflect upon access to language and information as a basic human right. Some background in linguistic structure, cognitive science, any signed language, or permission of the instructor is preferred. SO

CGSC 315a / PSYC 315a, The Modern Unconscious John Bargh

The notion of the unconscious mind traced from the early 1800s through Freud to present-day cognitive science, with a focus on the past thirty years. The power and function of the unconscious as a pervasive part of normal everyday human functioning. Readings from philosophy of mind and evolutionary biology. SO

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. SC

*** CGSC 390a, Junior Seminar in Cognitive Science** Natalia Córdova Sánchez

Discussion of historically important papers in cognitive science. Topics are varied and reflect student interests. Some attention to planning for the senior project. Intended for juniors in the Cognitive Science major.

*** CGSC 395a, Junior Colloquium in Cognitive Science** Natalia Córdova Sánchez

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 425b / PSYC 425b, Social Perception** Brian Scholl

Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze

processing and social attention; 'thin-slicing' and 'perceptual stereotypes'; and social and cultural influences on perception. SO

*** CGSC 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 471a and CGSC 472b, Directed Research in Cognitive Science** Joshua Knobe
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** Joshua Knobe
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** Natalia Córdova Sánchez

A research colloquium leading to the completion of the senior essay. Students attend regular colloquium presentations. Enrollment limited to Cognitive Science majors.

Chemistry (CHEM)

CHEM 104b, 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 ½ Course cr

CHEM 136La or b, General Chemistry Laboratory II Staff

Introduction to rate and equilibrium measurements, acid-base chemistry, synthesis of inorganic compounds, and qualitative/quantitative analysis. After CHEM 134L or the equivalent in advanced placement. To accompany or follow CHEM 165 or 167. May not be taken after a higher-numbered laboratory course. SC RP ½ Course cr

CHEM 161a or b, General Chemistry I Staff

A comprehensive survey of modern descriptive, inorganic, and physical chemistry. Atomic theory, stoichiometry, thermochemistry, chemical periodicity, concepts in chemical bonding, and the shapes of molecules. Appropriate either as a first chemistry course or for students with one year of high school chemistry. Attendance at a weekly discussion section required. Normally accompanied by CHEM 134L. Enrollment by placement only. QR, SC RP

*** CHEM 163a, Advanced University Chemistry I** 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** Mark Johnson

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 221a or b, The Organic Chemistry of Life Processes Staff
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 general chemistry 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
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 and Jonathan Parr
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 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 Robert Crabtree
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. Meets on Wednesday and Friday from 3:30 to 4:20 pm for the first week of the term and every Friday at 3:30 pm thereafter. 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** Kurt Zilm

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 335Lb, Materials and Biophysical Chemistry Laboratory** Ziad Ganim and Jonathan Parr

A laboratory course covering physical methods and chemical synthesis in materials and biophysical chemistry. Techniques include solution phase synthesis, solid state synthesis, UV-Vis, fluorescence, optical microscopy, SEM, STM, single molecule fluorescence, and optical trapping methods. After two terms of general chemistry with laboratory, or concurrently with CHEM 333. SC

*** CHEM 400a, Current Chemistry Seminar** Jonathan Parr

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 Robert Crabtree

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 404b, 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 405a, Inorganic Reaction Mechanisms Patrick Holland

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 418a, Advanced Organic Chemistry I** Scott Miller

Concise overview of structure, properties, thermodynamics, kinetics, reactions, and intermolecular interactions for organic molecular systems. Prerequisites: two terms of organic chemistry, CHEM 328 or 332, and CHEM 333. SC RP

CHEM 421a, Chemical Biology Jason Crawford and Sarah Slavoff

A one-term introduction to the origins and emerging frontiers of chemical biology. Discussion of the key molecular building blocks of biological systems and the history of macromolecular research in chemistry. Prerequisites: two terms of organic chemistry, and BIOL 101 or equivalent; BIOL 102 recommended. SC

CHEM 423a, Synthetic Methods in Organic Chemistry Jon Ellman

Survey of practical methods in synthetic organic chemistry. Emphasis on learning how to acquire new information and understand chemical reactivity from a fundamental and mechanistic perspective. Prerequisite: two terms of organic chemistry or permission of instructor. SC RP

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 430a, Statistical Mechanics and Thermodynamics Victor Batista

The fundamentals of statistical mechanics developed and used to elucidate gas phase and condensed phase behavior, as well as to establish a microscopic derivation of the postulates of thermodynamics. Topics include ensembles; Fermi, Bose, and Boltzmann

statistics; density matrices; mean field theories; phase transitions; chemical reaction dynamics; time-correlation functions; and Monte Carlo and molecular dynamics simulations. Prerequisites: CHEM 328 or 332, and CHEM 333, or permission of instructor. QR, SC RP

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 442b, Molecules and Radiation II Charles Schmuttenmaer

An extension of the material covered in CHEM 440 to atomic and molecular spectroscopy, including rotational, vibrational, and electronic spectroscopy, as well as an introduction to laser spectroscopy. Prerequisite: CHEM 440 or permission of instructor. QR, SC RP

CHEM 470a, Quantum Chemistry Sharon Hammes-Schiffer

The elements of quantum mechanics developed and illustrated with applications in chemistry and chemical physics. Prerequisites: CHEM 333, and MATH 120 or ENAS 151. QR, SC RP

*** CHEM 480a or b, Introduction to Independent Research in Chemistry** Staff

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

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 126b / EDST 191b, Clinical Child Development and Assessment of Young Children** Ann Close

Exposure to both conceptual material and clinical observations on the complexity of assessing young children and their families. Prerequisites: CHLD 125 or CHLD 128. SO
½ Course cr

*** CHLD 127a or b / EDST 127a or b / PSYC 127a or b, 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.

*** CHLD 350b / EDST 350b / PSYC 350b, Autism and Related Disorders** Fred Volkmar and James McPartland

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

Chinese (CHNS)

*** CHNS 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 Hsiu-hsien Chan

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 Hsiu-hsien Chan

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 154a, 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. After CHNS 151 or equivalent. L5

*** CHNS 155b, Upper Advanced Modern Chinese IV** Staff

Continuation of CHNS 154. After CHNS 154 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 Mick Hunter

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 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 161a / ARCG 161a / HSAR 247a, Art and Myth in Greek Antiquity Milette Gaifman

Visual exploration of Greek mythology through the study of ancient Greek art and architecture. Greek gods, heroes, and mythological scenes foundational to Western culture; the complex nature of Greek mythology; how art and architecture rendered myths ever present in ancient Greek daily experience; ways in which visual representations can articulate stories. Use of collections in the Yale University Art Gallery. HU

CLCV 204b / HIST 300b, Alexander the Great and the Hellenistic World Joseph Manning

The history and culture of the ancient world between the rise of Macedonian imperialism in the fourth century B.C.E. and the annexation of Egypt by Augustus in 30 B.C.E. Particular attention to Alexander, one of the most important figures in world history, and to the definition of 'Hellenism.' 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
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 258b / EVST 257b / HIST 201b, Ecocultures of Antiquity: Ecocritical Approaches to Ancient Greece and Rome** Kirk Freudenburg

This class examines how the Greeks and Romans exploited their natural surroundings not only as physical resources, but as resources for human thought. The focus is on how ancient thinkers, living lives that were largely city-bound and detached from nature, structured their thoughts about the lives they lived (and about human existence more generally) by reference to their nonhuman surroundings: creatures, plants and places, some of which existed in the real world (in places far off, largely unknown and elsewhere; in places penetrated, explored, and/or told of), others of which existed entirely in the imagination, whether as inherited lore, or as places and creatures invented *ad hoc* by individuals and groups to get certain kinds of cultural work done. We look not only at the how and what, but at the why of nature's encoding via culture, and vice versa (their symbiosis), paying special attention to ancient Rome (though with a short first glance at Homer, Hesiod and Aristotle). We begin by scrutinizing the categories themselves, attempting to find historically appropriate ways to connect modern ecocritical concerns and ways of thought to the ancient world. Topics include: the cosmos, the heavens, and the first humans (and first peoples in their places); humans in their 'kinds' and animals, wild and tame; mountains, rivers, the sea and the undersea; human and animal foods, farming and food ways; wine and fermentation; groves, forests and trees; gardens, flowers, vegetables and fungi; birds, fish, weasels and snakes; earthquakes, floods and natural disasters; pollution, dirt and the city of Rome; the ecocultural lives of others. HU

CLCV 308a / HIST 212a / HIST 308, The Ancient Economy Joseph Manning

A survey of the economies of the ancient Mediterranean world, with emphasis on economic institutions, the development of the economies over time, ancient economic thought, and the interrelationships between institutions and economic growth.

Material evidence for studying the economies of the ancient world, including coinage, documentary material, and archaeology. HU

*** 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 338a / AFAM 320a / LITR 153a, Classics in Africa and the Black Diaspora**

Emily Greenwood Milne

The reception and appropriation of Greco-Roman classics in Africa and the black diaspora during the twentieth century. The same classical canon that had been used to furnish arguments for colonialism, imperialism, and racism read by black writers and artists in ways that subverted those arguments. Works include drama from Nigeria and South Africa, Caribbean poetry and autobiography, novels by Ralph Ellison and Toni Morrison, and the Odysseus collages of Romare Bearden. WR, HU

*** CLCV 368b / CLCV 270 / HSAR 423b / HUMS 227b, The Art of Dionysos: Drink, Drama, and Ecstasy** Milette Gaifman

Artifacts of Greek art and architecture made in honor of Dionysos, the god of wine and theater, whose worship involved ecstatic experiences. The Great Dionysia, a festival where theatrical productions were performed, as the source of inspiration for artifacts and architectural monuments. Objects and structures such as painted vases and theaters as means of keeping the realm of Dionysos present in daily experience. 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)

* CLSS 476a / CLSS 876a / HSAR 435a / HSAR 552a, Roman Art and Archaeology In Its Global Context Staff

The Roman Empire was uncontestedly diverse and multicultural, and demonstrably connected with peoples residing far beyond state boundaries. Roman art and material culture however, are often viewed as homogenous, especially when considered within the contexts of histories of Western Civilization. This class critically examines common (mis)perceptions of the ancient past, looking at the foundations of the disciplines of Roman art and archaeology, introduces post-colonial critiques and alternate methods of inquiry (hybridity, creolization, network analysis, and selective consumption), and familiarizes students with bodies of Roman evidence often marginalized in traditional discourse. Among others, specific topics for inquiry include: the promise (and dangers) of the integration of forensic scientific techniques into the study of ethnicity and identity in the ancient past; unintended consequences of post-colonial critiques of the traditional “Romanization” model; historiographic factors contributing to the marginalization of certain material within Roman territory; the definition/dispute of ‘boundaries’ both physical and intellectual that have shaped the field; and evidence of Roman intercultural connections and bi-directional exchange with China, India, Persia, and Sub-Saharan Africa. HU

* CLSS 490a, Two-Term Senior Essay for the Intensive Major in Classics Andrew Johnston

Qualified students may write a two-term senior essay in ancient literature or classical archaeology under the guidance of a faculty adviser. A written statement of purpose must be submitted to the director of undergraduate studies.

CLSS 492a, One-Term Senior Essay for the Intensive Major in Classics Andrew Johnston

Qualified students may write a one-term senior essay in ancient literature or classical archaeology under the guidance of a faculty adviser. A written statement of purpose must be submitted to the director of undergraduate studies.

Computing and the Arts (CPAR)

Computer Science (CPSC)

* CPSC 035a / MUSI 035a, 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 Benedict Brown and 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 Y. Richard Yang and Benedict Brown
Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary. QR

CPSC 123b / PLSC 351b / S&DS 123b / S&DS 523b, YData: An Introduction to Data

Science John Lafferty and Elena Khusainova

Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

*** CPSC 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 184b, Intellectual Property in the Digital Age** Cecilia Xie

The evolving and oftentimes vexing intellectual property regime of the new digital age. Focus on copyright, fair use, remix culture, access to knowledge, technological innovations, the increasing relevance of trademarks in the new information society, the tension between creativity/creating and the intellectual property rules which either foster or inhibit it, and the new information culture of the digital age. Prerequisite: CPSC 183 or permission of instructor. HU, SO

*** CPSC 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 or b, Introduction to Information Systems Stephen Slade

The real-world artifacts and implementations that comprise the vital computational organisms that populate our world. Hardware and software and the related issues of security, privacy, regulation, and software engineering. Examples stress practical applications of technology, as well as limitations and societal issues. After CPSC 100 or 112 or equivalent. QR

CPSC 201a or b, Introduction to Computer Science Staff

Introduction to the concepts, techniques, and applications of computer science. Topics include computer systems (the design of computers and their languages); theoretical foundations of computing (computability, complexity, algorithm design); and artificial intelligence (the organization of knowledge and its representation for efficient search). Examples stress the importance of different problem-solving methods. After CPSC 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 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 257a, Information Security in the Real World Stephen Slade

Introduction to information security, the practice of protecting information from unauthorized actions, in the context of computer systems. Topics include current security-related issues, basic adversarial models and threats to computer systems, potential defenses, security tools, and common security breaches and their wider impacts. Prerequisite: CPSC 100, 112, or equivalent programming experience, or with permission of instructor. QR

CPSC 276b, Introduction to Web Application for the Digital Humanities Benedict Brown

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 or b, Directed Reading** James Aspnes

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 or b, Directed Research** James Aspnes

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. May be taken more than once for credit.

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, Object-Oriented Programming

Object-oriented programming as a means to efficient, reliable, modular, reusable code. Use of classes, derivation, templates, name-hiding, exceptions, polymorphic functions, and other features of C++. This course was previously number CPSC 427. After CPSC 223. QR

CPSC 334b, 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 335b, Theory and Implementation of Self-Driving Cars Man-Ki Yoon

This course explores the theory and practice of building self-driving cars using advanced computing technologies. It aims to provide students opportunities i) to understand the introductory theory that enables the autonomous driving and also ii) to have extensive hands-on experience with various software and hardware tools. Topics include embedded system programming, sensor fusion, control theory, and introductory perception, planning and navigation techniques using machine learning and computer vision. Over the course of the semester, students work in small groups to design and build miniaturized self-driving cars that autonomously navigate an indoor track that resembles real road environments. Students demonstrate their learned skills through the final driving showcase and semester-long group projects. Meets with CPSC 235. Students may earn credit for CPSC 235 or for CPSC 335; not for both. Prerequisite: CPSC 223 and 202. Basic knowledge of Python is required. Instructor's permission is required to waive the prerequisites. 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 James Glenn

Paradigms for algorithmic problem solving: greedy algorithms, divide and conquer, dynamic programming, and network flow. NP completeness and approximation algorithms for NP-complete problems. Algorithms for problems from economics, scheduling, network design and navigation, geometry, biology, and optimization.

Provides algorithmic background essential to further study of computer science. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 and 223. QR

*** CPSC 366b / ECON 366b, Intensive Algorithms** Yang Cai

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 421b, Compilers and Interpreters** Robert Soule

Compiler organization and implementation: lexical analysis, formal syntax specification, parsing techniques, execution environment, storage management, code generation and optimization, procedure linkage and address binding. The effect of language-design decisions on compiler construction. After CPSC 323. QR

CPSC 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 424b, Parallel Programming Techniques Andrew Sherman

Practical introduction to parallel programming, emphasizing techniques and algorithms suitable for scientific and engineering computations. Aspects of processor and machine architecture. Techniques such as multithreading, message passing, and data parallel computing using graphics processing units. Performance measurement, tuning, and debugging of parallel programs. Parallel file systems and I/O. Prerequisite: CPSC 323, or CPSC 223 and significant experience with C/C++ programming in another science, social science or engineering discipline, or permission of instructor. QR RP

CPSC 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 434b, 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 435a, Building an Internet Router Robert Soule

Over the course of the semester, students build a fully functioning Internet router. Students design the control plane in Python on a Linux host and design the data plane in the new P4 language on the bmv2 software switch. To provide context and background for the design of their router, students read a selection of papers to get both a historical perspective and exposure to current research in networking. Prerequisite: CPSC 433. SC

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 439b, Software Engineering Staff

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 and Benedict Brown

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 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, 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 454a, Software Analysis and Verification Ruzica Piskac

Introduction to concepts, tools, and techniques used in the formal verification of software. State-of-the art tools used for program verification; detailed insights into algorithms and paradigms on which those tools are based, including model checking, abstract interpretation, decision procedures, and SMT solvers. After CPSC 202 and 323 or equivalents. QR RP

CPSC 455a / ECON 425a, Economics and Computation Yang Cai

A mathematically rigorous investigation of the interplay of economic theory and computer science, with an emphasis on the relationship of incentive-compatibility and algorithmic efficiency. Our main focus is on algorithmic tools in mechanism design, algorithms and complexity theory for learning and computing Nash and market equilibria, and the price of anarchy. Case studies in Web search auctions, wireless spectrum auctions, matching markets, and network routing, and social networks. Prerequisite: CPSC 365 or permission of the instructor. Familiarity with basic microeconomic theory is helpful but not required. QR

*** CPSC 456b / EENG 451b, 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 457b, 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 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 464b, Topics in Foundations of Machine Learning** Nisheeth Vishnoi
This course focuses on current and important topics in machine learning where a foundational understanding is lacking or under development. This includes modern algorithmic methods, novel learning and generative models, and the societal impact of machine learning. Representative topics include optimization and sampling methods for non-convex functions in Euclidean spaces or manifolds, algorithms beyond worst

case, fairness, and robustness. This course is for students who would like to address the limitations of current machine learning systems deployed in the real world through a combination of foundational work such as coming up with the right definitions, modeling, methods, along with empirical evaluation. Prerequisites: CPSC 365 or 366 is required and S&DS 251 is recommended. Solid background in calculus, linear algebra, stochastic processes, and advanced algorithms along with a good background in programming is necessary.

CPSC 465a, Theory of Distributed Systems James Aspnes

Models of asynchronous distributed computing systems. Fundamental concepts of concurrency and synchronization, communication, reliability, topological and geometric constraints, time and space complexity, and distributed algorithms. After CPSC 365 or 366. QR

CPSC 467a / CPSC 367, Cryptography and Computer Security Michael Fischer

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 469b, Randomized Algorithms James Aspnes

A study of randomized algorithms from several areas: graph algorithms, algorithms in algebra, approximate counting, probabilistically checkable proofs, and matrix algorithms. Topics include an introduction to tools from probability theory, including some inequalities such as Chernoff bounds. After CPSC 365 or 366; a solid background in probability is desirable. QR

CPSC 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 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 Dragomir Radev

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 Theodore Kim

Introduction to the basic concepts of two- and three-dimensional computer graphics. Topics include affine and projective transformations, clipping and windowing, visual perception, scene modeling and animation, algorithms for visible surface determination, reflection models, illumination algorithms, and color theory. After CPSC 202 and 223. QR

*** CPSC 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 490a or b, Senior Project** James Aspnes

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.

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 246b / FILM 364b / RSEE 240b, Milos Forman and His Films** Karen von Kunes

An in-depth examination of selected films by Milos Forman and representatives of the New Wave, *cinéma vérité* in Czech filmmaking. Special attention to Forman's artistic and aesthetic development as a Hollywood director in such films as *Hair*, *One Flew over the Cuckoo's Nest*, *Ragtime*, and *Amadeus*. Screenings and discussion in English. HU

The DeVane Lecture Course (DEVN)

Directed Studies (DRST)

*** DRST 001a and DRST 002b, Directed Studies: Literature** Staff

An examination of major literary works with an aim of understanding how a tradition develops. In the fall term, works and authors include Homer, Aeschylus, Sophocles, Virgil, the Bible, and Dante. In the spring term, authors vary somewhat from year to year and include Petrarch, Cervantes, Shakespeare, Milton, Wordsworth, Goethe, Tolstoy, Proust, and Eliot. WR, HU

*** DRST 003a and DRST 004b, Directed Studies: Philosophy** Staff

An examination of major figures in the history of Western philosophy with an aim of discerning characteristic philosophical problems and their interconnections. Emphasis on Plato and Aristotle in the fall term. In the spring term, modern philosophers include Descartes, Berkeley, Hume, Kant, and Nietzsche. WR, HU

*** DRST 005a and DRST 006b, Directed Studies: Historical and Political Thought**
Staff

A study of works of primary importance to political thought and intellectual history. Focus on the role of ideas in shaping events, institutions, and the fate of the individual. In the fall term, Herodotus, Thucydides, Plato, Aristotle, Augustine, and Aquinas. In the spring term, Machiavelli, Hobbes, Locke, Rousseau, Burke, Tocqueville, Emerson, Marx, Nietzsche, and Arendt. SO

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

Ecology & Evolutionary Biology (E&EB)

*** E&EB 075Lb, Virus Discovery and Evolution** Alita Burmeister

An introduction to empirical research with a hybrid between lab exercises and mentored research on bacteriophage, which are viruses that infect bacteria. A general goal of this course is for each student to decide whether they want to continue with undergraduate research. Specific learning objectives and assessments focus on experimental design, hypothesis testing, data analysis, and presentation. Students will practice these skills and conduct independent research projects. Students will gain basic experience with methods and principles from microbiology, genetics, ecology, and evolutionary biology. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SC

*** 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 115a / F&ES 315a, Conservation Biology Linda Puth

An introduction to ecological and evolutionary principles underpinning efforts to conserve Earth's biodiversity. Efforts to halt the rapid increase in disappearance of both plants and animals. Discussion of sociological and economic issues. SC

*** E&EB 125b / EPS 125b, History of Life** Derek Briggs, Pincelli Hull, and Bhart-Anjan Bhullar

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 145b, Plants and People** Linda Puth

The interaction of plants and people throughout history explored from biological, historical, anthropological, and artistic perspectives. Basic botany; plants in the context of agriculture; plants as instruments of trade and societal change; plants as inspiration; plants in the environment. Includes field trips to the greenhouses at Yale Marsh Botanical Garden, the Yale Peabody Museum and Herbarium, the Yale Farm, and the Yale Art Gallery. SC

E&EB 210a / S&DS 101a, 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

E&EB 220a / EVST 223a, General Ecology David Post and David Vasseur

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 Paul Turner

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 230a / EVST 221a / F&ES 221a, Field Ecology** Linda Puth

A field-based introduction to ecological research, using experimental and descriptive approaches, comparative analysis, and modeling for field and small-group projects. Weekly field trips explore local lake, salt marsh, rocky intertidal, traprock ridge, and upland forest ecosystems. Includes one Saturday field trip and a three-day trip during the October recess. Concurrently with or after E&EB 220 or with permission of instructor. SC

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 269a, Bird Behavior** Richard Prum

A seminar discussion of classic and recent scientific literature on topics in bird behavior. Students develop experience in critical reading of the literature through the exploration of topics in bird behavior including courtship, breeding behavior, song and song learning, foraging ecology, migration and orientation, and sensory ecology. Prerequisite: BIOL 104 or permission of the instructor. SC

*** E&EB 272b, Ornithology** Richard Prum

An overview of avian biology and evolution, including the structure, function, behavior, and diversity of birds. The evolutionary origin of birds, avian phylogeny, anatomy, physiology, neurobiology, breeding systems, and biogeography. Enrollment limited to 50. SC

*** E&EB 273Lb, Laboratory for Ornithology** Richard Prum

Laboratory and field studies of avian morphology, diversity, phylogeny, classification, identification, and behavior. Enrollment limited to 12. SC ½ Course cr

*** E&EB 275b / EVST 400b, Biological Oceanography** Mary Beth Decker

Exploration of a range of coastal and pelagic ecosystems. Relationships between biological systems and the physical processes that control the movements of water and productivity of marine systems. Anthropogenic impacts on oceans, such as the effects of fishing and climate change. Includes three Friday field trips. Enrollment limited to 15. SC

E&EB 290b, Comparative Developmental Anatomy of Vertebrates Gunter Wagner

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 Gunter Wagner

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 295a, Life in Motion: Ecological and Evolutionary Physiology Martha Munoz

Physiology is the study of the functions that organisms perform and how they use those functions to interact with the environment. To survive, grow, and reproduce, all organisms must acquire energy and avoid conditions that exceed their physiological limits. These interactions all involve motion—ions traveling across membranes, muscle fibers twitching, respiration, and locomotion, to name a few. In this course, we tackle physiological processes from both “bottom up” and “top down” approaches, with integration among these dimensions, to extract general physiological rules of life. Then, we link our discoveries to the broader context of ongoing global change, and consider

whether and how organisms can physiologically respond to contemporary selective pressures. While the course focuses heavily on animal physiology, plants, fungi, and microbes are also featured. Prerequisites: BIOL 101, 102, 103, 104, and CHEM 161, or permission of the instructor. SC

*** E&EB 335a / HLTH 250a, Evolution and Medicine** Stephen Stearns

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 352b / E&EB 200, Evolutionary Theory Alvaro Sanchez

This course introduces students to the theory behind evolutionary biology. The aim of the course is for the student to understand how evolution works, focusing on the quantitative and predictive theory that is the backbone of modern evolutionary thinking. The course covers three main areas: An introduction to population genetics, an introduction to quantitative genetics and the genotype-phenotype map, and an introduction to life-history evolution. To master this material and to put the concepts studied in class into practice, students work on weekly problem sets. Through the completion of the course assignments, students gain valuable quantitative and mathematical modeling skills. Prerequisites: One of the following: E&EB 225, PHYS 170/171 or 180/181 or permission of the instructor. QR

E&EB 354a, Phylogenetic Biology Casey Dunn

Phylogenetic Biology is the study of the evolutionary relationships between organisms, and the use of evolutionary relationships to understand other aspects of organism biology. This course surveys phylogenetic methods, providing a detailed picture of the statistical, mathematical, and computational tools for building phylogenies and using them to study evolution. We also examine the application of these tools to particular problems in the literature and emerging areas of study. Prerequisites: E&EB 225 and an organismal course. SC

*** E&EB 362b, Tropical Field Biology** Linda Puth and Martha Munoz

Firsthand experience of a region can inspire great insights and understanding of ecology and evolutionary biology. This course immerses students in the communities and ecosystems of a single tropical region each year, but locations rotate among a small group of sites. We spend the first half of the semester learning about the geology, history, biomes and organisms of the region. The spring 2021 class will travel to 1-2 tropical forest research stations in Costa Rica. Prerequisites: E&EB 220, E&EB 225, and permission of the instructor. SC

*** E&EB 380b, Life History Evolution** Stephen Stearns

Life history evolution studies how the phenotypic traits directly involved in reproductive success are shaped by evolution to solve ecological problems. The intimate interplay between evolution and ecology. After E&EB 220 and 225, or with permission of instructor. WR, 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 or b / ANTH 464a or b / ARCG 464a or b, Human Osteology Eric Sargis
A lecture and laboratory course focusing on the characteristics of the human skeleton and its use in studies of functional morphology, paleodemography, and paleopathology. Laboratories familiarize students with skeletal parts; lectures focus on the nature of bone tissue, its biomechanical modification, sexing, aging, and interpretation of lesions. SC, SO

*** 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.

East Asian Languages and Literatures (EALL)

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 203a, The Tale of Genji Edward Kamens

A reading of the central work of prose fiction in the Japanese classical tradition in its entirety (in English translation) along with some examples of predecessors, parodies, and adaptations (the latter include Noh plays and twentieth-century short stories). Topics of discussion include narrative form, poetics, gendered authorship and readership, and the processes and premises that have given *The Tale of Genji* its place in 'world literature.' Attention will also be given to the text's special relationship to visual culture. No knowledge of Japanese required. A previous college-level course in the study of literary texts is recommended but not required. WR, HU TR

*** EALL 208a, Tales of Traditional China** Lucas Bender

This course is an introductory survey of the great works of Chinese narrative literature from the beginnings of the tradition to the end of the premodern period. We consider questions like: How did the form of Chinese narrative change over the centuries? What were the purposes of these different forms? How did the topics of stories change, and what do these changes tell us about narrative's place in the evolution of the Chinese social world? What was the relationship between narrative and fiction in different periods of China's history? How do Chinese ideas about narrative diverge from common conceptions nowadays, and how can premodern Chinese stories, novellas, memoirs, and novels give us insights into the uses and possibilities of narrative that might not be obvious in contemporary media? We also explore the continued relevance of these narratives in contemporary Chinese culture. For this purpose, we have film screenings roughly every other week. All readings in English; no knowledge of Chinese required. HU

EALL 210a / EAST 210a / LITR 172a, Man and Nature in Chinese Literature Kang-I Chang

An exploration of man and nature in traditional Chinese literature, with special attention to aesthetic and cultural meanings. Topics include the concept of nature and literature; neo-Taoist self-cultivation; poetry and Zen (Chan) Buddhism; travel in literature; loss, lament, and self-reflection in song lyrics; nature and the supernatural in classical tales; love and allusions to nature; religious pilgrimage and allegory. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 200. HU TR

EALL 211b / EAST 241b / LITR 174b / WGSS 405b, Women and Literature in Traditional China Kang-I Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU TR

EALL 212b / PHIL 203b, Ancient Chinese Thought Mick Hunter

An introduction to the foundational works of ancient Chinese thought from the ruling ideologies of the earliest historical dynasties, through the Warring States masters, to

the Qin and Han empires. Topics include Confucianism and Daoism, the role of the intellectual in ancient Chinese society, and the nature and performance of wisdom. HU

*** EALL 213b / HUMS 292b / PHIL 205b / RLST 211b, Philosophy, Religion, and Literature in Medieval China** Lucas Bender

Exploration of the rich intellectual landscape of the Chinese middle ages, introducing students to seminal works of Chinese civilization and to the history of their debate and interpretation in the first millennium. No previous knowledge of China is assumed. Instead, the course serves as a focused introduction to Chinese philosophy, religion, and literature. HU

*** EALL 230a / EAST 242a / HUMS 269a, Poetry and Ethics Amidst Imperial Collapse** Lucas Bender

Du Fu has for the last millennium been considered China's greatest poet. Close study of nearly one-sixth of his complete works, contextualized by selections from the tradition that defined the art in his age. Exploration of the roles literature plays in interpreting human lives and the ways different traditional forms shape different ethical orientation. Poetry as a vehicle for moral reflection. All readings are in English. WR, HU

*** EALL 233a / EAST 243a / HSAR 417a / HUMS 285a, History of Chinese Imperial Parks and Private Gardens** Pauline Lin

Study of notable parks and private gardens of China, spanning from the 2nd century BCE to contemporary China. Themes include the history, politics, and economics surrounding construction of parks; garden designs and planning; cultural representations of the garden; and modern reinterpreted landscapes. Some sessions meet in the Yale University Art Gallery. No previous knowledge of Chinese language is necessary. Students previously enrolled in EALL 050 may not take this course for credit. HU

*** EALL 256b / EAST 358b / GBL 251b / HUMS 272b / LITR 265b, China in the World** Jing Tsu

Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China and Africa, Mandarinization, labor and migration, Chinese America, nationalism and humiliation, and art and counterfeit. Readings and discussion in English. HU

*** EALL 271a / FILM 448a, Japanese Cinema after 1960** Aaron Gerow

The development of Japanese cinema after the breakdown of the studio system, through the revival of the late 1990s, and to the present. No knowledge of Japanese required. HU TR

*** EALL 280a / EAST 260a / FILM 307a, East Asian Martial Arts Film** Aaron Gerow

The martial arts film has not only been a central genre for many East Asian cinemas, it has been the cinematic form that has most defined those cinemas for others. Domestically, martial arts films have served to promote the nation, while on the international arena, they have been one of the primary conduits of transnational cinematic interaction, as kung-fu or samurai films have influenced films inside and outside East Asia, from *The Matrix* to *Kill Bill*. Martial arts cinema has become a crucial means for thinking through such issues as nation, ethnicity, history, East vs. West, the body, gender, sexuality, stardom, industry, spirituality, philosophy, and mediality, from modernity to postmodernity. It is thus not surprising that martial arts films have

also attracted some of the world's best filmmakers, ranging from Kurosawa Akira to Wong Kar Wai. This course focuses on films from Japan, China, Hong Kong, Taiwan, and South Korea – as well as on works from other countries influenced by them – covering such martial arts genres such as the samurai film, kung-fu, karate, wuxia, and related historical epics. It provides a historical survey of each nation and genre, while connecting them to other genres, countries, and media. HU TR

*** EALL 296b / EAST 391b / RLST 121b, 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 302b / EAST 341b, Readings in Classical Chinese Prose** Kang-I Chang
Close reading of classical Chinese texts (*wenyan*) primarily from late Imperial China. A selection of formal and informal prose, including memoirs, *sanwen* essays, classical tales, biographies, and autobiographies. Focus on cultural and historical contexts, with attention to reception in China and in some cases in Korea and Japan. Questions concerning readership and governmental censorship, function of literature, history and fictionality, memory and writing, and the aesthetics of *qing* (emotion). Readings in Chinese; discussion in English. Prerequisite: CHNS 171 or equivalent, or permission of instructor. Formerly CHNS 302. HU

*** EALL 325a, Chinese Poetic Form, 1490–1990** Kang-I Chang
Development of the classical Chinese poetic form by modern Chinese poets. The appeal and aesthetic concept of the classical form since the revivalist movement of the late fifteenth century. Emphasis on close critical reading, with attention to cultural and political contexts. Readings in Chinese; discussion in English. Prerequisite: a literary Chinese course or permission of instructor. HU

*** EALL 470a or b and EALL 471a or b, Independent Tutorial** Lucas Bender
For students with advanced Chinese, Japanese, or Korean language skills who wish to engage in concentrated reading and research on literary works in a manner not otherwise offered in courses. The work must be supervised by a specialist and must terminate in a term paper or its equivalent. Ordinarily only one term may be offered toward the major or for credit toward the degree. Permission to enroll requires submission of a detailed project proposal by the end of the first week of classes and its approval by the director of undergraduate studies.

*** EALL 491a or b, Senior Essay** Lucas Bender
Preparation of a one-term senior essay under faculty supervision.

*** EALL 492a or b and EALL 493a or b, Yearlong Senior Essay** Lucas Bender
Preparation of a two-term senior essay under faculty supervision. Credit for EALL 492 only on completion of EALL 493.

East Asian Studies (EAST)

* EAST 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 210a / EALL 210a / LITR 172a, Man and Nature in Chinese Literature Kang-I Chang

An exploration of man and nature in traditional Chinese literature, with special attention to aesthetic and cultural meanings. Topics include the concept of nature and literature; neo-Taoist self-cultivation; poetry and Zen (Chan) Buddhism; travel in literature; loss, lament, and self-reflection in song lyrics; nature and the supernatural in classical tales; love and allusions to nature; religious pilgrimage and allegory. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 200. 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 241b / EALL 211b / LITR 174b / WGSS 405b, Women and Literature in Traditional China Kang-I Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU

* EAST 242a / EALL 230a / HUMS 269a, Poetry and Ethics Amidst Imperial Collapse Lucas Bender

Du Fu has for the last millennium been considered China's greatest poet. Close study of nearly one-sixth of his complete works, contextualized by selections from the tradition that defined the art in his age. Exploration of the roles literature plays in interpreting human lives and the ways different traditional forms shape different ethical orientation. Poetry as a vehicle for moral reflection. All readings are in English. WR, HU

*** EAST 243a / EALL 233a / HSAR 417a / HUMS 285a, History of Chinese Imperial Parks and Private Gardens** Pauline Lin

Study of notable parks and private gardens of China, spanning from the 2nd century BCE to contemporary China. Themes include the history, politics, and economics surrounding construction of parks; garden designs and planning; cultural representations of the garden; and modern reinterpreted landscapes. Some sessions meet in the Yale University Art Gallery. No previous knowledge of Chinese language is necessary. Students previously enrolled in EALL 050 may not take this course for credit. HU

*** EAST 260a / EALL 280a / FILM 307a, East Asian Martial Arts Film** Aaron Gerow

The martial arts film has not only been a central genre for many East Asian cinemas, it has been the cinematic form that has most defined those cinemas for others. Domestically, martial arts films have served to promote the nation, while on the international arena, they have been one of the primary conduits of transnational cinematic interaction, as kung-fu or samurai films have influenced films inside and outside East Asia, from *The Matrix* to *Kill Bill*. Martial arts cinema has become a crucial means for thinking through such issues as nation, ethnicity, history, East vs. West, the body, gender, sexuality, stardom, industry, spirituality, philosophy, and mediality, from modernity to postmodernity. It is thus not surprising that martial arts films have also attracted some of the world's best filmmakers, ranging from Kurosawa Akira to Wong Kar Wai. This course focuses on films from Japan, China, Hong Kong, Taiwan, and South Korea – as well as on works from other countries influenced by them – covering such martial arts genres such as the samurai film, kung-fu, karate, wuxia, and related historical epics. It provides a historical survey of each nation and genre, while connecting them to other genres, countries, and media. 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 310a / GLBL 309a / PLSC 357a, 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 313a / ANTH 213a, Postwar Japan: Ghosts of Modernity**

This course introduces students to contemporary Japan, examining how its defeat in the Second World War and loss of empire in 1945 continue to shape Japanese culture and society. Looking especially at the sphere of cultural production, it focuses on the question of what it means to be modern as expressed through the tension between resurgent neo-nationalism and the aspiration to internationalize. The course charts how the legacy of Japan's imperial failure plays a significant role in its search for renewal and identity since 1945. How, it asks, does the experience of catastrophic failure—and failure to account for that failure—play into continued aspirations for modernity today? How does Japanese society wrestle with modernity's two faces: its promise for progress and its history of catastrophic violence? The course follows the trajectory of Japan's postwar nation-state development after the dissolution of empire, from its resurrection from the ashes after defeat, to its identity as a US ally and economic superpower during the Cold War, to decades of recession since the 1990s and the search for new relations with its neighbors and new reckonings with its own imperial violence and postwar inactions against the background of rising neonationalism. HU, SO

EAST 338a / ECON 338a / GLBL 318a, The Next China Staff

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's long-standing misperceptions of China. Prerequisite: introductory macroeconomics. SO

*** EAST 341b / EALL 302b, Readings in Classical Chinese Prose** Kang-I Chang

Close reading of classical Chinese texts (*wenyan*) primarily from late Imperial China. A selection of formal and informal prose, including memoirs, *sanwen* essays, classical tales, biographies, and autobiographies. Focus on cultural and historical contexts, with attention to reception in China and in some cases in Korea and Japan. Questions concerning readership and governmental censorship, function of literature, history and fictionality, memory and writing, and the aesthetics of qing (emotion). Readings in Chinese; discussion in English. Prerequisite: CHNS 171 or equivalent, or permission of instructor. Formerly CHNS 302. HU

*** EAST 344a / PLSC 444a, Governing China** Daniel Mattingly

Study of the politics of contemporary China, with a focus on recent research. Topics include elite politics, technology, economic growth, trade, repression, propaganda, protest, the military, and foreign policy. SO

*** EAST 351b / AFST 355b / ANTH 355b, China-Africa Encounters** Helen Siu

The history, effects, and implications of Chinese involvement in and with African countries over the past century. Diasporic experiences, with attention to informal economies, cultural strategies, and ethnic and religious tensions; land, finance, and infrastructure; Chinese aid and development in Africa since the late 1960s, including medical aid and charitable groups. SO

*** EAST 358b / EALL 256b / GLBL 251b / HUMS 272b / LITR 265b, China in the World** Jing Tsu

Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China and Africa, Mandarinization, labor and migration,

Chinese America, nationalism and humiliation, and art and counterfeit. Readings and discussion in English. 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 391b / EALL 296b / RLST 121b, 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 474b / HSAR 484b, Japanese Screens** Mimi Yiengpruksawan

The screen-painting tradition in Japan, particularly as it emerged in the sixteenth and seventeenth centuries. The format, techniques, and functions of screen painting; poetic and literary connections, as well as studio practices and politics, of the principal lineages of painters; aesthetics and styles associated with varying classes of patronage, from the shoguns to Buddhist monks to the Japanese court. HU

EAST 480a or b, One-Term Senior Essay Frances McCall Rosenbluth

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** Frances McCall Rosenbluth

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

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 or b, 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 110b, 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 111b, 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 Ryota Iijima

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** Zhen Huo

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 159b / GLBL 159b, Game Theory Marina Halac

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 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 252b, Financial Markets Robert Shiller

An overview of the ideas, methods, and institutions that permit human society to manage risks and foster enterprise. Description of practices today and analysis of prospects for the future. Introduction to risk management and behavioral finance principles to understand the functioning of securities, insurance, and banking industries. After two terms of introductory economics. SO

ECON 301b, International Trade: Data and Analysis Guillermo Noguera

The goal of this course is to provide students with rigorous theoretical and empirical tools to analyze questions of current interest in international trade. The emphasis is on applying economic concepts to international trade data, using both computable economic models and empirical regression methods. This course is primarily intended for junior and senior economics majors. Students benefit from having a background in MATH 118 or MATH 120, statistics/econometrics, and intermediate microeconomics. If you do not satisfy these requisites, instructor's approval is necessary. SO

ECON 325b / EP&E 321b / GLBL 322b / PLSC 185b / SAST 281b, Economics of Developing Countries: Focus on South Asia Zachary Barnett-Howell

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. Prerequisites: introductory microeconomics and introductory econometrics. 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 epigenetic adaptation to economic conditions in the pre-modern economy can determine nutritional status and health in developing economies. Apart from providing a particular perspective on development, an additional objective of this course is to demonstrate the use of economic theory in informing empirical research. Prerequisites: ECON 121 and Introductory Econometrics (ECON 117, 123, 132, or higher). 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 338a / EAST 338a / GLBL 318a, The Next China Staff

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's long-standing misperceptions of China. Prerequisite: introductory macroeconomics. 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 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

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 and Timothy Geithner
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 James Glenn

Paradigms for algorithmic problem solving: greedy algorithms, divide and conquer, dynamic programming, and network flow. NP completeness and approximation algorithms for NP-complete problems. Algorithms for problems from economics, scheduling, network design and navigation, geometry, biology, and optimization. Provides algorithmic background essential to further study of computer science. Either CPSC 365 or CPSC 366 may be taken for credit. Prerequisites: CPSC 202 and 223. QR

*** ECON 366b / CPSC 366b, Intensive Algorithms** Yang Cai

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 403b / GBLB 332b, Trade and Development** Guillermo Noguera

For some developing countries, international trade has brought about rapid growth and large-scale reductions in poverty. Meanwhile for other developing countries, international trade has simply increased inequality and brought little growth. This course draws on both theoretical models and empirical evidence to better understand the reasons for these very different experiences. Topics include: standard models of trade, trade and poverty in developing countries, the impact of trade on inequality and growth, the role of firms and multinationals in developing countries, trade policy, foreign direct investment, trade and technology transfer, the Chinese and Indian experience.

Prerequisites: Intermediate microeconomics and one econometrics/statistics course. SO

*** ECON 407a / GBLB 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 408b / GBLB 238b, International Trade Policy** Giovanni Maggi

Analysis of issues concerning international trade policy and agreements, including recent academic research. Welfare analysis of trade policy; the political economy of trade policy; international trade agreements. Attention to both theoretical methods and empirical research. Prerequisites: intermediate microeconomics and ECON 184. 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 411b, 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 417b, Computational Methods in Economics Tony Smith

Introduction to the basic tools of numerical analysis and how to apply them to the study of economic models in a variety of subdisciplines, including macroeconomics, labor economics, industrial organization, public finance, and environmental economics. Prerequisite: intermediate microeconomics, intermediate macroeconomics, and econometrics. SO

ECON 420a, Applied Microeconometrics Timothy Armstrong

Advanced study of econometric theory and applied econometrics, providing students opportunity and ability to conduct high-level empirical research, combining economics, econometrics, and data. Recommended for students planning to write or currently writing an empirical senior essay. Econ121 (Intermediate Micro), and either Econ 132 (Econometrics and Data Analysis II) or Econ 136 (Econometrics). SO

ECON 424a / GLBL 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 425a / CPSC 455a, Economics and Computation Yang Cai

A mathematically rigorous investigation of the interplay of economic theory and computer science, with an emphasis on the relationship of incentive-compatibility and algorithmic efficiency. Our main focus is on algorithmic tools in mechanism design, algorithms and complexity theory for learning and computing Nash and market equilibria, and the price of anarchy. Case studies in Web search auctions, wireless spectrum auctions, matching markets, and network routing, and social networks. Prerequisite: CPSC 365 or permission of the instructor. Familiarity with basic microeconomic theory is helpful but not required. QR

*** ECON 428b, Economics of Cities: Regional and Urban Economics** Staff

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 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 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. Prerequisite: One or two econometrics courses. SO

ECON 439b, Applied Econometrics: Macroeconomic and Finance Forecasting Ray Fair

This course has an applied econometrics focus. The focus is on forecasting macroeconomic and financial variables. Macroeconomic forecasting concerns forecasting variables like GDP, components of GDP like consumption, investment, and imports, inflation, the unemployment rate, interest rates, the government deficit, and exchange rates. There are various forecasting methods, some purely statistical time series techniques and some using economic theory. We consider both. Financial forecasting is more problematic, since changes in asset prices may be roughly unpredictable. We also examine topics like momentum forecasting to see if some asset prices are predictable. Prerequisites: At least one semester of econometrics, preferably two; and intermediate macroeconomics. 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 447b, Networks and Development** Kaivan Munshi

This course examines the emerging literature on networks and economic development. This course is divided into four sections: (i) Commitment—how communities can harness their pre-existing social connections to circumvent market imperfections in developing economies. (ii) Labor markets and Migration—how community networks can both facilitate and hinder the mobility of their members. (iii) Inter-group Interactions—how communities interact with each other in developing economies and societies. (iv) How information spreads, through social connections, in developing economies. Apart from providing a particular perspective on development, an additional objective of this course is to demonstrate the use of economic theory in informing empirical research. Prerequisites: Intermediate Microeconomics, Introductory Econometrics and Data Analysis. SO

*** ECON 449b / EP&E 244b / PLSC 374b, The Economic Analysis of Conflict** Gerard Padro

Introduction to the microeconomic analysis of internal conflict. In particular, how conflict imposes economic costs on the population and how people react to conflict. Topics include the correlates of war; the economic legacies of conflict on human capital, local institutions, households' income, and firm performance; and the causes and impacts of forced displacement. 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 453a, The Economics of Gender** Joseph Altonji

This seminar course is about the economics of gender and has a focus on labor and marriage markets. Students are given an overview of gender differences in these markets, as well as some potential reasons for those differences. The course also discusses policies that can affect the gender gaps. Prerequisites: ECON 121 or 125, and ECON 117, or equivalent. 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: Econometrics, or ECON 255, or permission of instructor. 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 479a, The Economics and Psychology of Poverty** Staff

This course focuses on the growing body of psychology and economics literature studying how poverty affects economic decision-making through psychological and behavioral mechanisms. Prerequisites: Intermediate microeconomics (ECON 121 or equivalent) and basic statistics (ECON 117 or equivalent). SO

*** ECON 480a / GLBL 311a, Banking Crises and Financial Stability** Sigrídur

Benediktsdóttir

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 481a / EP&E 298a, Empirical Microeconomics** Guillermo Noguera

Introduction to empirical microeconomics and its methodologies. Academic research in the field explored using tools from economic theory and econometrics. Topics include approaches to identification, environmental effects on health, and the economics of

crime, gender, and race. Prerequisites: intermediate microeconomics and econometrics. 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 491a or b and ECON 492a or b, The Senior Essay** Staff

Students deciding to write one-term senior essays by enrolling in ECON 491, or two-term senior essays by enrolling in ECON 491 and 492, must choose their topics and advisers by Monday, September 30, 2019. One-term senior essays are due on Monday, December 2, 2019 by 4:30 pm. Two-term senior essays are due by 4:30 pm on Wednesday, April 1, 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. 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. Meetings for seniors to discuss the senior essay guidelines and requirements will be held on Tuesday August 27, 2019 at 12:15 pm. and Wednesday, August 28, 2019 at 4:00 pm. in Room 106, 28 Hillhouse Avenue. Seniors planning to write either a one-term or a two-term senior essay should attend one of these meetings. Details regarding calculation of Distinction will be discussed and senior essay guidelines will be distributed. Senior essay prospectus forms are due Monday, September 30, 2019. Students who do not turn the prospectus in on time will not be permitted to write an essay.

*** 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** Matthew Croasmun

Consideration of education and what it has to do with real life – not just any life, but a life worth living. Engagement with three visions of different traditions of imagining

the good life and of imagining education: Confucianism, Christianity, and Modernism. Students will be asked to challenge the fundamental question of the good life and to put that question at the heart of their college education. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

*** EDST 107b / MB&B 107b / PHYS 107b, Being Human in STEM** Mark Hochstrasser
A collaboratively-designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant peer-reviewed literature and popular-press articles. Implementation of a questionnaire and interviews of STEM participants at Yale. Creation of role-play scenarios for provoking discussions and raising awareness. Design and implementation of group interventions. SO

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** 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

*** EDST 127a or b / CHLD 127a or b / PSYC 127a or b, 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** Ann Close and Carla Horwitz
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 130a / AFAM 125a / AMST 125a / HIST 136a, The Long Civil Rights Movement

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis. HU

EDST 135b / PHIL 130b, Philosophy of Education Jason Stanley

An introduction to the philosophy of education. In this course, we read classical texts about the nature and purpose of education, focusing ultimately on the question of the normative shape and form of education in liberal democracy. What is the difference between education and indoctrination? What is the proper relation, in a liberal democracy, between civic education and vocational education? What shape or form should education take, if it is to achieve its goals? How, for example, is the liberal ideal of equality best realized in the form and structure of an educational system? Authors include Plato, Rousseau, Du Bois, Washington, Stanton, Dewey, Cooper, Woodson, and Freire. HU

EDST 140a / PSYC 140a, Developmental Psychology Frank Keil

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 144a / ER&M 211a / EVST 144a / SOCY 144a, Race, Ethnicity, and Immigration

Grace Kao

Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO

EDST 160b / PSYC 150b, Social Psychology Maria Gendron

Theories, methodology, and applications of social psychology. Core topics include the self, social cognition/social perception, attitudes and persuasion, group processes, conformity, human conflict and aggression, prejudice, prosocial behavior, and emotion. SO

*** EDST 162b / SOCY 162b, Methods in Quantitative Sociology** Staff

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 191b / CHLD 126b, Clinical Child Development and Assessment of Young Children** Ann Close

Exposure to both conceptual material and clinical observations on the complexity of assessing young children and their families. Prerequisites: CHLD 125 or CHLD 128. SO
½ Course cr

*** EDST 210a, 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 223b / PLSC 223b, 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** Janna Wagner and Jessica Sager

Exploration of societal decisions about where children under the age of five spend their days. Topics include where young children belong; how to regulate, pay for, and support child care arrangements; consideration of gender, race, and family finances; and the profound impact of these decisions on the well-being of children, families, and the economy. Assignments draw heavily on student insights and reflections. 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 235b, Education and the Culture Wars** Talya Zemach-Bersin

Examination of the historical development and politics of the "culture wars" with a focus on how battles over the "soul of America" have focused on the American education system. Conflict over "American values" issues like abortion, gay marriage, and religion are compounded by legal battles over federal funding and school choice. Study of interdisciplinary readings from law, politics, history, and cultural studies. Preference for enrollment will be given to Education Studies Scholars.

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, Policy, Politics, and Learning on the Education Beat** Staff

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 their impact on policy. Students learn to develop strong, marketable ideas while crafting features aimed at publication. Journalists on the K-12 beat are frequent guests. WR, SO

*** EDST 240b / SOCY 396b, Cities, Suburbs, and School Choice** Sarah Camiscoli

The changing dynamic between cities and suburbs and the role of individuals and institutions in promoting desegregation or perpetuating segregation since the mid-twentieth century. The government's role in the expansion of suburbs; desegregating schools; the rise of school choice through magnets and charters; the effects of inner-ring suburban desegregation and of urban gentrification on the landscape of education reform. Recommended preparation: EDST 110. Preference to Education Studies Scholars. SO

*** EDST 250b, Contemporary Challenges to Liberal Education** Richard Hersh

The evolving nature and purpose of liberal learning. Ways in which contemporary liberal education is threatened by challenges such as the rising costs of attending liberal arts colleges and disagreements about the purpose and value of higher education. Students evaluate their Yale experience against national liberal education norms and develop models for strengthening liberal education in America. May not be taken after CSBK 300. 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 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 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 312a / HIST 423Ja / HUMS 221a / PLSC 310a, Idolizing Education**

Mordechai Levy-Eichel

This course is an iconoclastic introduction to the study of education. Besides examining the purposes and practice of education and learning across a wide variety of times and places, the course examines the study of education today in order to see what can be gained from a skeptical approach to the subject. Particular emphasis is placed on the origins and development of the research university. SO

*** EDST 325b / PLSC 325b, What is Education For?** Bryan Garsten

Should we expect to be transformed by our education? Should education aim to produce certain sorts of workers, or citizens, or human beings? This course explores competing ideas about education's public and private purposes. The course puts classic texts of political thought into conversation with contemporary literature and debates. Key moments in the history of American education serve as case studies, with special emphasis on Yale's place in this history. HU, SO

*** EDST 328b / PSYC 328b, Learning in the School-Age Child: Core Mechanisms**

Kristi Lockhart

This course focuses on empirically supported principles of learning that are used with K to 8th grade children (and also adolescents and adults) to enhance learning outcomes. We look at twenty-six (A to Z) core mechanisms used to promote learning. Each mechanism is explored from a theoretical, research-based, and practical perspective. Studies conducted in cognitive and perceptual psychology, social psychology, behavioral psychology as well as cultural psychology have contributed to the knowledge of these mechanisms. We discuss how the mechanisms work, what problems they overcome, and the positive (as well as negative) ways in which they can be implemented.

Prerequisite: PSYC 110 or credit for AP Psychology. so

*** EDST 350b / CHLD 350b / PSYC 350b, Autism and Related Disorders**

Fred Volkmar and James McPartland

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. so

*** EDST 377b / PSYC 477b, Psychopathology and the Family**

Kristi Lockhart

The influence of the family on development and maintenance of both normal and abnormal behavior. Special emphasis on the role of early childhood experiences. Psychological, biological, and sociocultural factors within the family that contribute to variations in behavior. Relations between family and disorders such as schizophrenia, depression, anorexia nervosa, and criminality. Family therapy approaches and techniques. 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**

Mira Debs

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 490a or b, Senior Essay Independent Study**

Staff

Independent research under faculty direction, involving research, policy or practice resulting in a final capstone paper. This course is open to Education Studies Scholars who are completing their capstone, in lieu of taking EDST 400 or EDST 410. To register for this course, students must submit a written plan of study approved by a faculty mentor to the Director of Undergraduate Study no later than the end of registration period in the term in which the course is to be taken. The course meets

biweekly (every two weeks), beginning in the first week of the term. Prerequisite: EDST 110.

Electrical Engineering (EENG)

EENG 101b, The Digital Information Age Priya Panda

An introduction to machine learning for communicating between humans and digital systems. Each student generates data by speaking the ten English digits 0 through 9 into the microphone of a laptop. Programs written in the popular engineering programming language Matlab convert the microphone speech into numerical features that are then processed to have the computer classify the speech sounds into their digit values. The course covers the ideas of template matching and neural networks for digit speech classification. The initial programs are written by the instructor and students modify them with the help of the instructor to accomplish a student-selected task. Intended for students in the humanities and social sciences interested in machine learning and for first-year students considering a major in electrical engineering. A familiarity with any programming language and matrix algebra is helpful. Priority given to non-science majors and first-year students interested in electrical engineering.

QR

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 Wenjun Hu

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 Hongxing 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 and 202. 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 A Stephen Morse

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 Hongxing 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 397a / ENAS 397a, Mathematical Methods in Engineering J Rimas Vaisnys

Exploration of several areas of mathematics useful in science and engineering; recent approaches to problem solving made possible by developments in computer software. Mathematica and Eureka are used to investigate and solve problems involving nonlinear differential equations, complex functions, and partial differential equations.

Prerequisites: MATH 222, and ENAS 194 or MATH 246, or equivalents; familiarity with computer programming. 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 Mark Reed

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 403b / APHY 321b, Semiconductor Silicon Devices and Technology Tso-Ping Ma

Introduction to integrated circuit technology, theory of semiconductor devices, and principles of device design and fabrication. Laboratory involves the fabrication and analysis of semiconductor devices, including Ohmic contacts, Schottky diodes, p-n junctions, solar cells, MOS capacitors, MOSFETs, and integrated circuits. Formerly EENG 401. Prerequisite: EENG 320 or equivalent or permission of instructor. QR, SC

*** EENG 408a, CMOS Devices and Beyond** Tso-Ping Ma

The science and technology of modern CMOS devices and circuits, as well as emerging technologies. Topics may include basic CMOS device physics; interface properties of MOS structures; hot-carrier effects; experimental techniques to probe MOS parameters; and scaling of CMOS devices. Prerequisite: EENG 320 or equivalent, or permission by instructor.

*** EENG 425a, Introduction to VLSI System Design** Richard Lethin

Chip design; integrated devices, circuits, and digital subsystems needed for design and implementation of silicon logic chips. CMOS fabrication overview, complementary logic circuits, design methodology, computer-aided design techniques, timing, and area estimation. Exploration of recent and future chip technologies. A course project is the design, through layout, of a digital CMOS subsystem chip; selected projects are fabricated for students. Prerequisite: familiarity with computer programming and with circuits at the level of introductory physics. 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 Joseph Chang

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 438b, Neural Networks for Pattern Recognition, Identification, and Control**

Kumpati Narendra

Design of artificial neural networks (ANN) for approximation, pattern recognition, identification, and control. Introduction to the theory of artificial neural networks and linear adaptive control; adaptive identification and control problems in nonlinear dynamical systems. Applications in engineering and biology. Prerequisite: EENG 436 or permission of instructor. QR

EENG 445a / BENG 445a, Biomedical Image Processing and Analysis James Duncan and Lawrence Staib

A study of the basic computational principles related to processing and analysis of biomedical images (e.g., magnetic resonance, computed X-ray tomography, fluorescence microscopy). Basic concepts and techniques related to discrete image representation, multidimensional frequency transforms, image enhancement, motion analysis, image segmentation, and image registration. Prerequisite: BENG 352 or EENG 310 or permission of instructors. Recommended preparation: familiarity with probability theory.

EENG 450a, Applied Digital Signal Processing J Rimas Vaisnys

An analysis, by computer, of processing requirements. Relevant probability and estimation theories applied to measurements corrupted by noise. Point estimates and system identification from random processes. MATLAB simulations verify the analysis. Prerequisite: EENG 310 or permission of instructor. QR

*** EENG 451b / CPSC 456b, 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

Egyptian (EGYP)

EGYP 110a or b, Introduction to Classical Hieroglyphic Egyptian I Gaelle Chantrain

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 128a / AFST 128a / ARCG 128a / NELC 129a / RLST 251a, Magic and Ritual in Ancient Egypt and the Near East** John Darnell

Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

*** EGYP 137a / RLST 423a, Gnostic Texts in Coptic** Daniel Bohac

Reading, translation, and analysis of Gnostic and Valentinian literature from Nag Hammadi, in several dialects of Coptic. Prerequisite: EGYP 127 or equivalent. Counts as L4 if taken after EGYP 147 or equivalent. L3

*** EGYP 141a, Intermediate Egyptian: Historical Texts** John Darnell

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 147b / RLST 422b, Egyptian Monastic Literature in Coptic** Stephen Davis

Readings in the early Egyptian classics of Christian asceticism in Sahidic Coptic, including the desert Fathers and Shenute. Prerequisite: EGYP 127 or equivalent. Counts as L4 if taken after EGYP 137 or equivalent. L3

*** EGYPT 157a, Ancient Egyptian Love Poetry** John Darnell

Egyptian love poetry, concentrating on the major documents. Most readings in hieratic, with discussions of the grammar of literary Late Egyptian, its relationship to nonliterary Late Egyptian and late Middle Egyptian. Readings in comparative texts and investigation of iconographic parallels. Prerequisite: EGYPT 141b.

Engineering & Applied Science (ENAS)

*** ENAS 050a / APHY 050a / PHYS 050a, 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 RP

*** ENAS 100b / APHY 100b / EVST 100b / G&G 105 / PHYS 100b, Energy Technology and Society** 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 and Lawrence Wilen

An introduction to engineering, innovation, and design process. Principles of material selection, stoichiometry, modeling, data acquisition, sensors, rapid prototyping, and elementary microcontroller programming. Types of engineering and the roles engineers play in a wide range of organizations. Lectures are interspersed with practical exercises. Students work in small teams on an engineering/innovation project at the end of the term. Priority to freshmen. RP

*** ENAS 120b / CENG 120b / ENVE 120b, Introduction to Environmental Engineering** John Fortner

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 Katherine Schilling

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 335a / EP&E 204a, Professional Ethics Mercedes Carreras

A theoretical and case-oriented approach to ethical decision making. Concepts, tools, and methods for constructing and justifying solutions to moral problems that students may face as professionals. SO

ENAS 345b / CENG 345b, Principles and Applications of Interfacial Phenomena Kyle Vanderlick

This course covers the nature and consequences of both flexible and rigid interfaces, such as those associated with liquids and solids respectively. We examine the properties of interfaces as they exist alone, as a collective (e.g., colloids), and also as they interact demonstrably with one another. Examples of the latter include thin films, confined fluids and biological membranes. An integral part of this course is the introduction and application of engineering analysis (e.g., finite element analysis) to calculate and predict behaviors central to technological applications. SC

ENAS 360b / ENVE 360b, Green Engineering and Sustainable Design Julie Zimmerman

Study of green engineering, focusing on key approaches to advancing sustainability through engineering design. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; biomimicry; and life cycle design,

management, and analysis. Prerequisites: CHEM 161, 165 or 163, 167 (or CHEM 112, 113, or 114, 115), or permission of instructor.

ENAS 397a / EENG 397a, Mathematical Methods in Engineering J Rimas Vaisnys
Exploration of several areas of mathematics useful in science and engineering; recent approaches to problem solving made possible by developments in computer software. Mathematica and Eureka are used to investigate and solve problems involving nonlinear differential equations, complex functions, and partial differential equations.

Prerequisites: MATH 222, and ENAS 194 or MATH 246, or equivalents; familiarity with computer programming. QR

*** 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 440a / MENG 440a, Applied Numerical Methods for Algebraic Systems, Eigensystems, and Function Approximation Beth Anne Bennett

The derivation, analysis, and implementation of various numerical methods. Topics include root-finding methods, numerical solution of systems of linear and nonlinear equations, eigenvalue/eigenvector approximation, polynomial-based interpolation, and numerical integration. Additional topics such as computational cost, error analysis, and convergence are studied in several contexts throughout the course. Prerequisites: MATH 115, and 222 or 225, or equivalents; ENAS 130 or some experience with Matlab, C++, or Fortran programming. QR

*** ENAS 450b / APHY 450b / MENG 450b, Advanced Synchrotron Techniques and Electron Spectroscopy of Materials** Charles Ahn

Introduction to concepts of advanced x-ray and electron-based techniques used for understanding the electronic, structural, and chemical behavior of materials. Students learn from world-leading experts on fundamentals and practical applications of various diffraction, spectroscopy, and microscopy methods. Course highlights the use of synchrotrons in practical experiments. Prerequisites: physics and quantum mechanics/physical chemistry courses for physical science and engineering majors, or by permission of instructor. QR, SC

English Language and Literature (ENGL)

*** ENGL 007a / AFAM 011a, Literature of the Black South** Staff

This course examines the enduring and often unanticipated connections between African American and Southern literature, and considers the ways in which the American South remains a space that simultaneously represents and repels an African American ethos. Through topics and lenses as varied as the Black church, the Great Migration, the Civil Rights Movement, and the rural/urban divide, we consider the ways in which Black culture and Southern culture continue to intersect and interact—even when the natal (Southern) place has ostensibly been rejected or abandoned. HU

*** ENGL 011a / PLSC 025a, Lincoln in Thought and Action** David Bromwich

An intensive examination of the career, political thought, and speeches of Abraham Lincoln in their historical context. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** ENGL 015a / AFAM 016a / AFST 015a, 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 016a, The Problem of Beauty** David Kastan

There are two large and incompatible ideas that dominate our (mis?)understanding of beauty: 1) it is the material form of some other concept, as in Keats' famous line: "Beauty is truth, truth beauty"; and 2) that beauty is completely subjective, always "in the eye of the beholder." This course is designed to explore the often-contested concept as a category of thought and experience in the writings of philosophers, artists, social scientists, and even evolutionary biologists. We read various writers, including Plato, Augustine, Shakespeare Hume, Burke, Kant, Adorno, Elaine Scarry, Zadie Smith, Toni Morrison, and Richard Prum – and visit Yale's art galleries and The Peabody Museum as part of our exploring. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** ENGL 031a / RLST 022a, Religion and Science Fiction** Maria Doerfler

Survey of contemporary science fiction with attention to its use and presentation of religious thought and practice. Focus on the ways in which different religious frameworks inform the literary imagination of this genre, and how science fiction in turn creates religious systems in both literature and society. 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. Preregistration required; see under English Department. 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. Preregistration required; see under English Department.

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. Preregistration required; see under English Department. 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. Preregistration required; see under English Department. 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. Preregistration required; see under English Department. 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, Alan Ginsberg, Chang-Rae Lee, and Toni Morrison, among others. Preregistration required; see under English Department. 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 / 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 include Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Shakespeare, Racine, Ibsen, Chekhov, Brecht, Beckett, and Soyinka. Focus on textual analysis and on developing the craft of persuasive argument through writing. Preregistration required; see under English Department. WR, HU

*** ENGL 130b / LITR 169b, 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 151b, Visions of Other Worlds in Medieval British Literature Emily Thornbury

This course provides a tour of otherworld visions and journeys in the literature of medieval Britain. After looking at some foundational texts from antiquity that influenced writers up to the present day, we examine the geography of the afterlife (heaven, hell, and purgatory), with a particular eye toward understanding how these transcendent realms reflected the more immediate concerns of medieval authors. We consider the physical connection of these places to the normal world, as well as the moral connection they have to human lives; we also look at texts that depict other, less transcendent worlds existing alongside our own. After taking this course, students know how to find the airport nearest to Purgatory, and what to do if they end up in the fairies' country: they are also able to analyze the classic motifs and meanings of otherworldly vision literature. No prior study of medieval literature is necessary. We read most Middle English texts in the original, while texts in other languages (Old English, Latin, Old French, Middle Welsh) are available in translation. HU

ENGL 154a / FREN 216a / HUMS 134a / LITR 194a, The Multicultural Middle Ages Ardis Butterfield

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. 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 161b / LITR 340b, (Writing Intensive) Global Shakespeares: Race, Gender and the Idea of the Human Ayesha Ramachandran

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. Along the way, we consider the challenges of decolonizing the canon and the particular place Shakespeare occupies as an index of cultural value. 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 intensive writing version of LITR 339 and is worth 1.5 credits. Meets with LITR 339. Students may earn credit for LITR 339 (1 credit) OR for LITR 340 (1.5 credits) but not for both. WR, HU 1½ Course cr

ENGL 165b / WGSS 266b, Gender, Class, and Narrative Form in the Victorian Novel Ruth Yeazell

A selection of nineteenth-century novels, with particular attention to questions of gender, class, and narrative form. Authors chosen from the Brontës, Gaskell, Dickens, Collins, Eliot, Trollope, and Hardy. WR, 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 187a / AMST 239a, Love and Hate in the American South Caleb Smith

An introduction to the literature and culture of the American South, a region of the mind identified with the former Confederate States of America and fabricated from a mix of beautiful dreams and violent nightmares, including: histories of slavery and settler colonialism, gothic fiction, the Delta blues, Hollywood movies, evangelical sermons, *The Confessions of Nat Turner*, love poems, protest poems, prison songs, *The Adventures of Huckleberry Finn*, country music, photographs, "Strange Fruit," folk tales, memoirs, cookbook recipes, and other fantasies. Close reading, cultural analysis, and historical context. Literary works by Capote, Faulkner, Hurston, Jacobs, O'Connor, Poe, Twain, Toomer, Walker, Welty, Wright. Music, film, and other media. HU

ENGL 189a, 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. HU

ENGL 191a or b / HUMS 206a or b / LITR 318a or b / MMES 215b / NELC 201a or b, 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 192b / FILM 240b / LITR 143b, World Cinema Marta Figlerowicz

Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. HU

ENGL 194b / WGSS 194b, 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 in Arabia and the South Pacific; Caribbean sexual morality; 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, visuality, and the environment, including how digital culture continues to shape these realms. WR, HU

ENGL 198a / FILM 394a / LITR 409a / RSEE 350a / WGSS 394a, Internet Cultures, Histories, Networks, and Practices Marijeta Bozovic

Examination, through the lenses of histories, network studies, and cultural studies, of how human beings have seemingly overnight learned to use and depend on computer networks for various kinds of work, military operations, pursuits of scientific knowledge, religious proselytizing, political organization, searches for mates and social communities, illegal activities, and infinite varieties of play. 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. HU RP

*** ENGL 217a / HUMS 179a, Shakespeare's Political Plays** David Bromwich

Reading and interpretation of selected histories and tragedies from *Richard II* to *Coriolanus* with emphasis on the tension between individual freedom and political obligation. WR, HU

*** ENGL 220a, Growing Up in the Victorian Novel** Stefanie Markovits

This course focuses on a set of British novels of the Victorian Period that organize plot through the device of *Bildung*: the development or education of the novel's protagonist. Questions include: What role does childhood play in development? How might we distinguish between the male and the female *Bildungsroman*? How do career and courtship function in these novels? How does the genre negotiate the interplay between external and internal development, subjective and objective experience? What are the political implications of the form(s) these books take for questions of gender, class, and colonialism? How do the novels negotiate both space (local, national, international) and time (personal memory and public history)? How does the form alter over the course of the period in question? Authors may include Brontë, Dickens, Eliot, Barrett Browning, Carroll, James, Kipling. WR, HU

*** ENGL 221b / AFAM 212b, African American Literature in the Archives** Melissa Barton

Examination of African American literary texts within their archival context; how texts were planned, composed, revised, and received in their time. Students pair texts with archival materials from Beinecke Library, including manuscripts, correspondence, photographs, and ephemera. Readings include Lorraine Hansberry, Langston Hughes, Zora Neale Hurston, James Weldon Johnson, and Richard Wright. 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 230a, Paleography & Empire, 1500–1800** Kathryn James

This course provides an introduction to English handwriting and manuscript culture, with a particular focus on the archival forms of the British empire in the early modern period. Taking paperwork as a political instrument, the course examines the documentary cultures of an emergent British empire from the sixteenth through the eighteenth century. Based in the Beinecke Library collections, the course offers a detailed introduction to the handwriting and material forms of early modern British manuscripts, with a particular focus on secretary hand and round hand (or copperplate) as the two main professional hands of the period. In learning to read and transcribe, students are asked to engage with the political inheritances of early modern British manuscript culture and its legacies in the archive. WR, HU

*** ENGL 236a / AMST 330a, Dystopic and Utopian Fictions** Jim Berger

Attempts since the late nineteenth century to imagine, in literature, cinema, and social theory, a world different from the existing world. The merging of political critique with desire and anxiety; the nature and effects of social power; forms of authority, submission, and resistance. HU

*** ENGL 237a / EVST 237a / HUMS 234a / LITR 323a, Animals in Literature and Theory** Jonathan Kramnick

Consideration of the role animals play in our aesthetic, ethical, political, and scientific worlds through reading of fiction, poetry, philosophy, and critical theory. Topics include: animal sentience and experience; vegetarianism; animal fables; pet keeping; animals alongside disability, race, and gender; and the representation of animal life in the visual arts. WR, HU

*** ENGL 241b / THST 214b, English Comic Drama, 1660–1800** Jill Campbell

An exploration of the distinctive wit, social functions, conditions of theatrical production, and changing forms of comic drama in Britain from the reopening of the theaters in 1660 to 1800. Particular attention to the construction of gender and sexuality in these plays, including the figures of the effeminate fop and male and female libertines; sexual harassment and coercion; same-sex and opposite-sex eroticism; and the interplay between sexual and verbal pleasures. Other topics to include representations of labor and social class; the shaping force of imperial trade on life in London; and 18th-century theories of laughter. Plays by William Wycherley, Aphra Behn, William Congreve, John Gay, Henry Fielding, Hannah Cowley, Oliver Goldsmith, and Richard Sheridan. WR, HU

*** ENGL 244b / HUMS 340b / LITR 344b, The Detective Story: Solving Mysteries from Oedipus to Sherlock** Paul Grimstad

The course looks closely at detective stories, novels and films, with attention to the basic narrative structure of criminal enigma, logical investigation and denouement (whodunnit), and considers the meaning of “genre” more broadly. Starting with the proto-detective story *Oedipus Rex* – in which tragic drama takes the form of a murder mystery – we move on to Edgar Allan Poe’s invention of the genre proper in “The Murders in the Rue Morgue” and “The Purloined Letter.” From there we go to Poe’s “golden age” inheritors Arthur Conan Doyle, G.K. Chesterton, Agatha Christie, and Dorothy Sayers, as well as the adaptation of Doyle’s tales for the BBC series *Sherlock*. We also spend time on American “hard boiled” writers (Dashiell Hammett, *The Maltese Falcon* and John Huston’s 1941 film adaption of the novel); fiction which draws upon the conventions of detective stories without being genre fiction (Nabokov, Borges), non-fiction works which have the structure of a detective story (Freud’s “Wolf Man” case study); neo-noir film (*Chinatown*); works that fuse detective fiction and science-fiction (*Minority Report*) and recent film homage to “golden age” whodunnits (*Knives Out*). Students write essays making interpretive claims and using evidence from works on the syllabus, with emphasis on writing clear prose in support of an original argument. HU

*** ENGL 250a, Romantic Poetry** Leslie Brisman

Introduction to the work of Blake, Coleridge, Wordsworth, Shelley, and Keats, with some attention to Byron, to the poets’ own problematic revisions, and to the minor poets of this rich period of poetic innovation and revolutionary spirit. WR, HU RP

*** ENGL 255b, Victorian Poetry** Leslie Brisman

The major Victorian poets, Tennyson and Browning, in the context of the romanticism they inherited and transformed. A selection of other Victorians whose genius or popularity warrants attention, including Morris, the Rossettis, Hardy, Swinburne, Hopkins, and Barrett Browning. Formerly ENGL 312 and ENGL 412. WR, HU

*** ENGL 268b / HUMS 254b / LITR 463b / PHIL 227b, Literature and Philosophy, Revolution to Romanticism** Jonathan Kramnick

This is a course on the interrelations between philosophical and literary writing beginning with the English Revolution and ending with the beginnings of Romanticism. We read major works in empiricism, political philosophy, and ethics alongside poetry and fiction in several genres. Topics include the mind/body problem, political ideology, subjectivity and gender, and aesthetic experience as they take philosophical and literary form during a long moment of historical change. WR, HU

*** ENGL 277b / AMST 475b, Performing American Literature** Wai Chee Dimock

A broad selection of short stories, poems, and novels, accompanied by class performances, and culminating in a term project with a significant writing component. “Performance” includes a wide range of activities including: staging; making digital films and videos; building websites; book illustration; game design; and creative use of social media. Readings include poetry by Walt Whitman and Emily Dickinson; plays by Suzan-lori Parks; and fiction by F. Scott Fitzgerald, Ray Bradbury, Walter Mosley, Jhumpa Lahiri, and Junot Diaz. Formerly ENGL 438. WR, HU

*** ENGL 280a / AMST 390a / HUMS 319a, Poetry, Film, Music and Art: John Ashbery's Work** Karin Roffman

A study of the poetry of John Ashbery (1927-2017) through examining the films, music, and art that provoked his imagination and structured and inhabited his poems. In the course, we study his original paintings and collages, read from his published art criticism, film and music reviews, and explore his off-the-cuff reactions to contemporary work in correspondence with friends. In short, we consider how he practiced and extended the art of American poetry through a vivid, lively, and continuous conversation with other arts. We also discuss critiques of the interdisciplinarity of Ashbery's poetics in work by second generation New York School poets. WR, HU

*** ENGL 281b / AMST 358b, Animals in Modern American Fiction** Jim Berger

Literary portrayals of animals are used to examine the relations between literature, science, and social and political thought since the late nineteenth century. Topics include Darwinist thought, socialism, fascism, gender and race relations, new thinking about ecology, and issues in neuroscience. HU RP

*** ENGL 285a / AMST 321a / FILM 334a / RLST 333a, Mormonism** Kathryn Lofton and John Peters

For some observers, Mormonism is an epithet, a poison, a problem; for others, Mormonism is a practice, a purpose, the bread of life. It's both wave and particle. It's radical and conservative. It's insane and mundane. It's deeply weird and definitionally conventional. This is not a course that decides where one ought to sit on these oppositional terms. We ask instead what makes a subject so inspiring *to* opposition. We do not consider Mormonism a subject *of* study as much as a prompt to ask what it is to study anything. This course, the first of its kind at Yale, does not reflect the recent efflorescence of Mormon Studies as an academic subfield as much as it reacts to that intellectual excitement. We consider Mormonism as an indicative problem in the history of interpretation. WR, HU

*** ENGL 296b / AFAM 395b / ER&M 294b, Auto-Criticism: Writing the Self in the World** Claudia Rankine

This course brings together a group of contemporary cultural critics who examine the intersections of aesthetics and politics across visual and literary forms. Our discussions focus on the different formal techniques and practices regarding archive driven scholarly works, public essays, memoirs, and reviews. We discuss different approaches toward interdisciplinary writing and criticism, the public humanities, and engaging scholarly expertise with a broader audience. In preparation for meetings, participants read selections of works from guest scholars and cultural critics. Our hope is to build a discussion about writing across different disciplinary background and domains and engage with how these practices might contribute to our works as scholars, writers, and activists. Workshops with critics are twice a month. WR, HU

*** ENGL 300b, Medieval Manuscripts** Jessica Brantley

A history of the medieval book and its social uses, based on materials at the Beinecke Library. Topics include the roles of authors, scribes, artists, and readers in constructing, writing, illuminating, and editing manuscripts. WR, HU

*** ENGL 305a, Shakespeare and Religion** David Kastan

This course is about how various understandings of religion (and religions) circulate through Shakespeare's plays, as they were written, performed, and read—and as they have continued to be sometimes re-written, performed, and read. Whatever Shakespeare's own religion was, it is clear that religion is central in the plays: it haunts them (think *Hamlet*) and was in so many ways inescapable in his England. We read a number of plays (including *The Merchant of Venice*, *Hamlet*, *Measure for Measure*, *Othello*, *King Lear*, and *The Winter's Tale*), various historical sources, as well as theological and philosophical texts, as we try to understand how religion functions in these plays as an essential, but often perplexing dimension of early modern identity (and perhaps of our own). HU

*** ENGL 311b, Milton's Paradise Lost** David Kastan

An intensive reading of Milton's *Paradise Lost*, along with some of the relevant prose, focusing on the ways in which the poem responds at the level of form to the various literary, political, and theological pressures that bear upon it. Formerly ENGL 415. Prerequisite: ENGL 220. WR, HU

*** ENGL 321a, Austen and Brontë and Twentieth-Century Women's Novels** Katie Trumpener

Examination of ways that twentieth-century Anglo-American writers rewrite, revise, and reconcile key novels by Jane Austen and Charlotte Brontë as prototypes of a women's novel tradition. Particular attention to narrative voice, reader identification, and the novel's function as a record of social norms and as an agent of historical change. Formerly ENGL 421. Advanced courses are open to students normally after two terms of English or the equivalent, or with the permission of the instructor. Starred courses may be used to fulfill the two-seminar requirement for English majors. WR, HU

*** ENGL 322b, Wordsworth and Coleridge** Paul Fry

An in-depth study of Wordsworth's poems, with less attention given to Coleridge, whose major poems and prose (chiefly his criticisms of Wordsworth and his theory of the imagination) are assigned primarily for comparison and contrast with Wordsworth. WR, HU

*** ENGL 325b / AMST 257b, Modern Apocalyptic Narratives** Jim Berger

The persistent impulse in Western culture to imagine the end of the world and what might follow. Social and psychological factors that motivate apocalyptic representations. Differences and constant features in apocalyptic representations from the Hebrew Bible to contemporary science fiction. Attitudes toward history, politics, sexuality, social class, and the process of representation in apocalyptic texts. HU

*** ENGL 330a, Henry James** Ruth Yeazell

Selected novels by Henry James, from *Roderick Hudson* through *The Golden Bowl*. Particular attention to the international theme and to the ways in which James's later novels revisit and transform the matter of his earlier ones. Formerly ENGL 435. WR, HU

*** ENGL 343b / AFAM 408b / AMST 460b, African American Poets of the Modern Era** Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden.

Class sessions at the Beinecke Library for inspection and discussion of original editions, manuscripts, letters, and other archival material. HU

*** ENGL 346a / HUMS 253a / RLST 233a, Poetry and Faith** Christian Wiman

Issues of faith examined through poetry, with a focus on modern Christian poems from 1850 to the present. Some attention to poems from other faith traditions, as well as to secular and antireligious poetry. HU

*** ENGL 347b, Lyric Theory** Langdon Hammer

The theory of lyric poetry from the nineteenth century to the present, with an emphasis on the New Criticism, Russian Formalism, the Frankfurt School, and Historical Poetics, and poeticsians such as William Wimsatt, Roman Jakobson, Paul de Man, and Theodor Adorno. Topics include genre, time, voice, sound, song, textuality, race, and the social in the lyric. Poetry and prose by Wallace Stevens, Ezra Pound, T. S. Eliot, Emily Dickinson, Charles Baudelaire, John Ashbery, Susan Howe, and Claudia Rankine read in the light of literary theory and as theoretical works themselves. This is a senior seminar in English, designed to fulfill in part the senior requirement in the English Major. Open to students in any major with a prior course in poetry, literary theory, or the philosophy of aesthetics. HU

*** ENGL 350b, Literary Sound Studies** Benjamin Glaser

Following recent theoretical turns in media studies, music theory, African American studies, and literary studies, this course teaches close listening to the soundscapes of twentieth- and twenty-first century literature. We study both written and performed texts across genres, as well as musical lyrics, to ask what social and aesthetic value lies in the production and reception of sound. Primary emphasis is on sound's racial construction, especially in dialect and musical performance. Additional topics include the relation of voice and gender, sonic expressions of colonialism and migration, and the influence of recording technology on poetry and its performance traditions. WR, HU

*** ENGL 354b / AMST 235b, Language, Disability, Fiction** Jim Berger

Portrayals of cognitive and linguistic impairment in modern fiction. Characters with limited capacities for language as figures of 'otherness.' Contemporaneous discourses of science, sociology, ethics, politics, and aesthetics. The ethics of speaking about or for subjects at the margins of discourse. HU

*** ENGL 356a, The Young Adult Dystopian Novel** Jill Richards

Survey of young adult fiction across the twentieth century, with a focus on American writers. Topics include environmental apocalypse, biopolitics, youth indebtedness, juvenile sentencing, sexual violence, and racial profiling. Creative and critical writing components. 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, Louisa May Alcott, 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 361a / THST 329a, Theater Now** Marc Robinson

Study of the drama and performance created in the last ten years, with special attention to work produced in 2019-2020. Readings from published and unpublished American

and British plays, contemporary criticism and theory, interviews, and essays by the artists themselves. Videos of works created by experimental theater companies. May include attendance at productions in New York City and New Haven. 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 378a / AFAM 449a / AFST 449a, 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 379a, Ulysses and Omeros: The Postcolonial Epic** Joe Cleary

An extended reading of James Joyce's *Ulysses* (1922) and Derek Walcott's *Omeros* (1990), two of the most ambitious and challenging Anglophone epics of the twentieth century. Beginning with a discussion of the modern epic as prose and poetic form, the class considers Joyce's and Walcott's re-workings of Homeric epic and their respective engagements with the wider Western literary tradition. Questions concerning the structure, style, narrative form, and symbolic meaning of these two exceptionally ambitious works are engaged and we also consider the critical controversies and interpretative challenges that *Ulysses* and *Omeros* have generated and continue to provoke. WR, HU

*** ENGL 383b / AMST 428b / AMST 888b / ENGL 832 / EVST 284b, Food in Literature, Culture, and Science** Wai Chee Dimock

From the global histories of sugar and salt to the latest research on chicken and antibiotics, this course explores some key texts—by Gabriel Garcia Marquez, Sinclair Lewis, Ruth Ozeki, Monique Truong, Jonathan Safran Foer, Octavia Butler, and Margaret Atwood—both as works of luminous imagination and as entry points to deeper scientific knowledge, encouraging cross-pollination among disciplines. Formerly ENGL 283. WR, HU

*** ENGL 395a / HUMS 380a / LITR 154a, 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 406a, Reading Poetry for Craft** David Gorin

An introduction to reading and writing poetry. Classic examples from Shakespeare and Milton, the modernist poetics of Stein, Pound, Moore, and Stevens, and recent work in a variety of forms and traditions. Students develop a portfolio of poems and write an

essay on the poetic craft of poets who have influenced their work. Formerly ENGL 135.
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 408b, Introduction to Writing Poetry** Cynthia Zarin

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** Jake 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 434a / THST 215a, Writing Dance** Brian Seibert

The esteemed choreographer Merce Cunningham once compared writing about dance to trying to nail Jello-O to the wall. This seminar and workshop takes on the challenge. Taught by a dance critic for the New York Times, the course uses a close reading of exemplary dance writing to introduce approaches that students then try themselves, in response to filmed dance and live performances in New York City, in the widest possible variety of genres. No previous knowledge of dance is required. WR, HU

*** ENGL 440a / AMST 414a, Poetry and Debates on the Value of Arts and Humanities**
Jim Berger

Attacks on and defenses of poetry in the broadest sense (as culture, the aesthetic, the humanities) from Plato to contemporary debates over the proper focus of education. The value of poetry in terms of knowledge claims, moral impact, economic utility, and other categories particular to artistic production and reception. WR, HU

*** ENGL 447b, Shakespeare and the Craft of Writing Poetry** Erica Chapman

Shakespeare's Craft aims to demystify the Bard by discerning elements of his craft, introducing students to contemporary poets who are in conversation with Shakespeare, and teaching students how to adapt aspects of Shakespeare's craft for their own poems – without sounding Elizabethan. With the belief that Shakespeare's poetry is still utterly alive, and that many contemporary poems find their origin in his protean touch, and/or in their resistance to it, weekly reading includes close readings from the plays, and one group of Shakespeare's sonnets, alongside contemporary poems that employ

similar methods. Weekly assignments include both critical responses and creative assignments, focusing on specific craft elements, such as “The Outlandish List: How to Make Anaphora Exciting,” “Verbs: Hurtling a Poem Forward,” “Concrete Nouns and Death-Defying Descriptions,” “The Poet as Culture Vulture: How to Collect and Command Contemporary Details,” “Wilding: How to Loot and Weirden the Natural World,” “Exciting Enjambments: How to Keep Iambic Pentameter From Being Boring,” “Finis: How to Make a Poem End.” This hybrid course is an exciting blend of creative and critical writing. Students write poems and present on specific poets and poems. The final project is either a scholarly engagement with specific texts and issues or a manuscript of poems that explores the ideas arising from the semester’s discussions. 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 is a creative portfolio or a critical essay; their midterm assignment is the opposite of their final assignment. Permission of the instructor required.

*** ENGL 449a, The Art of Editing** Meghan O'Rourke

This course is an intensive practicum in which students are introduced to key aspects of the history and contemporary practice of professional editing and publication. Under the instruction of the current editor of *The Yale Review* (which is undergoing a transformation and relaunching primarily as a digital publication) students look at many aspects of editing text across forms—from magazine to newspaper to book editing. We also talk about the art of podcast editing and distinguish the demands of storytelling in audio from those of storytelling in print. Students do some coursework at *The Yale Review* and attend editorial meetings for hands-on professional editorial experience. Because text editing is inseparable from good reading students reading a lot. Through exchanges with weekly visitors, all of whom are experts in their field, students develop an array of hands-on skills and understand the full dimensionality of professional editing. A serious interest in the contemporary practice of publication. Prospective students need not have taken a creative writing class; rather, they might have backgrounds in student publications on campus, or a background with literature, podcasting, art and art history, technology, and/or film. HU

*** 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 451b, Non-Fiction Writing: Argument and Persuasion** David Bromwich

This seminar offers practical training in argumentative writing that seeks to persuade. Among the topics for discussion: resemblances and differences between speaking and writing; implicit vs. explicit guidance of intended audience; the value of grammar and logic; grand, middle, and demotic styles. ENGL 120 or another writing-intensive course at Yale. WR, HU

*** 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 455a or b, Writing about Oneself** Anne Fadiman

A seminar and workshop 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 British and American memoirs, autobiographies, personal essays, and letters. An older work, usually from the nineteenth or early twentieth century, is paired each week with a more recent one on the same theme. WR

*** 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 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 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. Emphasis on developing an individual voice. Scenes read and critiqued in class. Admission by application, with priority to Theater Studies majors. A writing sample and statement of purpose should be submitted to the instructor before the first class meeting.

*** 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 483b / HUMS 428b / JDST 343b / LITR 305b, 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 484b, 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 / ENGL 470, 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. Students must apply 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. To apply for admission, a student must submit an application and prospectus signed by the faculty adviser to the office of the director of undergraduate studies. Students must apply 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** Cynthia Zarin

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** Benjamin Glaser

Students wishing to undertake an independent senior essay in English must apply through the office of the director of undergraduate studies 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** Benjamin Glaser

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 apply in the previous term; deadlines and instructions are posted at english.yale.edu/undergraduate/applications-and-deadlines. After ENGL 490.

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 400b, Senior Capstone Seminar** Michael Oristaglio

This course serves as the capstone seminar for the Energy Studies Multidisciplinary Academic Program (MAP). Capstone projects in Energy Studies are undertaken in the senior year and can comprise an independent study project or an extension of a summer internship, senior essay or senior project in the major. To register for this course, students must submit a project proposal to the Director of Energy Studies no later than the end of registration period in the term in which the course is to be taken. In addition to individual study, the seminar meets regularly during the term. Prerequisite: Enrollment in, and expected completion of, the course requirements for Energy Studies.

Environmental Engineering (ENVE)

*** ENVE 120b / CENG 120b / ENAS 120b, Introduction to Environmental Engineering**

John Fortner

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 360b / ENAS 360b, Green Engineering and Sustainable Design Julie Zimmerman

Study of green engineering, focusing on key approaches to advancing sustainability through engineering design. Topics include current design, manufacturing, and disposal processes; toxicity and benign alternatives; policy implications; pollution prevention and source reduction; separations and disassembly; material and energy efficiencies and flows; systems analysis; biomimicry; and life cycle design, management, and analysis. Prerequisites: CHEM 161, 165 or 163, 167 (or CHEM 112, 113, or 114, 115), or permission of instructor.

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, electrodialysis, 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 420b, Rethinking Urban Sanitation: The United States and Peru** Staff

This interdisciplinary course examines the challenges posed by the growing volumes of human excreta that are generated daily in cities around the world. Topics to be covered include: environmental, engineering, and public-health aspects of sanitation; the history of sanitation; innovation in sanitation; sewage reuse; cultural and social considerations; and case studies of different centralized and decentralized solutions. The course is organized around two alternative final projects: 1) a spring-break trip to

Lima, Peru, where students observe first-hand some of the components of this complex sanitation system, and meet with stakeholders ranging from government officials to slum-dwellers to non-profits pursuing innovative sanitation solutions; and 2) a U.S.-based analysis of a comparable sanitation system. Enrollment in the class is limited to 10 students each from the School of Forestry & Environmental Studies, the School of Public Health, and the Department of Chemical and Environmental Engineering. Participation in the Peru field trip/project is limited to five students from each school. Applications for enrollment and participation in the Peru field trip are due in December 2019. Prerequisite: ENVE 120.

ENVE 438a, 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.

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 204a / ENAS 335a, Professional Ethics Mercedes Carreras

A theoretical and case-oriented approach to ethical decision making. Concepts, tools, and methods for constructing and justifying solutions to moral problems that students may face as professionals. SO

EP&E 209a / PLSC 453a / S&DS 103a / S&DS 112E, 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** Staff

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 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 231b / GLBL 180b / PLSC 346b, Game Theory and International Relations

Alex Debs

Introduction to game theory and its applications in political science and economics, with a focus on international relations. Standard solution concepts in game theory; case studies from important episodes in the history of international relations, including World War II, the Cuban missile crisis, and the 2003 U.S.-led invasion of Iraq. Recommended preparation: introductory microeconomics. QR, SO

*** EP&E 235a / PHIL 457a / PLSC 283a, Recent Work on Justice** Thomas Pogge

In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on

student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

* **EP&E 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 242b / PLSC 372b, Politics and Markets** Peter Swenson

Examination of the interplay between market and political processes in different substantive realms, time periods, and countries. Inquiry into the developmental relationship between capitalism and democracy and the functional relationships between the two. Investigation of the politics of regulation in areas such as property rights, social security, international finance, and product, labor, and service markets. Topics include the economic motives of interest groups and coalitions in the political process. SO

* **EP&E 243a / GBL 336a / LAST 423a / PLSC 423a, Political Economy of Poverty Alleviation** Ana De La O

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. SO

* **EP&E 244b / ECON 449b / PLSC 374b, The Economic Analysis of Conflict** Gerard Padro

Introduction to the microeconomic analysis of internal conflict. In particular, how conflict imposes economic costs on the population and how people react to conflict. Topics include the correlates of war; the economic legacies of conflict on human capital, local institutions, households' income, and firm performance; and the causes and impacts of forced displacement. Prerequisites: Intermediate microeconomics and econometrics. SO

* **EP&E 248b / PLSC 256b, American Political Institutions** Michael Fotos

The origins and development of American political institutions, especially in relation to how institutions shape the policy process. Issues of temporality, policy feedback, and policy substance. WR, 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 253b / PLSC 398b, Comparative Political Economy** Frances McCall Rosenbluth

Introduction to issues in political economy across time and place. The field's diverse theoretical underpinnings and its place in the context of political science and of the social sciences more generally; theoretical perspectives such as materialism, institutionalism, and cognition/culture/beliefs; interactions between government

and the economy in democratic and nondemocratic regimes and in developed and developing countries. Enrollment limited to senior Political Science majors. SO

*** EP&E 257b / LAST 251b / PLSC 399b, Political Power and Inequality in Latin America** Ana De La O

Overview and analysis of politics in Latin America. The emergence of democracy and the forces that led to the unprecedented increase in inequality in the twentieth century. Topics include institutional design, historical legacies, corruption, clientelism, and violence. 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 298a / ECON 481a, Empirical Microeconomics** Guillermo Noguera

Introduction to empirical microeconomics and its methodologies. Academic research in the field explored using tools from economic theory and econometrics. Topics include approaches to identification, environmental effects on health, and the economics of crime, gender, and race. Prerequisites: intermediate microeconomics and econometrics. SO

*** EP&E 302b / GLBL 259b / HIST 469Jb / PLSC 391b, 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 / EP&E S306 / PLSC 228a / PLSC S228, 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 309a or b, 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 321b / ECON 325b / GLBL 322b / PLSC 185b / SAST 281b, Economics of Developing Countries: Focus on South Asia Zachary Barnett-Howell

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. Prerequisites: introductory microeconomics and introductory econometrics. so

*** 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 330a / PLSC 284a, Capitalism, Commodification, and Business Ethics**
Gregory Collins

For centuries, “business” activities—such as profit-making, capital investment, and trading—were seen with a distrustful eye by many members of society for prioritizing greed over virtue and religion. The aim of this course is to cast light on this tension

in contemporary culture by critically examining the ethical dilemmas that arise from the interaction between capitalism and business actors in a liberal society. The chief question that guides our inquiry is how the incentive structure of market exchange encourages businesses to commodify social relations in a way that raises moral questions about the pursuit of profit. We begin by defining “ethics” and “business.” We then explore the traditional tensions between them in the history of political and economic thought by surveying a number of key thinkers that have drawn attention to the fraught relation between markets and morality. Next we address some of the important contemporary debates and controversies surrounding business ethics, including corporate social responsibility, sweatshops, outsourcing, public accommodations, and the use of consumer data. Each week introduces a new theme, but the intent is for the themes to flow logically throughout the course in a manner that integrates and synthesizes the prior week’s readings and discussion. We conclude by connecting our study of business ethics to our wider understanding of the proper role of business and capitalist enterprise in society as a whole. SO

*** EP&E 334a / PHIL 455a, 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 336b / PLSC 258b / PLSC 841, Democracy and Bureaucracy** Ian Turner

Exploration of what government agencies do and why; focus on issues of accountability and the role of bureaucracy in representative democracy. Understanding how bureaucracy works internally and how it is affected by interactions with other political actors and institutions. SO

*** EP&E 339b / PLSC 273b, The Ethics of Journalism** Jacob Weisberg

An examination of key issues about the rights and responsibilities of the press. Topics include truth and verification, bias and objectivity, the handling of government secrets, the use of misrepresentation and deception, privacy, and the protection of sources. Case studies including WikiLeaks and the Pentagon Papers will supplement readings from critics such as Walter Lippmann, George Orwell, Janet Malcolm, and Neil Postman.

*** EP&E 342b, Economics of Income Inequality** Staff

This course is an overview of the contemporary research on income inequality with a special emphasis on the roles of technology and institutions. The motivation of this course is the recent empirical trends such as the declining labor shares and the increasing wealth gap observed in most developed economies. The objective of the course is to explore the causes and the consequences of rising income inequality, and to explain the relevant policy tools. SO

*** EP&E 344b, Ethical Challenges for Business in Developing Countries: Cases from South Africa** Itumeleng Makgetla

This course examines critical ethical challenges confronting businesses in developing countries using cases from South Africa. These challenges include navigating comparatively weak states and regulatory demands for racial diversification,

government pressure to develop local suppliers, political conflict, consumer demands for accountability, calls for environmental sustainability and trade union politics. Each week, class participants use a case drawn from South Africa related to a thematic area to debate the ethical considerations involved in doing business in a developing country context. The course combines the study of the political economy of development, with a focus on South Africa, and frameworks for ethical decision-making in the business environment. SO

*** EP&E 348b, Technology, Ethics, Economics** Staff

This course explores the economic and ethical challenges posed by the recent advances in technology. Topics include the technological forces behind rising inequality, the race between automation and education, and the impact of artificial intelligence/machine learning on the labor markets. Our focus is primarily on the ethical dimension of the debate including inequality, fairness, freedom, and responsibility. 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 354a / PLSC 300a / PLSC 623a, Rethinking the Political Enlightenment** Ian Shapiro

The calamities wrought by Fascism and Nazism, together with growing disillusionment at the excesses and direction Soviet communism and then Mao's China, led many postwar intellectuals to rethink the Enlightenment's promise. In politics that promise had centered on the creation of durable political institutions based on scientific principles that would foster, expand, and protect human freedom. We study the ways in which the harsh realities of twentieth century politics led political theorists to modify, recast, and in some cases reject these Enlightenment aspirations, and we evaluate those responses from the perspective of our contemporary politics. Readings are drawn from, among others, Jonathan Israel, James Tully, Hannah Arendt, Herbert Marcuse, Nicos Poulantzas, Jürgen Habermas, Leo Strauss, Isaiah Berlin, Michel Foucault, Richard Rorty, Alasdair MacIntyre, Charles Taylor, Anthony Appiah, Nancy Fraser, Carole Pateman, Judith Shklar, Quentin Skinner, J.G.A. Pocock, Michael Walzer, and Iris Marion Young. Among the themes discussed are the connections between Enlightenment aspirations and the ideas of modernization, progress, and democracy; the advantages and limitations of periodization in the study of political theory; and teleological conceptions of history. Open to PhD students in Political Science and to graduate students in other departments and programs by agreement with the instructor. Open to undergraduates as space permits, provided they have completed at least three political science courses, one of which is PLSC 114, PLSC 118, or equivalent such as Directed Studies. SO

*** EP&E 360a / GMAN 345a / HUMS 341a / LITR 226a, Sound of the Police: The Idea of Order after the French Revolution** Paul North

A theoretical investigation into the idea and function of police in modern sovereign states, particularly after the French Revolution, when a 'people' meant to govern itself, represent itself, even restrain itself, in order to do this, needs something that has come to be called 'order.' How does government of the people, by the people, for the people divide itself into a segment that surveils and curtails and a segment that is

surveilled and curtailed? Since the 18th century the institution of the police has taken on an unprecedented role in life in states, and can sometimes be the only direct tie between citizens and the state itself. And the first thing a citizen experiences is often the 'woop, woop' (to quote KRS-One, 'Sound of da Police') of the police coming. Following this sonic footprint, we read theories of the police in Hobbes, Schiller, Walter Benjamin, and Michel Foucault, and we listen for the police in cultural objects, such as films (*Invasion of the Body Snatchers*, *Dirty Harry*, *The Thin Blue Line*), television programs (*Law and Order*, *The Wire*), and music (*Sorrow, Tears, and Blood* by Fela Kuti, *Sound of da Police* by Teacha). For a glimpse of the possible music, see spotify playlist (<https://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrEhttps://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrE>). HU

*** EP&E 362a / PHIL 462a, 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 396a / AMST 469a / PLSC 251a, American Progressivism and Its Critics**
Stephen Skowronek

The progressive reform tradition in American politics. The tradition's conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

*** EP&E 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 491a, The Senior Essay** Peter Swenson

A one-term senior essay. The essay should fall within the student's area of concentration. If no appropriate seminar is offered in which the essay might be written, the student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

*** EP&E 492a and EP&E 493a, The Yearlong Senior Essay** Peter Swenson

A two-term senior essay. The essay should fall within the student's area of concentration. The student, in consultation with the director of undergraduate studies, should choose an appropriate member of the faculty to supervise the senior essay. Students must obtain the signature of the faculty member supervising their independent work on an Independent Study Form (available from the Ethics, Politics, and Economics registrar's office). This form must be submitted to the director of undergraduate studies at the time the student's class schedule is submitted.

*** EP&E 497a / EVST 247a / PLSC 219a, Politics of the Environment** Peter Swenson

Historical and contemporary politics aimed at regulating human behavior to limit damage to the environment. Goals, strategies, successes, and failures of movements, organizations, corporations, scientists, and politicians in conflicts over environmental policy. Focus on politics in the U.S., including the role of public opinion; attention to international regulatory efforts, especially with regard to climate change. so

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 110a, Dynamic Earth David Evans and Danny Rye

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 111Lb, Dynamic Earth Laboratory and Field Methods Danny Rye and 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, Pincelli Hull, and Bhart-Anjan Bhullar

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, Pincelli Hull, and Bhart-Anjan Bhullar

A survey of the diversification of life using suites of fossils and related modern organisms drawn from critical evolutionary stages. Emphasis on direct observation and description of specimens, the solution of problems posed by the instructor, and the generation and testing of hypotheses by the students. To be taken concurrently with or following G&G 125. SC ½ Course cr

EPS 140b, Atmosphere, Ocean, and Climate Change Juan Lora

Physical processes that control Earth's atmosphere, ocean, and climate. Quantitative methods for constructing energy and water budgets. Topics include clouds, rain, severe storms, regional climate, the ozone layer, air pollution, ocean currents and productivity, the seasons, El Niño, the history of Earth's climate, global warming, energy, and water resources. QR, SC

EPS 210b, The Geology of North America through its National Parks Alan Rooney

The *Geology of North America* (a.k.a. Parks & Plates) serves as a bridge between the introductory level courses and the more focused upper-level classes taught in the G&G department. While drawing on a traditional tectonics curriculum this course also integrates geomorphology, landscape evolution, and current environmental issues to investigate how geologic processes have shaped and continue to alter the world around us. This course is for those students interested in pursuing their major in the Geology & Geophysics department. Furthermore, with the integrated geology and environmental focus we hope that this course provides a fundamental scientific knowledge to engage students interested in pursuing the intersection of environmental policy, science, and natural resources. In addition to providing an essential scientific background to students regardless of their path, this course aims to teach skills in scientific literacy and introduce students to different career paths within the Earth sciences via interactions with professionals working in the National Parks System, at national laboratories, and in environmental/conservation law. Prerequisites: G&G 100, 110, 115 and 232 (can be taken concurrently with 232) or permission of instructor. SC

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 212b, Global Tectonics** Mark Brandon

The architecture of continents and oceans; detailed geology of lithospheric plate margins and mountain chains. Examples of plate-interaction histories from the ancient geological record emphasize the interdisciplinary approaches used to determine interlinked Earth-system processes involving the mantle, crust, hydrosphere, atmosphere, and biosphere. The course features a field trip during spring break. Prerequisite: one course in G&G (preferably 100, 110, or 115), or permission of instructor. Enrollment limited to 15. SC

EPS 220b, Petrology and Mineralogy Jay Ague

Study of the structures, chemistry, and physical properties of minerals, including common rock-forming minerals found in sedimentary, metamorphic, and igneous rocks, as well as rare and valuable minerals such as precious metals and gemstones. After one year of college-level chemistry; G&G 110 recommended. SC

EPS 232b, Earth Surface Processes Lidya Tarhan

Introduction to sedimentary rocks as paleoenvironmental archives. Reconstruction of depositional environments and paleoclimatic conditions using geochemical and sedimentological tools. Topics include sedimentology, stratigraphy, basin analysis, diagenesis, and sedimentary geochemistry. Prerequisite: G&G 100, 110, or 115, or permission of instructor. SC

*** 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 255b / EVST 265b, Environmental Geomicrobiology Ruth Blake

Microbial diversity in natural geologic habitats and the role of microorganisms in major biogeochemical cycles. Introduction to prokaryote physiology and metabolic diversity; enrichment culture and molecular methods in geomicrobiology. Prerequisite: college-level chemistry. 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 275b, Renewable Energy** Michael Oristaglio

Introduction to renewable energy, including physical principles, existing and emerging technologies, and interaction with the environment. Energy demand; transmission and storage; generation by hydroelectric, wind, solar, biofuel, and geothermal sources, as

well as waves and tidal generation. Includes field trips to conventional, hydroelectric, and wind power facilities in Connecticut. Prerequisites: high school physics, chemistry, and mathematics; college-level science, engineering, and mathematics recommended. SC

*** EPS 301b, Introduction to Geochemistry** Danny Rye and Ruth Blake
Basic principles of geochemistry and their use in geological science. Thermodynamics of aqueous and igneous systems. Element fractionation and isotope geochemistry. Biogeochemical cycles, geochronology, cosmochemistry. After CHEM 161, 165, or 167 (or CHEM 115 or 118), and MATH 115; G&G 220 recommended. QR, SC

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 336b / ANTH 336b / ARCG 336b, Geoarchaeology** Ellery Frahm
A survey of the numerous ways in which theories, approaches, techniques, and data from the earth and environmental sciences are used to address archaeological research questions. A range of interfaces between archaeology and the geological sciences are considered. Topics include stratigraphy, geomorphology, site formation processes, climate reconstruction, site location, and dating techniques. Prior introductory coursework in archaeology or geology (or instructor permission) suggested. SC, SO

EPS 355a, Extraordinary Glimpses of Past Life Derek Briggs
Study of exceptionally well-preserved fossil deposits (*lagerstaetten*) that contain nonmineralized animal skeletons and casts of the soft parts of organisms. Examples such as the Burgess Shale and Solnhofen limestones; what they can reveal about the history and evolution of life, ancient lifestyles and environments, and preservational processes. After G&G 230. SC

EPS 370b, Regional Perspectives on Global Geoscience David Evans
Examination of the geological record of a specific region of the world. The region studied varies from year to year and is selected by interested students. Successful completion of the course earns priority eligibility status for attendance on a departmental field trip to the studied region. Prerequisite: G&G 110, 115, or 212. SC

EPS 421b, Geophysical Fluid Dynamics Mary-Louise Timmermans
A survey of fluid dynamics, with applications to planetary atmospheres and oceans. Mathematical models illustrate the fundamental dynamical principles of geophysical fluid phenomena such as waves, boundary layers, flow stability, turbulence, and large-scale flows. Concepts are investigated through laboratory experiments in a rotating water tank. Prerequisites: differential equations, or mathematical physics or equivalent. 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 450a, Deformation of Earth Materials Shun-ichiro Karato

Basic physics and chemistry of Earth materials, with emphasis on kinetic and transport properties. Geochemical and geophysical processes in Earth's crust and mantle and their influence on the dynamics and evolution of this planet. Topics include plastic flow, diffusion, electrical conductivity, and chemical reaction. Prerequisites: CHEM 115, MATH 120, and PHYS 181, or equivalents. 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 457a / ANTH 457a, Topics in Evolutionary Theory** Eric Sargis and Jacques Gauthier

Classic and current literature in theoretical evolutionary biology. Intensive training in critical analysis of theoretical concepts and in scientific writing. Recommended preparation: ANTH 267. SO

*** 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, Research in Earth and Planetary Sciences** Mary-Louise Timmermans

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 489b, Research in Geology and Geophysics** Mary-Louise Timmermans

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** Mary-Louise Timmermans

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 end of the junior year. The plan requires approval of the full G&G faculty.

*** EPS 492a or b, The Senior Essay** Mary-Louise Timmermans

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.

Ethnicity, Race, & Migration (ER&M)

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 200b, 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 209b / LITR 279b / VIET 220b, Introduction to Vietnamese Culture, Values, and Literature Quang Van

Introduction to Vietnamese culture and values. Topics include cultural and national identity, aesthetics, the meaning of life, war, and death. Selected readings from Zen poems, folklore, autobiographies, and religious and philosophical writings. Course is taught in English and is an alternative to Western perspectives. Readings in translation. No previous knowledge of Vietnamese required. HU

ER&M 211a / EDST 144a / EVST 144a / SOCY 144a, Race, Ethnicity, and Immigration

Grace Kao

Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO

ER&M 214a / HIST 146a / HLTH 280a / HSHM 212a, Historical Perspectives on Global Health Joanna Radin

In the 21st century “global health” is recognized as an influential framework for orienting action among a huge range of groups including public health workers, activists, philanthropists, economists, political leaders, and students. How did this come to pass? This survey class introduces you to the historical circumstances that have contributed to the contemporary landscape of global health. We travel through several centuries to examine how ideas about disease, colonialism, race, gender, science, diplomacy, security, economy, and humanitarianism have shaped and been shaped by attempts to negotiate problems of health that transcend geopolitical borders. 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 228a / HIST 338a, Pirates, Rebels, and Revolutionaries: Caribbean History from 1400–Present Anne Eller

This course examines the entangled, interconnected, and global histories of the greater Caribbean, from moments before European contact through the present day. Topics include the indigenous societies, European colonialism, plantation slavery and emancipation, anti-colonial struggles, revolution, and dictatorships. WR, HU

ER&M 241a / ANTH 140a / SOCY 138a, The Corporation Douglas Rogers

Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO

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 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 293b / HIST 393Jb / 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 294b / AFAM 395b / ENGL 296b, Auto-Criticism: Writing the Self in the World** Claudia Rankine

This course brings together a group of contemporary cultural critics who examine the intersections of aesthetics and politics across visual and literary forms. Our discussions focus on the different formal techniques and practices regarding archive driven scholarly works, public essays, memoirs, and reviews. We discuss different approaches toward interdisciplinary writing and criticism, the public humanities, and engaging scholarly expertise with a broader audience. In preparation for meetings, participants read selections of works from guest scholars and cultural critics. Our hope is to build a discussion about writing across different disciplinary background and domains and engage with how these practices might contribute to our works as scholars, writers, and activists. Workshops with critics are twice a month. WR, HU

*** 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 308b / AMST 398b / HIST 158Jb, American Indian Law and Policy** Ned Blackhawk

Survey of the origins, history, and legacies of federal Indian law and policy during two hundred years of United States history. The evolution of U.S. constitutional law and political achievements of American Indian communities over the past four decades. WR, 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 324a / WGSS 325a, Asian Diasporas since 1800** Quan Tran

Examination of the diverse historical and contemporary experiences of people from East, South, and Southeast Asian ancestry living in the Americas, Australia, Africa, the Middle East, Asia, and Europe. Organized thematically and comparative in scope, topics include labor migrations, community formations, chain migrations, transnational connections, intergenerational dynamics, interracial and ethnic relations, popular cultures, and return migrations. HU, SO

ER&M 325b / AFST 335b / HIST 335b, A History of South Africa Daniel Magaziner
An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique. 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, WGGS, 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 353a / AMST 317a / HIST 323Ja, Race, Radicalism, and Migration in Latinx History** Stephen Pitti

Histories of Mexican American, Puerto Rican, Central American, Dominican, and Cuban American communities in the United States, with a focus on transnational and labor politics, cultural expression, print culture, and social movements. Readings and films locate Latinx experiences alongside African American and Asian American histories, and within broader patterns of U.S. and Latin American history. HU

*** ER&M 359b / HIST 345Jb, Gender and the State in Latin America and the Caribbean** Anne Eller

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 360a / HLTH 370a / HSHM 432a / SOCY 390a / WGSS 390a, 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 364b / HIST 334Jb / LAST 334b, Ethnicity, Nationalism, and the Politics of Knowledge in Latin America** Marcela Echeverri Munoz

Examination of ethnicity and nationalism in Latin America through the political lens of social knowledge. Comparative analysis of the evolution of symbolic, economic, and political perspectives on indigenous peoples, peasants, and people of African descent from the nineteenth century to the present. Consideration of the links between making ethnic categories in the social sciences and in literature and the rise of political mechanisms of participation and representation that have characterized the emergence of cultural politics. WR, HU RP

*** ER&M 372a / HSAR 492a, Visual Encounters in the Early Modern Atlantic World** Cecile Fromont

This course examines the visual, material, and human flows that connected Africa, Europe, and the Americas between 1450 and 1850 and gave its contours to the early modern Atlantic World. Readings, class discussions, and assignment will explore the role of the visual in key institutions and phenomena that emerged in the circum-Atlantic and continue cast their long shadow over the contemporary world. Topics include: colonialism, the slave trade, blackness and indigeneity, scientific exploration, religious encounters, revolt. HU

*** ER&M 381a / AMST 348a / EVST 304a, 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 392b / HIST 131Jb, Urban History in the United States, 1870 to the Present** Jennifer Klein

The history of work, leisure, consumption, and housing in American cities. Topics include immigration, formation and re-formation of ethnic communities, the segregation of cities along the lines of class and race, labor organizing, the impact of federal policy, the growth of suburbs, the War on Poverty and Reaganism, and post-Katrina New Orleans. WR, HU

*** ER&M 394a / ANTH 409a / EVST 422a / 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

*** ER&M 401a, 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 / 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 408a / AFAM 412a / AMST 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

*** ER&M 419a / AFAM 390a / SOCY 319a, Ethnography of the African American Community** Elijah Anderson

An ethnographic study of the African American community. Analysis of ethnographic and historical literature, with attention to substantive, conceptual, and methodological issues. Topics include the significance of slavery, the racial ghetto, structural poverty, the middle class, the color line, racial etiquette, and social identity. SO

*** ER&M 425b / AMST 486b, Asian American Studies of Race, Colonialism, and Empire** Lisa Lowe

This interdisciplinary course examines three periods of Asian American history that are paradigmatic within Asian American Studies of race, colonialism, and empire: 19th century Chinese immigrant labor, the internment of Japanese and Japanese Americans during World War II, and Korean Americans in 1992 Los Angeles. Studying these three examples in their national and global contexts, we consider Chinese immigrant railroad workers in relation to both conditions for emigration from China, and to Native American responses to U.S. settlement and expansion into the western frontier; the dispossession and incarceration of Japanese Americans in relation to wartime racialization of Mexican Americans, Blacks, and the longer history of U.S. war in Asia; and finally, we seek to understand the positioning of Korean Americans as 'middlemen' in post-Civil Rights multiracial Los Angeles in relation to Korean War, and U.S. development and investment in the industrialization of South Korea. We explore how Asian American histories of racialized labor and citizenship in the U.S. are better understood in comparative relation to the histories of other groups, and with consideration of the longer histories of U.S. interventions in Asian countries of origin.

HU

*** ER&M 433a / HIST 363Ja / SAST 334a, Mobile South Asians and the Global Legal Order** Rohit De

South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over

migration, multiculturalism, Islamic law, civil liberties, labor law, and international law.
WR, HU

* **ER&M 440a / AMST 436a, Antiracism, Racial Justice, and Freedom** Daniel HoSang

Examination of competing conceptualizations of anti-racism and racial justice within a range of historical, theoretical, and practical sites. Consideration of how the resurgence of collective and popular mobilizations against racial and colonial domination in the last ten years, witnessed in the struggles against the police and prison violence, immigrant detention and deportation, and indigenous-led campaigns against fossil fuel extraction, raise profound questions about the meaning, politics, and vision of racial justice. HU

* **ER&M 452b / AMST 452b / AMST 628, 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 491a, The Senior Colloquium: Theoretical and Methodological Issues** Albert Laguna and 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** Albert Laguna
Independent research on a one-term senior essay or project.

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 100b / APHY 100b / ENAS 100b / G&G 105 / PHYS 100b, Energy Technology and Society** 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 144a / EDST 144a / ER&M 211a / SOCY 144a, Race, Ethnicity, and Immigration Grace Kao

Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO

EVST 191b, Trees: Environmental Biology and Global Significance Craig Brodersen

Underlying principles that govern tree biology in both time and space. The biophysics of energy balance, water transport, and gas exchange, from individual plant organs to the tree and forest canopy; principles of cells and membranes; the fundamental differences between plant and animal cells; regional and global patterns in forest dynamics; implications of disruptions in the biotic and abiotic environment. Case studies focus on understanding forests and forest products and their global significance. SC

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 221a / E&EB 230a / F&ES 221a, Field Ecology** Linda Puth

A field-based introduction to ecological research, using experimental and descriptive approaches, comparative analysis, and modeling for field and small-group projects. Weekly field trips explore local lake, salt marsh, rocky intertidal, traprock ridge, and upland forest ecosystems. Includes one Saturday field trip and a three-day trip during the October recess. Concurrently with or after E&EB 220 or with permission of instructor. SC

EVST 223a / E&EB 220a, General Ecology David Post and David Vasseur

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 228b / HIST 459Jb / HUMS 228b / LITR 345b, 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 237a / ENGL 237a / HUMS 234a / LITR 323a, Animals in Literature and Theory** Jonathan Kramnick

Consideration of the role animals play in our aesthetic, ethical, political, and scientific worlds through reading of fiction, poetry, philosophy, and critical theory. Topics include: animal sentience and experience; vegetarianism; animal fables; pet keeping; animals alongside disability, race, and gender; and the representation of animal life in the visual arts. WR, HU

*** EVST 247a / EP&E 497a / PLSC 219a, Politics of the Environment** Peter Swenson

Historical and contemporary politics aimed at regulating human behavior to limit damage to the environment. Goals, strategies, successes, and failures of movements, organizations, corporations, scientists, and politicians in conflicts over environmental policy. Focus on politics in the U.S., including the role of public opinion; attention to international regulatory efforts, especially with regard to climate change. SO

EVST 255a / F&ES 255a / GLBL 282a / PLSC 215a, 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 257b / CLCV 258b / HIST 201b, Ecocultures of Antiquity: Ecocritical Approaches to Ancient Greece and Rome** Kirk Freudenburg

This class examines how the Greeks and Romans exploited their natural surroundings not only as physical resources, but as resources for human thought. The focus is on how ancient thinkers, living lives that were largely city-bound and detached from nature, structured their thoughts about the lives they lived (and about human existence more generally) by reference to their nonhuman surroundings: creatures, plants and places, some of which existed in the real world (in places far off, largely unknown and elsewhere; in places penetrated, explored, and/or told of), others of which existed entirely in the imagination, whether as inherited lore, or as places and creatures invented *ad hoc* by individuals and groups to get certain kinds of cultural work done. We look not only at the how and what, but at the why of nature's encoding via culture, and vice versa (their symbiosis), paying special attention to ancient Rome (though with a short first glance at Homer, Hesiod and Aristotle). We begin by scrutinizing the categories themselves, attempting to find historically appropriate ways to connect modern ecocritical concerns and ways of thought to the ancient world.

Topics include: the cosmos, the heavens, and the first humans (and first peoples in their places); humans in their 'kinds' and animals, wild and tame; mountains, rivers, the sea and the undersea; human and animal foods, farming and food ways; wine and fermentation; groves, forests and trees; gardens, flowers, vegetables and fungi; birds, fish, weasels and snakes; earthquakes, floods and natural disasters; pollution, dirt and the city of Rome; the ecocultural lives of others. HU

EVST 265b / EPS 255b, Environmental Geomicrobiology Ruth Blake

Microbial diversity in natural geologic habitats and the role of microorganisms in major biogeochemical cycles. Introduction to prokaryote physiology and metabolic diversity; enrichment culture and molecular methods in geomicrobiology. Prerequisite: college-level chemistry. SC

*** EVST 284b / AMST 428b / AMST 888b / ENGL 383b / ENGL 832, Food in Literature, Culture, and Science** Wai Chee Dimock

From the global histories of sugar and salt to the latest research on chicken and antibiotics, this course explores some key texts – by Gabriel Garcia Marquez, Sinclair Lewis, Ruth Ozeki, Monique Truong, Jonathan Safran Foer, Octavia Butler, and Margaret Atwood – both as works of luminous imagination and as entry points to deeper scientific knowledge, encouraging cross-pollination among disciplines. Formerly ENGL 283. WR, HU

*** EVST 285b / F&ES 285b, Political Ecology of Tropical Forest Conservation** Amity Doolittle

Study of the relationship between society and the environment focusing on tropical forest conservation. Global processes of environmental conservation, development, and conflicts over natural resource use and control; approaches to conserving trees and forest cover using strategies that support biodiversity and rural agricultural livelihoods; specific focus on tropical forest landscapes dominated by agriculture and cattle ranching practices using Panama and Colombia as a case studies. The course includes an optional field trip during Spring Break: March 6-March 15 in Colombia. Admission is by application only. Applications open in late November and close December 9; class list is determined by December 17. 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 299a, 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 304a / AMST 348a / ER&M 381a, 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 305a / GLBL 301a / MMES 305a, Environmental Security in the Middle East** Kaveh Madani

This course overviews how environmental, water, food, energy, and climate change have increasingly become linked to human and national security in the Middle East. It begins by exploring the state of the environment in the region and how the policies of the Middle East governments have lead to serious environmental degradation and subsequent loss of jobs, migration, social tension, violence, and regional conflicts. Drawing on an in-depth analysis of contemporary case/country studies, students learn how these problems can serve as major human and national security threats. This interdisciplinary course is of interest to students with background/interest in environmental science/engineering, ecology, geography, geosciences, social/political sciences, public policy, security and peace building, international relations, diplomacy, and global affairs. 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.

*** EVST 351b, The Anthropocene** Harvey Weiss

Examination of the detailed record of societal transformations of the earth from early agriculture through the Industrial Age, including the global interrelations of agriculture, deforestation, and carbon dioxide and methane production. The 'Early Anthropogenic' hypothesis and its models for east Asia, west Asia, and Europe, as well as the global effects of subsequent land-use intensification and industrialization that mark the Anthropocene. SO

*** EVST 369a / AFST 368a / HIST 366Ja, Commodities of Colonialism in Africa**

Robert Harms

This course examines historical case studies of several significant global commodities produced in Africa to explore interactions between world market forces and African resources and societies. Through the lens of four specific commodities—ivory, rubber, cotton, and diamonds—this course evaluates diverse industries and their historical trajectories in sub-Saharan Africa within a global context from ~1870-1990s. Students become acquainted with the historical method by developing their own research paper on a commodity using both primary and secondary sources. WR, HU

*** EVST 399b / ANTH 478b / ARCG 399b / NELC 399b, Agriculture: Origins, Evolution, Crises** Harvey Weiss

Analysis of the societal and environmental drivers and effects of plant and animal domestication, the intensification of agroproduction, and the crises of agroproduction:

land degradation, societal collapses, sociopolitical transformation, sustainability, and biodiversity. SC

*** EVST 400b / E&EB 275b, Biological Oceanography** Mary Beth Decker

Exploration of a range of coastal and pelagic ecosystems. Relationships between biological systems and the physical processes that control the movements of water and productivity of marine systems. Anthropogenic impacts on oceans, such as the effects of fishing and climate change. Includes three Friday field trips. Enrollment limited to 15. SC

*** 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 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 and EVST 464b / AMST 463a and AMST 464b / FILM 455a and FILM 456b, 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 and Staff

Independent research under the supervision of members of the faculty, resulting in a senior essay. Students meet with peers and faculty members regularly throughout the fall term to discuss the progress of their research. Projects should offer substantial opportunity for interdisciplinary work on environmental problems. Students typically complete a two-term senior essay, but students completing the requirements of two majors may consider a one-term senior project.

Forestry and Environment Studies (F&ES)

*** F&ES 221a / E&EB 230a / EVST 221a, Field Ecology** Linda Puth

A field-based introduction to ecological research, using experimental and descriptive approaches, comparative analysis, and modeling for field and small-group projects. Weekly field trips explore local lake, salt marsh, rocky intertidal, traprock ridge, and upland forest ecosystems. Includes one Saturday field trip and a three-day trip during the October recess. Concurrently with or after E&EB 220 or with permission of instructor. SC

F&ES 255a / EVST 255a / GBLB 282a / PLSC 215a, 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

*** F&ES 285b / EVST 285b, Political Ecology of Tropical Forest Conservation** Amity Doolittle

Study of the relationship between society and the environment focusing on tropical forest conservation. Global processes of environmental conservation, development,

and conflicts over natural resource use and control; approaches to conserving trees and forest cover using strategies that support biodiversity and rural agricultural livelihoods; specific focus on tropical forest landscapes dominated by agriculture and cattle ranching practices using Panama and Colombia as a case studies. The course includes an optional field trip during Spring Break: March 6-March 15 in Colombia. Admission is by application only. Applications open in late November and close December 9; class list is determined by December 17. SO

*** F&ES 290b / EVST 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.

F&ES 315a / E&EB 115a, Conservation Biology Linda Puth
An introduction to ecological and evolutionary principles underpinning efforts to conserve Earth's biodiversity. Efforts to halt the rapid increase in disappearance of both plants and animals. Discussion of sociological and economic issues. SC

*** F&ES 344b / EVST 444b, 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

*** F&ES 422a / ANTH 409a / ER&M 394a / EVST 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

Film and Media Studies (FILM)

*** FILM 045a / THST 099a, Dance on Film** Emily Coates
An examination of dance on film from c. 1920 to the present, including early Hollywood pictures, the rise of Bollywood, avant-garde films of the postwar period, translations of stage choreography to screen, music videos, and dance film festivals. The impact of industry, circulation and audience, aesthetic lineages, and craft in the union of the two mediums. Students develop an original short film for a final class project. No prior dance or filmmaking experience necessary. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. 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, visuality, 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. Materials fee: \$150. Prerequisite for all majors: ART 142; additional prerequisite for Film & Media Studies majors: FILM 150. 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.' Materials fee: \$150. 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 240b / ENGL 192b / LITR 143b, World Cinema Marta Figlerowicz

Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. HU

*** FILM 241b / PLSH 246b, Polish Communism and Postcommunism in Film** Krystyna Illakowicz

The Polish film school of the 1950s and the Polish New Wave of the 1960s. Pressures of politics, ideology, and censorship on cinema. Topics include gender roles in historical and contemporary narratives, identity, ethos of struggle, ethical dilemmas, and issues of power, status, and idealism. Films by Wajda, Munk, Polanski, Skolimowski, Kieslowski, Holland, and Kedzierzawska, as well as selected documentaries. Readings by Milosz, Andrzejewski, Mickiewicz, Maslowska, Haltoff, and others. Readings and discussion in English. HU

*** FILM 243a / MGRK 218a / WGSS 245a, Family in Greek Literature and Film** George Syrimis

The structure and multiple appropriations of the family unit, with a focus on the Greek tradition. The influence of aesthetic forms, including folk literature, short stories, novels, and film, and of political ideologies such as nationalism, Marxism, and

totalitarianism. Issues related to gender, sibling rivalry, dowries and other economic factors, political allegories, feminism, and sexual and social violence both within and beyond the family. WR, HU TR

*** FILM 246a / AFAM 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

*** FILM 307a / EALL 280a / EAST 260a, East Asian Martial Arts Film** Aaron Gerow

The martial arts film has not only been a central genre for many East Asian cinemas, it has been the cinematic form that has most defined those cinemas for others. Domestically, martial arts films have served to promote the nation, while on the international arena, they have been one of the primary conduits of transnational cinematic interaction, as kung-fu or samurai films have influenced films inside and outside East Asia, from *The Matrix* to *Kill Bill*. Martial arts cinema has become a crucial means for thinking through such issues as nation, ethnicity, history, East vs. West, the body, gender, sexuality, stardom, industry, spirituality, philosophy, and mediality, from modernity to postmodernity. It is thus not surprising that martial arts films have also attracted some of the world's best filmmakers, ranging from Kurosawa Akira to Wong Kar Wai. This course focuses on films from Japan, China, Hong Kong, Taiwan, and South Korea – as well as on works from other countries influenced by them – covering such martial arts genres such as the samurai film, kung-fu, karate, wuxia, and related historical epics. It provides a historical survey of each nation and genre, while connecting them to other genres, countries, and media. HU

*** FILM 320b / HSAR 490b, Close Analysis of Film** John MacKay and Moira Fradinger

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 325a / GMAN 379a / LITR 374a, German Cinema 1918–1933** Jan Hagens

The years between 1918 and 1933 are the Golden Age of German film. In its development from Expressionism to Social Realism, this German cinema produced works of great variety, many of them in the international avantgarde. This introductory seminar gives an overview of the silent movies and sound films made during the

Weimar Republic and situate them in their artistic, cultural, social, and political context between WWI and WWII, between the Kaiser's German Empire and the Nazis' Third Reich. Further objectives include: familiarizing students with basic categories of film studies and film analysis; showing how these films have shaped the history and the language of film; discussing topic-oriented and methodological issues such as: film genres (horror film, film noir, science fiction, street film, documentary film); set design, camera work, acting styles; narration in film; avantgarde cinema; the advent and use of sound in film; Realism versus Expressionism; film and popular mythology; melodrama; representation of women; modern urban life as spectacle; film and politics. Directors studied include: Grune, Lang, Lubitsch, Murnau, Pabst, Richter, Ruttman, Sagan, von Sternberg, Wiene, et al.

WR, HU

* **FILM 327b / AMST 395b, Studies in Documentary Film** Charles Musser

This course examines key works, crucial texts, and fundamental concepts in the critical study of non-fiction cinema, exploring the participant-observer dialectic, the performative, and changing ideas of truth in documentary forms. HU RP

* **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 334a / AMST 321a / ENGL 285a / RLST 333a, Mormonism** Kathryn Lofton and John Peters

For some observers, Mormonism is an epithet, a poison, a problem; for others, Mormonism is a practice, a purpose, the bread of life. It's both wave and particle. It's radical and conservative. It's insane and mundane. It's deeply weird and definitionally conventional. This is not a course that decides where one ought to sit on these oppositional terms. We ask instead what makes a subject so inspiring to opposition. We do not consider Mormonism a subject of study as much as a prompt to ask what it is to study anything. This course, the first of its kind at Yale, does not reflect the recent efflorescence of Mormon Studies as an academic subfield as much as it reacts to that intellectual excitement. We consider Mormonism as an indicative problem in the history of interpretation. WR, HU

* **FILM 335a / AFAM 335a, Black Experimental and Independent Film** Nicholas Forster

Since the birth of cinema over a century ago, black filmmakers have carved out alternative spaces for the production and distribution of cinema. This seminar examines the radical and experimental visions of post war black directors who have queered the screen, developed new modes of representation, and repeatedly challenged the accepted conventions of Hollywood. Frequently weaving documentary with the fictional, the films selected develop a new language of cinema. The seminar begins with William Greaves' 1968 psychodrama *Symbiopsychotaxiplasm: Take One*, a personal film that unsettles as it refuses to clarify whether what we are watching is real or a performance. Together, we examine Melvin Van Peebles *Sweet Sweetback's Baadasssss Song* (1971), which revolutionized independent cinema and made an explicit political

call for action. The black feminist visions of Madeline Anderson, a documentarian, and Jessie Maple, the first black woman in the cinematographer's union guide us, before we turn to the work of the L.A. Rebellion. The course finishes in dialogue with the interconnected zones between Hollywood and independent film, focusing on work like *Love and Basketball* (Gina Prince-Bythewood, 2000), *Pariah* (Dee Rees, 2011), and *An Oversimplification of Her Beauty* (Terrence Nance, 2012). Though most films are feature length works, we also turn to shorts and excerpts from television. Inhabiting his cinematic space of the undercommons, where artists have forged new visions of the world, we ask: what makes a work independent? What are the terms of experimental film? How can cinema create the cultural and political conditions for change? How have directors rewritten the possibilities of what it means to be, see, and feel in the world?

WR, 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 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. Materials fee: \$150. Limited enrollment. Priority to majors in Art and in Film & Media Studies. Prerequisites: ART 141 or 142, and FILM 150. HU RP

* **FILM 357a / AFAM 357a, Anatomy of an Actor: Performance on Film** Nicholas Forster

We are struck by performances on film. Perhaps more present than anything else, what moves us about the movies are the actors: their movements, their speech, their gestures. This course delves into the difficulties of writing about acting and provides a schematic history of methods and techniques in American cinema over the last century. What defines good acting? Is it something akin to authenticity, where an actor becomes the character, or is it in the expressive moments where we understand some emotion we hadn't felt before? What conventions have changed over time and how do those conventions clarify or complicate our understanding of acting? Must we like the character to understand the actor's performance? This course probes into the complicated performances from classical Hollywood artists (i.e. Bette Davis, Cary Grant) and the "method" school represented by James Dean and Al Pacino to recent performances by Denzel Washington and Alfre Woodard. Along the way we look at the portrayals in indie films and the special effects influence on blockbusters. By understanding historical context and the political possibilities of performance, students develop skills like close reading and learn to describe and make meaning out of the choices actors make. Students leave the class with a set of skills to help write about one of the most challenging and understudied aspects of cinema. HU

FILM 362a / FREN 384a / ITAL 384a / JDST 289a / LITR 338a, Representing the Holocaust Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

* **FILM 364b / CZEC 246b / RSEE 240b, Milos Forman and His Films** Karen von Kunes

An in-depth examination of selected films by Milos Forman and representatives of the New Wave, *cinéma vérité* in Czech filmmaking. Special attention to Forman's artistic and aesthetic development as a Hollywood director in such films as *Hair*, *One Flew over the Cuckoo's Nest*, *Ragtime*, and *Amadeus*. Screenings and discussion in English. HU

FILM 394a / ENGL 198a / LITR 409a / RSEE 350a / WGSS 394a, Internet Cultures, Histories, Networks, and Practices Marijeta Bozovic

Examination, through the lenses of histories, network studies, and cultural studies, of how human beings have seemingly overnight learned to use and depend on computer networks for various kinds of work, military operations, pursuits of scientific knowledge, religious proselytizing, political organization, searches for mates and social communities, illegal activities, and infinite varieties of play. 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 411b / LITR 380b, The Films of Alfred Hitchcock** Brigitte Peucker

An examination of Hitchcock's career as a filmmaker from *Blackmail* to *Frenzy*, with close attention to the wide variety of critical and theoretical approaches to his work.

Topics include the status of the image; the representation of the feminine and of the body; spectatorship; painterliness and theatricality; generic and psychoanalytic issues.

HU

*** FILM 416b / FREN 394b / LITR 366b, French Cinema through the New Wave**

Dudley Andrew

The history of French cinema c. 1930 to 1970, from the onset of sound through the New Wave movement. The New Wave 'idea of cinema'; the relation of cinema to national self-perception and state policy in France. HU RP

*** FILM 430b / AFAM 248b, Golden Age of Television** Nicholas Forster

Less than a century old, television is one of the youngest but most influential mediums to shape politics, pop culture, and American society. For years, scholars, critics, and fans looked back at the sitcoms and dramas made between 1947-1960 as representative of a "Golden Age of Television" that engaged with a changing society that followed the trauma of World War II. Decades later, in the early 2000s, premium cable shows like *The Sopranos*, *The Wire*, *Breaking Bad*, and *Oz* suggested that a new Golden Age of Television had arrived. This course pairs these two eras of television to ask: Are there similarities between these two eras of television? How do these stories, represented visually on television, relate to the world outside of the screen? How has the rise of streaming reconfigured our viewing habits and the ways that we understand the world? By looking at two eras of television we work to see what some of the major tropes or threads are, and understand how certain shows that are considered a part of either "Golden Age of Television" create meaning and interest in viewers. Programs include: *I Love Lucy*, *Roots*, *The Twilight Zone*, *The Wire*, *Deadwood*, and *How to Get Away with Murder*. HU

*** FILM 432a / FILM 431 / HUMS 348a / LITR 432a, World War II: Homefront Literature and Film** Katie Trumpener

Examination of quotidian, civilian World War II experiences in many parts of Europe. Modes of literary and filmic reflection occasioned by the war; civilian perspectives on the relationship between history and everyday life, during and after the war; children's experience of war; and ways homefront and occupation memories shaped postwar avant-gardes. 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 448a / EALL 271a, Japanese Cinema after 1960** Aaron Gerow

The development of Japanese cinema after the breakdown of the studio system, through the revival of the late 1990s, and to the present. No knowledge of Japanese required. HU TR

*** FILM 455a and FILM 456b / AMST 463a and AMST 464b / EVST 463a and EVST 464b, 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 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. Materials fee: \$150. 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** Staff

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** Staff

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)

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 109a, 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. May not be taken after FREN 151. Online preregistration required; see <http://french.yale.edu/academics/placement-and-registration> for details. L5 RP

*** 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

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. 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 270a / GMAN 214a / LITR 284a, Mad Poets of the Nineteenth and Twentieth Century Thomas Connolly

Nineteenth- and twentieth-century French (and some German) poetry explored through the lives and works of poets whose ways of behaving, creating, and perceiving the world might be described as insane. Authors include Hölderlin, Nerval, Baudelaire, Rimbaud, Verlaine, Mallarmé, Lautréamont, Apollinaire, Breton, Artaud, and Celan. Lectures in English; readings available both in original language and in English translation. WR, HU

*** FREN 319b, Montaigne Beyond Skepticism: Learning to Read the *Essais***

Dominique Brancher

Que sais-je? What do I know? This is Montaigne's motto, engraved on a medal in 1576 at the writer's request. At the crossroad of disciplines, this seminar explores how Michel de Montaigne develops a philosophy of doubt by literary means. We see that he does not naively or theoretically subscribe to the skeptical tradition, but rather proposes a practical and singular use of a non-judgmental attitude in the writing of *Les Essais*—the early modern masterpiece of the French literature of the self. We read essays on topics such as: idleness, education, eroticism, imagination. These texts are coupled with short, theoretical excerpts (Sextus Empiricus, Diogène Laërce, Henri Estienne). Readings and discussion in French. L5, HU

*** FREN 321b, Passions and Politics in the Theater of the Ancien Régime** Pierre Saint-Amand

This course consists in close readings of the major political tragedies of the classical period (17th–18th century), starting with Corneille who leads the genre and creates imitators. We consider how the language of passions intersects with the language of politics, the dialectics of hero and state. Study of the recurring major passions: love, jealousy, hate, and how they are dealt with, sometimes repaired. Readings in Pierre Corneille, Jean Racine, Voltaire, and Houdar de La Motte. L5, 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 384a / FILM 362a / ITAL 384a / JDST 289a / LITR 338a, Representing the Holocaust Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

*** FREN 394b / FILM 416b / LITR 366b, French Cinema through the New Wave** Dudley Andrew

The history of French cinema c. 1930 to 1970, from the onset of sound through the New Wave movement. The New Wave 'idea of cinema'; the relation of cinema to national self-perception and state policy in France. HU RP

*** FREN 412b / AFAM 287b / AFST 412b / AMST 465b / LITR 250b, Postcolonial Theory and Literature** Fadila Habchi

A survey of the principal modes of thought that have animated decolonization and life after colonialism, as seen in both theoretical and literary texts. Concentration on the British and French imperial and postcolonial contexts. Readings in negritude, orientalism, psychoanalysis, poststructuralism, and novels. Lectures in English; readings available both in French and in English translation. HU TR RP

*** 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.

Global Affairs (GLBL)

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 159b / ECON 159b, Game Theory Marina Halac

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 180b / EP&E 231b / PLSC 346b, Game Theory and International Relations

Alex Debs

Introduction to game theory and its applications in political science and economics, with a focus on international relations. Standard solution concepts in game theory; case studies from important episodes in the history of international relations, including World War II, the Cuban missile crisis, and the 2003 U.S.-led invasion of Iraq. Recommended preparation: introductory microeconomics. QR, SO

*** GLBL 195b / PLSC 341b, The Logic of Randomized Experiments in Political Science**

Alexander Coppock

Instruction in the design, execution, and analyzation 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

GLBL 201b / AMST 228b / HIST 128b, Origins of U.S. Global Power David

Engerman

This course examines the causes and the consequences of American global power in the "long 20th century," peeking back briefly into the 19th century as well as forward into the present one. The focus is on foreign relations, which includes but is not limited to foreign policy; indeed, America's global role was rooted as much in its economic and cultural power as it was in diplomacy and military strength. We study events like wars, crises, treaties, and summits—but also trade shows and movie openings. Our principal subjects include plenty of State Department officials, but also missionaries, business people, and journalists. We pay close attention also to conceptions of American power; how did observers in and beyond the United States understand the nature, origins, and operations of American power? HU

GLBL 203a / PLSC 186a, 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 207a / HIST 104a, The World Circa 2000 Daniel Magaziner and Samuel Moyn

The World Circa 2000 is a global history of the present since ~ 1960. The course moves thematically to consider topics including, decolonization and nation building in the global south, crises of nationalism and recurrent authoritarianism, the politics of aid, humanitarianism and neo-liberalism, technophilia, environmentalism and networked societies, climate change and 'free trade,' new religious fundamentalisms and imagined solidarities, celebrity, individuality, and consumerism in China, the United States, and beyond. HU

*** GBL 215a / LAST 386a / MGRK 237a / PLSC 375a / SOCY 389a, Populism** Paris

Aslanidis

Investigation of the nature of the populist phenomenon and its impact on politics, society, and the economy in various regions of the world. Conceptual and methodological analyses are supported by comparative assessments of various empirical instances, from populist politicians such as Hugo Chavez and Donald Trump, to populist social movements such as the Tea Party and Occupy Wall Street. SO

*** GBL 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 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 238b / ECON 408b, International Trade Policy** Giovanni Maggi

Analysis of issues concerning international trade policy and agreements, including recent academic research. Welfare analysis of trade policy; the political economy of trade policy; international trade agreements. Attention to both theoretical methods and empirical research. Prerequisites: intermediate microeconomics and ECON 184. SO

*** GLBL 244a / PLSC 445a, The Politics of Fascism** Staff

Study of the rise of fascism in Europe in the 1930s and its 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. SO

*** GLBL 250a / HIST 144Ja, Lessons of the Past** Michael Brenes

This course explores how American policymakers have used or misused history in making foreign policy decisions since World War I. In addition to the course readings on this topic, students examine the archives of American diplomats and policymakers behind those decisions. Students are introduced to the vast archival holdings of the Yale Library in diplomatic and international history, and are expected to use archival collections in their assignments. We discuss historical methods and the process of archival research alongside the history of 20th century American foreign policy. HU

*** GLBL 251b / EALL 256b / EAST 358b / HUMS 272b / LITR 265b, China in the World** Jing Tsu

Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China and Africa, Mandarinization, labor and migration, Chinese America, nationalism and humiliation, and art and counterfeit. Readings and discussion in English. HU

*** 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 259b / EP&E 302b / HIST 469Jb / PLSC 391b, 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 263b / PLSC 439b, Challenges of Young Democracies Ana De La O

Challenges faced by young democracies, such as organizing free and fair elections, controlling government corruption, building an accountable system of governance, sustaining development, and curtailing conflict and violence. Factors that lead to the consolidation of democratic politics or to stagnation and a return to nondemocratic political systems. SO

GLBL 268b / PLSC 111b / 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

*** 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 274a or b / PLSC 137a or b, 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 Nuno Monteiro

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 281b / HIST 221b, Military History of the West since 1500 Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

GLBL 282a / EVST 255a / F&ES 255a / PLSC 215a, 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 284b / PLSC 167b, Mass Atrocities in Global Politics** David Simon

Examination of the impact of global politics and institutions on the commission, execution, prevention, and aftermath of mass atrocities. 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 301a / EVST 305a / MMES 305a, Environmental Security in the Middle East** Kaveh Madani

This course overviews how environmental, water, food, energy, and climate change have increasingly become linked to human and national security in the Middle East. It begins by exploring the state of the environment in the region and how the policies of the Middle East governments have led to serious environmental degradation and subsequent loss of jobs, migration, social tension, violence, and regional conflicts. Drawing on an in-depth analysis of contemporary case/country studies, students learn how these problems can serve as major human and national security threats. This interdisciplinary course is of interest to students with background/interest in environmental science/engineering, ecology, geography, geosciences, social/political sciences, public policy, security and peace building, international relations, diplomacy, and global affairs. SO

*** GLBL 306a / AFST 306a, Social Enterprise in Developing Economies II** Bo Hopkins

Summer research developed into a case-study project on a topic related to the use of social enterprise in regional economic development. GLBL 305

*** 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 309a / EAST 310a / PLSC 357a, 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 318a / EAST 338a / ECON 338a, The Next China Staff

Economic development in China since the late 1970s. Emphasis on factors pushing China toward a transition from its modern export- and investment-led development model to a pro-consumption model. The possibility of a resulting identity crisis, underscored by China's need to embrace political reform and by the West's long-standing misperceptions of China. Prerequisite: introductory macroeconomics. SO

GLBL 322b / ECON 325b / EP&E 321b / PLSC 185b / SAST 281b, Economics of Developing Countries: Focus on South Asia Zachary Barnett-Howell

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. Prerequisites: introductory microeconomics and introductory econometrics. 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 332b / ECON 403b, Trade and Development** Guillermo Noguera

For some developing countries, international trade has brought about rapid growth and large-scale reductions in poverty. Meanwhile for other developing countries, international trade has simply increased inequality and brought little growth. This course draws on both theoretical models and empirical evidence to better understand the reasons for these very different experiences. Topics include: standard models of trade, trade and poverty in developing countries, the impact of trade on inequality and growth, the role of firms and multinationals in developing countries, trade policy, foreign direct investment, trade and technology transfer, the Chinese and Indian experience.

Prerequisites: Intermediate microeconomics and one econometrics/statistics course. SO

*** GLBL 336a / EP&E 243a / LAST 423a / PLSC 423a, Political Economy of Poverty Alleviation** Ana De La O

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. SO

*** GLBL 341b / PLSC 450b, The Geopolitics of Democracy** Staff

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 342b / HIST 482Jb / PLSC 321b, Studies in Grand Strategy I** Beverly Gage

The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. The spring term focuses on key moments in history that illustrate strategic thinking in action. During the summer, students undertake research projects or internships analyzing strategic problems or aspects of strategy. The following fall, students put their ideas into action 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. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. HU, 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 376a or b / GLBL 552a or b, Asia Now: Human Rights, Globalization, Cultural Conflicts** Jing Tsu

This course examines contemporary and global issues in Asia (east, southeast, northeast, south), in a historical and interdisciplinary context, that include international law, policy debates, cultural issues, security, military history, media, science and technology, and cyber warfare. Course is co-taught with a guest professor.

HU, 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 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 450a, Directed Research** Sigridur Benediktsdottir

Independent research under the direction of a faculty member on a special topic in global affairs not covered in other courses. Permission of the director of undergraduate studies and of the instructor directing the research is required.

GLBL 452b, The Crisis of Liberalism Samuel Moyn, Bryan Garsten, and Ross Douthat
Is there a “crisis of liberalism” occurring in the United States and around the world? What is liberalism? If it is in crisis, what are the features of the disorder and what are possible responses? Is it possible to believe in the further progress of liberal societies, or have they fallen into a decadent condition? This course meets twice a week and is lead by one of the instructors, followed by conversation among them. Undergraduates meet in a third session with one of the teaching assistants. SO

*** GLBL 499a, Senior Capstone Project** Staff

Students work in small task-force groups and complete a one-term public policy project under the guidance of a faculty member. Clients for the projects are drawn from government agencies, nongovernmental organizations and nonprofit groups, and private sector organizations in the United States and abroad. Projects and clients vary from year to year. Fulfills the capstone project requirement for the Global Affairs major.

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 102a / JDST 416a, Reading Yiddish** Joshua Price

This course is designed to build literacy in Yiddish, the vernacular of Ashkenazi Jewry. With focus on the accelerated treatment of Yiddish grammar, regularly supplemented with simple primary texts (poems, songs, folktales), and followed by close readings of (modern) Yiddish literature, students will be able to navigate most Yiddish texts with the aid of a dictionary. May not be taken concurrently with elementary or intermediate German.

*** GMAN 103b / JDST 418b, Reading Yiddish II** Joshua Price

Intermediate study of Yiddish literary language with annotated readings from classic authors including: Mendeleyev, Sholem Aleichem, Peretz, Bergelson, Der Nister, Bashevis, as well as American and Soviet Yiddish poetry. Secondary readings in English will offer a broader introduction to the modern Yiddish canon. Continuation of GMAN 102/ JDST 416. Previous knowledge of German or Hebrew-Aramaic recommended but not required.

*** GMAN 110a or b, Elementary German I** Staff

A beginning content- and task-based course that focuses on the acquisition of spoken and written communication skills, as well as on the development of cultural awareness and of foundations in grammar and vocabulary. Topics such as school, family life, and housing. Course materials include a variety of authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. To be followed by GMAN 120. Enrollment limited to 14 per section. 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 or b, Elementary German II Staff

Continuation of GMAN 110. A content- and task-based course that focuses on the acquisition of communicative competence in speaking and writing and on the development of strong cultural awareness. Topics such as multiculturalism, food, childhood, and travel; units on Switzerland and Austria. Course materials include a variety of authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. To be followed by GMAN 130. Enrollment limited to 14 per section. 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 125b, 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 or b, Intermediate German I Staff

Builds on and expands knowledge acquired in GMAN 120. A content- and task-based course that helps students improve their oral and written linguistic skills and their cultural awareness through a variety of materials related to German literature, culture, history, and politics. Course materials include authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. After GMAN 120 or according to placement examination. Followed by GMAN 140. Enrollment limited to 14 per section. 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 140a or b, Intermediate German II Staff

Builds on and expands knowledge acquired in GMAN 130. A content- and task-based course that helps students improve their oral and written linguistic skills and their cultural awareness through a variety of materials related to German literature, culture, history, and politics. Course materials include authentic readings, a feature film, and shorter video clips. Tutors are available for extra help. After GMAN 130 or according to placement examination. Normally followed by GMAN 150 or, with permission of the director of undergraduate studies, by GMAN 171. Enrollment limited to 14 per section. 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>. L4 1½ Course cr

*** GMAN 151a, Exploring Contemporary German Culture** Lieselotte Sippel

Advanced German course focusing on vocabulary expansion through reading practice; stylistic development in writing; and development of conversational German. Critical analysis of selected aspects of contemporary German culture, such as Green Germany, social movements from the 60s to today, the changing 'Sozialstaat,' and current events. Prerequisite: GMAN 140 or equivalent. L5

*** GMAN 164b / LING 164b, The History of the German Language** Theresa Schenker

Introduction to important historical and cultural developments in the German language through exemplary literary and cultural texts and objects. Students gain insight into early development of German language from Old High German to Middle High German and to Early New and New High German. Major literary works from each

epoch are examined from the perspective of their use of language. Students also explore cultural and historical contexts which led to linguistic changes. Prerequisite: successful completion of L4 German. L5, HU

*** GMAN 165a, The German Fairy Tale and its Legacy** Theresa Schenker

Once upon a time, long before Tolkien, Disney, or Rowling, two brothers named Grimm published a collection of fairy tales that went on to have an immense cultural impact throughout the world. German children grow up with these fairy tales and they play a huge part in German culture even today. The Grimm fairy tales are the textual point of departure for a multi-faceted, integrative exploration of this popular and influential genre through time. Students explore fairy tales by Wilhelm Hauff and Ludwig Bechstein, as well as traditional cultural theories of the German fairy tale, psychoanalytic and pedagogical interpretive approaches, and contextualization of this genre in cultural and social history. The focus is on the role that the literary fairy tale played in German culture throughout history and the impact German fairy tales still have today. Prerequisite: Successful completion of L4 German, or appropriate level on the German placement test. L5, HU

*** GMAN 167b, Green Germany, History and Culture of Sustainability** Marion Gehlker

Climate change and global warming, with their catastrophic effects on life on earth, such as accelerated ice-melting and extreme weather patterns, loss of biodiversity and habitat, safety and health risks, are the defining issues of our time. How did we get there? How will we get out? In this course, we explore Germany's history and culture of environmentalism and sustainability, which is often traced back to Saxon mining administrator Hans Carl von Carlowitz' demand in 1716 that only so much wood be cut as could be regrown. We discuss Germany's history and culture of environmentalism and sustainability from 1900 (Lebensreform, biodynamic agriculture, vegetarianism, Gartenstadt inspired settlements) to the present, with emphasis on 70s and 80s social (justice) movements (alternative life-styles, anti-nuclear protests, Green Party) to the present (Energiewende, renewables, coal and nuclear phase-out, food waste, factory farming & bioethics, consumerism & sustainable life-styles, slow growth/degrowth). Prerequisite: L5 class or equivalent, or permission of the instructor. L5, HU

*** GMAN 171a, Introduction to German Prose Narrative** Staff

Study of key authors and works of the German narrative tradition, with a focus on the development of advanced reading comprehension, writing, and speaking skills. Readings from short stories, novellas, and at least one novel. Writings by exemplary storytellers of the German tradition, such as Goethe, Kleist, Hebel, Hoffmann, Stifter, Keller, Kafka, Mann, Musil, Bachmann, and Bernhard. L5, HU

*** GMAN 172b, Introduction to German Theater** Staff

An advanced language course that addresses key authors and works of the German theatrical tradition. Refinement of skills in reading comprehension, writing, and speaking. Authors include Lessing, Goethe, Schiller, Kleist, Büchner, Hebbel, Wedekind, Brecht, and Müller. L5, HU

GMAN 208a / HIST 254a, Germany from Unification to Refugee Crisis Jennifer Allen

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 214a / FREN 270a / LITR 284a, Mad Poets of the Nineteenth and Twentieth Century Thomas Connolly

Nineteenth- and twentieth-century French (and some German) poetry explored through the lives and works of poets whose ways of behaving, creating, and perceiving the world might be described as insane. Authors include Hölderlin, Nerval, Baudelaire, Rimbaud, Verlaine, Mallarmé, Lautréamont, Apollinaire, Breton, Artaud, and Celan. Lectures in English; readings available both in original language and in English translation. WR, HU

* **GMAN 254a / JDST 335a / PHIL 274a / RLST 249a, Jewish Philosophy** Paul Franks
Introduction to Jewish philosophy, including classical rationalism of Maimonides, classical kabbalah, and Franz Rosenzweig's inheritance of both traditions. Critical examination of concepts arising in and from Jewish life and experience, in a way that illuminates universal problems of leading a meaningful human life in a multicultural and increasingly globalized world. No previous knowledge of Judaism is required. WR, HU

* **GMAN 313b, Game of Thrones and the Theory of Sovereignty** Kirk Wetters
Introduction to the classical and modern theory of sovereignty in the context of G.R.R. Martin's popular *Game of Thrones* series and, secondarily, the television series. Although *A Song of Ice and Fire* is not a work of German literature, it addresses theoretical and literary-historical discourses prominent in the German context. Emphasis on literary and theoretical analysis; literature as a testing ground for theory and theory as an analytical framework for evaluating literary and cultural depictions; questioning the basis of the contemporary relevance and popularity of Martin's fictional universe in light of questions of tragedy, individual agency, myth (vs. history, modernity), realism (vs. fantasy), environmental catastrophe and geopolitics. Students previously enrolled in GMAN 051 are not eligible to enroll in this course. WR, HU

* **GMAN 314b / PHIL 472b / PLSC 309b, Contemporary Critical Theory** Seyla Benhabib

Frankfurt School and Critical Theory focuses on a number of unresolved questions such as pragmatic Kantianism; modernity and post-colonial theory; the idea of progress; critiques of surveillance capitalism and neo-liberalism. Readings from Habermas, Honneth, Fraser, A. Allen, Jaeggi and others. Prerequisite: Directed Studies or two or more advanced courses in modern political philosophy. SO

* **GMAN 321b / PHIL 447b, Aesthetics of Existence, Life as a Work of Art?** Staff
A research seminar exploring issues at the intersection of ethics and aesthetics. We discuss the modern idea that in order to attain their highest vocation human beings need to form and transform their nature like a work of art. On this picture, we have to turn our sensible nature into a "second nature" that is expressive of supersensible ideas. After a brief look at the affinity of the virtuous and the beautiful in ancient thought, we discuss the emergence and articulation of the modern idea in Kant, Schiller, Goethe, Schelling, Hegel, and Nietzsche, before exploring how this thought has informed 20th century thought (Adorno, Foucault, Rancière, Agamben). In the last section of the seminar, we highlight the critical notion that the most recent phase of capitalism has exploited the idealist, romantic, and critical ideas of artistic creation and self-

creation and turned them into a new disciplinary mechanism (Boltanski/Chiapello). Participants should be familiar with issues in modern aesthetics and ethics. Priority is given to juniors and seniors, who are asked to write a brief e-mail to the instructor, detailing their interest in the course and their familiarity with its topics. HU

*** GMAN 326b / LITR 248b, Franz Kafka and Thomas Mann: Two Modernisms** Jan Hagens

Comparison of Kafka's radical modernism and Mann's neoclassical realism as fundamentally different modes of responding to the challenges of twentieth-century culture. Close reading of short stories by both writers, with attention to the authors' themes, literary techniques, and worldviews. Discussion in English; readings in German or English. HU

*** GMAN 341b / THST 378b, Performance and Theater** Katrin Truestedt

What does it mean to perform a role? What does it take to enter a public realm and to be recognized in a role? And how can one play with the expectations of performing a certain self? This course turns to the rich history of theatrical forms and theories of performance and performativity to gain new perspectives on these fundamental questions. Topics include the history of theater, drama, and play from Greek tragedy to Shakespeare, Brecht, and contemporary performances; conceptions of performance, performativity, theatricality, and antitheatricality; speech act theory; subjectivity and authority; performance in the context of race, class, and gender; and the re-entry of the body within the theatrical play. The course combines an introduction to major plays with a historical overview of theatrical forms and a theoretical exploration of performance studies. The course thus practices an instance of "literature in context" studies. While a history of theatrical forms is not the primary goal of the course, it serves as an introduction to that history through the lens of performance studies. HU

*** GMAN 345a / EP&E 360a / HUMS 341a / LITR 226a, Sound of the Police: The Idea of Order after the French Revolution** Paul North

A theoretical investigation into the idea and function of police in modern sovereign states, particularly after the French Revolution, when a 'people' meant to govern itself, represent itself, even restrain itself, in order to do this, needs something that has come to be called 'order.' How does government of the people, by the people, for the people divide itself into a segment that surveils and curtails and a segment that is surveilled and curtailed? Since the 18th century the institution of the police has taken on an unprecedented role in life in states, and can sometimes be the only direct tie between citizens and the state itself. And the first thing a citizen experiences is often the 'woop, woop' (to quote KRS-One, 'Sound of da Police') of the police coming. Following this sonic footprint, we read theories of the police in Hobbes, Schiller, Walter Benjamin, and Michel Foucault, and we listen for the police in cultural objects, such as films (*Invasion of the Body Snatchers*, *Dirty Harry*, *The Thin Blue Line*), television programs (*Law and Order*, *The Wire*), and music (*Sorrow, Tears, and Blood* by Fela Kuti, *Sound of da Police* by Teacha). For a glimpse of the possible music, see spotify playlist (<https://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrEhttps://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrE>). HU TR

*** GMAN 365b / HUMS 322b / LITR 460b, German Novels After 1945** Rudiger Campe

The course discusses exemplary novels in German language after 1945 from West and East Germany and Germany after Reunification, as well as from Austria and

Switzerland. Part I, 'Zero Hour - or Not,' on the political critique of Nazi Germany and the attempt at an aesthetic clean break (e.g., Gunther Grass, Ingeborg Bachmann, Max Frisch); Part II '1968: Revolution or New Interiority,' on social protest versus aesthetic internationalism (e.g., Peter Handke, Christa Wolf, Hubert Fichte, Thomas Bernhard); Part III, 'The Attempt at Being Contemporary,' on German and German speaking societies in the global world (e.g., Elfriede Jelinek, Yoko Tawada, Rainald Goetz). While 'contemporaneity' is the particular mark of the last section, all works desire to critically intervene in their historical moment. Giving an account of this desire is the goal of the course. Contextualization as needed; close reading of selected passages as the mode of work in the course; all works are provided in English translation and German. 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 378a / HUMS 345a / LITR 247a, German Fiction Around 1800** Kirk Wetters

The literary forms of novel, the novella, the short story and the fairy tale were fundamentally reconfigured in Germany around 1800. In the decades 1790-1820, narrative forms begin to take on the importance and enduring shape that will extend through the 19th century and beyond. Techniques such as frame narration (stories in stories), unreliable narrators, gothic and supernatural elements, the Bildungsroman, the novel of the artist, take shape in the context of a highly experimental literary culture. Works covered include Goethe, *Conversations of German Refugees* and Wilhelm Meister's *Journeyman Years*; Schiller, *The Ghost-Seer*; Tieck, *Blond Eckbert*; Novalis, *Heinrich of Ofterndingen*; E.T.A. Hoffmann, *The Sandmann* and *Kreisleriana*. Readings are available in German and English. HU

*** GMAN 379a / FILM 325a / LITR 374a, German Cinema 1918-1933** Jan Hagens

The years between 1918 and 1933 are the Golden Age of German film. In its development from Expressionism to Social Realism, this German cinema produced works of great variety, many of them in the international avantgarde. This introductory seminar gives an overview of the silent movies and sound films made during the Weimar Republic and situate them in their artistic, cultural, social, and political context between WWI and WWII, between the Kaiser's German Empire and the Nazis' Third Reich. Further objectives include: familiarizing students with basic categories of film studies and film analysis; showing how these films have shaped the history and the language of film; discussing topic-oriented and methodological issues such as: film genres (horror film, film noir, science fiction, street film, documentary film); set design, camera work, acting styles; narration in film; avantgarde cinema; the advent and use of sound in film; Realism versus Expressionism; film and popular mythology; melodrama; representation of women; modern urban life as spectacle; film and politics. Directors studied include: Grune, Lang, Lubitsch, Murnau, Pabst, Richter, Ruttman, Sagan, von Sternberg, Wiene, et al.

WR, HU

*** GMAN 409b, Structural Transformations of the Public Sphere** Kirk Wetters

An in-depth discussion of the idea, the structure and the recent radical transformations of the “critical public sphere,” considered a cornerstone of liberal-democratic society. We explore the modern emergence of the critical public sphere from the public forums of critique and literary-critical discourse, followed by the two waves of “structural transformations of the public sphere” (Habermas). (1) Transformation through mass media and consumer culture, and (2) the most recent transformations of the public sphere through social media. These transformations have been welcomed as a democratization of public life, but at the same time may endanger the emancipatory ideals of enlightenment and critique at the heart of the public sphere. The ambivalent character of the recent changes, the fragmentation, capitalization, and surveillance of public life as well as strategies of resistance are highlighted. HU

*** GMAN 478a or b, Directed Readings or Individual Research in Germanic Languages and Literatures** Staff

Individual study under faculty supervision. Applicants must submit a prospectus and bibliography approved by the faculty adviser to the director of undergraduate studies. 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.

*** GMAN 492a and GMAN 493b, The Senior Essay Tutorial** Paul North

Preparation of an original essay under the direction of a faculty adviser.

Ancient Greek (GREK)

GREK 110a, Beginning Greek: The Elements of Greek Grammar Raymond Lahiri

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** Staff

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 Emily Helm

Close reading of selections from classical Greek prose with review of grammar. Counts as L4 if taken after GREK 141 or equivalent. L3

GREK 403b, The History and Structure of Ancient Greek: From Word to Text

Egbert Bakker

An introduction to three essential aspects of Ancient Greek: (i) the structure of the word; (ii) the structure of sentences and clauses in the language; (iii) the structure of longer stretches of connected discourse. The first component (weeks 1-7) is a brief

introduction into Into-European comparative-historical linguistics and will focus on the phonology and morphology of Greek verbs and nouns; the third component (weeks 8-13) is a systematic analysis of Greek prose, with detailed attention to the properties through which texts 'cohere' (such as particles, deictics, and tenses); the second component is taught as part of each class meeting on the basis of translation-into-Greek ('composition') exercises. GREK 131 or equivalent. This course is open to all undergraduate students who are eligible to enroll in GREK 400-level courses. It is also required for graduate students in the Classical Philology track as per the current program. L5, HU

*** GREK 416b, Texts and Objects in Ancient Greece** Pauline LeVen

A vase at the Yale Art Gallery depicting Orestes clutching the altar of Apollo; a Hellenistic poem describing the details of a highly-wrought cup; an inscription on a stone referring to its "stony voice": all these snapshots have in common to set textual and material objects in dialogue—in dialogue with each other, or with a myth, or with a cultural practice. This advanced level seminar explores the many relationships between texts and objects in ancient Greek literature and culture—their overlaps, the challenges they pose to one another, their engagement with common issues, their unique ways of exploiting sensual, representational and intellectual resources. Students read, in ancient Greek, a selection of poetic and prose texts and look at ancient objects bearing direct witness on those questions, and discuss issues related to materiality and media, representation and interpretation, the art of *ekphrasis*, and the issue of *enargeia*. Prerequisite: Proficiency in ancient Greek, L4. L5, HU

GREK 420a, Sophocles' Antigone: Interpretation and Reception Egbert Bakker

A reading of Sophocles' *Antigone*. Students read the play and study its literary and cultural interpretation. We also study the rich reception history of Sophocles' classic. The readings comprise relevant other texts in Greek. Prerequisite: GREK 141 or equivalent. L5, HU

*** GREK 454a, Greek Myth, Fiction, and Science Fiction** Pauline LeVen

Relationships between ancient Greek myths, fiction, and speculative/science fiction, with attention to interpretive approaches and methodologies. Narrative modes of representing reality; distinguishing fiction from myth and science fiction; cultural uses of myth and fiction. Readings include works by Homer, Longus, Lucian, and Philostratus. L5

GREK 720a, Sophocles Egbert Bakker

GREK 754a, Greek Myth, Fiction, and Science Fiction Pauline LeVen

Relationships among ancient Greek myths, fiction, and speculative/science fiction, with attention to interpretive approaches and methodologies. Narrative modes of representing reality; distinguishing fiction from myth and science fiction; cultural uses of myth and fiction. Readings include works by Homer, Longus, Lucian, and Philostratus.

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, Intermediate Modern Hebrew I** Shiri Goren

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 137a, Intermediate Biblical Hebrew I** Staff

Review and continuation of grammatical study leading to a deeper comprehension of biblical Hebrew style. Focus on extended reading of biblical narrative, poetry, prophecy, and Wisdom texts. Prerequisite: HEBR 127 or equivalent. L3 RP

HEBR 140b, Intermediate Modern Hebrew II Orit Yeret

Continuation of HEBR 130. Review and continuation of grammatical study leading to a deeper comprehension of style and usage. Focus on selected readings and on writing, comprehension, and speaking skills. Prerequisite: HEBR 130 or equivalent. L4 RP 1½ Course cr

* **HEBR 147b, Intermediate Biblical Hebrew II** Staff

Continuation of HEBR 137. Prerequisite: HEBR 137 or equivalent. L4 RP

* **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 152b / JDST 401b, Reading Academic Texts in Modern Hebrew** Dina Roginsky

Reading of academic texts in modern Hebrew, for students with a strong background in Hebrew. Discussion of grammar and stylistics; special concentration on the development of accuracy and fluency. Prerequisite: HEBR 150 or permission of instructor. Conducted in Hebrew. L5 RP

* **HEBR 158b / JDST 305b / MMES 168b, Contemporary Israeli Society in Film** Shiri Goren

Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private and collective memory. Readings in Hebrew and English provide a sociohistorical background and bases for class discussion. HEBR 140 or permission of instructor. L5, HU RP

*** 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 169b / JDST 403b / LING 165b / MMES 162b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky

Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Hebrew and Arabic have been in cultural contact, especially in medieval Spain, the Middle East, and North Africa – as evidenced by the Judeo-Arabic languages. In modern Israel, Arabic is the native tongue of about 20% of its population, yet lack of communication exists today between Hebrew speakers and Arabic speakers for mainly political reasons. This L5 advanced Hebrew class explores cultural and linguistic contacts between the two languages and relationships between the communities, including both Jewish and non-Jewish Arabic speakers and Hebrew speakers. Additionally, students benefit from regular meetings with a parallel L5 Arabic class which discusses similar topics. The shared meetings enable Hebrew learners and Arabic learners to participate together in one class, to promote social interaction based on mutual respect and to focus on cultural and linguistic aspects of the material. L4 Hebrew or equivalent (placement test). L5 RP

Hungarian (HGRN)

History (HIST)

*** HIST 001a / AFAM 095a / AFAM 163 / AMST 001a, African American Freedom Movements in the Twentieth Century** Crystal Feimster

Introduction to the study and writing of history, focusing on how African Americans fought for civil rights throughout the twentieth century. The civil rights movement placed in its historical context; African American freedom struggles placed in the larger narrative of U.S. history. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

*** HIST 016a / AFAM 060a / AMST 060a, Significance of American Slavery** Edward Rugemer

This first-year seminar explores the significance of racial slavery in the history of the Americas during the eighteenth and nineteenth centuries. We read the work of historians and we explore archival approaches to the study of history. Taught in the Beinecke Library with the assistance of curators and librarians, each week is organized around an archival collection that sheds light on the history of slavery. The course also includes visits to the Department of Manuscripts and Archives in the Sterling Library, the British Art Center, and the Yale University Art Gallery. Each student writes a research paper grounded in archival research in one of the Yale Libraries. Topics include slavery and slaveholding, the transatlantic slave trade, resistance to slavery, the abolitionist movement, the coming of the American Civil War, the process of

emancipation, and post-emancipation experiences. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 017b, American Indians in Higher Education: Introduction to the Indigenous History of American Education** Ned Blackhawk

Education remains an essential element in Native American history, a complex arena full of conflict, resistance, adaptation, and social change. Charting the centuries-long relationships between Native Americans and Euro-American institutions of higher education, this seminar seeks to expose students to the educational history of Native North America. Through in-class assignments, discussion, and sets of experiential campus and off-campus tours, this class both introduces the educational history of Native North America and links it with the broader political history of federal Indian law and policy. 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 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 034a, Cuba from Slavery to Revolution** Anne Eller

Cuba's rich history from the early colonial period to the present. Topics include colonialism, slavery, independence, emancipation, the Cuban Revolution, and the nation's relationship with the United States. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HIST 040b, Comparative Women's History** Rebecca Tannenbaum

Comparative perspective on the lives of women and their experiences, the ways in which historical forces shaped gender roles in different cultures, and the similarities and differences in gender roles across different time periods and around the world. Topics include work, family roles, political participation, health and sexuality, religious roles, and global feminisms. Enrollment limited to first-year students. 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 061b, Information Revolutions: From the Origins of Writing to the Digital Age** Staff

This course explores the history of information and its organization from the origins of writing to the present day. The course focuses on technologies of knowledge and information sharing (or hoarding) as they are embedded in social and political contexts, with an emphasis on paradigm shifts and on losses and gains as new systems of information organization replace old ones. The thematic focus is on the Western tradition and on scholarly knowledge, though students may explore other traditions and parts of the world in their research projects. Class structure consists of discussion of theoretical and historical readings selected by experts followed by hands-on interaction with special collection materials and site visits. The course introduces students to the multiple collections, curators, and librarians at Yale and serves to deepen their understanding of the modern research library. 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 078b / HUMS 091b, Truth and Post-Truth** Marci Shore

This European intellectual history seminar explores the epistemological question in philosophy: does the world really exist? How do I know it's really there and not just a projection of my consciousness? Is there such a thing as truth? We begin with European philosophy, moving through Descartes, Kant and Husserl and through the role of ideology and lies in 20th century totalitarianism, then to dissident thought in Eastern Europe in the 1970s and 1980s, and finally to the emergence of 'post-truth' in the 20th century and its implications in both philosophy and life. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

HIST 103b, The World Circa 1800 Stuart Semmel

Global history studies cross-cultural interactions, connections, influences, and conflicts. Our subjects include: colonial expansion; war and resistance; slavery; migration and diaspora; the diffusion of ideas and technologies; and the transplanting of crops, livestock, and bacteria. Looking at the world around 1800 lets us consider the impact of European imperial expansion, the French revolution, religious movements, industrialization, and the "international" emergence of "nationalism." We consider and explore the very notions of "modernization" and "globalization." HU

*** HIST 103Ja / AFAM 202a, Life and Writings of Frederick Douglass** David Blight

The life, times, and works of Frederick Douglass, African American abolitionist and leader of the nineteenth century. Douglass's writings, including autobiographies, oratory, and editorials, and his role as a historical actor in the antislavery and early civil rights movements. Deep inquiry into the craft of biography. WR, HU

HIST 104a / GBL 207a, The World Circa 2000 Daniel Magaziner and Samuel Moyn
 The World Circa 2000 is a global history of the present since ~ 1960. The course moves thematically to consider topics including, decolonization and nation building in the global south, crises of nationalism and recurrent authoritarianism, the politics of aid, humanitarianism and neo-liberalism, technophilia, environmentalism and networked societies, climate change and 'free trade,' new religious fundamentalisms and imagined solidarities, celebrity, individuality, and consumerism in China, the United States, and beyond. HU

* **HIST 110Ja / HSHM 496a, Childbirth in America, 1650-2000** Rebecca Tannenbaum

This course considers the ways childbirth has been conducted in the United States over three centuries. Topics include the connections between childbirth and historical constructions of gender, race, and motherhood, as well as changes in the medical understanding and management of childbirth. WR, HU

HIST 111a, Introduction to American History, 1492 to 1865 Mark Peterson
 From the time that permanent contact between Europe and the Americas was established, North America experienced profound changes, in what was truly a world-historical transformation. This course introduces students to the scale and significance of these changes, and provides an intellectual framework for understanding why and how they happened that will be useful in making sense of our contemporary world. The emergence of the United States in the 1770s and its dissolution in Civil War in the 1860s are key events in this story, but the course takes a wider view of the experiences of the peoples of America, Africa, and Europe in shaping the new societies, economies, and politics that emerged in this critical era. HU

HIST 114b / HSHM 206b, History of Reproductive Health and Medicine in the U.S.
 Miriam Rich

This course surveys the history of reproductive health and medicine in the United States from the late eighteenth century to the present. The course emphasizes the cultural and historical contexts of reproductive health; the significance of reproduction within the broader social, cultural, and political history of the United States; and the entanglements of reproductive medicine with social and political categories of race, gender, disability, nation, and kinship. Topics include the management of reproduction in U.S. slavery and empire, reproductive medicine and concepts of race, practitioners and professional authority over childbearing and pregnancy, eugenics and sterilization, movements for reproductive rights and healthcare, reproductive biotechnology, and present-day disparities in access to and quality of reproductive care. HU

* **HIST 116Jb, A History of American Citizenship: Membership and Exclusion; Rights and Belonging in U.S. History** Brendan Shanahan

This course explores the contested history of American citizenship from the early republic to the age of Trump. It interrogates both the relative inclusion and/or exclusion of disparate immigrant populations into the American citizenry *and* campaigns to expand citizenship status and rights to long-marginalized native-born populations throughout the history of the republic. It especially probes the degree to which policies governing U.S. citizenship have been employed to incorporate access to rights for some while restricting access to others. WR, HU

*** HIST 118Ja, U.S. Immigration Policy: History Politics, and Activism, 1607–Present**
Brendan Shanahan

How can we study a history so broad, complex, and evolving as the history of American immigration policy? This course explores that question by studying U.S. immigration law, politics, and activism from the colonial era to the present day. Chronologically, we particularly examine: (1) antebellum immigration policy in the context of forced migration, settler colonialism, and slavery, (2) the rise of a federal “gatekeeping” immigration regime in the post-Civil War era, and (3) transformations in immigration policymaking and policies during the long twentieth century. Thematically, we emphasize how U.S. immigration policies have often been framed – and challenged by immigrant rights advocates – on the grounds of racialized and gendered exclusion and/or subordination. WR, HU

*** HIST 119Jb / AMST 453b, The United States Constitution of 1787** Staff

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 128b / AMST 228b / GLBL 201b, Origins of U.S. Global Power David Engerman

This course examines the causes and the consequences of American global power in the “long 20th century,” peeking back briefly into the 19th century as well as forward into the present one. The focus is on foreign relations, which includes but is not limited to foreign policy; indeed, America’s global role was rooted as much in its economic and cultural power as it was in diplomacy and military strength. We study events like wars, crises, treaties, and summits – but also trade shows and movie openings. Our principal subjects include plenty of State Department officials, but also missionaries, business people, and journalists. We pay close attention also to conceptions of American power; how did observers in and beyond the United States understand the nature, origins, and operations of American power? HU

*** HIST 128Jb / HSHM 475b, Race and Disease in American Medicine** Sakena Abedin

An exploration of the history of race and disease in American medicine from the late 19th century to the present, focusing on clinical practice and clinical research. We discuss cancer, psychiatric disease, sickle cell disease, and infectious diseases including tuberculosis and HIV. We examine the role of race in the construction of disease and the role of disease in generating and supporting racial hierarchies, with special attention to the role of visibility and the visual in these processes. We also consider the history of race and clinical research, and the implications of racialized disease construction for the production of medical knowledge. WR, HU

*** HIST 129Jb, America’s Wars: From Reconstruction to the Present** Michael Brenes

This course explores the history of American warfare since the late 19th century, focusing on the development of U.S. military strategy and policy since the end of the Civil War. We discuss how the United States waged war – why the United States got

into wars, and how the U.S. extricated itself (or tried to extricate itself) from war. The course also pays close attention to the relationship between war and state-building in the United States and abroad, as we cover topics such as the history of American occupations, the political economy of the American military, and the technology of modern warfare. By taking an expansive view of American military power, we therefore seek to understand how wartime, as well as “peacetime,” shaped the history of the United States throughout the twentieth century. WR, HU

*** HIST 131Jb / ER&M 392b, Urban History in the United States, 1870 to the Present**

Jennifer Klein

The history of work, leisure, consumption, and housing in American cities. Topics include immigration, formation and re-formation of ethnic communities, the segregation of cities along the lines of class and race, labor organizing, the impact of federal policy, the growth of suburbs, the War on Poverty and Reaganism, and post-Katrina New Orleans. WR, HU

*** HIST 132Jb / AFAM 422b, Plantation Societies in the Greater British Caribbean 1627-1761** Staff

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 133Ja, 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 135Jb, 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 136a / AFAM 125a / AMST 125a / EDST 130a, The Long Civil Rights Movement

Crystal Feimster

Political, social, and artistic aspects of the U.S. civil rights movement from the 1920s through the 1980s explored in the context of other organized efforts for social change. Focus on relations between the African American freedom movement and debates about gender, labor, sexuality, and foreign policy. Changing representations of social movements in twentieth-century American culture; the politics of historical analysis. 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 144Ja / GLBL 250a, Lessons of the Past** Michael Brenes

This course explores how American policymakers have used or misused history in making foreign policy decisions since World War I. In addition to the course readings on this topic, students examine the archives of American diplomats and policymakers behind those decisions. Students are introduced to the vast archival holdings of the Yale Library in diplomatic and international history, and are expected to use archival collections in their assignments. We discuss historical methods and the process of archival research alongside the history of 20th century American foreign policy. HU

HIST 146a / ER&M 214a / HLTH 280a / HSHM 212a, Historical Perspectives on Global Health Joanna Radin

In the 21st century “global health” is recognized as an influential framework for orienting action among a huge range of groups including public health workers, activists, philanthropists, economists, political leaders, and students. How did this come to pass? This survey class introduces you to the historical circumstances that have contributed to the contemporary landscape of global health. We travel through several centuries to examine how ideas about disease, colonialism, race, gender, science, diplomacy, security, economy, and humanitarianism have shaped and been shaped by attempts to negotiate problems of health that transcend geopolitical borders. HU

*** HIST 150Ja / HSHM 406a, 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 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 158Jb / AMST 398b / ER&M 308b, American Indian Law and Policy** Ned Blackhawk

Survey of the origins, history, and legacies of federal Indian law and policy during two hundred years of United States history. The evolution of U.S. constitutional law and political achievements of American Indian communities over the past four decades. WR, HU

*** HIST 162Jb / AFAM 297b, Urban Inequality after Civil Rights** Elizabeth Hinton

By examining the impact of social, political, and economic changes in the decades after the civil rights movement, this course addresses historical developments that functioned to increase segregation and income stratification in the United States as a whole, and in African American communities in particular. Topics include radical social movements and urban unrest, the rise of black mayors, the critical withdrawal of federal resources and public services in cities, and mass criminalization. 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 165b / AMST 199b, 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 167Ja / PLSC 209a / PLSC 839, 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 168Ja, 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 169b, Early National America Joanne Freeman

An introduction to America's first decades as a nation. Topics include the creation of a national politics, partisan conflict in the states and on a national level, the logistics of democratic politicking, and changes in American society and culture. HU

*** HIST 170Ja, Native Peoples and the Making of the Southwest** Naomi Sussman

This class traces Native communities across the region's Spanish, Mexican, and U.S. American regimes (between the 15th century and the present). We foreground Indigenous peoples' distinct geopolitical agendas and explore their innovative, hard-won persistence. Likewise, we interrogate the strategies – displacement, forced labor, genocide, assimilation – that colonial governments have used to dominate native peoples. Finally, we consider the function of the U.S.-Mexico border, and of ideas of “citizenship” on both sides of the border, since 1848. WR, HU

*** HIST 171Jb, The Left After 1968: Social Movements and Progressive Politics in a Transnational Perspective** Staff

In this reading-intensive and discussion-focused seminar, students examine the myriad afterlives of 1968 with a focus on grassroots activism and the changing vernaculars of radicalism in the last three decades of the twentieth century. Conventionally, historians have marked 1968 as the apex of leftist mobilization, often characterizing the decades after as ones of decline. Without denying the strengthening of conservative dispensations during this period, students consider how the Left lived on through well-organized and powerful movements that challenged structural inequalities through demands for black power, women's liberation, anti-colonial non-alignment, environmentalism, LGBT, indigenous, and human rights. WR, HU

*** HIST 174Ja / AMST 451a / RLST 260a, Religion, War, and the Meaning of America**

Harry Stout

The relationship between religion and war in American history from colonial beginnings through Vietnam. The religious meanings of Americans at war; the mutually reinforcing influences of nationalism and religion; war as the norm of American national life; the concept of civil religion; biblical and messianic contexts of key U.S. conflicts. HU

*** HIST 175Ja / AFAM 306a, Movements for Black Freedom in the Nineteenth-Century Americas** Bianca Dang

This seminar examines Black freedom in the Americas both as a lived experience and as an idea that moved throughout the region during the long nineteenth century. This course explores the hemispheric impacts and reverberations of multiple, yet connected, movements for Black freedom in the nineteenth-century Americas. It begins with the Haitian Revolution, a revolution enacted and won by enslaved African and Afro-descended people that fundamentally transformed the hemisphere. It concludes with Black people's resistance to Jim Crow policies in the post-American Civil War era, emphasizing the enduring strength of Black freedom movements. Organized in a series of themes, such as the Law, the Environment, and Indigeneity and Blackness, this seminar highlights the transnational dimensions of movements for Black freedom in the nineteenth century. At the same time, it traces the distinctiveness of each of these movements to provide a broad, yet nuanced, account of the hemispheric and global dynamics of slavery, freedom, race, and gender from the Age of Revolutions to the turn of the twentieth century. WR, HU

*** HIST 176Jb / HSHM 465b / WGSS 457b, Reproductive Health, Gender & Power in the U.S.** Ziv Eisenberg

This seminar examines women's and men's reproductive health in the United States from the 19th century to the present. How have gender norms and social power structures shaped medical knowledge, scientific investigation, political regulation, and private reproductive experiences? What do the lessons of the history of reproductive health tell us about contemporary policy, legal and economic debates? Topics include abortion, activism, childbirth, contraceptives, eugenics, feminism, fertility, medicalization, pregnancy, reproductive science and technology, sexual health, social justice, and sterilization. WR, HU

*** HIST 179Ja / HSHM 415a, Historical Perspectives on Science and Religion** Ivano Dal Prete

The engagement between science and religion from a historical standpoint and a multicultural perspective. The Islamic, Jewish, Buddhist, and Christian traditions; the roots of modern creationism; salvation expectations and the rise of modern science and technology. WR, HU

HIST 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 184a / AFAM 160a / AFST 184a / AMST 160a, The Rise and Fall of Atlantic Slavery Edward Rugemer

The history of peoples of African descent throughout the Americas, from the first African American societies of the sixteenth century through the century-long process of emancipation. HU

HIST 187b / AFAM 162b / AMST 162b, African American History from Emancipation to the Present Staff

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 194Jb / HSHM 424b, Citizenship, Race, and Public Health in U.S. History** Miriam Rich

This seminar examines the history of citizenship, race, and public health in the modern United States. The course explores how public health practices structured shifting boundaries of social and political inclusion, focusing particularly on the late nineteenth and early twentieth centuries. How did public health interventions serve to affirm, regulate, or deny the citizenship of different groups? How have public health issues both shaped and been shaped by systems of racial inequality? Topics include the history of public health and immigration, surveillance and regulation of racialized and gendered subjects, eugenics and racial hygiene, health activism and reform, and ethics of public health powers. WR, HU

*** HIST 195Ja / HSHM 436a, Health and Incarceration in U.S. History** Miriam Rich

This course examines the U.S. history of incarceration through the lens of health and medicine, covering the late eighteenth century to the present. Across this period, incarcerated populations have been subject to extensive health risks and harms; since 1976, they also comprise the only group in the U.S. with a recognized constitutional right to health care. In this seminar, we explore how medical practices and institutions have been involved in establishing, structuring, and challenging historical systems of incarceration. In the modern United States, incarceration has played a major role in the formation of racial disparities, the regulation and surveillance of marginalized communities, and the delineation of the state's relationship to its subjects. Within this history, health and medicine have been central to debates over the harms of the prison system, the extent of institutional authority over vulnerable bodies, and the state's obligations to provide care. WR, HU

*** HIST 196Jb / AMST 353b, 21st-Century US History: The First Decade** Joanne Meyerowitz

Students conduct collaborative primary source research on the first ten years of the 21st century. Topics include September 11th, the wars in Iraq and Afghanistan, Hurricane Katrina, the financial crisis of 2008, the election of Barack Obama, and battles over domestic surveillance, immigration, policing, gun control, same-sex marriage, and reproductive rights. 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 201b / CLCV 258b / EVST 257b, Ecocultures of Antiquity: Ecocritical Approaches to Ancient Greece and Rome** Kirk Freudenburg

This class examines how the Greeks and Romans exploited their natural surroundings not only as physical resources, but as resources for human thought. The focus is on how ancient thinkers, living lives that were largely city-bound and detached from nature, structured their thoughts about the lives they lived (and about human existence more generally) by reference to their nonhuman surroundings: creatures, plants and places, some of which existed in the real world (in places far off, largely unknown and elsewhere; in places penetrated, explored, and/or told of), others of which existed entirely in the imagination, whether as inherited lore, or as places and creatures invented *ad hoc* by individuals and groups to get certain kinds of cultural work done. We look not only at the how and what, but at the why of nature's encoding via culture, and vice versa (their symbiosis), paying special attention to ancient Rome (though with a short first glance at Homer, Hesiod and Aristotle). We begin by scrutinizing the categories themselves, attempting to find historically appropriate ways to connect modern ecocritical concerns and ways of thought to the ancient world. Topics include: the cosmos, the heavens, and the first humans (and first peoples in their places); humans in their 'kinds' and animals, wild and tame; mountains, rivers, the sea and the undersea; human and animal foods, farming and food ways; wine and fermentation; groves, forests and trees; gardens, flowers, vegetables and fungi; birds, fish, weasels and snakes; earthquakes, floods and natural disasters; pollution, dirt and the city of Rome; the ecocultural lives of others. 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 212a / CLCV 308a / HIST 308, The Ancient Economy Joseph Manning

A survey of the economies of the ancient Mediterranean world, with emphasis on economic institutions, the development of the economies over time, ancient economic thought, and the interrelationships between institutions and economic growth. Material evidence for studying the economies of the ancient world, including coinage, documentary material, and archaeology. HU

*** 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 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 220Ja, 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 221b / GLBL 281b, Military History of the West since 1500 Paul Kennedy

A study of the military history of the West since 1500, with emphasis on the relationship between armies and navies on the one hand, and technology, economics, geography, and the rise of the modern nation-state on the other. The coming of airpower in its varied manifestations. Also meets requirements for the Air Force and Naval ROTC programs. HU

*** HIST 225Ja, Perfect Worlds? Utopia and Dystopia in Western Cultures** Staff

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, 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

HIST 231b / HUMS 277b, What was Enlightenment? Isaac Nakhimovsky

A survey of eighteenth-century European intellectual life, considered in its social and cultural contexts and with attention to its historical legacies, focusing on responses to emerging global networks of trade, finance, and empire. HU

*** HIST 231Jb, 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 232a, Hitler, Stalin, and Us Timothy Snyder

This course presents the study of the Stalinist and Nazi regimes, reviews the mass atrocities of the mid-twentieth century, and considers the legacies of these regimes in contemporary memory and politics. HU

*** HIST 232Jb / HUMS 443b / JDST 270b / MMES 342b / RLST 201b, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

HIST 236b / HSHM 226b, 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, and natural history. HU

HIST 237b / RSEE 390b / RUSS 241b, Russian Culture: The Modern Age Sergei Antonov

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. Readings and discussion in English. HU

*** HIST 238Jb / ITAL 322b / LITR 212b, USA: Travelers, Immigrants, Exiles from Italy (1920-2001)** Giuseppe Mazzotta

The course focuses on the experiences of Italian travelers to North America. Its goal is to promote a critical historical consciousness of the social, political, and cultural reality of the Italian presence in the United States from the end of the First World War to the beginning of the twenty-first century. Students engage with a variety of media: from letters and diaries to memoirs and unpublished documents, from novels and poems to music and films. Through close readings and literary analyses, this class considers the historical and cultural context of each source, eliciting reflections in at least three

key areas: national identity, transcultural encounters, and the relevance of the arts for travelers, migrants and exiles. HU

*** HIST 239Ja, Plague in Early Modern Europe**

This course studies the appearance and regular reappearance of plague from the fourteenth to the eighteenth century in Europe. Beyond a basic understanding of the debates over plague's epidemiology and transmission, we develop a multidisciplinary interpretation of the religious, medical, political, and cultural responses to and effects of the plague using a variety of different primary sources. Our concerns are two-fold: to understand daily life in times of plague; and to study plague as an agent of change and its contributions to the making of the modern world. WR, HU

*** HIST 240Ja / RSEE 241a, Government, Law, and Society in Modern Russia, 1853-1953** Sergei Antonov

Russian political culture from the Crimean War to the death of Stalin. Special attention to continuities, as well as changes, across the revolutionary divide of 1917, and to comparing official policies with daily experiences of ordinary Russians. Changing ideologies and ruling styles of tsars and early Soviet leaders (esp. Lenin, Trotsky, and Stalin) and relations with aristocratic and bureaucratic elites; political dissent and protest, including popular and state-imposed violence; the problem of legality and the rule of law. All discussions and readings in English. WR, HU

*** HIST 241Ja, Developing the First Modern Global Corporation: The Jesuits in Europe's Empires, 1540-1750** Thomas Santa Maria

This course tracks the making of the world's first truly global enterprise: Christian missions as a process of cultural encounter. Throughout the course we emphasize the religious motivations of zealous missionaries with careful attention to the experiences of those they sought to convert. Topics discussed include: the foundations of the global world, colonialism, empire, race, religious plurality, gender, travel, international finance, conflict, and more. 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 243a, State and Society in Early Modern France, 1515-1715

This lecture course surveys the social, cultural, and political transformations of France in the sixteenth and seventeenth centuries. Early Modern France has frequently been characterized as an "immobile" society, especially viewed from the perspective of the peasantry, its dominant social grouping. HU

*** HIST 243Ja, The Jewish Metropolis: Warsaw before the Holocaust** Karolina Kolpak

Between the two world wars, Poland was the home of the largest Jewish community in Europe. Its capital city, Warsaw, was one of the biggest and most important hubs of Jewish life#the largest Jewish metropolis in Poland and all of Europe, second largest in the world (after New York City). This course explores this complex story, placing Warsaw, its citizens, ideas and institutions at the center. It begins with the end

of the First World War and the establishment of the state of Poland and ends with the Warsaw Ghetto Uprising in 1943 when the Jewish metropolis ceased to exist. It treats Polish Jews as agents not only within their own very diverse community but also outside it, as active citizens of a minority within a multiethnic state. At the same time, it strives to illustrate the various attitudes of the Poles towards the Jews and their proposed solutions to the “Jewish Question” in the Second Polish Republic. The questions of the challenges and possibilities of building a democracy in a multiethnic state; of respect for minority rights and their active protection by the state (or lack thereof); of the rise of radical right-wing ideologies (when, how, why) and the tension between them and modernism; of the significance of human relationships and cooperation across ethnic, religious, etc. lines, are asked throughout this course. WR, HU

HIST 244a / HSHM 321a, Cultures of Western Medicine John Warner

A survey of Western medicine and its global encounters, encompassing medical theory, practice, institutions, and healers from antiquity to the present. Changing concepts of health, disease, and the body in Europe and America explored in their social, cultural, economic, scientific, technological, and ethical contexts. HU

*** HIST 245Ja or b / GLBL 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 253Jb / LAST 253b, Dissidence and Control in Early Modern Spain and its Empire** Staff

Aspects of Spanish culture and society in the Golden Age (c. 1550–1650) that demonstrate discontent, dissidence, and suggestions for reform. Emphasis on the intersection of historical and literary sources and the dynamic between popular and elite cultures. WR, HU

HIST 254a / GMAN 208a, Germany from Unification to Refugee Crisis Jennifer Allen

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 260Ja / HSHM 468a, 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 269Ja, 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 275a, Revolutionary France, 1789–1871 John Merriman

Dimensions of political, social, and economic change in France during its most turbulent period. The causes and impact of the revolutions of 1789, 1830, 1848, and 1871; demographic change and large-scale industrialization; shifting political elites, republican and socialist alternatives to monarchy, and urbanization. HU

HIST 276b, France since 1871 John Merriman

The emergence of modern France since the Paris Commune of 1871 and the beginnings of the Third Republic. The social, economic, political, and cultural transformation of France; the impact of France's revolutionary heritage, of industrialization, and of the dislocation wrought by two world wars and decolonialization; and the political response of the Left and the Right to changing French society, including the impact of immigration and the emergence and challenges of the European Union. HU

*** HIST 277Jb, 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 289Jb / HSAR 399b / HSHM 407b / HUMS 220b, 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 292Jb / HIST 286J / HUMS 279b / PLSC 286b, Democracy and the French Revolution** Isaac Nakhimovsky

The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical

change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

*** HIST 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 300b / CLCV 204b, Alexander the Great and the Hellenistic World Joseph Manning

The history and culture of the ancient world between the rise of Macedonian imperialism in the fourth century B.C.E. and the annexation of Egypt by Augustus in 30 B.C.E. Particular attention to Alexander, one of the most important figures in world history, and to the definition of 'Hellenism.' HU

HIST 303a, Japan's Modern Revolution Daniel Botsman

A survey of Japan's transformation over the course of the nineteenth century from an isolated, traditional society on the edge of northeast Asia to a modern imperial power. Aspects of political, social, and cultural history. 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 304Jb, Japanese Historical Documents** Daniel Botsman

Few pre-industrial societies anywhere in the world have bequeathed us a body of historical documents as varied and plentiful as those Tokugawa Japan (1600-1867). This class offers students who already have a solid command of modern Japanese an introduction to these remarkable sources, focusing particularly on what they can teach us about life in the great cities of Edo (now Tokyo), Osaka, and Kyoto—three of the largest urban centers anywhere in the pre-industrial world. Prerequisite: JAPN 140 or equivalent.

*** 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 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 314Jb / SAST 226b, The Environmental History of South and Southeast Asia**
Sunil Amrith

This is a research and writing seminar on the environmental history of South and Southeast Asia. We examine a range of approaches to studying the major environmental transformations in a region that is home to a significant part of the world’s population. Students write a substantial primary source-based research paper by the end of the course. 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 323Ja / AMST 317a / ER&M 353a, Race, Radicalism, and Migration in Latinx History** Stephen Pitti

Histories of Mexican American, Puerto Rican, Central American, Dominican, and Cuban American communities in the United States, with a focus on transnational and labor politics, cultural expression, print culture, and social movements. Readings and films locate Latinx experiences alongside African American and Asian American histories, and within broader patterns of U.S. and Latin American history. HU

*** HIST 334Jb / ER&M 364b / LAST 334b, Ethnicity, Nationalism, and the Politics of Knowledge in Latin America** Marcela Echeverri Munoz

Examination of ethnicity and nationalism in Latin America through the political lens of social knowledge. Comparative analysis of the evolution of symbolic, economic, and political perspectives on indigenous peoples, peasants, and people of African descent from the nineteenth century to the present. Consideration of the links between making ethnic categories in the social sciences and in literature and the rise of political mechanisms of participation and representation that have characterized the emergence of cultural politics. WR, HU RP

HIST 335b / AFST 335b / ER&M 325b, A History of South Africa Daniel Magaziner

An introduction to the history of southern Africa, especially South Africa. Indigenous communities; early colonial contact; the legacies of colonial rule; postcolonial mismanagement; the vagaries of the environment; the mineral revolution; segregationist regimes; persistent inequality and crime since the end of apartheid; the specter of AIDS; postcolonial challenges in Zimbabwe, Angola, and Mozambique. HU

HIST 337b / SAST 330, The Indian Ocean World Sunil Amrith

This lecture course provides a survey of the Indian Ocean’s history, from medieval to contemporary times. By foregrounding oceanic connections, the class links the histories of South Asia, Southeast Asia, the Middle East, and East Africa. Long

before the Atlantic, the Indian Ocean was “global” — it was a crossroads of trade and commerce, following the monsoon winds. We study the centuries-long movement of material culture, of cultural and religious ideas across the ocean’s arc of port cities. We examine how the Indian Ocean became a crucible of competition between empires, as Europeans hungered for its spices and fabled riches, and eventually established dominion. We examine the vast migration of people across the Indian Ocean that followed — indentured, indebted, and free migrants whose labor shaped the modern world. The legacies of that movement that can be seen to this day, in the multicultural but divided societies around the ocean’s rim. In the first half of the twentieth century, the Indian Ocean became a hotbed of political activism; anticolonial movements learned from each other and diasporas became a conduit for new political ideas about nation, race, and equality. Today the Indian Ocean is at the forefront of strategic competition between India and China; perhaps even more significantly, it stands at the front line of climate change and its growing impact. In the last part of the course, we seek to understand how both of these features of the contemporary Indian Ocean world are shaped by a deeper history. Throughout the course, we emphasize how the Indian Ocean world provides a distinctive vantage point from which to understand key processes in global history — slavery and unfree labor, the rise and fall of empires, the formation of diasporas, and massive environmental transformation. HU

HIST 338a / ER&M 228a, Pirates, Rebels, and Revolutionaries: Caribbean History from 1400–Present Anne Eller

This course examines the entangled, interconnected, and global histories of the greater Caribbean, from moments before European contact through the present day. Topics include the indigenous societies, European colonialism, plantation slavery and emancipation, anti-colonial struggles, revolution, and dictatorships. WR, HU

HIST 342a / RLST 180a / SAST 280a, Mughal India, 1500–1800 Supriya Gandhi
Exploration of religion and the state in Mughal India, focusing on the period between 1500–1800. Topics include sacred sovereignty, orthodoxy, Sufism, vernacular literary and religious cultures, and the early colonial encounter. 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 345b / JDST 265b / MMES 148b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as

a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU

*** HIST 345Jb / ER&M 359b, Gender and the State in Latin America and the Caribbean** Anne Eller

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 346a / MMES 144a, Making of Modern Iran Abbas Amanat

This course examines political, social and cultural history of Iran from the turn of the 19th century to the present with greater emphasis on the latter part of the 20th century aiming to explain how secular Iran became an Islamic Republic and why is it matter in today's world. Beginning with an overview, it covers encounter with European empires (Russia and Britain), Shi'ism and clerical establishment, reform trends and search for democracy, discovery of oil and Iran in the Cold War and troubled relations with the United States, in the Persian Gulf and clash with Arab nationalism; the Islamic Revolution of 1979 and its global impact, repression and human rights, women, gender and minorities under the Islamic Republic; the 2009 Green Movement, the "Nuclear Deal" and Iran as a regional and global power. HU

HIST 350b / AKKD 350b, Culture and Politics in Lusophone Africa, 1885-1992

Benedito Machava

The peculiar nature of Portugal as a colonial power produced a very distinct history in the five Portuguese-speaking African countries, namely Angola, Guiné-Bissau (Guinea-Bissau), Moçambique (Mozambique), and the Atlantic islands of Cabo-Verde (Cape Verde) and São Tomé e Príncipe. Lusophone Africa is a loose term that refers to the world created by Portugal's colonialism in Africa. This course explores this distinct history through the lens of culture and politics. Focusing on the long twentieth-century, we consider Lusophone Africa as a study unit, dissecting its disparate societies, cultures, and political trajectories, while remaining anchored in the general context of Africa. Military conquest, colonial rule, race/lusotropicalism, nationalism, and liberation struggle are some of the core themes of the course. We begin with a brief assessment of Portugal's efforts to retain its colonial enclaves amid the voracious expansion of British, French, Belgian, and German presence in Africa in the late 19th century. But our focus is on the twentieth-century, from the establishment of the colonial administration in the early 1900s to the fall of the Portuguese empire in 1974. We dedicate a good portion

of the term to exploring the multiple ways (cultural and political) in which Africans responded to Portugal's encroachment and how they navigated the color bar that came to dictate their social mobility under colonial rule. We end with the multifaceted longings for self-determination that led to the longest and bloodiest liberation wars in Africa. Our readings include scholarly essays (old and recent), primary sources, literary works (novels, poetry and short stories), photographs, music and films. We become acquainted with Portuguese-speaking African voices, faces, and places. Luís Bernardo Honwana's collection of short stories in *We Killed Mangy Dog and Other Stories* (1964) and Zezé Gamboa's film *The Great Kilapy* (2012) carry us through the important theme of race and race relations. While cautious in situating the discussion of race in its historical context, these and other materials challenge us to think about race relations and emancipation in our time. HU

HIST 353a or b, 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 361a / LAST 361a, History of Brazil Stuart Schwartz

Brazilian history from European contact to the reestablishment of civilian government in the 1990s. Focus on the multiethnic nature of Brazilian society, the formation of social and political patterns, and the relationship of people to the environment. HU

*** HIST 363Ja / ER&M 433a / SAST 334a, Mobile South Asians and the Global Legal Order** Rohit De

South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over migration, multiculturalism, Islamic law, civil liberties, labor law, and international law. WR, HU

*** HIST 366Ja / AFST 368a / EVST 369a, Commodities of Colonialism in Africa**
Robert Harms

This course examines historical case studies of several significant global commodities produced in Africa to explore interactions between world market forces and African resources and societies. Through the lens of four specific commodities—ivory, rubber,

cotton, and diamonds—this course evaluates diverse industries and their historical trajectories in sub-Saharan Africa within a global context from ~1870-1990s. Students become acquainted with the historical method by developing their own research paper on a commodity using both primary and secondary sources. WR, HU

*** HIST 371Jb, The Inquisitions of Early Modern Spain, Portugal, and Latin America**
Stuart Schwartz

Inquisitions in Spain, Portugal, and their American colonies from the fifteenth to the nineteenth centuries. Attempts to impose orthodoxy through persecution of religious minorities, heresies, and sexual deviance, and through constraints on intellectual inquiry. The ability of state and church to establish control, and the resistance of individuals and groups to that control. Methodological problems inherent in the use of judicial sources, primary documents, and modern studies for historical analysis. WR, HU

*** HIST 374Ja / AFST 486a / HSHM 486a, 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 382Ja, Vietnamese History from Earliest Times to 1920** Ben Kiernan

Evolution of a Vietnamese national identity, from Chinese colonization to medieval statehood, to French conquest and capitalist development. The roles of Confucianism, Buddhism, gender, and ethnicity in the Southeast Asian context. WR, HU

*** HIST 393Jb / 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

*** HIST 396Jb / AFST 396b, Revolutions and Socialist Experiments in Africa**

Benedito Machava

This seminar explores the contours of Africa's embrace and engagement with the most influential ideology of the twentieth-century. Why, and through which channels, were Africans attracted to socialism? Did particular forms of colonialism and decolonization push African political actors towards revolution and socialist experiments? Is it legitimate, as some scholars have suggested, to speak of genuinely African socialisms? If so, what was the nature of these socialisms and how did they differ from the versions of socialism around the world? What political, social, economic, and cultural ends did socialism serve in Africa? And what were the consequences and legacies of African socialist experiments? The seminar addresses these questions. Our goal is to place Africa in the mainstream of conversations about socialism. We begin with the assumption that, like any doctrine, socialism was the object of multiple interpretations, modification, and appropriation from its inception. In so doing, we challenge orthodox understandings of socialism, which hold the European versions as the pure models and the rest as diluted if not populist façades of the 'true' doctrine. We begin with theoretical readings that help us situate the major debates about socialism in general and socialism in Africa. We then proceed to examine the overall historical context in which African nationalists adopted socialism. We differentiate the first branch of "African Socialism" from the second wave of "Afro-Marxism." We also pay close attention to issues of decolonization and political imagination; ideas and experiments of development; gender, morality, and social engineering. WR, HU

*** HIST 408Ja, 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 415Ja / AMST 318a, The Problem of Global Poverty** Joanne Meyerowitz

Study of the programs and policies that aimed to end global poverty from 1960 to the present, from modernization to microcredit to universal basic income. Topics include the green revolution, population control, the 'women in development' movement, and the New International Economic Order. Extensive work with primary sources. May count toward geographical distributional credit within the History major for any region studied, upon application to the director of undergraduate studies. 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 417a / AFST 220a / HSHM 220a, Histories of Confinement: From Atlantic Slavery to Social Distancing Nana Osei Quarshie

This course looks closely at the history of asylums, hospitals, prisons, and schools. It seeks to understand their workings and the interplay between bureaucratic forms, spatial and material organization, and modes of discipline, control, and remediation. It asks, how is institutional power organized, displayed, deployed, and disputed, and what are the limits and contradictions inherent in these efforts? Our readings draw from a range of contexts and disciplines to consider the relationship between the built environment and institutional life. HU

*** HIST 423Ja / EDST 312a / HUMS 221a / PLSC 310a, Idolizing Education**

Mordechai Levy-Eichel

This course is an iconoclastic introduction to the study of education. Besides examining the purposes and practice of education and learning across a wide variety of times and places, the course examines the study of education today in order to see what can be gained from a skeptical approach to the subject. Particular emphasis is placed on the origins and development of the research university. SO

*** HIST 433Jb, World Population History** Fabian Drixler

The history of fertility, mortality, and population growth, with an emphasis on how understandings of the demographic past inform present-day policy and expectations of the future. The scope is global, with special attention to East Asia and Europe in the early modern period. Topics include the sources and methods of historical demography; paleodemography; premodern population control; the European fertility decline; the 20th-century population explosion; the emergence of very low fertility; and debates about population policies. HU, SO

*** 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 459Jb / EVST 228b / HUMS 228b / LITR 345b, 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 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 469Jb / EP&E 302b / GBL 259b / PLSC 391b, 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 482Jb / GBL 342b / PLSC 321b, Studies in Grand Strategy I** Beverly Gage

The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. The spring term focuses on key moments in history that illustrate strategic thinking in action. During the summer, students undertake research projects or internships analyzing strategic problems or aspects of strategy. The following fall, students put their ideas into action 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. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. HU, SO

*** HIST 483Ja / GBL 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 494a or b, Individual Writing Tutorial** Staff

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.

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 140b / SOCY 126b, **Health of the Public** Nicholas Christakis

Introduction to the field of public health. The social causes and contexts of illness, death, longevity, and health care in the United States today. How social scientists, biologists, epidemiologists, public health experts, and doctors use theory to understand issues and make causal inferences based on observational or experimental data. Biosocial science and techniques of big data as applied to health. so

* 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** Stephen Stearns

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 280a / ER&M 214a / HIST 146a / HSHM 212a, Historical Perspectives on Global Health Joanna Radin

In the 21st century "global health" is recognized as an influential framework for orienting action among a huge range of groups including public health workers, activists, philanthropists, economists, political leaders, and students. How did this come to pass? This survey class introduces you to the historical circumstances that have contributed to the contemporary landscape of global health. We travel through several centuries to examine how ideas about disease, colonialism, race, gender, science, diplomacy, security, economy, and humanitarianism have shaped and been shaped by attempts to negotiate problems of health that transcend geopolitical borders. HU

*** HLTH 370a / ER&M 360a / HSHM 432a / SOCY 390a / WGSS 390a, 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, 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. SO

*** HLTH 495a, Interdisciplinary Health Research Topics** Carolyn Mazure

Empirical research project or literature review. A faculty member who establishes requirements and oversees the student's progress must sponsor each student. Registration requires the completion of the tutorial form with faculty sponsor. Tutorial forms must be submitted to the director of undergraduate studies within five business days from the start of the term. The standard minimum requirement is a written report detailing the completed research or literature review. However, alternate equivalent

requirements may be set by faculty sponsors. May be elected for one or two terms. May be repeated for credit. May not be used for a senior requirement. ½ Course cr

Human Rights Studies (HMRT)

Hindi (HNDI)

*** HNDI 110a, Elementary Hindi I** Staff

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 and Seema Khurana

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 and Seema Khurana

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 Seema Khurana

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 160a, Modern Hindi Literature** Swapna Sharma

An advanced language course designed to develop overall language skills and to enrich cultural insight through the literature of different genres. Literature is the cultural

canvas of a society. Reading modern Hindi literature and translations of vernacular literature from various states in India enhance the understanding of Indian culture and society. Prerequisite: HNDI 150 or instructor permission. L5

*** HNDI 198a or b, Advanced Tutorial** Staff

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 of Art (HSAR)

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 119a, Introduction to the History of Art: Asian Art and Culture Quincy Ngan

This introductory course explores the art of India, China, Japan, and Korea from prehistory to the present. We consider major works and monuments from all four regions. Themes include the representation of nature and the body, the intersection of art with spirituality and politics, and everything from elite to consumer culture. All students welcome, including those who have no previous experience with either art history or the study of Asian art. This class makes frequent visits to Yale University Art Gallery. HU

HSAR 144b, Arts of the Silk Road Mimi Yiengpruksawan

Introduction to the art history of the Silk Road regions, 200 BCE – 1200 CE, with emphasis on the intersection of local and global in visual practices from Kashgar to Nara and beyond. Emphasis on examples of Buddhist, Manichaean, Zoroastrian, Christian, and Islamic art in the context of transaction and exchange along the Silk Road network. HU

HSAR 150b, Introduction to the History of Art: Sacred Art and Architecture

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 221a / RUSS 220a, 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 247a / ARCG 161a / CLCV 161a, Art and Myth in Greek Antiquity Milette Gaifman

Visual exploration of Greek mythology through the study of ancient Greek art and architecture. Greek gods, heroes, and mythological scenes foundational to Western culture; the complex nature of Greek mythology; how art and architecture rendered myths ever present in ancient Greek daily experience; ways in which visual representations can articulate stories. Use of collections in the Yale University Art Gallery. HU

*** HSAR 266b / ARCH 271b / MMES 126b / SAST 266b, 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. Field trip to the Metropolitan Museum of Art in New York. HU

HSAR 305b, Time in Chinese Art Quincy Ngan

This class explores the theme of “time” in Chinese art from the traditional to the contemporary period. Drawing upon scholarship on Chinese philosophical understanding of time and clockworks, this course explores how art made manifest notions of the future, past, and present, the passage of time, *ksana*, aeons, eternity and deadlines. This class also investigates manipulations of time—how the unique format, artistic ideas and medium and materials of Chinese art helped to pause, rewind, compress and shorten time. Observing such temporalities, we analyze narrative murals and handscrolls, “this life” v. afterlife in funeral art, paintings of immortality, the significance of bronze corrosion in antiquarianism, uses of the past in traditional Chinese painting and contemporary art, the future and agelessness in movies and digital art, the materiality and nostalgia of old photography and time-based artworks, as well as the history of People’s Republic of China as presented at the Tian’anmen Square. HU

HSAR 312a / ARCH 312a, Modern Architecture in a Global Context, 1750-present Craig Buckley

Architects, movements, and buildings central to the development of modern architecture from the mid eighteenth century through to the present. Common threads and differing conceptions of modern architecture around the globe. The relationship of architecture to urban transformation; the formulation of new typologies; architects' responses to new technologies and materials; changes in regimes of representation and media. Architects include Claude Nicolas Ledoux, Giovanni Battista Piranesi, John Soane, Frank Lloyd Wright, Le Corbusier, Ludwig Mies van der Rohe, Lina Bo Bardi, Louis Kahn, and Kenzo Tange. HU

HSAR 326a / ARCH 260a, History of Architecture: Antiquity to the Baroque Kyle Dugdale

The first half of a two-term sequence in the history of architecture. Architecture and urbanism from ancient Egypt through Greek and Roman classical traditions to the Enlightenment. The formal expression—organizational, structural, and ornamental—and social context of specific buildings and urban areas. Architecture as a form of social expression that builds on its own stylistic development, articulating a response to

changes in history and culture. Emphasis on Western architecture, with selections from other parts of the world. HU

*** HSAR 377b / AMST 377b, Ahab, Ishmael and the Visual World of Moby Dick**

Bryan Wolf

This class reads Herman Melville's *Moby Dick* over the course of a semester, pairing weekly readings of *Moby Dick* with discussions of the social, cultural, and *visual* histories that the readings engage. Focusing on painting, sculpture and vernacular art, we recreate the visual environment that undergirds Melville's epic, from tavern signs and scrimshaw to images of slavery, the landscape, and everyday life in America. In addition to *Moby Dick* and several short stories by Melville, we study: nineteenth-century landscape and genre painting; slavery and race in antebellum society; commerce, industry and early 'globalism'; and gender and class. We conclude with another voyage into the mysteries of art, language and history: Art Spiegelman's *Maus*. HU

*** HSAR 399b / HIST 289Jb / HSHM 407b / HUMS 220b, 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 or b, Critical Approaches to Art History** Staff

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 406a, Photography and Sculpture in Modernity** Joanna Fiduccia

Photography and sculpture are peculiar, yet consistent bedfellows in the modern world. This course pursues the history of their entanglements through concerns central to art and visual culture in the modern era up to the present day: reproduction and mass-production; testimony and embodiment; authorship and appropriation; intimacy, sexuality, and privacy; race and representation; cultures of pedagogy and display; and fragmented and virtual images of the body. The seminar meets in Yale's museums and special collections, foregrounding close analysis of primary materials and works of art. HU

*** HSAR 409a, The Architecture of Death in Medieval Europe** Staff

This course examines the representation of death in the Latin West from early Christianity and the time of Constantine in Rome to the late Middle Ages. We identify changing attitudes towards death through the examination of spaces created for both the holy and ordinary dead, developments in tomb style, the emergence of new chapels, and images that personify Death, the dead, and their relationship with the living. We consider the popularity of the doctrine of Purgatory and how it informed spaces and practices designed to help the dead achieve their heavenly aspirations. HU

*** HSAR 414a / SAST 469a, Visual Storytelling in South Asia** Subhashini Kaligotla

This seminar explores the polyglot variety of visual narration in South Asia. We examine the lives of exemplary individuals like the Buddha, the epic story of Rama, and royal biography and autobiography. We consider stories told through stone, in the medium of paint, and in print, film, graphic books, and contemporary media. We

experience story telling in sumptuous courtly settings and in temples, monasteries, and other sacred spaces. Weekly readings and discussions analyze the handling of narrative ambiguity and absence, double meaning and punning, the treatment of space and place, representations of sex, desire, and love, and the visual construction of political persona, power, and nation. The course is ultimately interested in how South Asian narratives unsettle and expand the notion of representation.

Prerequisite: one introductory course in Art History. HU

*** HSAR 417a / EALL 233a / EAST 243a / HUMS 285a, History of Chinese Imperial Parks and Private Gardens** Pauline Lin

Study of notable parks and private gardens of China, spanning from the 2nd century BCE to contemporary China. Themes include the history, politics, and economics surrounding construction of parks; garden designs and planning; cultural representations of the garden; and modern reinterpreted landscapes. Some sessions meet in the Yale University Art Gallery. No previous knowledge of Chinese language is necessary. Students previously enrolled in EALL 050 may not take this course for credit.

HU

*** HSAR 421b, Saints and Relics in Medieval Europe** Jacqueline Jung

In medieval Europe, the dead were always present, and none had a greater impact on visual arts, material culture, and architecture than the 'very special' dead known as saints. This course examines the men and women whose holy lives and often spectacular deaths loomed so large in the Christian imagination, including biblical saints such as the apostle Peter and Mary Magdalene, early martyrs such as St Stephen and St Foy, and thirteenth-century celebrities such as Francis of Assisi and Christina the Astonishing. We look at how their stories inspired iconic and narrative representations in various media (textual and visual), and how their bodily remains, enshrined in various forms of reliquaries, forged communities of the faithful over centuries. HU

*** HSAR 423b / CLCV 270 / CLCV 368b / HUMS 227b, The Art of Dionysos: Drink, Drama, and Ecstasy** Milette Gaifman

Artifacts of Greek art and architecture made in honor of Dionysos, the god of wine and theater, whose worship involved ecstatic experiences. The Great Dionysia, a festival where theatrical productions were performed, as the source of inspiration for artifacts and architectural monuments. Objects and structures such as painted vases and theaters as means of keeping the realm of Dionysos present in daily experience. HU

*** HSAR 435a / CLSS 476a / CLSS 876a / HSAR 552a, Roman Art and Archaeology In Its Global Context** Staff

The Roman Empire was uncontestedly diverse and multicultural, and demonstrably connected with peoples residing far beyond state boundaries. Roman art and material culture however, are often viewed as homogenous, especially when considered within the contexts of histories of Western Civilization. This class critically examines common (mis)perceptions of the ancient past, looking at the foundations of the disciplines of Roman art and archaeology, introduces post-colonial critiques and alternate methods of inquiry (hybridity, creolization, network analysis, and selective consumption), and familiarizes students with bodies of Roman evidence often marginalized in traditional discourse. Among others, specific topics for inquiry include: the promise (and dangers) of the integration of forensic scientific techniques into the study of ethnicity and identity in the ancient past; unintended consequences of post-colonial critiques of the traditional "Romanization" model; historiographic factors contributing to the

marginalization of certain material within Roman territory; the definition/dispute of 'boundaries' both physical and intellectual that have shaped the field; and evidence of Roman intercultural connections and bi-directional exchange with China, India, Persia, and Sub-Saharan Africa. HU

*** HSAR 439b, Surrealism** Joanna Fiduccia

"‘Transform the world,’ said Marx, ‘change life,’ said Rimbaud; these two mottoes are for us one and the same." With this mandate, the French poet and author André Breton established the revolutionary ambitions of Surrealism, an avant-garde movement founded in France in the 1920s. Yet how exactly did Surrealism propose to merge psychological and political revolutions? This course sets out to answer this question by mining Surrealism's central artistic strategies and critical operations, from automatism and chance procedures to radical experiments with the novel, sculpture, photography, film, and exhibition format. A significant portion of coursework emerges from Surrealist exercises. Class meetings and assignments engage with Yale's art collections and archives. 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 448a, The Long 1960s: Art, Revolution, Politics** Pamela Lee

Consideration of the art and visual culture of the "Long 1960s," treating the art of this pivotal decade against the backdrop of the global Cold War. We consider the most significant art movements of the period (Pop, minimal art, conceptual art etc.) alongside debates on the relationship between art, revolution, and politics both within the United States and abroad. Topics include the rise of media culture and its impact on art; the global reception of Pop; Black Power and the Black Arts Movement; art and activism of the New Left; the counterculture and new media; the aesthetics of Third Worldism and the anti-war movement; 1968 and the Society of the Spectacle; and gay liberation at Stonewall. Mandatory weekend field trip to Washington DC. Some art history recommended, but not required. Enrollment is restricted and by application. Contact instructor for details. HU

*** HSAR 455a, Conceptualization of Space** Craig Buckley

Introduction to the discipline of architecture through the elusive concept of space. This course traces key shifts in the conceptualization of space in aesthetics and architectural theory from the eighteenth century through to the present. HU

*** HSAR 456a / MMES 456a, Art and Politics in the Modern Middle East** Kishwar Rizvi

Political ideologies have either unified the modern Middle East, such as Pan-Arabism of the 1960s and Islamism of the 1980s, or caused deep ruptures, such as Zionism and sectarianism. Examination of the art and architectural productions that have gone hand-in-hand with these political developments from the nineteenth century until

present day. Poetic, visual, and urban interventions document the profound changes that have defined the countries of this region, while connecting them to political movements throughout the world. WR, 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 466a, The Technical Examination of Art** Staff

Introduction to methods used in the technical examination of works of art, including critical assessment of the information such methods provide. What technical examination can reveal about the materials and techniques used in a particular work's creation and about its subsequent history.

*** HSAR 470b / AFAM 291b, Pop Art and Black Culture** Kobena Mercer

Pop art strategies among African American artists who contributed a critique of the modernist canon from the 1950s to present. Critical uses of vernacular materials are studied in view of postmodern theories of art and popular culture. HU

*** HSAR 484b / EAST 474b, Japanese Screens** Mimi Yiengpruksawan

The screen-painting tradition in Japan, particularly as it emerged in the sixteenth and seventeenth centuries. The format, techniques, and functions of screen painting; poetic and literary connections, as well as studio practices and politics, of the principal lineages of painters; aesthetics and styles associated with varying classes of patronage, from the shoguns to Buddhist monks to the Japanese court. HU

*** HSAR 486b, Gender and Sexuality in Asian Art** Quincy Ngan

This class uses art to investigate the stereotypes of, and expectations for, gender in China, Japan, and Korea, spanning from the modern to the contemporary. It explores relationships between masculinity, femininity, homosexuality, and androgyny, as well as the politics and economy of these identities in East Asia. Together, we analyze how artworks—painting, performance, manga, movies, fashion, illustration, and sculpture—have made manifest genders and helped to enact, modify, and conceal one's sexuality. It also probes how representations of social spaces and leisure activities reinforce or complicate gender stereotypes and expectations. This class is divided into four parts. The first explores methodological frameworks and theories for parsing gender and sexuality in East Asia. The second focuses on masculinity, studying the representations, burdens and desires of heroes, leaders, and male celebrities. The third focuses on femininity, exploring the production and consumption of images of beautiful women, along with the economy and politics of being attractive and seductive in East Asia. While the second and third parts examine the conventional dichotomy of the two sexes, the fourth balances this account by focusing on the imageries of homosexuality and transgender. HU

*** HSAR 490b / FILM 320b, Close Analysis of Film** John MacKay and Moira Fradinger

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 491b, The Artist in African Art** Staff

The names of many of Africa's greatest artists are currently unidentified, while their works are celebrated in public and private collections around the world. Since the 1940s art historians have sought to remedy this lacunae, attributing groups of objects to individual 'hands' or workshops through a combination of formal analysis, provenance research, and fieldwork. This course offers the opportunity to think about the role of the artist in different African societies by closely engaging with the Yale University Art Gallery's important collection of African art. Considering a broad sweep of artists who were specialists in a variety of different media, including ceramics, metalwork, painting, textiles and wooden sculpture we reflect on the degree to which knowledge of an artist's identity may inform our understanding of a work of art. The critical analysis of objects introduces students to the role of artworks as original documents, and throughout the course, students are introduced to many aspects of museum practice with a particular focus on the development of the forthcoming fall 2022 Yale University Art Gallery exhibition *Bámigbóyè: A Master Sculptor of the Yorùbá Tradition*. HU

*** HSAR 492a / ER&M 372a, Visual Encounters in the Early Modern Atlantic World**

Cecile Fromont

This course examines the visual, material, and human flows that connected Africa, Europe, and the Americas between 1450 and 1850 and gave its contours to the early modern Atlantic World. Readings, class discussions, and assignment will explore the role of the visual in key institutions and phenomena that emerged in the circum-Atlantic and continue cast their long shadow over the contemporary world. Topics include: colonialism, the slave trade, blackness and indigeneity, scientific exploration, religious encounters, revolt. HU

*** HSAR 495a, The Ghent Altarpiece** Staff

The Ghent Altarpiece, a monument of early Netherlandish painting, poses questions and challenges to art historians, curators, conservators, and conservation scientists to this day. The complex work, acknowledged for both its 'revolutionary impact' and its resistance to providing easy answers to its many puzzles, is intimately linked to the development of technical art history. This class explores the significance of the Ghent Altarpiece from its early reception to the recent documentation and treatment campaign. Making use of the *clostertovaneyck* website, consideration of artistic materials and processes are central to class discussions, which encompass the complicated physical history of the artwork. Topics include the viability of study using online resources, connoisseurship and technical art history in the 21st century, materials and techniques and their impact on conservation approaches, and myth-making and studying art as objects of national significance. Sessions incorporate conversations with curators and conservators, visits to the Institute for the Preservation of Cultural Heritage, and a trip to the Metropolitan Museum of Art in New York will place the altarpiece in context. HU

History of Science, Medicine, and Public Health (HSHM)

HSHM 206b / HIST 114b, History of Reproductive Health and Medicine in the U.S.

Miriam Rich

This course surveys the history of reproductive health and medicine in the United States from the late eighteenth century to the present. The course emphasizes the cultural and historical contexts of reproductive health; the significance of reproduction within the broader social, cultural, and political history of the United States; and the entanglements of reproductive medicine with social and political categories of race, gender, disability, nation, and kinship. Topics include the management of reproduction in U.S. slavery and empire, reproductive medicine and concepts of race, practitioners and professional authority over childbearing and pregnancy, eugenics and sterilization, movements for reproductive rights and healthcare, reproductive biotechnology, and present-day disparities in access to and quality of reproductive care. 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 212a / ER&M 214a / HIST 146a / HLTH 280a, Historical Perspectives on Global Health Joanna Radin

In the 21st century “global health” is recognized as an influential framework for orienting action among a huge range of groups including public health workers, activists, philanthropists, economists, political leaders, and students. How did this come to pass? This survey class introduces you to the historical circumstances that have contributed to the contemporary landscape of global health. We travel through several centuries to examine how ideas about disease, colonialism, race, gender, science, diplomacy, security, economy, and humanitarianism have shaped and been shaped by attempts to negotiate problems of health that transcend geopolitical borders. HU

HSHM 220a / AFST 220a / HIST 417a, Histories of Confinement: From Atlantic Slavery to Social Distancing Nana Osei Quarshie

This course looks closely at the history of asylums, hospitals, prisons, and schools. It seeks to understand their workings and the interplay between bureaucratic forms, spatial and material organization, and modes of discipline, control, and remediation.

It asks, how is institutional power organized, displayed, deployed, and disputed, and what are the limits and contradictions inherent in these efforts? Our readings draw from a range of contexts and disciplines to consider the relationship between the built environment and institutional life. HU

HSHM 226b / HIST 236b, 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, and natural history. HU

HSHM 321a / HIST 244a, Cultures of Western Medicine John Warner

A survey of Western medicine and its global encounters, encompassing medical theory, practice, institutions, and healers from antiquity to the present. Changing concepts of health, disease, and the body in Europe and America explored in their social, cultural, economic, scientific, technological, and ethical contexts. HU

*** HSHM 406a / HIST 150Ja, 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

*** HSHM 407b / HIST 289Jb / HSAR 399b / HUMS 220b, 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

*** HSHM 415a / HIST 179Ja, Historical Perspectives on Science and Religion** Ivano Dal Prete

The engagement between science and religion from a historical standpoint and a multicultural perspective. The Islamic, Jewish, Buddhist, and Christian traditions; the roots of modern creationism; salvation expectations and the rise of modern science and technology. WR, HU

*** HSHM 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

*** HSHM 424b / HIST 194Jb, Citizenship, Race, and Public Health in U.S. History** Miriam Rich

This seminar examines the history of citizenship, race, and public health in the modern United States. The course explores how public health practices structured shifting boundaries of social and political inclusion, focusing particularly on the late nineteenth and early twentieth centuries. How did public health interventions serve to affirm, regulate, or deny the citizenship of different groups? How have public health issues both shaped and been shaped by systems of racial inequality? Topics include the

history of public health and immigration, surveillance and regulation of racialized and gendered subjects, eugenics and racial hygiene, health activism and reform, and ethics of public health powers. WR, HU

*** HSHM 432a / ER&M 360a / HLTH 370a / SOCY 390a / WGSS 390a, 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 436a / HIST 195Ja, Health and Incarceration in U.S. History** Miriam Rich

This course examines the U.S. history of incarceration through the lens of health and medicine, covering the late eighteenth century to the present. Across this period, incarcerated populations have been subject to extensive health risks and harms; since 1976, they also comprise the only group in the U.S. with a recognized constitutional right to health care. In this seminar, we explore how medical practices and institutions have been involved in establishing, structuring, and challenging historical systems of incarceration. In the modern United States, incarceration has played a major role in the formation of racial disparities, the regulation and surveillance of marginalized communities, and the delineation of the state's relationship to its subjects. Within this history, health and medicine have been central to debates over the harms of the prison system, the extent of institutional authority over vulnerable bodies, and the state's obligations to provide care. WR, HU

*** 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

*** HSHM 462b, Pharmaceuticals in Medicine and Health Care, 1900-Present** Jason Schwartz

The history of pharmaceuticals and their role in medicine and health care from 1900 to the present. This seminar examines how pharmaceuticals have shaped the practice of medicine and delivery of health care, approaches to prevention and treatment, medical knowledge and disease definitions, and related topics. It looks broadly at pharmaceuticals in the United States and globally as well as deeply at specific classes of products that have raised particular questions and considerations throughout their histories. Additional topics include pharmaceutical regulation and the U.S. Food and Drug Administration, pricing and financial issues, marketing and direct-to-consumer advertising, research and development, and safety controversies. WR, HU

*** HSHM 465b / HIST 176Jb / WGSS 457b, Reproductive Health, Gender & Power in the U.S.** Ziv Eisenberg

This seminar examines women's and men's reproductive health in the United States from the 19th century to the present. How have gender norms and social power structures shaped medical knowledge, scientific investigation, political regulation, and private reproductive experiences? What do the lessons of the history of reproductive health tell us about contemporary policy, legal and economic debates? Topics include abortion, activism, childbirth, contraceptives, eugenics, feminism, fertility, medicalization, pregnancy, reproductive science and technology, sexual health, social justice, and sterilization. WR, HU

*** HSHM 468a / HIST 260Ja, 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 471a 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 475b / HIST 128Jb, Race and Disease in American Medicine** Sakena Abedin

An exploration of the history of race and disease in American medicine from the late 19th century to the present, focusing on clinical practice and clinical research. We discuss cancer, psychiatric disease, sickle cell disease, and infectious diseases including tuberculosis and HIV. We examine the role of race in the construction of disease and the role of disease in generating and supporting racial hierarchies, with special attention to the role of visibility and the visual in these processes. We also consider the history of race and clinical research, and the implications of racialized disease construction for the production of medical knowledge. WR, HU

*** HSHM 486a / AFST 486a / HIST 374Ja, 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.

*** HSHM 496a / HIST 110Ja, *Childbirth in America, 1650-2000*** Rebecca Tannenbaum

This course considers the ways childbirth has been conducted in the United States over three centuries. Topics include the connections between childbirth and historical constructions of gender, race, and motherhood, as well as changes in the medical understanding and management of childbirth. WR, HU

Humanities (HUMS)

*** 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. This is a 1.5 credit intensive writing course that fulfills one WR requirement. Friday sessions will alternate between writing workshops and field trips to Yale collections. WR, HU 1½ Course cr

*** HUMS 065a / EDST 065a, *Education and the Life Worth Living*** Matthew Croasman

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 075a, Mastering the Art of Watercolor** Adam Van Doren

An introductory course on the art of watercolor as a humanistic discipline within the liberal arts tradition. Readings, discussions, and studio work emphasize critical, creative thinking through a tactile, “learning by doing” study of the watercolor medium. Students analyze and imitate the classic techniques of J. M.W. Turner, John Singer Sargent, Georgia O’Keeffe, and Edward Hopper, among others. Studio components include painting *en plein air* to understand color, form, perspective, composition, and shade and shadow. Basic drawing skills recommended. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU RP

*** HUMS 091b / HIST 078b, Truth and Post-Truth** Marci Shore

This European intellectual history seminar explores the epistemological question in philosophy: does the world really exist? How do I know it’s really there and not just a projection of my consciousness? Is there such a thing as truth? We begin with European philosophy, moving through Descartes, Kant and Husserl and through the role of ideology and lies in 20th century totalitarianism, then to dissident thought in Eastern Europe in the 1970s and 1980s, and finally to the emergence of ‘post-truth’ in the 20th century and its implications in both philosophy and life. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

*** HUMS 095a, Certain Uncertainties: Literature, Physics, Philosophy** Brianne Bilsky

Why does the universe exist? What is the nature of reality? Who are we? Where are we? How do we know? This course attempts to address such uncertainties by looking at three seemingly disparate disciplines: literature, physics, and philosophy. Throughout the twentieth century, significant advances were made in each of these fields. In literature, the modernists and postmodernists changed the way we read and write. In physics, modern cosmology and quantum mechanics profoundly affected our understanding of the universe’s origins and the nature of reality. In philosophy, new schools of thought such as structuralism and poststructuralism challenged our perception of language and meaning. By placing such seemingly separate fields of study and some of their signature advances in conversation, this course not only aims to explore certain uncertainties but also to underscore the value of a liberal arts education. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** HUMS 096b, Collecting History: ‘Treasures’ of Yale** Staff

This course considers the concept of “treasure” by visiting nearly all of Yale’s galleries, museums, and library special collections. We explore questions around how these objects and materials were created, how they came to be at Yale, and the considerations and compromises that make up collections of cultural heritage materials. We learn what these objects say about themselves, their creators, their users, and their collectors. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. 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 130b / LITR 130b, How to Read** Martin Hagglund

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

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. HU

*** HUMS 140b / NELC 121b, The Hero in the Ancient Near East** Kathryn Slanski

Exploration of the interaction of religion, history, and literature in the ancient Near East through study of its heroes, including comparison with heroes, heroic narratives, and hero cults in the Bible and from classical Greece. WR, HU

*** HUMS 175b / RUSS 175b, Reading the Russian Revolution** Constantine Muravnik

The course explores the complex political and social landscape of the Russian Revolution of 1917 through the multiple and shifting perspectives of its main participants from Nicholas II to Lenin. All of the participants of the Revolution understood the immense significance of the changes taking place in front of them in 1917; many took detailed notes of conversations, actions, and events in which they participated or which they witnessed. Later, many reworked these notes into meticulous memoirs and histories. The expected subjectivity of these documents, as well as the contradictory nature of the opinions expressed in them – but generally, not the facts – highlight the complexity of the situation they describe. The readings chosen for the course represent the entire political spectrum of the Russian Revolution from the extreme right to extreme left. They chronologically document the precipitous progression of the events starting with the murder of Rasputin, carried out by the Monarchists and one member of the royal family on the eve of 1917, and ending with

the Bolshevik coup d'état in October 1917. They trace the gradual shift of the epicenter of the Revolution from right to left until the Revolution ends or succeeds (it depends on the point of view) in Lenin's gaining full control over the country on the brink of the Civil War. Prerequisites: Six semesters of Russian or permission of the instructor. L5, HU RP

*** HUMS 179a / ENGL 217a, Shakespeare's Political Plays** David Bromwich
Reading and interpretation of selected histories and tragedies from *Richard II* to *Coriolanus* with emphasis on the tension between individual freedom and political obligation. WR, HU

HUMS 180a / ITAL 310a / LITR 183a, Dante in Translation Simona Lorenzini
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 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 189a / MUSI 189a, Music & Jane Austen** Jessica Peritz
This course takes Jane Austen as a guide to the world of early nineteenth-century music culture in Britain, exploring through her novels the relationships between music, gender, and class in the decades around 1800. We approach this period of music history by delving into how "regular people" — especially women — consumed, curated, and created music in their everyday lives. Austen, an accomplished musician herself, wove music into her novels in ways that reveal much about contemporary practices of (and prejudices against) musicking. We focus on three of Austen's novels (*Pride & Prejudice*, *Sense & Sensibility*, *Emma*) and excerpts from her music manuscript collections, alongside recent scholarship and modern film adaptations, which taken together raise a series of interdisciplinary questions. By learning about Austen's musical milieu, we open up the musical lives of Regency-era women and the 'middling sort,' while becoming more attuned to the social critiques embedded in Austen's representations of music, ultimately enriching our engagement with the novels themselves. The ability to read musical notation is not required, but will be helpful. 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 201b / FREN 240b / 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

**HUMS 206a or b / ENGL 191a or b / LITR 318a or b / MMES 215b / NELC 201a or b,
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 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 220b / HIST 289Jb / HSAR 399b / HSHM 407b, 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 221a / EDST 312a / HIST 423Ja / PLSC 310a, Idolizing Education**
Mordechai Levy-Eichel

This course is an iconoclastic introduction to the study of education. Besides examining the purposes and practice of education and learning across a wide variety of times and places, the course examines the study of education today in order to see what can be gained from a skeptical approach to the subject. Particular emphasis is placed on the origins and development of the research university. SO

*** HUMS 227b / CLCV 270 / CLCV 368b / HSAR 423b, The Art of Dionysos: Drink, Drama, and Ecstasy** Milette Gaifman

Artifacts of Greek art and architecture made in honor of Dionysos, the god of wine and theater, whose worship involved ecstatic experiences. The Great Dionysia, a festival where theatrical productions were performed, as the source of inspiration for artifacts and architectural monuments. Objects and structures such as painted vases and theaters as means of keeping the realm of Dionysos present in daily experience. HU

*** HUMS 228b / EVST 228b / HIST 459Jb / LITR 345b, 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 234a / ENGL 237a / EVST 237a / LITR 323a, Animals in Literature and Theory** Jonathan Kramnick

Consideration of the role animals play in our aesthetic, ethical, political, and scientific worlds through reading of fiction, poetry, philosophy, and critical theory. Topics include: animal sentience and experience; vegetarianism; animal fables; pet keeping; animals alongside disability, race, and gender; and the representation of animal life in the visual arts. WR, HU

*** HUMS 242b, Middle East in French Literature and Art** Marie Girard and Maryam Sanjabi

This course examines representations of the Orient in the French literature from 17th to the 20th centuries in fiction, poetry, travel literature, and art. The topics range from problems of Orientalism and encounters with peoples, monuments, and cultures of the Muslim Middle East, to Oriental influences on French prose, poetry and arts, use of Oriental “Other” in social and political critique, the popular lure of Oriental exoticism, fantasy and fantastic, the Orient as a romantic space and literature of escapism and also the impact of the “Imagined Orient” on figurative art. The seminar makes use of the extensive collections at the Beinecke Rare Books and Manuscripts Library like Denon, *Voyage dans la Basse et la Haute Égypte*, the Reserve of Sterling, Botta and Flandin, *Monuments de Ninive*, and the Yale University Art Gallery for drawings and photographs. Readings cover the Middle East (Levant and Egypt), Iran (Persia) and include works by preeminent French writers such as Molière, Montesquieu, Voltaire, Chateaubriand, Nerval, Gautier, Flaubert, travelers like Tavernier, Denon, Jane Dieulafoy or Bouvier and essayists such as Said. Artists like Delacroix, Decamps, Ingres, Horace Vernet, Chassériau, Fromentin and Gérôme are also considered. Prerequisite: Knowledge of French at L5 level. L5, HU

*** 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 253a / ENGL 346a / RLST 233a, Poetry and Faith** Christian Wiman

Issues of faith examined through poetry, with a focus on modern Christian poems from 1850 to the present. Some attention to poems from other faith traditions, as well as to secular and antireligious poetry. HU

*** HUMS 254b / ENGL 268b / LITR 463b / PHIL 227b, Literature and Philosophy, Revolution to Romanticism** Jonathan Kramnick

This is a course on the interrelations between philosophical and literary writing beginning with the English Revolution and ending with the beginnings of Romanticism. We read major works in empiricism, political philosophy, and ethics alongside poetry and fiction in several genres. Topics include the mind/body problem, political ideology, subjectivity and gender, and aesthetic experience as they take philosophical and literary form during a long moment of historical change. WR, HU

*** HUMS 269a / EALL 230a / EAST 242a, Poetry and Ethics Amidst Imperial Collapse** Lucas Bender

Du Fu has for the last millennium been considered China's greatest poet. Close study of nearly one-sixth of his complete works, contextualized by selections from the tradition that defined the art in his age. Exploration of the roles literature plays in interpreting human lives and the ways different traditional forms shape different ethical orientation. Poetry as a vehicle for moral reflection. All readings are in English. WR, 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 272b / EALL 256b / EAST 358b / GLBL 251b / LITR 265b, China in the World** Jing Tsu

Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China and Africa, Mandarinization, labor and migration, Chinese America, nationalism and humiliation, and art and counterfeit. Readings and discussion in English. HU

HUMS 277b / HIST 231b, What was Enlightenment? Isaac Nakhimovsky

A survey of eighteenth-century European intellectual life, considered in its social and cultural contexts and with attention to its historical legacies, focusing on responses to emerging global networks of trade, finance, and empire. HU TR

*** HUMS 279b / HIST 286J / HIST 292Jb / PLSC 286b, Democracy and the French Revolution** Isaac Nakhimovsky

The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

*** HUMS 285a / EALL 233a / EAST 243a / HSAR 417a, History of Chinese Imperial Parks and Private Gardens** Pauline Lin

Study of notable parks and private gardens of China, spanning from the 2nd century BCE to contemporary China. Themes include the history, politics, and economics surrounding construction of parks; garden designs and planning; cultural representations of the garden; and modern reinterpreted landscapes. Some sessions meet in the Yale University Art Gallery. No previous knowledge of Chinese language is necessary. Students previously enrolled in EALL 050 may not take this course for credit. HU

*** 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 292b / EALL 213b / PHIL 205b / RLST 211b, Philosophy, Religion, and Literature in Medieval China** Lucas Bender

Exploration of the rich intellectual landscape of the Chinese middle ages, introducing students to seminal works of Chinese civilization and to the history of their debate and interpretation in the first millennium. No previous knowledge of China is assumed. Instead, the course serves as a focused introduction to Chinese philosophy, religion, and literature. HU TR

*** HUMS 295a / JDST 223a / PLSC 307a, Trials of Uncertainty** Norma Thompson

Is the demise of the trial at hand? The trial as cultural achievement, considered as the *epitome* of humanistic inquiry, where all is brought to bear on a crucial matter in an uncertain context. Truth may be hammered out or remain elusive, but the expectation in the court case has been that the adversarial mode works best for sorting out evidentiary conundrums. Inquiries into issues of meaning of the trial, its impartiality, and challenges to its endurability. The role of character, doubt, and diagnosis explored in Sophocles, Plato, Cicero, Burke, Jane Austen, Tocqueville, and Kafka, as well as in twentieth-century trials, films, documentaries, and twenty-first-century medical narratives. WR, HU TR

*** HUMS 304b, Women in Greek Political Thought** Staff

In the classical polis, women were silent and absent, confined to the household and excluded from political life. Yet women remain loud and present in Greek political thought. What are we to make of Euripides' Medea, for example, who screams that she would stand in the first line of battle three times rather than give birth once? The incorporation of women into Greek political thought raises enduring questions – about hierarchy, rule, and justice; courage, war, and mourning; citizenship, friendship, marriage, and motherhood; the definition of the demos and the threat of a “barbarian other”; and the emotions, the virtues, and the well-ordered soul. To address these questions, we read texts (or selections from texts) by Thucydides, Aristophanes, Sophocles, Euripides, Plato, Wole Soyinka, and Arlene Saxonhouse. WR, HU

*** 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 Petrovi#, Norman Manea, Lev Kopelev, Igor Pomerantsev, Tomas Venclova. HU

*** HUMS 319a / AMST 390a / ENGL 280a, Poetry, Film, Music and Art: John Ashbery's Work** Karin Roffman

A study of the poetry of John Ashbery (1927-2017) through examining the films, music, and art that provoked his imagination and structured and inhabited his poems. In the course, we study his original paintings and collages, read from his published art criticism, film and music reviews, and explore his off-the-cuff reactions to contemporary work in correspondence with friends. In short, we consider how he practiced and extended the art of American poetry through a vivid, lively, and continuous conversation with other arts. We also discuss critiques of the interdisciplinarity of Ashbery's poetics in work by second generation New York School poets. WR, HU

*** HUMS 320b / LITR 324b / THST 330b, Representations of the Underworld** Toni Dorfman

What is the underworld? What questions have different ideas about the underworld posed about mortality, freedom, and goodness? Topics include dreams, hell, ghosts, the unconscious, and string theory. Sophomore standing required. HU

*** HUMS 322b / GMAN 365b / LITR 460b, German Novels After 1945** Rudiger Campe

The course discusses exemplary novels in German language after 1945 from West and East Germany and Germany after Reunification, as well as from Austria and Switzerland. Part I, 'Zero Hour - or Not,' on the political critique of Nazi Germany and the attempt at an aesthetic clean break (e.g., Gunther Grass, Ingeborg Bachmann, Max Frisch); Part II '1968: Revolution or New Interiority,' on social protest versus aesthetic internationalism (e.g., Peter Handke, Christa Wolf, Hubert Fichte, Thomas

Bernhard); Part III, 'The Attempt at Being Contemporary,' on German and German speaking societies in the global world (e.g., Elfriede Jelinek, Yoko Tawada, Rainald Goetz). While 'contemporaneity' is the particular mark of the last section, all works desire to critically intervene in their historical moment. Giving an account of this desire is the goal of the course. Contextualization as needed; close reading of selected passages as the mode of work in the course; all works are provided in English translation and German. HU

*** 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

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 340b / ENGL 244b / LITR 344b, The Detective Story: Solving Mysteries from Oedipus to Sherlock** Paul Grimstad

The course looks closely at detective stories, novels and films, with attention to the basic narrative structure of criminal enigma, logical investigation and denouement (whodunnit), and considers the meaning of "genre" more broadly. Starting with the proto-detective story *Oedipus Rex*—in which tragic drama takes the form of a murder mystery—we move on to Edgar Allan Poe's invention of the genre proper in "The Murders in the Rue Morgue" and "The Purloined Letter." From there we go to Poe's "golden age" inheritors Arthur Conan Doyle, G.K. Chesterton, Agatha Christie, and Dorothy Sayers, as well as the adaptation of Doyle's tales for the BBC series *Sherlock*. We also spend time on American "hard boiled" writers (Dashiell Hammett, *The Maltese Falcon* and John Huston's 1941 film adaption of the novel); fiction which draws upon the conventions of detective stories without being genre fiction (Nabokov, *Borges*), non-fiction works which have the structure of a detective story (Freud's "Wolf Man" case study); neo-noir film (*Chinatown*); works that fuse detective fiction and science-fiction (*Minority Report*) and recent film homage to "golden age" whodunnits (*Knives Out*). Students write essays making interpretive claims and using evidence from works on the syllabus, with emphasis on writing clear prose in support of an original argument. HU

*** HUMS 341a / EP&E 360a / GMAN 345a / LITR 226a, Sound of the Police: The Idea of Order after the French Revolution** Paul North

A theoretical investigation into the idea and function of police in modern sovereign states, particularly after the French Revolution, when a 'people' meant to govern itself, represent itself, even restrain itself, in order to do this, needs something that has come to be called 'order.' How does government of the people, by the people, for the people divide itself into a segment that surveils and curtails and a segment that is surveilled and curtailed? Since the 18th century the institution of the police has taken on an unprecedented role in life in states, and can sometimes be the only direct tie between citizens and the state itself. And the first thing a citizen experiences is often the 'woop, woop' (to quote KRS-One, 'Sound of da Police') of the police coming. Following this sonic footprint, we read theories of the police in Hobbes, Schiller, Walter Benjamin, and Michel Foucault, and we listen for the police in cultural objects, such as films (*Invasion of the Body Snatchers*, *Dirty Harry*, *The Thin Blue Line*), television programs (*Law and Order*, *The Wire*), and music (*Sorrow, Tears, and Blood* by Fela Kuti, *Sound of da Police* by Teacha). For a glimpse of the possible music, see spotify playlist (<https://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrEhttps://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrE>). HU

*** HUMS 345a / GMAN 378a / LITR 247a, German Fiction Around 1800** Kirk Wetters

The literary forms of novel, the novella, the short story and the fairy tale were fundamentally reconfigured in Germany around 1800. In the decades 1790-1820, narrative forms begin to take on the importance and enduring shape that will extend through the 19th century and beyond. Techniques such as frame narration (stories in stories), unreliable narrators, gothic and supernatural elements, the Bildungsroman, the novel of the artist, take shape in the context of a highly experimental literary culture. Works covered include Goethe, *Conversations of German Refugees* and Wilhelm Meister's *Journeyman Years*; Schiller, *The Ghost-Seer*; Tieck, *Blond Eckbert*; Novalis, *Heinrich of Ofterdingen*; E.T.A. Hoffmann, *The Sandmann* and *Kreisleriana*. Readings are available in German and English. HU

*** HUMS 348a / FILM 431 / FILM 432a / LITR 432a, World War II: Homefront Literature and Film** Katie Trumpener

Examination of quotidian, civilian World War II experiences in many parts of Europe. Modes of literary and filmic reflection occasioned by the war; civilian perspectives on the relationship between history and everyday life, during and after the war; children's experience of war; and ways homefront and occupation memories shaped postwar avant-gardes. HU

*** HUMS 349b / LITR 470b, Identity in Modern Thought** Benjamin Barasch

Identity is at the heart of our present social conflicts, from campus debates about power and privilege, to movements like Black Lives Matter and Me Too, to the resurgence of ethnic nationalism. But what is identity, after all? How does it come into being? What role do "nature" and "culture" play in that process, and are they separable? To what extent are we defined by our belonging to identity categories such as race, class, gender, and sexuality? How free are we to create our own identities? What makes me "me"? Is there a true self? This class explores the complexities of identity through readings in modern literature, philosophy, and social theory, from psychoanalysis to critical race theory, romanticism to postmodernism, autobiography to autofiction. Authors include J.-J. Rousseau, William Wordsworth, R. W. Emerson, Sigmund Freud, Melanie Klein,

G. H. Mead, Erik Erikson, Judith Butler, Hannah Arendt, Theodor Adorno, Djuna Barnes, Nella Larsen, W. E. B. Du Bois, Frantz Fanon, Ralph Ellison, James Baldwin, Ta-Nehisi Coates, Thomas Chatterton Williams, Saidiya Hartman, Claudia Rankine, Ben Lerner, Maggie Nelson, Camille Paglia. WR, HU

* **HUMS 380a / ENGL 395a / LITR 154a, 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 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 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 428b / ENGL 483b / JDST 343b / LITR 305b, 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 443b / HIST 232Jb / JDST 270b / MMES 342b / RLST 201b, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans

or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

*** HUMS 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. Exploration of the city's rich interweaving of history, theology, literature, philosophy, and the arts in significant moments of Roman and world history. HU

*** HUMS 470a and HUMS 471b, Special Studies in the Humanities** Paul Grimstad

For students who wish to pursue a topic in Humanities not otherwise covered. May be used for research or for directed reading under the guidance of one or more faculty advisers. In either case a term paper or its equivalent is required, as are regular meetings with the adviser or advisers. To apply, a student should present a prospectus and a bibliography signed by the adviser or advisers to the director of undergraduate studies. Enrollment limited to juniors and seniors majoring in Humanities.

*** HUMS 491a or b, 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, 2018, if the essay is to be submitted during the spring term, by May 1, 2019, for yearlong or fall-term essays. A rough draft of the essay is due at noon on March 25, 2019 for spring-term essays or on October 29, 2018 for fall-term essays. The final essay is due at noon on April 8, 2019 for spring-term essays or on December 3, 2018 for fall-term essays; late essays will be penalized by a lower grade. RP

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** Indriyo Sukmono

Development of advanced fluency through discussion of original Indonesian sociohistorical, political, and literary texts and audiovisual sources. Extension of

cultural understanding of Indonesia. Prerequisite: INDN 140 or equivalent. May not be taken after INDN 153. L5

*** INDN 160b, Advanced Indonesian II** Indriyo Sukmono

Continuation of INDN 150. Prerequisite: INDN 150 or equivalent. L5

*** INDN 170a, Advanced Indonesian: Special Topics** Dinny Aletheiani

Continuation of INDN 160. Students advance their communicative competence in listening, speaking, reading, and writing. Use of Indonesian book chapters, Web pages, printed and electronic articles, social networking posts, newsgroups, and letters. Prerequisite: INDN 160.

*** 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 (ITAL)

*** ITAL 110a or b, 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 120a or b, Elementary Italian II** Staff

Continuation of ITAL 110. L2 1½ Course cr

*** ITAL 125b, Intensive Elementary Italian** Michael Farina

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** Anna Iacovella

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 Sarah Atkinson

Discussion of modern Italian literature and cinema with accompanying social, political, and critical issues in order to improve active command of the language. Development of advanced reading skills through short stories, novels and films; enhancement of writing skills through experiments with reviews, essays, adaptations, translations and creative writing. Classroom emphasis on advanced speaking skills and vocabulary building.

L5

*** ITAL 151b, Advanced Italian Workshop** Giovanni Miglianti

The history of modern Italy is pinpointed by crises and emergencies of social, political, and environmental nature. This course explores the role of literature and other media (including films, songs, and social media) in representing and making sense of such critical events, from unification to the present. Case studies draw upon the southern question and organized crime groups like the Mafia, the world wars and Fascism, the transition to democracy, the memory and postmemory of the Holocaust, far-left and neo-fascist terrorism in the 1970s, the sexual revolution, Berlusconiism and populism, the migrant crisis, natural disasters, and the coronavirus pandemic. The analysis of literary and artistic representations of these crises and emergencies, as well as the state responses to them, often unveils diverging narratives. We first consider these narratives as the result of translation practices to 'make sense' of the events (intersemiotic translation). Then, through a workshop in intralingual (rewording in Italian) and interlingual (Italian to English) translation, students develop their own creative project, to be presented in class by the end of the term. L5

*** ITAL 159a, History and Culture of Naples** Anna Iacovella

Historical phenomena and literary and cultural movements that have shaped the city of Naples, Italy, from antiquity to the present. The linguistic richness and diversity that characterizes Naples; political, social, and cultural change; differences between standard Italian and the Neapolitan dialect in literature, film, and everyday life. Prerequisite: ITAL 140 or equivalent. 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 310a / HUMS 180a / LITR 183a, Dante in Translation Simona Lorenzini
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 322b / HIST 238Jb / LITR 212b, USA: Travelers, Immigrants, Exiles from Italy (1920-2001)** Giuseppe Mazzotta

The course focuses on the experiences of Italian travelers to North America. Its goal is to promote a critical historical consciousness of the social, political, and cultural reality of the Italian presence in the United States from the end of the First World War to the beginning of the twenty-first century. Students engage with a variety of media: from letters and diaries to memoirs and unpublished documents, from novels and poems to music and films. Through close readings and literary analyses, this class considers the historical and cultural context of each source, eliciting reflections in at least three key areas: national identity, transcultural encounters, and the relevance of the arts for travelers, migrants and exiles. HU TR

*** ITAL 328a or b / LITR 191a or b, Early Modern Ecologies: Representing Peasants, Animals, Labor, Land** Jane Tylus

To what extent does writing about the land and depicting landscapes in early modern Europe reflect a new interest in engaging the boundaries between the human and non-human? What does it show about the commitment of artists and intellectuals to representing cultures and environments not necessarily their own? And how did writers and artists seek to legitimize their intellectual labors by invoking images of agricultural work? Since antiquity, artists have often chosen to make the countryside and its human and non-human denizens symbols of other things: leisure, song, exile, patriotism, erotic sensibilities, anti-urbanism. Early Christianity in turn embraced the desert—and the countryside—as a space for spirituality. We explore these origins, and turn to the early modern period when such interests exploded into poems, novels, plays, and paintings—a period that coincided with new world discoveries and new possibilities for ‘golden ages’ abroad. We read works by Virgil, St. Jerome, Petrarch, Shakespeare, Spenser, Milton, Tasso, Seamus Heaney, and others, and take at least one trip to a local gallery (New Haven or NY). Finally, we explore recent work in ecocriticism and environmental studies in order to grapple with ancient and early modern understandings of the natural world. Priority given to juniors and seniors.

ITAL 384a / FILM 362a / FREN 384a / JDST 289a / LITR 338a, Representing the Holocaust Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

*** ITAL 470a or b and ITAL 471a or b, 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 or b, 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 75 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** Hiroyo Nishimura

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** Staff

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** Staff

Continuation of JAPN 150. After JAPN 150 or equivalent. L5 RP

*** JAPN 156a, Advanced Japanese III** Kumiko Nakamura

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** Staff

Continuation of JAPN 156. After JAPN 156 or equivalent. L5

JAPN 170a, 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 223a / HUMS 295a / PLSC 307a, Trials of Uncertainty** Norma Thompson
Is the demise of the trial at hand? The trial as cultural achievement, considered as the *epitome* of humanistic inquiry, where all is brought to bear on a crucial matter in an uncertain context. Truth may be hammered out or remain elusive, but the expectation in the court case has been that the adversarial mode works best for sorting out evidentiary conundrums. Inquiries into issues of meaning of the trial, its impartiality, and challenges to its endurability. The role of character, doubt, and diagnosis explored in Sophocles, Plato, Cicero, Burke, Jane Austen, Tocqueville, and Kafka, as well as in twentieth-century trials, films, documentaries, and twenty-first-century medical narratives. WR, HU

*** JDST 235b / MMES 235b / NELC 231b / RLST 147b, Introduction to Judaism in the Ancient World: From Temple to Talmud** Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; the synagogue; faith in reason; Sabbath and festivals; history and its redemption. No prior background in Jewish history assumed. HU

JDST 265b / HIST 345b / MMES 148b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU

*** JDST 270b / HIST 232Jb / HUMS 443b / MMES 342b / RLST 201b, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness – humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts

toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

JDST 289a / FILM 362a / FREN 384a / ITAL 384a / LITR 338a, Representing the Holocaust Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

*** JDST 305b / HEBR 158b / MMES 168b, Contemporary Israeli Society in Film** Shiri Goren

Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private and collective memory. Readings in Hebrew and English provide a sociohistorical background and bases for class discussion. HEBR 140 or permission of instructor. L5, HU RP

*** JDST 306b / MMES 157b / NELC 157b, Israeli Narratives** Shiri Goren

This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz's major novel *A Tale of Love and Darkness*, *Anne Frank: The Graphic Diary*, Maya Arad's novella "The Hebrew Teacher," TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU TR

*** 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 326a / LITR 317a, Marxist Theory of Literature** Hannan Hever

The role of Marxist thought in understanding literary institutions and texts in the twentieth century. Marx's theory of ideology; Lukacs's theory of literature as the basis for development of Marxist literary theory; the Frankfurt and materialistic schools. Readings include works by Raymond Williams, Catherine Belsey, Walter Benjamin, Pierre Macherey, and Frederic Jameson. HU

*** JDST 335a / GMAN 254a / PHIL 274a / RLST 249a, Jewish Philosophy** Paul Franks

Introduction to Jewish philosophy, including classical rationalism of Maimonides, classical kabbalah, and Franz Rosenzweig's inheritance of both traditions. Critical examination of concepts arising in and from Jewish life and experience, in a way that illuminates universal problems of leading a meaningful human life in a multicultural and increasingly globalized world. No previous knowledge of Judaism is required. WR, HU

*** JDST 342b, History of the State of Israel** Staff

This seminar examines the history of the state of Israel from the precursors of the Zionism in the nineteenth century to the present. In this course, we examine the origins of Zionist ideology and inquire into the historical conditions as well as the political strategies and the cultural developments that made its success possible. Topics of study include immigration to Palestine/Israel 1840s -2000; the Israel-Arab conflict before and after 1948; Israeli politics of nation building: statehood, religion and ethnicity; and the emergence of modern Hebrew Culture. Intended for advanced undergraduates, this course also focuses on the different ways in which the history of the emergence of Israel has been understood and written. HU

*** JDST 343b / ENGL 483b / HUMS 428b / LITR 305b, 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 392b / NELC 382b / RLST 405b, Mishnah Seminar: Tractate Megillah** Steven Fraade

Study of rabbinic texts treating rules for the public recitation and translation of the Scroll of Esther on the holiday of Purim and of other sacred scriptures and translations throughout the year, with special attention to the relation between law and ritual and

the narrativity of both. EMWAR area of concentration designations: STHJ, RabJud, ScrInterp. Prerequisite: reading fluency in ancient Hebrew. L5, HU

*** JDST 401b / HEBR 152b, Reading Academic Texts in Modern Hebrew** Dina Roginsky

Reading of academic texts in modern Hebrew, for students with a strong background in Hebrew. Discussion of grammar and stylistics; special concentration on the development of accuracy and fluency. Prerequisite: HEBR 150 or permission of instructor. Conducted in Hebrew. L5 RP

*** JDST 403b / HEBR 169b / LING 165b / MMES 162b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky

Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Hebrew and Arabic have been in cultural contact, especially in medieval Spain, the Middle East, and North Africa—as evidenced by the Judeo-Arabic languages. In modern Israel, Arabic is the native tongue of about 20% of its population, yet lack of communication exists today between Hebrew speakers and Arabic speakers for mainly political reasons. This L5 advanced Hebrew class explores cultural and linguistic contacts between the two languages and relationships between the communities, including both Jewish and non-Jewish Arabic speakers and Hebrew speakers. Additionally, students benefit from regular meetings with a parallel L5 Arabic class which discusses similar topics. The shared meetings enable Hebrew learners and Arabic learners to participate together in one class, to promote social interaction based on mutual respect and to focus on cultural and linguistic aspects of the material. L4 Hebrew or equivalent (placement test). L5 RP

*** JDST 416a / GMAN 102a, Reading Yiddish** Joshua Price

This course is designed to build literacy in Yiddish, the vernacular of Ashkenazi Jewry. With focus on the accelerated treatment of Yiddish grammar, regularly supplemented with simple primary texts (poems, songs, folktales), and followed by close readings of (modern) Yiddish literature, students will be able to navigate most Yiddish texts with the aid of a dictionary. May not be taken concurrently with elementary or intermediate German.

*** JDST 418b / GMAN 103b, Reading Yiddish II** Joshua Price

Intermediate study of Yiddish literary language with annotated readings from classic authors including: Mendeleyev, Sholem Aleichem, Peretz, Bergelson, Der Nister, Bashevis, as well as American and Soviet Yiddish poetry. Secondary readings in English will offer a broader introduction to the modern Yiddish canon. Continuation of GMAN 102/ JDST 416. Previous knowledge of German or Hebrew-Aramaic recommended but not required.

JDST 701a / RLST 763a, The Bible Christine Hayes

This course introduces students to the writings common to both Jewish and Christian scripture (the twenty-four books of the Hebrew Bible or Tanakh found in all Bibles) and examines these writings as diverse and often conflicting expressions of the religious life and thought of ancient Israel as well as a foundational element of Western civilization. Special emphasis on the writings' cultural and historical setting in the ancient Near East; close reading of selected passages; the interpretive history of selected passages influential in Western culture. Students are also introduced to a wide range of

critical and literary approaches to biblical studies, including source criticism, tradition criticism, redaction criticism, and contemporary literary criticism. Students view course lectures, which survey the entire Bible, online; class time focuses on comparative materials, close readings, and the interpretation of specific biblical passages in Jewish and Christian culture.

JDST 721a or b / NELC 703 / RLST 751b, Introduction to Judaism in the Ancient World: From Temple to Talmud Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; the synagogue; faith in reason; Sabbath and festivals; history and its redemption.

JDST 727a, Mishnah Seminar: Tractate Megillah Steven Fraade

Study of rabbinic texts treating rules for the public recitation and translation of the Scroll of Esther on the holiday of Purim and of other sacred scriptures and translations throughout the year, with special attention to the relation between law and ritual and the narrativity of both. *EMWAR area of concentration designations: STHJ, RabJud, ScrInterp*. Prerequisite: reading fluency in ancient Hebrew.

JDST 760a / RLST 772a, Rabbinics Research Seminar Christine Hayes

An in-depth survey of research debates and of methods and resources employed in the study of classical (pre-Geonic) rabbinic literature of all genres. Required of graduate students in ancient Judaism. Prerequisites: knowledge of Hebrew and Aramaic, ability to read academic Hebrew, and permission of the instructor.

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 764b / HIST 590b / MDVL 590b / RLST 777b, Jews in Muslim Lands from the Seventh through the Sixteenth Century Ivan Marcus

Introduction to Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire.

JDST 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 842a / CPLT 688a / RLST 775a, What is Political Theology? Hannan Hever
This course investigates the theological aspects of modern political ideologies. It takes its title from the controversial work of the German political thinker Carl Schmitt, who argued that theological assumptions stood behind the veneer of secular politics. Concepts such as sovereignty, citizenship, universalism, law, and the state of exception have been said to have their provenance in Jewish and Christian concepts of God, election, Messiah, the commandment, and antinomianism. In recent years the study of the theological origins of political concepts has become important for both those seeking to critique the neutrality of certain western-democratic institutions as well as those hoping to better understand the relationship between religion and politics. Subjects covered in the course include sovereignty, universalism, law, election, commandment, messianism, and nationalism. Readings focus on the work of modern political thinkers such as Benedict Spinoza, Thomas Hobbes, and Bruno Bauer, whose normative works assumed a direct relationship between the political and the theological, as well as those who have theorized the very idea of political-theology, such as Martin Buber, Alain Badiou, Slavoj Zizek, Daniel Boyarin, and Giorgio Agamben.

JDST 861b / HIST 597b / RLST 797b, Twentieth-Century Jewish Politics David Sorkin

This seminar explores major aspects of twentieth-century Jewish politics with an emphasis on new forms of political practice.

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: KHRM 120 or equivalent. L3 RP 1½ Course cr

KHRM 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: KHRM 130 or equivalent. L4 RP 1½ Course cr

Korean (KREN)

* **KREN 110a / KREN S110, 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, 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** Seungja Choi

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** Angela Lee-Smith

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 Angela Lee-Smith

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, Advanced Korean for Advanced Learners** Angela Lee-Smith

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 1½ Course cr

* **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 American Studies (LAST)

* **LAST 030b / ANTH 030b / ARCG 030b, Inca Culture and Society** Richard Burger

History of the Inca empire of the Central Andes, including the empire's impact on the nations and cultures it conquered. Overview of Inca religion, economy, political organization, technology, and society. Ways in which different schools of research have approached and interpreted the Incas over the last century, including the influence of nationalism and other sources of bias on contemporary scholarship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. 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 / SPAN 223a, 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 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 232a / ANTH 232a / ARCG 232a, Ancient Civilizations of the Andes Richard Burger

Survey of the archaeological cultures of Peru and Bolivia from the earliest settlement through the late Inca state. SO

*** LAST 243a / SPAN 243a, Advanced Spanish Grammar** Staff

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 251b / EP&E 257b / PLSC 399b, Political Power and Inequality in Latin America** Ana De La O

Overview and analysis of politics in Latin America. The emergence of democracy and the forces that led to the unprecedented increase in inequality in the twentieth century. Topics include institutional design, historical legacies, corruption, clientelism, and violence. SO

*** LAST 253b / HIST 253Jb, Dissidence and Control in Early Modern Spain and its Empire** Staff

Aspects of Spanish culture and society in the Golden Age (c. 1550–1650) that demonstrate discontent, dissidence, and suggestions for reform. Emphasis on the intersection of historical and literary sources and the dynamic between popular and elite cultures. WR, HU

*** LAST 266a / SPAN 266a, Studies in Latin American Literature I** Rolena Adorno

Cultural encounters in the New World as interpreted by authors of native American (Aztec and Inca) cultural traditions, the Spanish conquistadors and friars who encountered them and their heirs, and the Mexican creole nun (the now-world-famous Sor Juana Inés de la Cruz) who gave voice to some of their traditions as she created a space for her own writing in the literary world. Their resonance and legacy today. L5, HU

LAST 267b / LITR 258b / SPAN 267b, Studies in Latin American Literature II

Roberto Gonzalez Echevarria

An introduction to Latin American literature from the nineteenth century to the present. Works by Borges, García Márquez, Paz, Neruda, Cortázar, and others. L5, HU

*** LAST 293b / ER&M 293b / HIST 393Jb, 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 334b / ER&M 364b / HIST 334Jb, Ethnicity, Nationalism, and the Politics of Knowledge in Latin America** Marcela Echeverri Munoz

Examination of ethnicity and nationalism in Latin America through the political lens of social knowledge. Comparative analysis of the evolution of symbolic, economic, and political perspectives on indigenous peoples, peasants, and people of African descent from the nineteenth century to the present. Consideration of the links between making ethnic categories in the social sciences and in literature and the rise of political mechanisms of participation and representation that have characterized the emergence of cultural politics. WR, HU RP

*** LAST 343a / SPAN 343a, Humor in Contemporary Spanish American Narrative** Aníbal González-Pérez

With the use of theoretical and philosophical discussions of humor, examination of how contemporary Spanish American narrative deploys humor for a variety of purposes: from social satire and critical reflection to the promotion of harmony among individuals and social groups. Authors include Bryce Echenique, Luis Rafael Sánchez, Cabrera Infante, and Augusto Monterroso. Conducted in Spanish. L5, HU

LAST 361a / HIST 361a, History of Brazil Stuart Schwartz

Brazilian history from European contact to the reestablishment of civilian government in the 1990s. Focus on the multiethnic nature of Brazilian society, the formation of social and political patterns, and the relationship of people to the environment. HU

*** LAST 385a / LITR 260a / PORT 385a, Brazilian Novel of the 21st Century** Kenneth David Jackson

Changing narratives, themes, styles, and aesthetic ideals in current Brazilian prose and poetry. The writers' attempts to express or define a personal, national, and global consciousness influenced by the return of political democracy to Brazil. Focus on readings published within the last five years. Readings and discussion in English; texts available in Portuguese. WR, HU

*** LAST 386a / GLBL 215a / MGRK 237a / PLSC 375a / SOCY 389a, Populism** Paris Aslanidis

Investigation of the nature of the populist phenomenon and its impact on politics, society, and the economy in various regions of the world. Conceptual and methodological analyses are supported by comparative assessments of various empirical instances, from populist politicians such as Hugo Chavez and Donald Trump, to populist social movements such as the Tea Party and Occupy Wall Street. SO

*** LAST 391b / LITR 289b / SPAN 392b, Literature of the Americas, North and South** Rolena Adorno

Readings of U.S. and Latin American short stories and novels to explore related themes and narrative structures. Topics include the literary dialogue between Anglo and Latin American writers and their comparative treatments of history, myth, memory, and war. Paired readings of Poe and Cortázar; Bierce and Fuentes; Crane and Borges; and Faulkner's *Absalom, Absalom!* and García Márquez's *One Hundred Years of Solitude*. Conducted in English; a section in Spanish available depending on demand. Readings of Latin American texts in Spanish for Spanish and Literature majors. Prerequisite: SPAN 140, 142, 145, or equivalent. HU

*** LAST 423a / EP&E 243a / GBL 336a / PLSC 423a, Political Economy of Poverty Alleviation** Ana De La O

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. SO

Latin (LATN)

LATN 110a, Beginning Latin: The Elements of Latin Grammar Carl Rice

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 Treasa Bell

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 Christina Kraus

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 421b, Vergil's *Aeneid*** Kirk Freudenburg

An in-depth study of Vergil's *Aeneid* within its political context. L5

*** LATN 428a, Verse Letters** Irene Peirano Garrison

Introduction to the forms and themes of literary letters written in verse. Close reading of poetic letters in the Roman tradition, including those of Horace, Propertius, and Ovid. Comparison with literary letters written in prose, such as those of Pliny the Younger, and with documentary letters from the Greco-Roman world. L5, HU

*** LATN 429b, The Roman World of the Plinys** Andrew Johnston

The Roman world of the Flavian Age and the principate of Trajan (c. 70–110 C.E.) as seen through the writings of two of its public intellectuals, Pliny the Elder and his nephew Pliny the Younger. The former's encyclopedic *Natural History* and the latter's *Letters* and *Panegyric*. Politics, physical science, history, literature, zoology, magic, patronage, art history, and slavery during the period. Prerequisite: LATN 131 or equivalent. L5, HU

*** LATN 432a, Seneca: Letters on Ethics** Brad Inwood

Lucius Annaeus Seneca was one of the most distinguished writers of Latin prose and also an important Stoic philosopher. This course focusses on readings in his most important and best known works, the *Epistulae Morales*. Most of the letters we read deal with themes of broad general interest, but some include the more challenging philosophical topics in Stoic ethics that form the culmination of the work. We aim to read the letters included in *Seneca: Selected Letters* ed. Catharine Edwards (Cambridge 2019), which has an excellent literary and philological commentary; a few additional letters are read with the more philosophical commentary found in Brad Inwood *Seneca: Selected Philosophical Letters* (Oxford 2007). Prerequisite: L4 Latin course or advanced high school Latin. L5, HU

LATN 437a, Roman Comedy Joseph Solodow

A close reading of the *Pseudolus* of Plautus and the *Adelphoe* of Terence, with attention to the literary, social, and historical contexts of both plays. L5, HU

Linguistics (LING)

LING 103a, Language Contact in the Ancient World Chelsea Sanker

What languages were people using in our earliest written records? How were they written? What were people talking about in these texts? This course examines the languages of the ancient near east and other civilizations that they interacted with, from Greece to Egypt. Language contact is reflected both in ancient people's discussion of languages and use of translations, as well as in loanwords and other influences of languages on each other. Based on the written records, we also have information about other languages that were never written down, through names and other borrowed words. From the earliest tokens tracking trade commodities to epic poetry, these written records give us insights into the lives of people in the ancient world: The complaints of scribes in training, correspondences between kings, and dedications to gods. HU

LING 110a, Language: Introduction to Linguistics Claire Bowerin

The goals and methods of linguistics. Basic concepts in phonology, morphology, syntax, and semantics. Techniques of linguistic analysis and construction of linguistic models. Trends in modern linguistics. The relation of linguistics to psychology, logic, and other disciplines. SO

LING 112b, Historical Linguistics Chelsea Sanker

Introduction to language change and language history. Types of change that a language undergoes 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. 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 117a, Language in America Staff

This course examines the linguistic landscape of the USA. Covering Indigenous, immigrant, and colonial languages, with a focus on contemporary issues of language and politics, race and ethnicity, discrimination, and reclamation. Language variation, including varieties of English (regional varieties, African American Language), and ideologies around language use (such as 'English only' movements). SO

LING 125b / SKRT 120b, Introductory Sanskrit II Aleksandar Uskokov

Continuation of SKRT 110. Focus on the basics of Sanskrit grammar; readings from classical Sanskrit texts written in Devanagari script. After SKRT 110. L2 1½ Course cr

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 148b / SKRT 140b, Intermediate Sanskrit II Aleksandar Uskokov

Continuation of SKRT 130, focusing on Sanskrit literature from the *kavya* genre. Readings include selections from the *Jatakamala* of Aryasura and the opening verses of Kalidasa's *Kumarasambhava*. After SKRT 130 or equivalent. L4

* **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 164b / GMAN 164b, The History of the German Language** Theresa Schenker

Introduction to important historical and cultural developments in the German language through exemplary literary and cultural texts and objects. Students gain insight into early development of German language from Old High German to Middle High German and to Early New and New High German. Major literary works from each epoch are examined from the perspective of their use of language. Students also explore cultural and historical contexts which led to linguistic changes. Prerequisite: successful completion of L4 German. L5, HU

* **LING 165b / HEBR 169b / JDST 403b / MMES 162b, Languages in Dialogue:**

Hebrew and Arabic Dina Roginsky

Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Hebrew and Arabic have been in cultural contact, especially in medieval Spain, the Middle East, and North Africa – as evidenced by the Judeo-Arabic languages. In modern Israel, Arabic is the native tongue of about 20% of its population, yet lack of communication exists today between Hebrew speakers and Arabic speakers for mainly political reasons. This L5 advanced Hebrew class explores cultural and linguistic contacts between the two languages and relationships between the communities, including both Jewish and non-Jewish Arabic speakers and Hebrew speakers. Additionally, students benefit from

regular meetings with a parallel L5 Arabic class which discusses similar topics. The shared meetings enable Hebrew learners and Arabic learners to participate together in one class, to promote social interaction based on mutual respect and to focus on cultural and linguistic aspects of the material. L4 Hebrew or equivalent (placement test). L5 RP

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 220b / PSYC 318b, General Phonetics Staff

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 227b / PSYC 327b, Language and Computation I Robert Frank

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: prior programming experience or permission of instructor. QR, SO

*** LING 232b, Phonology I** Staff

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 234a, 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 241b, 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. 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 Veneeta 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 264b, Semantics II** Veneeta Dayal

The model-theoretic approach to semantics and its treatment of core linguistic phenomena. Topics include quantification; tense, aspect, and modality; context and interpretation; and the semantics-pragmatics interface. Prerequisite: LING 263 or permission of instructor. SO

LING 271a / PHIL 271a, Philosophy of Language Zoltan Szabo

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU

*** LING 280a, Morphology** Jim Wood

The theory of word structure within a formal grammar. Relation to other areas of grammar (syntax, phonology); basic units of word structure; types of morphology

(inflection, derivation, compounding). Prerequisites: LING 232 and 253, or permission of instructor. SO

*** LING 300a / CGSC 300a / LING 700a / PSYC 309 / PSYC 332a / PSYC 632a, The**

Cognitive Science of Sign Languages Maria Pinango and Muye Zhang

Natural sign languages like American Sign Language have all of the structure and complexity of spoken languages. They are learned and processed like spoken languages, and activate neural structures that maximally overlap with those activated by spoken languages. These findings have not only had important implications for the sociopolitical status of Deaf people, as a native, American minority community but also have caused linguists and psychologists to re-evaluate their most fundamental theories of language representation and processing in the mind and brain. The course introduces you to the analysis of sign languages at different levels of linguistic structure and related aspects of cognition in the visual modality. The primary goal is to encourage you as linguists, psychologists, and cognitive scientists to consider how natural sign languages can and must inform your linguistic theories (linguistics), models of language and cognition (psychology), and technological applications of language processing (computer science/artificial intelligence). We also consider the ways in which signing communities/Deaf culture interact with the hearing world often as marginalized minority groups and reflect upon access to language and information as a basic human right. Some background in linguistic structure, cognitive science, any signed language, or permission of the instructor is preferred. SO

*** LING 326b / LING 726, Language Change Practicum** Veneeta Dayal and Joshua Phillips

Advanced work in language change focusing on practical application of methods in historical linguistics. The class gives students practice in research methods related to studying language change. Exact topics vary from year to year but could include phylogenetic analysis, methods in language and ecology, and historical reconstruction and language reclamation. An emphasis is placed on collaborative work which may result in academic publications. Prerequisite: LING 212 or equivalent or permission of instructor.

*** LING 341a, Phonology at the Interfaces: Contrast Dispersion** Staff

This course explores how languages of the world structure contrasts in sound systems through a property known as contrast dispersion. We analyze contrast dispersion from a variety of different perspectives (for example, phonetic, phonological, diachronic, etc.). Students explore different ways the contrast dispersion has been defined over time, alternative theoretical approaches to contrast dispersion, and how scholars have formally modeled phenomena involving contrast dispersion. Prerequisite: LING 232 SO

*** LING 349b, Topics in Phonology: The Phonetics-Phonology Interface** Staff

The relationship between phonology, as the mental representation of speech, and phonetics, as the physical substance of speech. Universal and language-particular phonetics; phonetic knowledge as grammatical knowledge; phonetic detail in phonological representation and computation; unified vs. modular conceptions of the phonetics-phonology divide; the shaping of phonological systems by phonetic pressures; the shaping of phonetic patterning by phonological structure. Prerequisites: LING 220 and 235, or with permission of instructors. SO

*** LING 376b / PHIL 445b, Implicature and Pragmatic Theory** Laurence Horn

This seminar explores theoretical and experimental approaches to conversational and conventional implicature. We examine the role that pragmatic inference plays in the determination of what is said and of truth-conditional content in neo-Gricean pragmatics and relevance theory as well as considering arguments for and against the grammatical view of scalar implicature. Our investigations draw on evidence from linguistic diagnostics, corpora, and a range of experimental studies on the acquisition, processing, and patterning of scalar implicature, negative strengthening, and exhaustivity in focus constructions. Finally, we review current work on the effects of discourse context, politeness considerations, and lexical semantics in constraining when and how pragmatic inferences are drawn. Prerequisite: At least one course in semantics, pragmatics, or philosophy of language; or permission of instructor. SO RP

*** LING 378b, The Syntax of Speech Participants** Raffaella Zanuttini

This course focuses on grammatical elements that make salient the role of speaker and addressee: markers of politeness; pronouns that express the familiar and polite distinction; vocatives; as well as “presentatives,” including sentences whose function is to bring something to the attention of the addressee. On the empirical side, we discover, describe, and compare elements that convey information about the addressee, the speaker, or the speaker-addressee relation. On the theoretical side, we ask which aspects of the information that they convey should be encoded in the syntax, if any, and how it should be encoded. Prerequisite: LING 253, or permission of instructor. SO

*** LING 396a / LING 696 / LING 796a, Semantic Investigations in an Unfamiliar Language** Veneeta Dayal

This course introduces students to semantic fieldwork. It chooses a language that is likely not known to any student in the class and has no substantive semantic literature. Students are introduced to a phenomenon in the language on which there is some syntactic literature, either in that language or in one or more related language. This provides a starting point for students to articulate questions to investigate that are primarily semantic nature. Working with a native speaker consultant, students elicit data that answer these initial questions but very likely lead to further questions to investigate. To keep the elicitation focused, these investigations are restricted to topics related to the primary phenomenon discussed, while allowing some margin for individual interests. In addition to the syntactic and semantic literature on the chosen topic or topics, students also read material on fieldwork methodologies for linguistics generally as well as those specifically for semantics. Students work in small groups to fulfill part of the requirements. Prerequisites: LING 253, LING 263 or permission of the instructor SO

*** LING 490a / PSYC 372a, 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.

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 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. This is a 1.5 credit intensive writing course that fulfills one WR requirement. Friday sessions will alternate between writing workshops and field trips to Yale collections. WR, HU 1½ Course cr

* **LITR 028a, Medicine and the Humanities: Certainty and Unknowing** Staff

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 130b / HUMS 130b, How to Read** Martin Hagglund

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 140a, How To Compare** Samuel Hodgkin

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 exiled 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 143b / ENGL 192b / FILM 240b, World Cinema Marta Figlerowicz

Development of ways to engage films from around the globe productively. Close analysis of a dozen complex films, with historical contextualization of their production and cultural functions. Attention to the development of critical skills. Includes weekly screenings, each followed immediately by discussion. HU

*** LITR 153a / AFAM 320a / CLCV 338a, Classics in Africa and the Black Diaspora**
Emily Greenwood Milne

The reception and appropriation of Greco-Roman classics in Africa and the black diaspora during the twentieth century. The same classical canon that had been used to furnish arguments for colonialism, imperialism, and racism read by black writers and artists in ways that subverted those arguments. Works include drama from Nigeria and South Africa, Caribbean poetry and autobiography, novels by Ralph Ellison and Toni Morrison, and the Odysseus collages of Romare Bearden. WR, HU

*** LITR 154a / ENGL 395a / HUMS 380a, 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 168a or b / ENGL 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 include Homer's *Iliad* and plays by Aeschylus, Sophocles, Euripides, Seneca, Shakespeare, Racine, Ibsen, Chekhov, Brecht, Beckett, and Soyinka. Focus on textual analysis and on developing the craft of persuasive argument through writing. WR, HU

*** LITR 169b / ENGL 130b, 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 172a / EALL 210a / EAST 210a, Man and Nature in Chinese Literature Kang-I Chang

An exploration of man and nature in traditional Chinese literature, with special attention to aesthetic and cultural meanings. Topics include the concept of nature and literature; neo-Taoist self-cultivation; poetry and Zen (Chan) Buddhism; travel in literature; loss, lament, and self-reflection in song lyrics; nature and the supernatural in classical tales; love and allusions to nature; religious pilgrimage and allegory. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 200. HU TR

LITR 174b / EALL 211b / EAST 241b / WGSS 405b, Women and Literature in Traditional China Kang-I Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. 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 183a / HUMS 180a / ITAL 310a, Dante in Translation Simona Lorenzini

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 191a or b / ITAL 328a or b, Early Modern Ecologies: Representing Peasants, Animals, Labor, Land** Jane Tylus

To what extent does writing about the land and depicting landscapes in early modern Europe reflect a new interest in engaging the boundaries between the human and non-human? What does it show about the commitment of artists and intellectuals to representing cultures and environments not necessarily their own? And how did writers and artists seek to legitimize their intellectual labors by invoking images of agricultural work? Since antiquity, artists have often chosen to make the countryside and its human and non-human denizens symbols of other things: leisure, song, exile, patriotism, erotic sensibilities, anti-urbanism. Early Christianity in turn embraced the desert—and the countryside—as a space for spirituality. We explore these origins, and turn to the early modern period when such interests exploded into poems, novels, plays, and paintings—a period that coincided with new world discoveries and new possibilities for ‘golden ages’ abroad. We read works by Virgil, St. Jerome, Petrarch, Shakespeare, Spenser, Milton, Tasso, Seamus Heaney, and others, and take at least one trip to a local gallery (New Haven or NY). Finally, we explore recent work in ecocriticism and environmental studies in order to grapple with ancient and early modern understandings of the natural world. Priority given to juniors and seniors.

LITR 194a / ENGL 154a / FREN 216a / HUMS 134a, The Multicultural Middle Ages
Ardis Butterfield

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. HU

LITR 202b / RUSS 260b, Nabokov and World Literature Marijeta Bozovic
Vladimir Nabokov's writings explored in the context of his life story and of the structures and institutions of literary life in Russian émigré circles. Themes of exile, memory, and nostalgia; hybrid cultural identities and cosmopolitan elites; language and bilingualism; the aims and aesthetics of émigré and diasporic modernism in novels and other media. Additional readings from works of world literature inspired and influenced by Nabokov. Readings and discussion in English. HU

*** LITR 212b / HIST 238Jb / ITAL 322b, USA: Travelers, Immigrants, Exiles from Italy (1920-2001)** Giuseppe Mazzotta

The course focuses on the experiences of Italian travelers to North America. Its goal is to promote a critical historical consciousness of the social, political, and cultural reality of the Italian presence in the United States from the end of the First World War to the beginning of the twenty-first century. Students engage with a variety of media: from letters and diaries to memoirs and unpublished documents, from novels and poems to music and films. Through close readings and literary analyses, this class considers the historical and cultural context of each source, eliciting reflections in at least three key areas: national identity, transcultural encounters, and the relevance of the arts for travelers, migrants and exiles. HU

LITR 214b / FREN 240b / HUMS 201b, 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

*** LITR 226a / EP&E 360a / GMAN 345a / HUMS 341a, Sound of the Police: The Idea of Order after the French Revolution** Paul North

A theoretical investigation into the idea and function of police in modern sovereign states, particularly after the French Revolution, when a 'people' meant to govern itself, represent itself, even restrain itself, in order to do this, needs something that has come to be called 'order.' How does government of the people, by the people, for the people divide itself into a segment that surveils and curtails and a segment that is surveilled and curtailed? Since the 18th century the institution of the police has taken on an unprecedented role in life in states, and can sometimes be the only direct tie between citizens and the state itself. And the first thing a citizen experiences is often the 'woop, woop' (to quote KRS-One, 'Sound of da Police') of the police coming. Following this sonic footprint, we read theories of the police in Hobbes, Schiller, Walter Benjamin, and Michel Foucault, and we listen for the police in cultural objects, such as films (*Invasion of the Body Snatchers*, *Dirty Harry*, *The Thin Blue Line*), television programs (*Law and Order*, *The Wire*), and music (*Sorrow, Tears, and Blood* by Fela Kuti, *Sound of da Police* by Teacha). For a glimpse of the possible music, see spotify playlist (<https://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrEhttps://open.spotify.com/playlist/2yr6lgy8dhPpxFQ8qddRrE>). HU

*** 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 247a / GMAN 378a / HUMS 345a, German Fiction Around 1800** Kirk Wetters

The literary forms of novel, the novella, the short story and the fairy tale were fundamentally reconfigured in Germany around 1800. In the decades 1790-1820, narrative forms begin to take on the importance and enduring shape that will extend through the 19th century and beyond. Techniques such as frame narration (stories in stories), unreliable narrators, gothic and supernatural elements, the Bildungsroman, the novel of the artist, take shape in the context of a highly experimental literary culture. Works covered include Goethe, *Conversations of German Refugees* and Wilhelm Meister's *Journeyman Years*; Schiller, *The Ghost-Seer*; Tieck, *Blond Eckbert*; Novalis, *Heinrich of Ofterndingen*; E.T.A. Hoffmann, *The Sandmann* and *Kreiseriana*. Readings are available in German and English. HU

*** LITR 248b / GMAN 326b, Franz Kafka and Thomas Mann: Two Modernisms** Jan Hagens

Comparison of Kafka's radical modernism and Mann's neoclassical realism as fundamentally different modes of responding to the challenges of twentieth-century culture. Close reading of short stories by both writers, with attention to the authors'

themes, literary techniques, and worldviews. Discussion in English; readings in German or English. HU TR

*** LITR 250b / AFAM 287b / AFST 412b / AMST 465b / FREN 412b, Postcolonial Theory and Literature** Fadila Habchi

A survey of the principal modes of thought that have animated decolonization and life after colonialism, as seen in both theoretical and literary texts. Concentration on the British and French imperial and postcolonial contexts. Readings in negritude, orientalism, psychoanalysis, poststructuralism, and novels. Lectures in English; readings available both in French and in English translation. HU RP

*** LITR 252b / PORT 350b, Machado de Assis** Kenneth David Jackson

The place of Machado de Assis in world literature explored through close reading of his collected short stories in translation. Focus on Machado's hybrid literary world, skeptical critique of empire in Brazil, psychological and narrative constructions. Readings and discussion in English; reading of texts in Portuguese for Portuguese majors. WR, HU TR

*** LITR 256a / CPLT 657a / PORT 352a / PORT 652a, Clarice Lispector: The Short Stories** Kenneth David Jackson

This course is a seminar on the complete short stories of Clarice Lispector (1920-1977), a master of the genre and one of the major authors of twentieth-century Brazil known for existentialism, mysticism and feminism. WR, HU TR

LITR 258b / LAST 267b / SPAN 267b, Studies in Latin American Literature II

Roberto Gonzalez Echevarria

An introduction to Latin American literature from the nineteenth century to the present. Works by Borges, García Márquez, Paz, Neruda, Cortázar, and others. L5, HU TR

*** LITR 260a / LAST 385a / PORT 385a, Brazilian Novel of the 21st Century** Kenneth David Jackson

Changing narratives, themes, styles, and aesthetic ideals in current Brazilian prose and poetry. The writers' attempts to express or define a personal, national, and global consciousness influenced by the return of political democracy to Brazil. Focus on readings published within the last five years. Readings and discussion in English; texts available in Portuguese. WR, HU TR

*** LITR 265b / EALL 256b / EAST 358b / GLBL 251b / HUMS 272b, China in the World** Jing Tsu

Recent headlines about China in the world, deciphered in both modern and historical contexts. Interpretation of new events and diverse texts through transnational connections. Topics include China and Africa, Mandarinization, labor and migration, Chinese America, nationalism and humiliation, and art and counterfeit. Readings and discussion in English. HU

LITR 279b / ER&M 209b / VIET 220b, Introduction to Vietnamese Culture, Values, and Literature Quang Van

Introduction to Vietnamese culture and values. Topics include cultural and national identity, aesthetics, the meaning of life, war, and death. Selected readings from Zen poems, folklore, autobiographies, and religious and philosophical writings. Course is

taught in English and is an alternative to Western perspectives. Readings in translation. No previous knowledge of Vietnamese required. HU

LITR 284a / FREN 270a / GMAN 214a, Mad Poets of the Nineteenth and Twentieth Century Thomas Connolly

Nineteenth- and twentieth-century French (and some German) poetry explored through the lives and works of poets whose ways of behaving, creating, and perceiving the world might be described as insane. Authors include Hölderlin, Nerval, Baudelaire, Rimbaud, Verlaine, Mallarmé, Lautréamont, Apollinaire, Breton, Artaud, and Celan. Lectures in English; readings available both in original language and in English translation. WR, HU

LITR 286b / PORT 351b, Pessoa, Lispector, Rosa, Saramago Kenneth David Jackson
Study of works in translation by four contemporary masters in the Portuguese language, Fernando Pessoa, Clarice Lispector, João Guimarães Rosa and José Saramago. These authors radically experiment with prose in order to question notions of identity, existence, and meaning. WR, HU

*** LITR 289b / LAST 391b / SPAN 392b, Literature of the Americas, North and South**
Rolena Adorno

Readings of U.S. and Latin American short stories and novels to explore related themes and narrative structures. Topics include the literary dialogue between Anglo and Latin American writers and their comparative treatments of history, myth, memory, and war. Paired readings of Poe and Cortázar; Bierce and Fuentes; Crane and Borges; and Faulkner's *Absalom, Absalom!* and García Márquez's *One Hundred Years of Solitude*. Conducted in English; a section in Spanish available depending on demand. Readings of Latin American texts in Spanish for Spanish and Literature majors. Prerequisite: SPAN 140, 142, 145, or equivalent. HU

*** 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 305b / ENGL 483b / HUMS 428b / JDST 343b, 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 317a / JDST 326a, Marxist Theory of Literature** Hannan Hever

The role of Marxist thought in understanding literary institutions and texts in the twentieth century. Marx's theory of ideology; Lukacs's theory of literature as the basis for development of Marxist literary theory; the Frankfurt and materialistic schools. Readings include works by Raymond Williams, Catherine Belsey, Walter Benjamin, Pierre Macherey, and Frederic Jameson. HU

LITR 318a or b / ENGL 191a or b / HUMS 206a or b / MMES 215b / NELC 201a or b,

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 323a / ENGL 237a / EVST 237a / HUMS 234a, Animals in Literature and Theory** Jonathan Kramnick

Consideration of the role animals play in our aesthetic, ethical, political, and scientific worlds through reading of fiction, poetry, philosophy, and critical theory. Topics include: animal sentience and experience; vegetarianism; animal fables; pet keeping; animals alongside disability, race, and gender; and the representation of animal life in the visual arts. WR, HU

*** LITR 324b / HUMS 320b / THST 330b, Representations of the Underworld** Toni Dorfman

What is the underworld? What questions have different ideas about the underworld posed about mortality, freedom, and goodness? Topics include dreams, hell, ghosts, the unconscious, and string theory. Sophomore standing required. HU

LITR 338a / FILM 362a / FREN 384a / ITAL 384a / JDST 289a, Representing the Holocaust Maurice Samuels and Millicent Marcus

The Holocaust as it has been depicted in books and films, and as written and recorded by survivors in different languages and national contexts. Questions of aesthetics and authority, language and its limits, ethical engagement, metaphors and memory, and narrative adequacy to record historical truth. Interactive discussions about films (*Life Is Beautiful*, *Schindler's List*, *Shoah*), novels, memoirs (Primo Levi, Charlotte Delbo, Art Spiegelman), commentaries, theoretical writings, and testimonies from Yale's Fortunoff Video Archive. WR, HU

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 340b / ENGL 161b, (Writing Intensive) Global Shakespeares: Race, Gender and the Idea of the Human Ayesha Ramachandran

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. Along the way, we consider the challenges of decolonizing the canon and the particular place Shakespeare occupies as an index of cultural value. 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 intensive writing version of LITR 339 and is worth 1.5 credits. Meets with LITR 339. Students may earn credit for LITR 339 (1 credit) OR for LITR 340 (1.5 credits) but not for both. WR, HU 1½ Course cr

*** LITR 344b / ENGL 244b / HUMS 340b, The Detective Story: Solving Mysteries from Oedipus to Sherlock** Paul Grimstad

The course looks closely at detective stories, novels and films, with attention to the basic narrative structure of criminal enigma, logical investigation and denouement (whodunnit), and considers the meaning of “genre” more broadly. Starting with the proto-detective story *Oedipus Rex* – in which tragic drama takes the form of a murder mystery – we move on to Edgar Allan Poe’s invention of the genre proper in “The Murders in the Rue Morgue” and “The Purloined Letter.” From there we go to Poe’s “golden age” inheritors Arthur Conan Doyle, G.K. Chesterton, Agatha Christie, and Dorothy Sayers, as well as the adaptation of Doyle’s tales for the BBC series *Sherlock*. We also spend time on American “hard boiled” writers (Dashiell Hammett, *The Maltese Falcon* and John Huston’s 1941 film adaption of the novel); fiction which draws upon the conventions of detective stories without being genre fiction (Nabokov, Borges), non-fiction works which have the structure of a detective story (Freud’s “Wolf Man” case study); neo-noir film (*Chinatown*); works that fuse detective fiction and science-fiction (*Minority Report*) and recent film homage to “golden age” whodunnits (*Knives Out*). Students write essays making interpretive claims and using evidence from works on the syllabus, with emphasis on writing clear prose in support of an original argument. HU

*** LITR 345b / EVST 228b / HIST 459Jb / HUMS 228b, 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 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

*** 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 366b / FILM 416b / FREN 394b, French Cinema through the New Wave**

Dudley Andrew

The history of French cinema c. 1930 to 1970, from the onset of sound through the New Wave movement. The New Wave 'idea of cinema'; the relation of cinema to national self-perception and state policy in France. HU RP

*** LITR 374a / FILM 325a / GMAN 379a, German Cinema 1918–1933** Jan Hagens

The years between 1918 and 1933 are the Golden Age of German film. In its development from Expressionism to Social Realism, this German cinema produced works of great variety, many of them in the international avantgarde. This introductory seminar gives an overview of the silent movies and sound films made during the Weimar Republic and situate them in their artistic, cultural, social, and political context between WWI and WWII, between the Kaiser's German Empire and the Nazis' Third Reich. Further objectives include: familiarizing students with basic categories of film studies and film analysis; showing how these films have shaped the history and the language of film; discussing topic-oriented and methodological issues such as: film genres (horror film, film noir, science fiction, street film, documentary film); set design, camera work, acting styles; narration in film; avantgarde cinema; the advent and use of sound in film; Realism versus Expressionism; film and popular mythology; melodrama; representation of women; modern urban life as spectacle; film and politics. Directors studied include: Grune, Lang, Lubitsch, Murnau, Pabst, Richter, Ruttman, Sagan, von Sternberg, Wiene, et al.

WR, HU

*** LITR 380b / FILM 411b, The Films of Alfred Hitchcock** Brigitte Peucker

An examination of Hitchcock's career as a filmmaker from *Blackmail* to *Frenzy*, with close attention to the wide variety of critical and theoretical approaches to his work. Topics include the status of the image; the representation of the feminine and of the body; spectatorship; painterliness and theatricality; generic and psychoanalytic issues.

HU

LITR 409a / ENGL 198a / FILM 394a / RSEE 350a / WGSS 394a, Internet Cultures, Histories, Networks, and Practices Marijeta Bozovic

Examination, through the lenses of histories, network studies, and cultural studies, of how human beings have seemingly overnight learned to use and depend on computer networks for various kinds of work, military operations, pursuits of scientific knowledge, religious proselytizing, political organization, searches for mates and social communities, illegal activities, and infinite varieties of play. HU

*** LITR 432a / FILM 431 / FILM 432a / HUMS 348a, World War II: Homefront Literature and Film** Katie Trumpener

Examination of quotidian, civilian World War II experiences in many parts of Europe. Modes of literary and filmic reflection occasioned by the war; civilian perspectives on the relationship between history and everyday life, during and after the war; children's experience of war; and ways homefront and occupation memories shaped postwar avant-gardes. HU

*** LITR 460b / GMAN 365b / HUMS 322b, German Novels After 1945** Rudiger Campe

The course discusses exemplary novels in German language after 1945 from West and East Germany and Germany after Reunification, as well as from Austria and Switzerland. Part I, 'Zero Hour - or Not,' on the political critique of Nazi Germany and the attempt at an aesthetic clean break (e.g., Gunther Grass, Ingeborg Bachmann, Max Frisch); Part II '1968: Revolution or New Interiority,' on social protest versus aesthetic internationalism (e.g., Peter Handke, Christa Wolf, Hubert Fichte, Thomas Bernhard); Part III, 'The Attempt at Being Contemporary,' on German and German speaking societies in the global world (e.g., Elfriede Jelinek, Yoko Tawada, Rainald Goetz). While 'contemporaneity' is the particular mark of the last section, all works desire to critically intervene in their historical moment. Giving an account of this desire is the goal of the course. Contextualization as needed; close reading of selected passages as the mode of work in the course; all works are provided in English translation and German. HU

*** LITR 463b / ENGL 268b / HUMS 254b / PHIL 227b, Literature and Philosophy, Revolution to Romanticism** Jonathan Kramnick

This is a course on the interrelations between philosophical and literary writing beginning with the English Revolution and ending with the beginnings of Romanticism. We read major works in empiricism, political philosophy, and ethics alongside poetry and fiction in several genres. Topics include the mind/body problem, political ideology, subjectivity and gender, and aesthetic experience as they take philosophical and literary form during a long moment of historical change. WR, HU

TR

*** LITR 470b / HUMS 349b, Identity in Modern Thought** Benjamin Barasch

Identity is at the heart of our present social conflicts, from campus debates about power and privilege, to movements like Black Lives Matter and Me Too, to the resurgence of ethnic nationalism. But what is identity, after all? How does it come into being? What role do “nature” and “culture” play in that process, and are they separable? To what extent are we defined by our belonging to identity categories such as race, class, gender, and sexuality? How free are we to create our own identities? What makes me “me”? Is there a true self? This class explores the complexities of identity through readings in modern literature, philosophy, and social theory, from psychoanalysis to critical race theory, romanticism to postmodernism, autobiography to autofiction. Authors include J.-J. Rousseau, William Wordsworth, R. W. Emerson, Sigmund Freud, Melanie Klein, G. H. Mead, Erik Erikson, Judith Butler, Hannah Arendt, Theodor Adorno, Djuna Barnes, Nella Larsen, W. E. B. Du Bois, Frantz Fanon, Ralph Ellison, James Baldwin, Ta-Nehisi Coates, Thomas Chatterton Williams, Saidiya Hartman, Claudia Rankine, Ben Lerner, Maggie Nelson, Camille Paglia. 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.

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**

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 James Barnes

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. 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. 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. No prior acquaintance with calculus or computing assumed. May not be taken after MATH 110 or 111. 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. Exercises involve the software package Mathematica. After MATH 112 or equivalent; open to freshmen with some preparation in calculus. May not be taken after MATH 116. QR

*** MATH 116b, Mathematical Models in the Biosciences I: Calculus Techniques** John Hall

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. Applications include Norton's chemotherapy scheduling and stochastic models of tumor suppressor gene networks. After MATH 112 or equivalent. 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. After MATH 115, or with permission of instructor. May not be taken after MATH 121. QR

MATH 160b / AMTH 160b / S&DS 160b, The Structure of Networks Ronald Coifman

Network structures and network dynamics described through examples and applications ranging from marketing to epidemics and the world climate. Study of social and biological networks as well as networks in the humanities. Mathematical graphs provide a simple common language to describe the variety of networks and their properties. 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. After MATH 115 or equivalent. May not be taken after MATH 225. QR

MATH 225a or b, Linear Algebra and Matrix Theory Staff

An introduction to the theory of vector spaces, matrix theory and linear transformations, determinants, eigenvalues, and quadratic forms. Some relations to calculus and geometry are included. After or concurrently with MATH 120. May not be taken after MATH 222. QR

*** MATH 230a, Vector Calculus and Linear Algebra I** Patrick Devlin

A careful study of the calculus of functions of several variables, combined with linear algebra. QR

*** MATH 231b, Vector Calculus and Linear Algebra II** Patrick Devlin

Continuation of MATH 230. Application of linear algebra to differential calculus. Inverse and implicit function theorems; the idea of a manifold; integration of differential forms; general Stokes' theorem. QR

*** MATH 235b, Reflection Groups** Igor Frenkel

Concepts of linear algebra are used to explore the algebraic and geometric properties of groups generated by reflections. Examples from reflection groups introduce elements of group theory, Lie algebras, and representation theory. Reflections in a real Euclidean space, groups generated by reflections, crystallographic groups, and Coxeter groups. Preference to sophomores majoring in mathematics or the sciences. Prerequisite: MATH 222 or 225. QR

MATH 240b, Advanced Linear Algebra Staff

The course continues the study of linear algebra from MATH 225 or MATH 230/231. It discusses several aspects of linear algebra that are of crucial importance for the subject and its applications to abstract algebra, geometry and number theory. Topics include

generalized eigenspaces and Jordan normal form theorem, dual vector spaces, bilinear and hermitian forms, symmetric and hermitian operators, Hom spaces and tensor products. After MATH 225 or MATH 230/231.

MATH 241a / S&DS 241a, Probability Theory Yihong Wu and Winston Lin
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 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

MATH 244a or b / AMTH 244a or b, Discrete Mathematics
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 equivalent. QR

MATH 250a or b, Vector Analysis Staff
Calculus of functions of several variables, using vector and matrix methods. The derivative as a linear mapping. Inverse and implicit function theorems. Transformation of multiple integrals. Line and surface integrals of vector fields. Curl and divergence. Differential forms. Theorems of Green and Gauss; general Stokes' theorem. Prerequisites: After MATH 120, and 222 or 225 or equivalent. May not be taken after MATH 231. QR

MATH 251b / EENG 434b / S&DS 351b, Stochastic Processes Joseph Chang
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 270a, Set Theory Yifeng Liu
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 300b, Topics in Analysis Anibal Velozo
An introduction to analysis, with topics chosen from infinite series, the theory of metric spaces, and fixed-point theorems with applications. Students who have taken

MATH 230, 231 should take MATH 301 instead of this course. After MATH 250 or with permission of instructor. QR

*** MATH 301a, Introduction to Analysis** Peter Jones

Foundations of real analysis, including metric spaces and point set topology, infinite series, and function spaces. After MATH 230, 231 or equivalent. QR

MATH 305b, Real Analysis Yair Minsky

The Lebesgue integral, Fourier series, applications to differential equations. After MATH 301 or with permission of instructor. QR

MATH 310a, Introduction to Complex Analysis

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. After MATH 231 or 250 or equivalent. 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** Tom VandenBoom

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** Tom VandenBoom

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. QR RP

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** Richard Kenyon

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. After MATH 231 or 250. QR

MATH 353b, Introduction to Representation Theory

An introduction to basic ideas and methods of representation theory of finite groups and Lie groups. Examples include permutation groups and general linear groups. Connections with symmetric functions, geometry, and physics. After MATH 350.

*** MATH 354b, Number Theory**

Prime numbers; quadratic reciprocity law, Gauss sums; finite fields, equations over finite fields; zeta functions. After MATH 350. QR

MATH 370b, Fields and Galois Theory

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 Alexander Goncharov

Structure of fields of algebraic numbers (solutions of polynomial equations with integer coefficients) and their rings of integers; prime decomposition of ideals and finiteness of the ideal class group; completions and ramification; adeles and ideles; zeta functions. Prerequisites: MATH 310 and 370. QR

MATH 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 435b, Differential Geometry Andrew Neitzke

Applications of calculus to the study of the geometry of curves and surfaces in Euclidean space, intrinsic differential geometric properties of manifolds, and connections with non-Euclidean geometries and topology. After MATH 231 or 250 or equivalent. QR

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

Highly qualified 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 early in the fall term.

*** 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 present several talks on the chosen topic. One section each year is devoted to topics of interest to Economics and Mathematics majors, and is co-taught by a member of the Economics department.

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 107b / EDST 107b / PHYS 107b, Being Human in STEM** Mark Hochstrasser

A collaboratively-designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant peer-reviewed literature and popular-press articles. Implementation of a questionnaire and interviews of STEM participants at Yale. Creation of role-play scenarios for provoking discussions and raising awareness. Design and implementation of group interventions. SO

* **MB&B 200a or b / MCDB 300a 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

* **MB&B 251La or b / MCDB 301La or b, 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 and andrew.miranker@yale.edu prior to the first week of classes. Please note: During the fall term, this course runs as two sections, Tuesday or Thursday from 1:15 p.m.-5:15 p.m., for the entire semester. During the spring term it meets once a week on Tuesdays. Prerequisite: BIOL 101. SC ½ Course cr

MB&B 300a, Principles of Biochemistry I Matthew Simon, Michael Koelle, and Candie Paulsen

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, Joan Steitz, 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 302b, Principles of Biophysics Enrique De La Cruz and Charles Sindelar
An introduction to the theoretical basis of biophysical concepts and approaches with selected examples and applications. Prerequisites: MB&B 300 and CHEM 328. SC

MB&B 330a / BENG 230a / MCDB 330a / NSCI 324a, Modeling Biological Systems I
Thierry Emonet, Damon Clark, and Joe Howard

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 Jing Yan

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 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 425a, 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 435a, Quantitative Approaches in Biophysics and Biochemistry 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 Christian Schlieker
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, Daniel DiMaio, Franziska Bleichert, Sandy Chang, Karla Neugebauer, and Seyedtaghi Takyar

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** Andrew Miranker and Aruna Pawashe

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** Jack Zhang

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** Jack Zhang

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** Jack Zhang

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 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, Immunology and Microbes** Paula Kavathas

Introduction to the immune system and its interaction with specific microbes. Attention both to microbes that cause illness, such as influenza, HIV, and HPV, and to microbes that live in harmony with humans, collectively called the 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 RP

*** 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

Introduction to the basics of the immune system; strategies to fight pathogens while maintaining harmony with our microbiome. Discussion of specific microbes such as influenza, HIV, and HPV; historical analysis of the polio vaccine and the AIDS epidemic. Enrollment limited to freshmen and sophomores. SC

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 201Lb, Molecular Biology Laboratory Maria Moreno

Basic molecular biology training in a project-based laboratory setting. Experiments analyze gene function through techniques of PCR, plasmid and cDNA cloning, DNA sequence analysis, and protein expression and purification. Instruction in experimental design, data analysis, and interpretation. Concurrently with or after MCDB 200, or with permission from instructor. For freshmen and sophomores interested in research integrated laboratory experience. Special registration procedures apply. Interested students must contact the instructor and attend an organizational meeting during the first week of classes. WR, SC ½ Course cr

*** MCDB 202a, Genetics** Stephen Dellaporta and Iain Dawson

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, 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 and Seth Guller

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 Seth Guller

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** Iain Dawson

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 301La or b / MB&B 251La or b, 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 and andrew.miranker@yale.edu prior to the first week of classes. Please note: During the fall term, this course runs as two sections, Tuesday or Thursday from 1:15 p.m.-5:15 p.m., for the entire semester. During the spring term it meets once a week on Tuesdays. Prerequisite: BIOL 101. SC ½ Course cr

*** MCDB 303Lb, Advanced Molecular Biology Laboratory** Maria Moreno

A laboratory course that provides advanced biology research skills. Weekly workshops focus on laboratory practice, experimental design, data analysis, reading of primary literature, scientific presentations, and scientific writing skills. Application of these skills in project-based laboratory training sponsored by a faculty member. Enrollment limited. Special registration procedures apply; interested students must contact the instructor and attend an organizational meeting. This class is recommended to students in the sciences who are in their junior year and will be completing a senior research project requirement for graduation. SC RP

*** MCDB 310a / BENG 350a, 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

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 330a / BENG 230a / MB&B 330a / NSCI 324a, Modeling Biological Systems I

Thierry Emonet, Damon Clark, and Joe Howard

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** Joseph Wolenski

An inquiry-based approach to research in cell and molecular biology, with emphasis on experimental techniques commonly used in modern biomedical laboratories. Research

is module-based and covers pertinent and timely topics. Methods include SDS-PAGE, immunoblotting, immunoprecipitation of proteins, column chromatography, mammalian cell culture, cell fractionation, cell transfection, DNA purification, PCR, and phase contrast and confocal microscopy. Meets during January and February. Prerequisite: MCDB 205. Special registration procedures apply; interested students must contact the instructor at least eighteen months in advance. SC ½ Course cr

*** MCDB 345Lb, Experimental Strategies in Cellular Biology** Joseph Wolenski
Continuation of MCDB 344L, with increased emphasis on experimental design, independent research, presentation of data and research seminars. Students develop semi-independent research projects in modern biomedical research. Emphasis on key components of being a successful principal investigator, including benchwork, seminar presentations, lab meetings, and critical analysis of data. Prepares for MCDB 475, 485, or 495. Meets during March and April. Prerequisite: MCDB 344L. Special registration procedures apply; interested students should contact the instructor. SC ½ Course cr

*** MCDB 350a, Epigenetics** Nadya Dimitrova, Josien van Wolfswinkel, and Yannick Jacob
Study of epigenetic states and the various mechanisms of epigenetic regulation, including histone modification, DNA methylation, nuclear organization, and regulation by non-coding RNAs. Detailed critique of papers from primary literature and discussion of novel technologies, with specific attention to the impact of epigenetics on human health. Introductory courses (BIOL 101-104) and two MCDB 200-level courses (strongly recommended: MCDB 202 and MCDB 200 or MCDB 210) or instructor permission. SC

*** 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
Thierry Emonet, Joe Howard, and Jing Yan

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 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 387b, 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 425a / MB&B 425a, Basic Concepts of Genetic Analysis** Jun Lu

The universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers that illustrate the best of genetic analysis in the study of various biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 202 or pre-approval of instructor. SC

*** MCDB 430a, Biology of the Immune System** Eric Meffre, Daniel Prober, David Schatz, Peter Cresswell, 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** Staff

Individual or small-group study for qualified students who wish to investigate a broad area of experimental biology not presently covered by regular courses. A student must be sponsored by a Yale faculty member, who sets the requirements. The course must include one or more written examinations and/or a term paper. Intended to be a supplementary course and, therefore, to have weekly or biweekly discussion meetings between the student and the sponsoring faculty member. To register, the student must prepare a form, 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 474a or b, Independent Research** Joseph Wolenski, David Breslow, and Jing Yan

Research project under faculty supervision taken Pass/Fail. This is the only independent research course available to undergraduates. 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, David Breslow, and Jing Yan

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 485a and MCDB 486b, Senior Research** Joseph Wolenski, David Breslow, and Jing Yan

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 and MCDB 496b, Senior Research Intensive** Joseph Wolenski, David Breslow, and Jing Yan

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

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 211a or b, Thermodynamics for Mechanical Engineers Staff

Study of energy and its transformation and utilization. First and Second Laws for closed and open systems, equations of state, multicomponent nonreacting systems, auxiliary functions (H, A, G), and the chemical potential and conditions of equilibrium. Engineering devices such as power and refrigeration systems and their efficiencies. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC RP

MENG 280a, Mechanical Engineering I: Strength and Deformation of Mechanical Elements Staff

Elements of statics; mechanical behavior of materials; equilibrium equations, strains and displacements, and stress-strain relations. Elementary applications to trusses, bending of beams, pressure vessels, and torsion of bars. Prerequisites: PHYS 180 or 200, and MATH 115. QR, SC RP

MENG 285a, Introduction to Materials Science Sudhangshu Bose

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 Jan Schroers
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 325b, 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 383a, 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 Juan de la Mora

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 390a, Mechatronics Laboratory Madhusudhan Venkadesan

Hands-on synthesis of control systems, electrical engineering, and mechanical engineering. Review of Laplace transforms, transfer functions, software tools for solving ODEs. Review of electronic components and introduction to electronic instrumentation. Introduction to sensors; mechanical power transmission elements; programming microcontrollers; PID control. Prerequisites: ENAS 194 or equivalent, ENAS 130, and EENG 200; or permission of instructor. QR RP

MENG 400a or b, Computer-Aided Engineering Staff

Aspects of computer-aided design and manufacture (CAD/CAM). The computer's role in the mechanical design and manufacturing process; commercial tools for two- and three-dimensional drafting and assembly modeling; finite-element analysis software for modeling mechanical, thermal, and fluid systems. Prerequisite: ENAS 130 or permission of instructor. QR

MENG 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 440a / ENAS 440a, Applied Numerical Methods for Algebraic Systems, Eigensystems, and Function Approximation Beth Anne Bennett

The derivation, analysis, and implementation of various numerical methods. Topics include root-finding methods, numerical solution of systems of linear and nonlinear equations, eigenvalue/eigenvector approximation, polynomial-based interpolation, and numerical integration. Additional topics such as computational cost, error analysis, and convergence are studied in several contexts throughout the course. Prerequisites:

MATH 115, and 222 or 225, or equivalents; ENAS 130 or some experience with Matlab, C++, or Fortran programming. QR

*** MENG 450b / APHY 450b / ENAS 450b, Advanced Synchrotron Techniques and Electron Spectroscopy of Materials** Charles Ahn

Introduction to concepts of advanced x-ray and electron-based techniques used for understanding the electronic, structural, and chemical behavior of materials. Students learn from world-leading experts on fundamentals and practical applications of various diffraction, spectroscopy, and microscopy methods. Course highlights the use of synchrotrons in practical experiments. Prerequisites: physics and quantum mechanics/physical chemistry courses for physical science and engineering majors, or by permission of instructor. QR, SC

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** Joran Booth

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 473a and MENG 474b, Special Projects II** Joran Booth

Faculty-supervised one- or two-person projects with emphasis on research (experiment, simulation, or theory), engineering design, or tutorial study. Students are expected to consult the course instructor, director of undergraduate studies, and/or appropriate faculty members to discuss ideas and suggestions for topics. These courses may be taken at any time during the student's career and may be taken more than once. Prerequisites: MENG 471 or 472; permission of adviser and director of undergraduate studies.

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 and MENG 361. MENG 185 and MENG 325 are strongly suggested. ½ Course cr

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 151a, Advanced Modern Greek** Maria Kaliambou

Advanced language course intended to further develop reading, writing, speaking, and listening skills, while sharpening students' sensitivity toward modern Greek culture. MGRK 140 or permission of instructor. L5

*** 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 218a / FILM 243a / WGSS 245a, Family in Greek Literature and Film**

George Syrimis

The structure and multiple appropriations of the family unit, with a focus on the Greek tradition. The influence of aesthetic forms, including folk literature, short stories, novels, and film, and of political ideologies such as nationalism, Marxism, and totalitarianism. Issues related to gender, sibling rivalry, dowries and other economic factors, political allegories, feminism, and sexual and social violence both within and beyond the family. WR, HU TR

*** MGRK 236a or b / PLSC 138a or b / SOCY 221a or b, The Euro Crisis**

Paris Aslanidis

Examination of how Europe continues to struggle with repercussions of the Great Recession and the impact of the Eurozone crisis in countries such as Portugal, Ireland, Spain, and, especially, Greece. Topics include the euro as a viable common currency; why and how the Eurozone crisis erupted and spread; and whether this catastrophe could have been averted. SO

*** MGRK 237a / GLBL 215a / LAST 386a / PLSC 375a / SOCY 389a, Populism**

Paris Aslanidis

Investigation of the nature of the populist phenomenon and its impact on politics, society, and the economy in various regions of the world. Conceptual and methodological analyses are supported by comparative assessments of various empirical instances, from populist politicians such as Hugo Chavez and Donald Trump, to populist social movements such as the Tea Party and Occupy Wall Street. SO

*** 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

Modern Middle East Studies (MMES)

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 126b / ARCH 271b / HSAR 266b / SAST 266b, 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. Field trip to the Metropolitan Museum of Art in New York. HU

*** MMES 140a / ARBC 131a, Intermediate Levantine Arabic I** Sarab Al Ani

This course develops and enhances Arabic language skills using Levantine Arabic. By implementing an interactive student-centered approach, students attain mastery of the essential modes of communicative (interpersonal, interpretive, and presentational). Relevant cultural aspects and values in the Arab world are introduced and discussed using multi-modal authentic materials, especially but not limited to those that are reflected in the usage and structure of the language. Grammar is viewed from a functionality perspective as a tool that serves the main objective of the course.

Prerequisites: ARBC 110, ARBC 120, equivalent or permission of instructor. L3
1½ Course cr

*** MMES 141b / ARBC 141b, Intermediate Levantine Arabic II** Sarab Al Ani

Continuation of ARBC 131. This course develops and enhances Arabic language skills using Levantine Arabic in the intermediate level with the goal of reaching Intermediate High to Advanced Low Level (ACTFL standards). By implementing an interactive student-centered approach, students attain mastery of the essential modes of communicative (interpersonal, interpretive, and presentational). Relevant cultural aspects and values in the Arab world are introduced and discussed using multi-modal authentic materials, especially but not limited to those that are reflected in the usage and structure of the language. Grammar is viewed from a functionality perspective as a tool that serves the main objective of the course. Prerequisites: at least 3 Arabic courses, ARBC 110, 120, 130, 131, or equivalent or permission of instructor. L4
1½ Course cr

MMES 144a / HIST 346a, Making of Modern Iran Abbas Amanat

This course examines political, social and cultural history of Iran from the turn of the 19th century to the present with greater emphasis on the latter part of the 20th century aiming to explain how secular Iran became an Islamic Republic and why is it matter in today's world. Beginning with an overview, it covers encounter with European empires (Russia and Britain), Shi'ism and clerical establishment, reform trends and search for democracy, discovery of oil and Iran in the Cold War and troubled relations with the United States, in the Persian Gulf and clash with Arab nationalism; the Islamic Revolution of 1979 and its global impact, repression and human rights, women, gender and minorities under the Islamic Republic; the 2009 Green Movement, the "Nuclear Deal" and Iran as a regional and global power. HU

MMES 148b / HIST 345b / JDST 265b / RLST 202b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as

a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU

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 157b / JDST 306b / NELC 157b, Israeli Narratives** Shiri Goren

This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz's major novel *A Tale of Love and Darkness*, *Anne Frank: The Graphic Diary*, Maya Arad's novella "The Hebrew Teacher," TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU TR

*** 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 162b / HEBR 169b / JDST 403b / LING 165b, Languages in Dialogue: Hebrew and Arabic** Dina Roginsky

Hebrew and Arabic are closely related as sister Semitic languages. They have a great degree of grammatical, morphological, and lexical similarity. Historically, Hebrew and Arabic have been in cultural contact, especially in medieval Spain, the Middle East, and North Africa—as evidenced by the Judeo-Arabic languages. In modern Israel, Arabic is the native tongue of about 20% of its population, yet lack of communication exists today between Hebrew speakers and Arabic speakers for mainly political reasons. This L5 advanced Hebrew class explores cultural and linguistic contacts between the two languages and relationships between the communities, including both Jewish and non-Jewish Arabic speakers and Hebrew speakers. Additionally, students benefit from

regular meetings with a parallel L5 Arabic class which discusses similar topics. The shared meetings enable Hebrew learners and Arabic learners to participate together in one class, to promote social interaction based on mutual respect and to focus on cultural and linguistic aspects of the material. L4 Hebrew or equivalent (placement test). L5

TR RP

*** MMES 168b / HEBR 158b / JDST 305b, Contemporary Israeli Society in Film** Shiri Goren

Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private and collective memory. Readings in Hebrew and English provide a sociohistorical background and bases for class discussion. HEBR 140 or permission of instructor. L5, HU RP

*** MMES 170b / ARBC 168b, Modern Arab Writers** Muhammad Aziz

Study of novels and poetry written by modern Arab writers. Such writers include Taha Hussein, Zaid Damraj, Huda Barakat, Nizar Qabbani, al-Maqalih, and Mostaghanimi.

Prerequisite: ARBC 140 or permission of instructor. L5

MMES 191a / RLST 100a, Introduction to World Religions Gerhard Bowering

Introduction to the literature, ideals, concepts, practices, rituals, and institutions of four major world religions as they have appeared in history: Hinduism, Buddhism, Christianity, and Islam. A historical survey combined with a phenomenological treatment of principal topics. HU

MMES 215b / ENGL 191a or b / HUMS 206a or b / LITR 318a or b / NELC 201a or b, 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 235b / JDST 235b / NELC 231b / RLST 147b, Introduction to Judaism in the Ancient World: From Temple to Talmud** Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; the synagogue; faith in reason; Sabbath and festivals; history and its redemption. No prior background in Jewish history assumed. 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 304a / AFST 304a / PLSC 458a, Modern North Africa in Flux** Staff

Study of the politics of modern North Africa (Morocco, Algeria, Tunisia, and to a limited degree, Libya and Mauritania), including colonialism; state-formation and early nationalism; the cultivation of authoritarian regimes; modern authoritarian politics; civil-military relations; democratization; civil society; protest, dissent, social and movement mobilization; oil and rentierism; Islamism and the politics of religion; linkages to the Mashreq; and the dynamics of foreign intervention. Readings and

approach to politics are cross-disciplinary, integrating political science, anthropological, historical, religious, as well as gender/race studies Prerequisite: MMES 191 or permission of the instructor.

*** MMES 305a / EVST 305a / GLBL 301a, Environmental Security in the Middle East**

Kaveh Madani

This course overviews how environmental, water, food, energy, and climate change have increasingly become linked to human and national security in the Middle East. It begins by exploring the state of the environment in the region and how the policies of the Middle East governments have led to serious environmental degradation and subsequent loss of jobs, migration, social tension, violence, and regional conflicts. Drawing on an in-depth analysis of contemporary case/country studies, students learn how these problems can serve as major human and national security threats. This interdisciplinary course is of interest to students with background/interest in environmental science/engineering, ecology, geography, geosciences, social/political sciences, public policy, security and peace building, international relations, diplomacy, and global affairs. so

*** MMES 342b / HIST 232Jb / HUMS 443b / JDST 270b / RLST 201b, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness—humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

MMES 364b / PLSC 396b, Politics of the Contemporary Middle East Elizabeth Nugent

This course is an overview of contemporary politics of the Middle East, and is organized thematically and (more or less) chronologically. We examine prominent explanations for the democratic deficit in the Middle East, and challenge the notion that the region is completely devoid of competitive and meaningful politics. We also explore the ways in which a variety of factors—including foreign intervention, persistent authoritarianism, oil, and Islam, among others—has affected domestic politics. We consider different aspects of domestic politics, including redistribution, gender politics, and public opinion. We end the course by building on what we learned to make sense of the 2010-2011 'Arab Spring' uprisings, in an effort to understand whether these developments mark change or continuity. so

*** MMES 370a / RLST 226a / SOCY 368a, Transnational Islam and Muslim Communities** Staff

This seminar explores key themes, concepts, and discussions on Islamic movements and Muslim communities living in the West. It examines the relationships between Muslim communities and the state/wider society within global and transnational processes. Students gain a comprehensive understanding of diversity and complexity of transnational Islamic mobilizations through readings and discussions of representative case studies. The seminar begins with a historical and anthropological account of locating Muslim communities in the West and proceeds with the discovery of key themes and debates. Throughout the term, students explore key issues around

Islamophobia and radicalization, governance of Muslim practices, ethno-religious and cultural diversity of Muslim communities, gender and sexuality, as well as the ways in which these shape perceptions, policies and public debates in the 'host' countries. SO

MMES 391a / RLST 287a, Islamic Theology and Philosophy Frank Griffel

Historical survey of major themes in Muslim theology and philosophy, from teachings of the Qur'an to contemporary Muslim thought. The systematic character of Muslim thought and of the arguments given by thinkers; reason vs. revelation; the emergence of Sunnism and Shi'ism; the reaction of Muslim theology (from 1800) to the challenges of the West. HU

*** MMES 399b / ANTH 441b / MMES 430b / WGSS 430b, 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 430b / ANTH 441b / MMES 399b / WGSS 430b, 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 456a / HSAR 456a, Art and Politics in the Modern Middle East** Kishwar Rizvi

Political ideologies have either unified the modern Middle East, such as Pan-Arabism of the 1960s and Islamism of the 1980s, or caused deep ruptures, such as Zionism and sectarianism. Examination of the art and architectural productions that have gone hand-in-hand with these political developments from the nineteenth century until present day. Poetic, visual, and urban interventions document the profound changes that have defined the countries of this region, while connecting them to political movements throughout the world. WR, HU

Modern Tibetan (MTBT)

Music (MUSI)

*** MUSI 009a, Jazz and Architecture** Michael Veal

A conceptual and structural comparison between modern jazz and modern architecture after World War II, focusing on recent experimental currents in each discipline. Effects of digital technology on both sonic and architectural practices. Form, structure, and material used in free jazz; processes in contemporary architecture that can be compared with those in modern jazz. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU

*** MUSI 012b, One Thousand Years of Love Songs** Anna Zayaruszny

History of the love song in Western culture from the twelfth-century troubadours to contemporary popular hits. Music and the shifting social constructions of desire over

the past millennium. The song repertory's engagement with ideas and movements such as courtly love, humanism, romanticism, sexual libertinism, and the LGBT rights movement. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. HU RP

*** MUSI 035a / CPSC 035a, 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 050a, Transformations in 20th and 21st Century Music** Staff

Introduction to outstanding pieces of 20th- and 21st-century instrumental music. Students examine details of the music and the social/historical context of each piece, in chronological order: one piece for each of the twelve decades from 1900 to the present. Composers include Mahler, Stravinsky, Ravel, Varèse, Copland, Cage, Reich, Xenakis, Eastman, Takemitsu, Czernowin, and Monk. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program.

MUSI 100a or b, Melody, Rhythm, and Notation in Global Context Ian Quinn

This course develops skills in singing, hearing, and writing music through repertory-based case studies of improvised and written melody in global ritual song traditions. Modern Western music notation is introduced through a study of its historical development as a tool for vocal literacy. Topics include mode, scale, rhythm, meter, and form. Lectures introduce theoretical concepts in their epistemological, cultural, and historical contexts, and small-group recitation and improvisation sessions turn these concepts into musical intuitions. Principles of modal and tonal organization are introduced by modeling repertories including Vedic chant, Torah cantillation, Byzantine psalm intonation, and Carolingian chant. Interdependencies between melodic design, musical meter, and poetic prosody are explored through immersion in a repertory of folk hymnody from the Second Great Awakening, a major site of antebellum musical contact between Americans of European and African descent. Willingness to sing is essential for this course, though talent is not a prerequisite. No experience with musical notation is required.

MUSI 110a or b, Introduction to the Elements of Music Staff

The fundamentals of musical language (notation, rhythm, scales, keys, melodies, and chords), including writing, analysis, singing, and dictation. Intended for students who have no music reading ability.

MUSI 115b, The Mathematics of Music Richard Cohn

An introduction to applied mathematics in the context of music theory and analysis. Concepts from algebra, modular arithmetic, set theory, geometry, and elementary topology are applied to the study of musical rhythms, melodies, and chords across a wide repertoire of classical, atonal, and popular musics. Prerequisite: ability to read music. QR, HU

MUSI 175a or b, Listening to Music Angharad Davis

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. WR, HU

*** MUSI 189a / HUMS 189a, Music & Jane Austen** Jessica Peritz

This course takes Jane Austen as a guide to the world of early nineteenth-century music culture in Britain, exploring through her novels the relationships between music, gender, and class in the decades around 1800. We approach this period of music history by delving into how “regular people”—especially women—consumed, curated, and created music in their everyday lives. Austen, an accomplished musician herself, wove music into her novels in ways that reveal much about contemporary practices of (and prejudices against) musicking. We focus on three of Austen’s novels (*Pride & Prejudice*, *Sense & Sensibility*, *Emma*) and excerpts from her music manuscript collections, alongside recent scholarship and modern film adaptations, which taken together raise a series of interdisciplinary questions. By learning about Austen’s musical milieu, we open up the musical lives of Regency-era women and the ‘middling sort,’ while becoming more attuned to the social critiques embedded in Austen’s representations of music, ultimately enriching our engagement with the novels themselves. The ability to read musical notation is not required, but will be helpful. 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, Elementary Studies in Analysis and Model Composition II** Staff

Continuation of MUSI 210. Recommended to be taken concurrently with MUSI 218 or 219. Admission after MUSI 210 or by the music theory placement test. See the *Calendar for the Opening Days* or the Music department Web site for information about the placement test. HU RP

*** MUSI 217a or b, Music Theory Skills at the Keyboard** Nathaniel Adam

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 or the corresponding placement exam, basic piano sight-reading ability, and permission of instructor. HU ½ Course cr

*** MUSI 218a or b, Elementary Musicianship I** Staff

Exercises in melodic and harmonic dictation, sight-singing, keyboard harmony, and aural analysis Admission after MUSI 110 or by the music theory placement test. See the *Calendar for the Opening Days* or the Music department Web site for information about the placement test RP ½ Course cr

*** MUSI 219a or b, Elementary Musicianship II** Staff

Continuation of MUSI 218. Prerequisite: MUSI 218. Recommended to be taken concurrently with MUSI 210 or 211. RP ½ Course cr

*** MUSI 220a and MUSI 221b, The Performance of Chamber Music** Wendy Sharp

Coached chamber music emphasizing the development of ensemble skills, familiarization with the repertory, and musical analysis through performance. Admission by audition only. May be repeated for credit. For audition information e-mail wendy.sharp@yale.edu. Credit for MUSI 220 only on completion of MUSI 221. ½ Course cr per term

*** MUSI 222b, The Performance of Vocal Music** Richard Lalli

A course for singers and pianists that emphasizes the analysis and musical preparation of classical solo song and operatic repertoire. Examination of structure (poetic, harmonic, motivic), discussion of style, exploration of vocal techniques, and introduction to the International Phonetic Alphabet. Students are strongly encouraged to supplement the course with individual voice instruction. Admission by audition only. May be repeated for credit. For audition information e-mail richard.lalli@yale.edu. HU

*** MUSI 228a / THST 224a, Musical Theater Performance I** Annette Jolles

The structure and meaning 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. For singers, pianists, and directors. Prerequisites: MUSI 211 and 219, or with permission of instructor. Admission by audition only. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. HU RP

*** MUSI 229b / THST 226b, Musical Theater Performance II** Maria-Christina Oliveras

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

Introduction to elements of music- and lyric-writing for theater songs. Focus on the development of compositional proficiency in the musical theater idiom and on the refinement of each student's compositional voice as composer and/or lyricist. Prerequisite: MUSI 110 or equivalent. Enrollment limited to 12. HU 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. 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 315a, Fundamentals of Music Technology** Konrad Kaczmarek

Fundamental principles of music technology including sound recording and reproduction, digital audio, digital signal processing, audio synthesis techniques, musical acoustics, and psychoacoustics. Emphasis on the theory of music technology through investigations into the tools used to analyze, perform, and create electroacoustic and computer-generated music. QR, SC RP

*** MUSI 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 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** Scott Frankel

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 and Toni Dorfman

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** Staff

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 350b, History of Western Music: Middle Ages and Renaissance** Anna Zayaruzny

A detailed investigation of the history of musical style from A.D. 900 to 1600.

Preference to Music majors according to class. HU

*** MUSI 352a, The Western Art-Music Tradition, 1800-2020** Gundula Kreuzer

A survey of musical practices, institutions, genres, styles, and composers in Europe and North America from 1800 to the present. This class is for Music majors and includes obligatory sections that focus on detailed musical discussions. Knowledge of Western musical notation and basic harmony is required. Interested non-majors may enroll with permission from instructor. HU

MUSI 380a, Jazz in America 1900-1960 Brian Kane

A course on key moments in the history of jazz in America until 1960 with special focus on the role of jazz within broader streams of American cultural life; improvisation; jazz as popular music and as art music; the racial politics of jazz; and its artistic achievements.

*** MUSI 404a, Nineteenth-Century Music: Analysis and Model Composition** Richard Cohn

Studies in the theory, analysis, and composition of music of the nineteenth century.

Prerequisite: MUSI 211. Enrollment limited to 18. Preference to Music majors according to class. HU

*** MUSI 408b, Introduction to Schenkerian Analysis** Daniel Harrison

Advanced work in harmony, counterpoint, thoroughbass, structure, and form; Schenkerian analysis of selected compositions from the tonal repertoire. Prerequisite: two courses from MUSI 301-311. HU RP

*** 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** 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 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 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** Staff

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 455a / MUSI 235, A History of Music Notation** Anna Zayaruzny

The history of music notation is intimately linked with the histories of musical composition and performance. This course combines a study of musical paleography (i.e. how music is written down) with consideration of the historical and intellectual currents that shaped, and were shaped by, systems of music writing. Among the systems surveyed are the neumes used to preserve early plainchant, the increasingly specific rhythmic notations that recorded Western polyphony from the thirteenth century onward, and the notational puzzles and games of the fourteenth and fifteenth centuries. Final projects may focus on medieval or later music notations. Prerequisite: ability to read modern music notation comfortably. HU

*** MUSI 472b / THST 333b, Stephen Sondheim and the American Musical Theater Tradition** Dan Egan

The musical theater of Stephen Sondheim, both as a popular phenomenon of the contemporary Broadway stage and in relation to models and forms employed in the past. HU RP

*** MUSI 491a / AFAM 803a / AFST 828a / AMST 831a / MUSI 833, Musical Afrofuturisms** Michael Veal

A survey of the Afrofuturist theme as it has been articulated in African American music of the post-World War II era, with additional references to its concurrent manifestations in film, literature, and visual arts. The introductory meetings lay historical, political, technological, and cultural foundations, before proceeding with a series of work-based (i.e., album-based) case studies for the remainder of the term. Ability to understand musical terminology is very helpful but not required. HU

*** MUSI 492b / AMST 477b, The Beach Boys in American Culture and Counterculture**
Daniel Harrison

The sixty-year career of the Beach Boys is an armature to study a variety of topics of interest to musicologists, American cultural historians, and students of media. The group's musical production is notably large and stylistically varied, its complex history (and mythology) is well documented in print and on film, and recent scholarship about the group is sophisticated and suggestive. Starting with close listening of a large set of songs, readings from both academic and popular sources, and discussions with expert guests in cultural studies, rock journalism, biography, and music analysis, students identify and work on an original research project related to the group, broadly conceived. HU

*** MUSI 495a or b, Individual Study** Anna Zayaruzny

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 Zayaruzny

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 Zayaruzny

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, The Senior Project in Musical Theater Composition** Anna Zayaruzny

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 Zayaruzny

Preparation of a senior essay under faculty supervision. Admission by permission of the director of undergraduate studies.

Naval Science (NAVY)

NAVY 100a or b, Naval Science Laboratory Quinlan Melvin

Leadership and practical application skills from the Professional Core Competency objectives that are not covered in other Naval Science courses. Emphasis on professional training that is not of an academic nature. Includes both classroom instruction and physical training. Topics and special briefings as determined by Naval Science faculty and the Naval Service Training Command. Required for NROTC students each term. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** NAVY 111a, Introduction to Naval Science** Quinlan Melvin

An overview of the naval service for first-year Naval ROTC students and others interested in pursuing the NROTC program. Organization, missions, customs and

traditions, leadership principles, ethics, duties of a junior officer, and career options in the U.S. Navy and Marine Corps. Discussion of shipboard organization and procedures, safety, and damage control prepares students for summer training aboard naval vessels. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** NAVY 112b, Navigation** Staff

Introduction to surface-ship navigation and practical piloting in both restricted and open water. Celestial navigation theory, navigational charts and instruments, and electronic navigation. Weather and other environmental factors that affect naval operations. Navigation rules and regulations, maneuvering board concepts, and practical exercises. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 211a, Leadership and Management Adam Schlismann

A study of leadership, ethics, resource management, and organizational behavior, with emphasis on situations commonly encountered by junior officers in the naval service. Classical theories of management, motivation, and communication; development of skills in organizational thinking and problem solving. Required for second-year NROTC students. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 311a, Naval Engineering Brandon Ordway

An overview of Naval engineering systems and a detailed study of the principles behind ship construction. Topics include ship design, hydrodynamic forces, stability, conventional and nuclear propulsion, electrical theory and systems, interior communications, damage control, hydraulics, and ship control. Basic concepts in the theory and design of steam, gas turbine, and diesel propulsion. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 312b, Naval Systems Adam Schlismann

The characteristics and capabilities of the major systems and platforms used in the U.S. Navy. Technical concepts and scientific theory addressed through study of designations, characteristics, capabilities, and missions of ships and aircraft. How computers and electronic and space-based communications influence operational employment of various naval platforms. Classic theory of radar, sonar, and fire-control systems. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** NAVY 313b, Fundamentals of Maneuver Warfare**

Detailed examination of the broad aspects of warfare and their interactions with maneuver warfare doctrine. Specific focus on the United States Marine Corps as the premier maneuver warfare fighting institution. Historical influences on current tactical, operational, and strategic implications of maneuver warfare practices in current and future operations. Prerequisites: NAVY 111 and 212. Required for Marine-option

NROTC students. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

NAVY 411a, Naval Operations and Seamanship Staff

Study of relative motion, formation tactics, and ship employment. Introductions to Naval operations and operations analysis, ship behavior and characteristics in maneuvering, applied aspects of ship handling, afloat communications, Naval command and control, Naval warfare areas, and joint warfare. Analysis of case studies involving related moral, ethical, and leadership issues. Prerequisites: NAVY 111 and 112. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** NAVY 412b, Leadership and Ethics** Quinlan Melvin

Exploration of Western moral traditions and ethical philosophy and of their applications to naval leadership in the twenty-first century. Topics include military leadership, core values, and professional ethics; the Uniform Code of Military Justice and Navy regulations; the roles of enlisted members, junior and senior officers, command relationships, and the conduct of warfare. Discussion of current and historical events in the United States Navy and Marine Corps. Prerequisite: NAVY 212. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** NAVY 413b, Maneuver Warfare**

The development of warfare to the present day, with attention to the causes of continuity and change in the means and methods of warfare. The influence of political, economic, and societal factors on the conduct of war, with a focus on the role of technological innovation in changing the battlefield. The contributions of preeminent military theorists and battlefield commanders to the modern understanding of the art and science of war. Prerequisites: NAVY 111 and 212. Required for Marine-option NROTC students. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

Near Eastern Languages and Civilizations (NELC)

*** 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 121b / HUMS 140b, The Hero in the Ancient Near East** Kathryn Slanski
Exploration of the interaction of religion, history, and literature in the ancient Near East through study of its heroes, including comparison with heroes, heroic narratives, and hero cults in the Bible and from classical Greece. WR, 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 129a / AFST 128a / ARCG 128a / EGYPT 128a / RLST 251a, Magic and Ritual in Ancient Egypt and the Near East** John Darnell

Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

*** NELC 157b / JDST 306b / MMES 157b, Israeli Narratives** Shiri Goren

This course looks at contemporary representations of social, political, and domestic space in Israel through cultural production such as literature, visual work, and art. It focuses on close reading of major Israeli works in translation with attention to how their themes and forms relate to the Israeli condition. Reading and viewing include: Amos Oz’s major novel *A Tale of Love and Darkness*, *Anne Frank: The Graphic Diary*, Maya Arad’s novella “The Hebrew Teacher,” TV show *Arab Labor* and writing by Yehudah Amichai, Etgar Keret, and Sayed Kashua, among others. We discuss topics and theories of personal and collective identity formation, war and peace, ethnicity and race, migration, nationalism, and gender. No knowledge of Hebrew required. WR, HU
TR

NELC 201a or b / ENGL 191a or b / HUMS 206a or b / LITR 318a or b / 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 224b / RLST 224b, Zoroastrianism** Kayla Dang

Surveys the history of Zoroastrianism, one of the world’s oldest continuous religious traditions, from its origins in the first millennia BC to the present day. Readings in primary sources in English translation and secondary readings in modern scholarship.

*** NELC 231b / JDST 235b / MMES 235b / RLST 147b, Introduction to Judaism in the Ancient World: From Temple to Talmud** Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; the synagogue; faith in reason; Sabbath and

festivals; history and its redemption. No prior background in Jewish history assumed.
HU

*** NELC 250b, Assyria: The First Near Eastern Empire** Eckart Frahm

Survey of the history and culture of ancient Assyria, with a focus on its imperial phase in the first millennium B.C.E. Assyria's aggressive foreign policy; the role of the military; Assyrian royal ideology, religion, literature, art, and court life; Assyria's impact on the Bible; Assyria's image in classical sources. Readings from primary sources in translation. HU

NELC 311a / CLCV 219a / HIST 311a, Egypt of the Pharaohs 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

*** NELC 382b / JDST 392b / RLST 405b, Mishnah Seminar: Tractate Megillah** Steven Fraade

Study of rabbinic texts treating rules for the public recitation and translation of the Scroll of Esther on the holiday of Purim and of other sacred scriptures and translations throughout the year, with special attention to the relation between law and ritual and the narrativity of both. EMWAR area of concentration designations: STHJ, RabJud, ScrInterp. Prerequisite: reading fluency in ancient Hebrew. L5, HU

*** NELC 399b / ANTH 478b / ARCG 399b / EVST 399b, Agriculture: Origins, Evolution, Crises** Harvey Weiss

Analysis of the societal and environmental drivers and effects of plant and animal domestication, the intensification of agroproduction, and the crises of agroproduction: land degradation, societal collapses, sociopolitical transformation, sustainability, and biodiversity. SO

*** 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 492a and NELC 493b, The Senior Essay** Jonas Elbousty

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 141a / PSYC 141a, The Criminal Mind Arielle Baskin-Sommers

Theoretical and empirical study of the development of criminal behavior, including constitutional, social, and neurobiological elements. Personality and psychopathological factors associated with criminal behavior; theoretical and psychobiological explanations of crime; the biological/environment interaction; the impact of psychobiological models for policy and intervention. SO

NSCI 160a / PSYC 160a, 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 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 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, Damon Clark, and Joe Howard

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 Jing Yan

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 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. SC

NSCI 355b / PSYC 303b, Social Neuroscience

Molly Crockett

Exploration of the psychological and neural mechanisms that enable the formation, maintenance, and dissolution of social relationships. Topics include the neuroscience of how we form impressions and decide whether to instigate relationships with others; how we build relationships through trust, cooperation, attachment, conflict, and reconciliation; and group-level processes including intergroup bias, moral judgment, and decision making. Prerequisite: PSYC 110 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 470a and NSCI 471b, 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 480a and NSCI 481b, 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 and NSCI 491b, 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)

*** OTTM 310a, Introduction To Ottoman Turkish I** Ozgen Felek

This course studies the Turkish language written in the Arabic alphabet during the Ottoman Empire (1299-1923), which ruled for almost 700 years from North Africa to the Balkans, and the early years of the Turkish Republic established in 1923. The knowledge of Ottoman Turkish thus gives students an important advantage over experts on just one geographical and cultural area of the Muslim world. Students

participating in the course develop skills that enable them to read Ottoman Turkish texts and pursue independent work in Ottoman studies. We work on building up a richer vocabulary, developing a good competence of Ottoman Turkish, and improving students' reading skills. Since culture is an integrated part of the language, various cultural expressions are introduced through a variety of historical and literary Ottoman texts from the fourteenth to nineteenth centuries.

*** OTTM 320b, Introduction to Ottoman Turkish II** Ozgen Felek

This course studies the Turkish language written in the Arabic alphabet during the Ottoman Empire (1299–1923), which ruled for almost 700 years from North Africa to the Balkans, and the early years of the Turkish Republic established in 1923. The knowledge of Ottoman Turkish thus gives students an important advantage over experts on just one geographical and cultural area of the Muslim world. Students develop skills that enable them to read Ottoman Turkish texts and pursue independent work in Ottoman studies. We work on building up a richer vocabulary, developing a good competence of Ottoman Turkish, and improving students' reading skills. Since culture is an integrated part of language, various cultural expressions are introduced through a variety of historical and literary Ottoman texts from the fourteenth to twentieth centuries. Prerequisite: OTTM 310.

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 151b, Persian Culture and Media** Farkhondeh Shayesteh

Advanced study of Persian grammar, vocabulary, and culture through the use of authentic Persian media. Examination of daily media reports on cultural, political, historical, and sporting events in Iran, Afghanistan, Tajikistan, and other Persian-speaking regions. Designed for nonnative speakers. Prerequisite: PERS 140 or permission of instructor. L5

*** PERS 156a, Manichaean Middle Persian & Parthian** Kevin van Bladel

Introduction to reading Middle Persian and Parthian, two different but closely related ancient Iranian languages, in the distinctive script employed by Manichaean scribes.

Includes extensive study of the Manichaean religion through original texts and secondary readings. Permission of instructor required.

Philosophy (PHIL)

* **PHIL 022a, Philosophy of Masculinities** Robin Dembroff

What is masculinity? What relationships does it bear to femininity, misogyny, and homophobia? To race? To biological sex? This course examines these and other questions related to masculinity from a philosophical perspective. The course develops students' understanding of masculinity as a cultural product that changes across context and time. It pays particular attention to the ways that masculinity is socially policed and reinforced, rather than a "natural" expression of male sex. Through combinations of academic and popular texts, students critically examine language surrounding masculinity (e.g., "real man", "bromance"), interlocking relationships between masculinity and other social features, such as race/ethnicity and class, social mechanisms that reproduce masculine norms (e.g., misogyny), and forces that challenge these norms (e.g., trans and queer identifications). From this groundwork, students consider the influence of masculinity on main fields of philosophy, such as epistemology, philosophy of science, ethics, and metaphysics, as well as the prospects for non-hierarchical, non-'toxic' forms of masculinity. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

PHIL 115b, First-Order Logic Kenneth Winkler

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 Keith DeRose

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 128b, Philosophy, Gender, and Patriarchy Robin Dembroff

This course provides an introductory survey of issues that arise in philosophy of gender and sexuality. We discuss topics concerning the metaphysics of gender and sexual orientation (such as biological essentialism vs. social constructivism); the nature of patriarchy and masculinity; bias and epistemic injustice; sexual harassment and violence; intersectionality; and feminism.

PHIL 130b / EDST 135b, Philosophy of Education Jason Stanley

An introduction to the philosophy of education. In this course, we read classical texts about the nature and purpose of education, focusing ultimately on the question of the normative shape and form of education in liberal democracy. What is the difference between education and indoctrination? What is the proper relation, in a liberal democracy, between civic education and vocational education? What shape or form should education take, if it is to achieve its goals? How, for example, is the liberal ideal

of equality best realized in the form and structure of an educational system? Authors include Plato, Rousseau, Du Bois, Washington, Stanton, Dewey, Cooper, Woodson, and Freire. 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 178b, Introduction to Political Philosophy Thomas Pogge

A survey of social and political theory, beginning with Plato and continuing through modern philosophers such as Rawls, Nozick, and Cohen. Emphasis on tracing the development of political ideas; challenges to political theories. HU

PHIL 179a, Life Shelly Kagan

Examination of elements that may contribute to a good life, including the question of which truly have value and why. Factors to consider in choosing a career; the significance of the decision whether to have children; the value of education; the importance of love and accomplishment. HU

PHIL 182a / CGSC 282a / PSYC 182a, 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 202a or b / RLST 277a or b, Existentialism** Noreen Khawaja

Introduction to key problems in European existentialism. Existentialism considered not as a unified movement, but as a tradition of interlocking ideas about human freedom woven through the philosophy, religious thought, art, and political theory of late modern Europe. Readings from Kierkegaard, Nietzsche, Heidegger, Fanon, Sartre, de Beauvoir, Césaire. HU

PHIL 203b / EALL 212b, Ancient Chinese Thought Mick Hunter

An introduction to the foundational works of ancient Chinese thought from the ruling ideologies of the earliest historical dynasties, through the Warring States masters, to the Qin and Han empires. Topics include Confucianism and Daoism, the role of the intellectual in ancient Chinese society, and the nature and performance of wisdom. HU

*** PHIL 205b / EALL 213b / HUMS 292b / RLST 211b, Philosophy, Religion, and Literature in Medieval China** Lucas Bender

Exploration of the rich intellectual landscape of the Chinese middle ages, introducing students to seminal works of Chinese civilization and to the history of their debate and interpretation in the first millennium. No previous knowledge of China is assumed. Instead, the course serves as a focused introduction to Chinese philosophy, religion, and literature. HU

PHIL 214b, The Philosophies of Hegel and Schelling Paul Franks

The competing versions of absolute idealism developed by Hegel and Schelling in the early 1800s. The relationships between philosophy and a history that culminates in

modernity, and between philosophy and religion; the possibility of absolute knowledge and systematicity; the role of kabbalah in philosophy. HU

*** PHIL 227b / ENGL 268b / HUMS 254b / LITR 463b, Literature and Philosophy, Revolution to Romanticism** Jonathan Kramnick

This is a course on the interrelations between philosophical and literary writing beginning with the English Revolution and ending with the beginnings of Romanticism. We read major works in empiricism, political philosophy, and ethics alongside poetry and fiction in several genres. Topics include the mind/body problem, political ideology, subjectivity and gender, and aesthetic experience as they take philosophical and literary form during a long moment of historical change. WR, HU

PHIL 263a, Skepticism, Faith, Evidence, and Rationality Keith DeRose

A study of the rationality of everyday, scientific, philosophical, and religious beliefs, through critical readings of the works of some major early modern philosophers, Descartes, Berkeley, Hume, and Reid, together with writings of recent decades in both religious epistemology and general epistemology. Evidentialist and conservative approaches to the roles of faith and evidence in our governing of our fundamental beliefs are investigated and compared. 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 271a / LING 271a, Philosophy of Language Zoltan Szabo

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation. HU

*** PHIL 274a / GMAN 254a / JDST 335a / RLST 249a, Jewish Philosophy** Paul Franks

Introduction to Jewish philosophy, including classical rationalism of Maimonides, classical kabbalah, and Franz Rosenzweig's inheritance of both traditions. Critical examination of concepts arising in and from Jewish life and experience, in a way that illuminates universal problems of leading a meaningful human life in a multicultural and increasingly globalized world. No previous knowledge of Judaism is required. WR, HU

PHIL 281a, Infinity Mark Maxwell

The idea of infinity. Traditional and contemporary versions of the paradoxes of space, time, and motion, as well as the paradoxes of classes, chances, and truth. Some elementary arithmetic, geometry, probability theory, and set theory. QR, HU

*** PHIL 311a / RLST 303a, The End of Metaphysics** Nancy Levene

Exploration of metaphysics in light of the supposition that it is at an end. Readings from classics and critics in philosophy, religion, and literature. WR, HU

PHIL 326b / RLST 402b, The Philosophy of Religion John Pittard

The relation between religion and ethics, traditional arguments for the existence of God, religious experience, the problem of evil, miracles, immortality, science and religion, and faith and reason. HU

*** PHIL 410b / PSYC 410b, The Self Over Time: Psychological and Philosophical Approaches** Paul Bloom and Laurie Paul

What makes someone the same person over time? Philosophers and psychologists have long been fascinated by identity and the nature of the self. Philosophers ask: are there really such things as individuals who endure over time, from cradle to grave? Or is this an illusion—is a single life nothing but a string of related individuals? If so, is it rational to value who you are now over who you might become in the distant future? In any case, how can someone undergo profound change yet remain the same person? Psychologists explore beliefs and inclinations. What is our natural understanding of personal identity and the self, and how does this change through development? How does this understanding connect to how we think about moral responsibility, love, gratitude, and guilt? What can neuroscience and cognitive science tell us about the nature of a persisting self? In this course, we explore the nature of personal identity and see what happens when philosophy meets psychology. While the course begins with introductory material, we quickly get to contemporary debates of real interest.

Prerequisite: Some background in Psychology, Philosophy, or related disciplines. Permission of instructor is required.

*** PHIL 411b, Early Modern Philosophy of Language** Zoltan Szabo and Kenneth Winkler

Early modern contributions to the philosophy of language. Topics include the nature of signs, ideas as sources of meaning, the formation of propositions, truth, necessary truth, inference, and logical form. Readings from works by Arnauld and Nicole, Locke, Leibniz, and Berkeley; contemporary philosophical reception in the writings of Chomsky, Davidson, and their critics. HU

*** PHIL 416a, The Philosophy of Spinoza** Michael Della Rocca

An in-depth study of Spinoza's philosophy. Readings from his *Ethics*, political writings, *Treatise on the Emendation of the Intellect*, letters, and other works. Spinoza's metaphysics and his views on philosophy of mind, teleology, action, and emotion. Some attention to methods for interpreting works in the history of philosophy. HU

*** PHIL 421a, John Rawls** Thomas Pogge

This seminar offers a close study of Rawls's principal writings. It explores how his thinking evolved in communication with contemporary debates in philosophy, political science, law, and economics. And it probes the suitability of his mature conception of justice in regard to the role Rawls intended this conception to play in the 21st century United States. Featuring ample feedback on written and oral work, this seminar is meant to prepare students for future graduate work at a top institution. Prerequisites: Two courses with substantial normative content. HU

*** PHIL 425a, 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 434a, Disagreement and Higher-Order Evidence** John Pittard

Investigation of the epistemic significance of disagreement. Whether one can reasonably maintain confident belief in the face of disagreement with apparently qualified thinkers; recent responses to that question from conciliationists and anticonciliationists. Related issues in the theory of rationality. HU

*** 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 442b, Language and Power** Jason Stanley

Investigation into the way language shapes our social world, drawing on readings from feminist theory, critical race theory, formal semantics and pragmatics, political psychology, and European history. Prerequisite: one philosophy course; a basic course in logic would be helpful. HU

*** PHIL 444a / WGSS 432a, Social Ontology** Robin Dembroff

Study of conceptual and methodological foundations of social ontology, as well as particular topics within social ontology, such as the nature of gender and race. Prerequisites: at least one, but preferably two philosophy courses. HU

*** PHIL 445b / LING 376b, Implicature and Pragmatic Theory** Laurence Horn

This seminar explores theoretical and experimental approaches to conversational and conventional implicature. We examine the role that pragmatic inference plays in the determination of what is said and of truth-conditional content in neo-Gricean pragmatics and relevance theory as well as considering arguments for and against the grammatical view of scalar implicature. Our investigations draw on evidence from linguistic diagnostics, corpora, and a range of experimental studies on the acquisition, processing, and patterning of scalar implicature, negative strengthening, and exhaustivity in focus constructions. Finally, we review current work on the effects of discourse context, politeness considerations, and lexical semantics in constraining when and how pragmatic inferences are drawn. Prerequisite: At least one course in semantics, pragmatics, or philosophy of language; or permission of instructor. SO RP

*** PHIL 447b / GMAN 321b, Aesthetics of Existence, Life as a Work of Art?** Staff

A research seminar exploring issues at the intersection of ethics and aesthetics. We discuss the modern idea that in order to attain their highest vocation human beings

need to form and transform their nature like a work of art. On this picture, we have to turn our sensible nature into a “second nature” that is expressive of supersensible ideas. After a brief look at the affinity of the virtuous and the beautiful in ancient thought, we discuss the emergence and articulation of the modern idea in Kant, Schiller, Goethe, Schelling, Hegel, and Nietzsche, before exploring how this thought has informed 20th century thought (Adorno, Foucault, Rancière, Agamben). In the last section of the seminar, we highlight the critical notion that the most recent phase of capitalism has exploited the idealist, romantic, and critical ideas of artistic creation and self-creation and turned them into a new disciplinary mechanism (Boltanski/Chiapello). Participants should be familiar with issues in modern aesthetics and ethics. Priority is given to juniors and seniors, who are asked to write a brief e-mail to the instructor, detailing their interest in the course and their familiarity with its topics. HU

* **PHIL 455a / EP&E 334a, 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 457a / EP&E 235a / PLSC 283a, Recent Work on Justice** Thomas Pogge
In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

* **PHIL 460a, Hylomorphism: A Critical Assessment of Aristotle's and Neo-Aristotelian Theories** David Charles

What is hylomorphism? It is, in broad outline, the idea that substances and artefacts are made up of matter and form (or structure). A statue is, on this account, made up of its matter (for example, clay) and its shape (for example that of Athena), if the clay statue is a statue of Athena. You and I are not simply quantities of physical materials; we are physical materials with a certain form or organization. This idea has been employed by Aristotle and by several recent writers, such as David Wiggins, Kit Fine and Kathrin Koslicki to answer questions about identity over time, change and generation. It has also been used to address mind-body problems, taking the body as matter and the mind as form. The specific questions to be investigated include: (a) What is a form? Is it best understood in terms of structure, capacity, activity....?; (b) What is the relation between form and matter in a substance and artefact?; (c) What are the causal roles of matter and form in a substance or artefact? Our general goal is to assess the strengths and weaknesses of the hylomorphic account of substances and artefacts. Priority given to seniors and juniors in philosophy or classics. HU

* **PHIL 462a / EP&E 362a, 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 464b / PLSC 291b, Justice, Taxes, and Global Financial Integrity** Thomas Pogge

Study of the formulation, interpretation, and enforcement of national and international tax rules from the perspective of national and global economic justice. Previous courses in one or two of the following: law, economics, political science, or political philosophy. HU

*** PHIL 472b / GMAN 314b / PLSC 309b, Contemporary Critical Theory** Seyla Benhabib

Frankfurt School and Critical Theory focuses on a number of unresolved questions such as pragmatic Kantianism; modernity and post-colonial theory; the idea of progress; critiques of surveillance capitalism and neo-liberalism. Readings from Habermas, Honneth, Fraser, A. Allen, Jaeggi and others. Prerequisite: Directed Studies or two or more advanced courses in modern political philosophy. SO

*** PHIL 475b, Ethics and the Future** Shelly Kagan

Decisions we make now may affect whether human life will continue on earth or not, or what the quality of that life will be like. This means that the existence and nature of hundreds of trillions of lives (a conservative estimate) may hang in the balance.

Arguably, then, our highest moral priority should be to ensure that human life continues, and at an acceptable level of well-being. The view that this should be our overriding moral concern has been dubbed ‘long-termism.’ The seminar is devoted to examining this position, and exploring the moral assumptions that lie behind it. Prerequisite: A previous course in moral philosophy. HU

*** PHIL 480a or b, Tutorial** Daniel Greco

A reading course supervised by a member of the department and satisfying the following conditions: (1) the work of the course must not be possible in an already existing course; (2) the course must involve a substantial amount of writing, i.e., a term essay or a series of short essays; (3) the student must meet with the instructor regularly, normally for at least an hour a week; (4) the proposed course of study must be approved by both the director of undergraduate studies and the instructor.

*** PHIL 490a or b and PHIL 491b, The Senior Essay** Daniel Greco

The essay, written under the supervision of a member of the department, should be a substantial paper; a suggested length is between 8,000 and 12,000 words for one-term projects, and between 12,500 and 15,000 words for two-term projects. Students completing a one-term project should enroll in either 490 in the fall or 491 in the spring. Students completing a two-term project should enroll in both 490 and 491. The deadline for senior essays completed in the fall is December 5; the deadline for both one- and two-term senior essays completed in the spring is April 21.

*** PHIL 499b / CLCV 320, Before Socrates** Brad Inwood

The origins of Greek philosophy lie in the period before Socrates and Plato. The so-called Presocratics set up many of the questions developed by Plato: the nature of being, the structure of matter, human knowledge and its limitations, causation, etc. Three of the most important early Greek thinkers are studied in this course: Heraclitus, Parmenides, and Empedocles. Knowledge of ancient Greek is not required. Prerequisites: PHIL 125, CLCV 125 or the fall semester of Directed Studies Philosophy. WR, 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 / APHY 050a / ENAS 050a, 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 RP

*** PHYS 100b / APHY 100b / ENAS 100b / EVST 100b / G&G 105, Energy Technology and Society** 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 107b / EDST 107b / MB&B 107b, Being Human in STEM** Mark Hochstrasser

A collaboratively-designed, project-oriented course that seeks to examine, understand, and disseminate how diversity of gender, race, religion, sexuality, economic circumstances, etc. shape the STEM experience at Yale and nationally, and that seeks to formulate and implement solutions to issues that are identified. Study of relevant peer-reviewed literature and popular-press articles. Implementation of a questionnaire and interviews of STEM participants at Yale. Creation of role-play scenarios for provoking discussions and raising awareness. Design and implementation of group interventions. SO

*** PHYS 120b, Quantum Physics and Beyond** Staff

Current topics in modern physics, beginning with quantum physics and continuing through subatomic physics, special and general relativity, cosmology, astrophysics, and string theory. SC

PHYS 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 and PHYS 166Lb, General Physics Laboratory Sidney Cahn, Sean Barrett, David DeMille, 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 per term

*** PHYS 170a and PHYS 171b, University Physics for the Life Sciences** Simon Mochrie and 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 181b, 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 and PHYS 201b, Fundamentals of Physics Paul L. Tipton and Peter Schiffer

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 205La or b and PHYS 206La or b, Modern Physical Measurement Staff

A two-term sequence of experiments in classical and modern physics for students who plan to major in Physics. In the first term, the basic principles of mechanics, electricity, and magnetism are illustrated in experiments designed to make use of computer data handling and teach error analysis. In the second term, students plan and carry out experiments illustrating aspects of wave and quantum phenomena and of atomic, solid

state, and nuclear physics using modern instrumentation. May be begun in either term.

SC ½ Course cr per term

*** PHYS 260a and PHYS 261b, Intensive Introductory Physics** Jack Harris

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 Marla Geha

An introduction to research methods in astronomy and astrophysics. The acquisition and analysis of astrophysical data, including the design and use of ground- and space-based telescopes, computational manipulation of digitized images and spectra, and confrontation of data with theoretical models. Examples taken from current research at Yale and elsewhere. Use of the Python programming language. Prerequisite: background in high school calculus and physics. No previous programming experience required. QR, SC RP

PHYS 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 320a, Science and Public Policy Bonnie Fleming and Sarah Demers

Case studies in the science and technology enterprise in the United States and selected foreign countries; how science and technology affect public policy and in turn are affected by it; how research is planned, supported, evaluated, and utilized; how criteria for selection of research areas are developed and used in the executive and legislative

branches of government. No detailed background in physical science or mathematics required. WR, SO

PHYS 341b, Biological Physics Staff

An introduction to the physics of biological structures and life processes, and to the burgeoning field of biological physics. Related concepts from probability theory and statistical physics are developed as needed. Prerequisite: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

PHYS 343b / ASTR 343b, Gravity, Astrophysics, and Cosmology Staff

Introduction to frontier areas of research in astrophysics and cosmology exploring ideas and methods. In--depth discussion of the physics underlying several recent discoveries including extrasolar planets—their discovery, properties, and issues of habitability; black holes—prediction of their properties from GR, observational signatures, and detection; and the accelerating universe—introduction to cosmological models and the discovery of dark energy. Prerequisites: PHYS 170, 171, or 180, 181, or 200, 201, or 260, 261, or permission of instructor. QR, SC

PHYS 353a / BENG 353a, 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 382Lb, Advanced Physics Laboratory** Staff

Laboratory experiments with some discussion of theory and techniques. An advanced course focusing on modern experimental methods and concepts in atomic, optical, nuclear, and condensed matter physics. Intended to prepare students for independent research. For majors in the physical sciences. After or concurrently with PHYS 439 or 440, or with permission of instructor. PHYS 206L WR, SC

PHYS 401a and PHYS 402b, 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 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 430b, Electromagnetic Fields and Optics Staff

Electrostatics, magnetic fields of steady currents, electromagnetic waves, and relativistic dynamics. Provides a working knowledge of electrodynamics. Prerequisites: PHYS 301 and 410 or equivalents. QR, SC

PHYS 439a / APHY 439a, Basic Quantum Mechanics Peter Rakich

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 440b, Quantum Mechanics and Natural Phenomena I Staff

The first term of a two-term sequence covering principles of quantum mechanics with examples of applications to atomic physics. The solution of bound-state eigenvalue problems, free scattering states, barrier penetration, the hydrogen-atom problem, perturbation theory, transition amplitudes, scattering, and approximation techniques. Prerequisite: PHYS 410 or 401. QR, SC

PHYS 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 442b, Introduction to Nuclear and Elementary Particle Physics Staff

Fundamental concepts in nuclear and particle physics, including the discovery of radioactivity, the Dirac equation, antimatter, Feynman diagrams, hadron resonances, quarks and gluons, fundamental symmetries, the weak interaction, beta decay, quantum chromodynamics, neutrino oscillation, unification, and particle theories for dark matter. Prerequisite: two term courses in quantum mechanics. QR, SC

PHYS 448a / APHY 448a, Solid State Physics I Staff

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 and PHYS 470b, 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 and PHYS 472b, 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.

Political Science (PLSC)

*** PLSC 025a / ENGL 011a, Lincoln in Thought and Action** David Bromwich

An intensive examination of the career, political thought, and speeches of Abraham Lincoln in their historical context. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

*** 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 030a, Law and the Limits of Freedom** Alexander Rosas

This course evaluates the desired role of law in free and modern societies and dissects, more broadly, the relationship between law, the state, and the individual in such societies. Particularly, this course considers when, if ever, it is appropriate to use law to limit freedom in the name of equality, security, community, utility, and/or morality. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program. SO

*** PLSC 040a, How to Read the News: Journalism and Media in an Era of Newsroom Cuts and "Fake News"** Andrew Butters

With so many questions about quality, quantity, and bias in today's headlines, individual consumers of news need to be active participants in the news ecosystem. Students are taught journalistic skills and practices that help them make sense of the modern media maelstrom. Students are asked to create and curate their own digital news platform, acting throughout the semester as its editor and collecting clips of what they think are the most important stories of the week. Using class lectures and readings as criteria for analysis, students annotate their weekly selections. By the end of the semester, students develop their own agenda for the editorial, business, or technological changes that need to be made so that journalism can continue to protect humane, democratic society. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SO

PLSC 111b / GLBL 268b / 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 Christina Kinane

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 Helene Landmore-Jelaca

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 116a, Comparative Politics: States, Regimes, and Conflict Sarah Khan

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 118b, The Moral Foundations of Politics Ian Shapiro

An introduction to contemporary discussions about the foundations of political argument. Emphasis on the relations between political theory and policy debate (e.g., social welfare provision and affirmative action). Readings from Bentham, Mill, Marx, Burke, Rawls, Nozick, and others. 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 135b / AFST 135b, Media and Conflict** Staff

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 137a or b / GLBL 274a or b, 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 138a or b / MGRK 236a or b / SOCY 221a or b, The Euro Crisis** Paris Aslanidis

Examination of how Europe continues to struggle with repercussions of the Great Recession and the impact of the Eurozone crisis in countries such as Portugal, Ireland, Spain, and, especially, Greece. Topics include the euro as a viable common currency; why and how the Eurozone crisis erupted and spread; and whether this catastrophe could have been averted. SO

*** PLSC 161a / GLBL 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 166b, The New Europe David Cameron

European politics since World War II, with emphasis on postwar geopolitical settlement, the development of the European Community and Union, the demise of the Soviet Union and other communist regimes, and current challenges facing Europe. SO

*** PLSC 167b / GBL 284b, Mass Atrocities in Global Politics** David Simon

Examination of the impact of global politics and institutions on the commission, execution, prevention, and aftermath of mass atrocities. SO

PLSC 172a, Strategy, Technology, and War Paul Bracken

This course deals with the strategic management of technology and innovation in the highly dynamic national security space. As more new technologies (cyberwar, ASAT, drones, AI, quantum computing, hypersonic missiles, nuclear weapons) come into military postures a major technological arms race has come about. Strat Tech covers the new technologies; competitive strategies in Europe and Asia; and foreign investment in the US technology sector. Silicon Valley and the Pentagon, and global technology companies receive special focus. SO

*** PLSC 173a / GBL 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 185b / ECON 325b / EP&E 321b / GBL 322b / SAST 281b, Economics of Developing Countries: Focus on South Asia Zachary Barnett-Howell

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality, and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. Prerequisites: introductory microeconomics and introductory econometrics. SO

PLSC 186a / GBL 203a, 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 / GBL 275a, Approaches to International Security Nuno Monteiro

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 205b, The American Presidency Stephen Skowronek

Examination of the constitutional law, historical development, and current operations of the American presidency. Topics include formal powers, the organization and mobilization of popular support, the modern executive establishment, and the politics of presidential leadership. SO

*** PLSC 209a / HIST 167Ja / PLSC 839, 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** Joshua Kalla

Introduction to research methods and topics in American political behavior. Focus on decision making from the perspective of ordinary citizens. Topics include utility theory, heuristics and biases, political participation, retrospective voting, the consequences of political ignorance, the effects of campaigns, and the ability of voters to hold politicians accountable for their actions. SO

*** PLSC 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 213b, The Legislative Process: Theoretical and Empirical Approaches to Studying the U.S. Congress** Staff

This course covers important theoretical and empirical approaches to the study of legislative politics. The main objectives are to come to a deeper understanding of the motivations and institutions that influence legislator behavior in the U.S. Congress, as well as to think critically about existing explanations for these behaviors. While we focus mainly on the United States Congress, many of the theories and empirical strategies are applicable to other legislative institutions. Each week we read at least two important pieces of theoretical or empirical research to demonstrate how to engage in rigorous social science. Prerequisite: PLSC 113. SO

PLSC 214b, The Politics of American Public Policy Jacob Hacker

Public policy in the United States and the methodological and theoretical tools used to study the forces that shape it. Economic and political science perspectives on the policy process and contemporary American governance. Domestic policy issues such as health care, economic inequality, job insecurity, the federal debt, environmental protection, criminal justice, financial regulation, and primary and higher education. SO

PLSC 215a / EVST 255a / F&ES 255a / GLBL 282a, 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 219a / EP&E 497a / EVST 247a, Politics of the Environment** Peter Swenson
Historical and contemporary politics aimed at regulating human behavior to limit damage to the environment. Goals, strategies, successes, and failures of movements, organizations, corporations, scientists, and politicians in conflicts over environmental policy. Focus on politics in the U.S., including the role of public opinion; attention to international regulatory efforts, especially with regard to climate change. so

* **PLSC 220a / PLSC S220 / WGSS 220a, Gender Politics** Andrea Aldrich
Exploration of theoretical and empirical work in political science to study the relationship between gender and politics in the United States and around the world. Topics include women's representative in legislative and executive branch politics in democratic regimes; the impact of gender stereotypes on elections and public opinion; conditions that impact the supply and demand of candidates across genders; and the underrepresentation of women in political institutions. WR, so

* **PLSC 223b / EDST 223b, 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 226b, Congress: How Legislating Works** Staff

This course examines the United States Congress and lawmaking. Topics are divided into six categories: the Constitution and legislative power, congressional behavior, congressional structure, theories of lawmaking, polarization, and Congress's impact on America's political development. so

* **PLSC 228a / EP&E 306a / EP&E S306 / PLSC S228, 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** Staff

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, Policy, Politics, and Learning on the Education Beat** Staff

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 their impact on policy. Students learn to develop strong, marketable ideas while crafting features aimed at publication. Journalists on the K-12 beat are frequent guests. WR, SO

*** PLSC 251a / AMST 469a / EP&E 396a, American Progressivism and Its Critics**

Stephen Skowronek

The progressive reform tradition in American politics. The tradition’s conceptual underpinnings, social supports, practical manifestations in policy and in new governmental arrangements, and conservative critics. Emphasis on the origins of progressivism in the early decades of the twentieth century, with attention to latter-day manifestations and to changes in the progressive impulse over time. SO

*** PLSC 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 256b / EP&E 248b, American Political Institutions** Michael Fotos

The origins and development of American political institutions, especially in relation to how institutions shape the policy process. Issues of temporality, policy feedback, and policy substance. WR, 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 258b / EP&E 336b / PLSC 841, Democracy and Bureaucracy** Ian Turner

Exploration of what government agencies do and why; focus on issues of accountability and the role of bureaucracy in representative democracy. Understanding how bureaucracy works internally and how it is affected by interactions with other political actors and institutions. SO

*** PLSC 261b / AMST 468b, American Political Development** Stephen Skowronek

This course examines patterns of political change and institutional development in the United States. It looks to the past for leverage on thinking about the problems of government and politics today. Students examine issues of political culture like racism and liberalism, as well as standard developmental themes like party building, state building, social movement effects, and constitutional change. 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 265b, The Politics of Economic Security** Staff

This course examines the politics of economic security in the United States. Topics include the psychology of risk pooling, the design of social policy, and why people want (or don't want) to address economic insecurity and poverty. We also consider how local contextual factors and family structure affect support for redistribution and social insurance. SO

*** PLSC 273b / EP&E 339b, The Ethics of Journalism** Jacob Weisberg

An examination of key issues about the rights and responsibilities of the press. Topics include truth and verification, bias and objectivity, the handling of government secrets, the use of misrepresentation and deception, privacy, and the protection of sources. Case studies including WikiLeaks and the Pentagon Papers will supplement readings from critics such as Walter Lippmann, George Orwell, Janet Malcolm, and Neil Postman.

*** PLSC 274a, Cities: Making Public Choices in New Haven** Staff

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 277a, 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 278b, Politics and the Supreme Court** Kelly Rader

The role of the U.S. Supreme Court in the American political system. Ways in which the political preferences of Congress, the President, and the American public shape, constrain, or compel the Court's decision making. Supreme Court justices as political actors who issue decisions that make policy. so

*** PLSC 283a / EP&E 235a / PHIL 457a, Recent Work on Justice** Thomas Pogge

In-depth study of one contemporary book, author, or debate in political philosophy, political theory, or normative economics. Focus varies from year to year based on student interest and may include a ground-breaking new book, the life's work of a prominent author, or an important theme in contemporary political thought. HU

*** PLSC 284a / EP&E 330a, Capitalism, Commodification, and Business Ethics**

Gregory Collins

For centuries, “business” activities—such as profit-making, capital investment, and trading—were seen with a distrustful eye by many members of society for prioritizing greed over virtue and religion. The aim of this course is to cast light on this tension in contemporary culture by critically examining the ethical dilemmas that arise from the interaction between capitalism and business actors in a liberal society. The chief question that guides our inquiry is how the incentive structure of market exchange encourages businesses to commodify social relations in a way that raises moral questions about the pursuit of profit. We begin by defining “ethics” and “business.” We then explore the traditional tensions between them in the history of political and economic thought by surveying a number of key thinkers that have drawn attention to the fraught relation between markets and morality. Next we address some of the important contemporary debates and controversies surrounding business ethics, including corporate social responsibility, sweatshops, outsourcing, public accommodations, and the use of consumer data. Each week introduces a new theme, but the intent is for the themes to flow logically throughout the course in a manner that integrates and synthesizes the prior week’s readings and discussion. We conclude by

connecting our study of business ethics to our wider understanding of the proper role of business and capitalist enterprise in society as a whole. so

*** PLSC 286b / HIST 286J / HIST 292Jb / HUMS 279b, Democracy and the French Revolution** Isaac Nakhimovsky

The French Revolution of 1789 and its legacies, as viewed through the late-eighteenth-century debates about democracy, equality, representative government, and historical change that shaped an enduring agenda for historical and political thought in Europe and around the world. WR, HU

PLSC 290a / SOCY 151a, Foundations of Modern Social Theory Emily Erikson

Major works of social thought from the beginning of the modern era through the 190s. 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 291b / PHIL 464b, Justice, Taxes, and Global Financial Integrity** Thomas Pogge

Study of the formulation, interpretation, and enforcement of national and international tax rules from the perspective of national and global economic justice. Previous courses in one or two of the following: law, economics, political science, or political philosophy. 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 300a / EP&E 354a / PLSC 623a, Rethinking the Political Enlightenment** Ian Shapiro

The calamities wrought by Fascism and Nazism, together with growing disillusionment at the excesses and direction Soviet communism and then Mao's China, led many postwar intellectuals to rethink the Enlightenment's promise. In politics that promise had centered on the creation of durable political institutions based on scientific principles that would foster, expand, and protect human freedom. We study the ways in which the harsh realities of twentieth century politics led political theorists to modify, recast, and in some cases reject these Enlightenment aspirations, and we evaluate those responses from the perspective of our contemporary politics. Readings are drawn from, among others, Jonathan Israel, James Tully, Hannah Arendt, Herbert Marcuse, Nicos Poulantzas, Jürgen Habermas, Leo Strauss, Isaiah Berlin, Michel Foucault, Richard Rorty, Alasdair MacIntyre, Charles Taylor, Anthony Appiah, Nancy Fraser, Carole Pateman, Judith Shklar, Quentin Skinner, J.G.A. Pocock, Michael Walzer, and Iris Marion Young. Among the themes discussed are the connections between Enlightenment aspirations and the ideas of modernization, progress, and democracy; the advantages and limitations of periodization in the study of political theory; and teleological conceptions of history. Open to PhD students in Political Science and to graduate students in other departments and programs by agreement with the instructor. Open to undergraduates as space permits, provided they have completed at least three political science courses, one of which is PLSC 114, PLSC 118, or equivalent such as Directed Studies. so

*** PLSC 302a, Commerce and Equality: Montesquieu and Rousseau** Staff

This course engages in close readings of the works of two of the greatest minds of the 18th century, Montesquieu and J.J. Rousseau, addressing fundamental questions about commerce and equality, liberalism and democracy, cosmopolitanism and nationalism, and the meaning of modernity. HU

PLSC 303a, Demagoguery and Democracy Bryan Garsten

This course offers historical and theoretical perspective on contemporary debates about democratic leadership and political discourse. How can demagoguery be distinguished from healthy forms of popular leadership? Under what conditions do demagogues tend to emerge? What institutional arrangements and political strategies help to manage demagogues? The course traces these themes through a set of conversations that begin in ancient Greek and Roman texts on the art of persuasion and continue through the Renaissance and early modern period and into revolutionary and post-revolutionary thinking about leaders' claims to speak for the people. Contemporary issues including populism and the impact of social media are addressed. 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 307a / HUMS 295a / JDST 223a, Trials of Uncertainty** Norma Thompson

Is the demise of the trial at hand? The trial as cultural achievement, considered as the *epitome* of humanistic inquiry, where all is brought to bear on a crucial matter in an uncertain context. Truth may be hammered out or remain elusive, but the expectation in the court case has been that the adversarial mode works best for sorting out evidentiary conundrums. Inquiries into issues of meaning of the trial, its impartiality, and challenges to its endurability. The role of character, doubt, and diagnosis explored in Sophocles, Plato, Cicero, Burke, Jane Austen, Tocqueville, and Kafka, as well as in twentieth-century trials, films, documentaries, and twenty-first-century medical narratives. WR, HU

*** PLSC 309b / GMAN 314b / PHIL 472b, Contemporary Critical Theory** Seyla Benhabib

Frankfurt School and Critical Theory focuses on a number of unresolved questions such as pragmatic Kantianism; modernity and post-colonial theory; the idea of progress; critiques of surveillance capitalism and neo-liberalism. Readings from Habermas, Honneth, Fraser, A. Allen, Jaeggi and others. Prerequisite: Directed Studies or two or more advanced courses in modern political philosophy. SO

*** PLSC 310a / EDST 312a / HIST 423Ja / HUMS 221a, Idolizing Education**

Mordechai Levy-Eichel

This course is an iconoclastic introduction to the study of education. Besides examining the purposes and practice of education and learning across a wide variety of times and places, the course examines the study of education today in order to see what can be gained from a skeptical approach to the subject. Particular emphasis is placed on the origins and development of the research university. 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 318a, Lincoln's Statecraft and Rhetoric Steven Smith

Close reading of major speeches and letters by Abraham Lincoln, with a focus on his views concerning slavery, equality, and race in American society. The relation of words to deeds in Lincoln's practice of statecraft; his place in the history and theory of statesmanship. The emergence of Lincoln's thought from an engagement with views of the American founders; ways in which his vision of American democracy both drew upon and transformed the founders' vision. 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 321b / GLBL 342b / HIST 482Jb, Studies in Grand Strategy I** Beverly Gage

The study of grand strategy, of how individuals and groups can accomplish large ends with limited means. The spring term focuses on key moments in history that illustrate strategic thinking in action. During the summer, students undertake research projects or internships analyzing strategic problems or aspects of strategy. The following fall, students put their ideas into action 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. Previous study courses in political science, history, global affairs, or subjects with broad interdisciplinary relevance encouraged. HU, SO

*** PLSC 325b / EDST 325b, What is Education For?** Bryan Garsten

Should we expect to be transformed by our education? Should education aim to produce certain sorts of workers, or citizens, or human beings? This course explores competing ideas about education's public and private purposes. The course puts classic texts of political thought into conversation with contemporary literature and debates. Key moments in the history of American education serve as case studies, with special emphasis on Yale's place in this history. HU, SO

*** PLSC 327a, Advanced Topics in Modern Political Philosophy** Giulia Oskian

Advanced survey of selected topics in political philosophy. The focus is on political realism with special attention to the problems of order, conflict, and faction. The role of statecraft and the role of political ethics are also considered. Close analysis of the writings of Thucydides, Machiavelli, and the Federalist along with selected critical studies. Prerequisite: substantial course work in intellectual history and/or political theory. HU, SO

*** PLSC 331b, Individualism and Community: Tocqueville and J.S. Mill** Staff

Alexis de Tocqueville and John Stuart Mill were two of the most prominent liberal theorists and statesmen of the 19th century. They recognized that the modern era was to be democratic, and both sought a “new political science” to understand and guide “a world altogether new.” This course will compare their political philosophies, asking how each understood the relations between individualism and community, democracy and liberty, and citizenship and human flourishing. HU

PLSC 340a / S&DS 315a, Measuring Impact and Opinion Change Joshua Kalla

This course introduces students to measuring impact. Political campaigns, marketers, governments, and non-profit organizations regularly try to produce opinion change through TV, radio, online ads, mail, and door-to-door canvassing. Are these efforts successful at producing opinion change? In this course, we learn how to use experiments and natural experiments to measure the impact of opinion change efforts, and how to be appropriately skeptical of findings that claim to measure impact. This course also teaches data analysis skills in R. Prerequisite: A prior statistics course at Yale (e.g., PLSC 425, S&DS 242) and programming experience in R. QR

*** PLSC 341b / GLBL 195b, The Logic of Randomized Experiments in Political Science**

Alexander Coppock

Instruction in the design, execution, and analyzation 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

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 346b / EP&E 231b / GLBL 180b, Game Theory and International Relations

Alex Debs

Introduction to game theory and its applications in political science and economics, with a focus on international relations. Standard solution concepts in game theory; case studies from important episodes in the history of international relations, including

World War II, the Cuban missile crisis, and the 2003 U.S.-led invasion of Iraq.
Recommended preparation: introductory microeconomics. 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 351b / CPSC 123b / S&DS 123b / S&DS 523b, YData: An Introduction to Data

Science John Lafferty and Elena Khusainova

Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

*** PLSC 352a / PLSC 523a, Mixed Methods Research** Elizabeth Nugent

This course is intended as an overview for creating and critiquing sophisticated research designs using both quantitative and qualitative methodologies and data. The course begins with fundamental definitions and assumptions underpinning mixed methods research, and then moves on to analyzing the strengths and weaknesses of specific combinations of quantitative tests, case studies, and narrative and interpretive work. Next, the course discusses the research design choices of two award-winning books using mixed methods research, and then evaluates the qualitative and quantitative data in isolation and in combination. The final assignment builds on the course material to produce a mixed method research design proposal. This course is ideal for upper level undergraduates who are interested in learning more about designing and carrying out mixed methods research in seminar papers, senior essays, and independent research projects. SO

*** PLSC 353b / S&DS 314b, Introduction to Causal Inference** Winston Lin

Introduction to causal inference with applications to the social and health sciences. Topics include randomized experiments, matching and propensity score methods, sensitivity analysis, instrumental variables, and regression discontinuity designs.

Mathematical problems, data analysis in R, and critical discussions of published applied research. Prerequisite: S&DS 242 and some programming experience in R. QR

*** 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 357a / EAST 310a / GLBL 309a, 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 / PLSC 722, 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 366b, European Politics** David Cameron

Comparison of the political systems of the major European countries. Topics include political institutions, electoral politics and political parties, public policies, and contemporary problems. SO

*** PLSC 372b / EP&E 242b, Politics and Markets** Peter Swenson

Examination of the interplay between market and political processes in different substantive realms, time periods, and countries. Inquiry into the developmental relationship between capitalism and democracy and the functional relationships between the two. Investigation of the politics of regulation in areas such as property rights, social security, international finance, and product, labor, and service markets. Topics include the economic motives of interest groups and coalitions in the political process. SO

*** PLSC 374b / ECON 449b / EP&E 244b, The Economic Analysis of Conflict** Gerard Padro

Introduction to the microeconomic analysis of internal conflict. In particular, how conflict imposes economic costs on the population and how people react to conflict. Topics include the correlates of war; the economic legacies of conflict on human capital, local institutions, households' income, and firm performance; and the causes and impacts of forced displacement. Prerequisites: Intermediate microeconomics and econometrics. SO

*** PLSC 375a / GLBL 215a / LAST 386a / MGRK 237a / SOCY 389a, Populism** Paris Aslanidis

Investigation of the nature of the populist phenomenon and its impact on politics, society, and the economy in various regions of the world. Conceptual and methodological analyses are supported by comparative assessments of various empirical

instances, from populist politicians such as Hugo Chavez and Donald Trump, to populist social movements such as the Tea Party and Occupy Wall Street. SO

*** PLSC 377b / SAST 344b / WGSS 397b, Political Economy of Gender in South Asia**

Sarah Khan

This course focuses on the political and economic underpinnings and implications of gender inequality in South Asia. We draw on evidence from Bangladesh, Pakistan, and India to guide our theoretical and empirical inquiry into the following broad questions: What is gender, and what approaches do social scientists use to study gender inequality? How does gender inequality manifest in different social, economic, and political spheres e.g. the household, the labor market, the electorate, the government? What are the cultural and structural drivers of gender inequality? How effective are different approaches to tackling gender inequality in South Asia? Previous course work in statistical data analysis is helpful, but not required. SO

*** PLSC 391b / EP&E 302b / GLBL 259b / HIST 469Jb, 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 393a, Comparative Constitutionalism and Legal Institutions** Staff

Introduction to the field of comparative constitutional law. Constitutional texts, materials, and cases drawn primarily from those constitutional democracies that are also members of the Group of Twenty Nations and that respect judicial independence. SO

PLSC 396b / MMES 364b, Politics of the Contemporary Middle East Elizabeth

Nugent

This course is an overview of contemporary politics of the Middle East, and is organized thematically and (more or less) chronologically. We examine prominent explanations for the democratic deficit in the Middle East, and challenge the notion that the region is completely devoid of competitive and meaningful politics. We also explore the ways in which a variety of factors—including foreign intervention, persistent authoritarianism, oil, and Islam, among others—has affected domestic politics. We consider different aspects of domestic politics, including redistribution, gender politics, and public opinion. We end the course by building on what we learned to make sense of the 2010-2011 'Arab Spring' uprisings, in an effort to understand whether these developments mark change or continuity. SO

*** PLSC 398b / EP&E 253b, Comparative Political Economy** Frances McCall

Rosenbluth

Introduction to issues in political economy across time and place. The field's diverse theoretical underpinnings and its place in the context of political science and of the social sciences more generally; theoretical perspectives such as materialism, institutionalism, and cognition/culture/beliefs; interactions between government and the economy in democratic and nondemocratic regimes and in developed and developing countries. Enrollment limited to senior Political Science majors. SO

*** PLSC 399b / EP&E 257b / LAST 251b, Political Power and Inequality in Latin America** Ana De La O

Overview and analysis of politics in Latin America. The emergence of democracy and the forces that led to the unprecedented increase in inequality in the twentieth century. Topics include institutional design, historical legacies, corruption, clientelism, and violence. SO

*** PLSC 408b, Human Rights, Law and Politics in Contemporary Russia** Staff

The seminar is designed to give a broad understanding of the lines of theorizing and types of research that animate the study of human rights issues and human rights mobilizations in post-soviet Russia. Acquainting students with academic research in history, sociology, anthropology and political science on the matter, the seminar seeks to analyze these topics going beyond media portrayals of Russian society and binary oppositions that often structure narratives of Post-soviet social and political reality (state vs. civil society, rule of law vs. kangaroo justice, democracy vs. authoritarianism, repression vs. resistance). This course analyzes how “human rights” have been constructed—as a cause, as a discourse, as a legal and institutional framework—since the Soviet dissident movement, then in the 1990s and 2000s, until today, when “human rights” have become a dominant frame on a number of very heterogeneous issues for media and activists denouncing the political regime in Putin’s Russia. It pays particular attention to the sociology of actors, as well as to historical, political and social conditions of emergence and development of human rights mobilizations. The course also focuses on various empirical case studies on highly mediated human rights issues: political prisoners, protest-related trials, women’s rights, LGBTQ rights, prison and penitentiary institutions. These case studies provide students with a broader empirical knowledge on contemporary Russian society, and serve as a magnifying glass, as they highlight complex dynamics of Russian politics and law in the last thirty years. SO

*** PLSC 410a, Political Protests** Maria Jose Hierro

The study of political protest, with discussion of theoretical approaches explaining the origin and decline of social movements and protest. Topics include the conditions under which individuals coordinate and start protest actions; what favors individual participation in protests; and when do protests succeed. 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 423a / EP&E 243a / GLBL 336a / LAST 423a, Political Economy of Poverty Alleviation** Ana De La O

Overview of classic and contemporary approaches to the question of why some countries have done better than others at reducing poverty. Emphasis on the role of politics. SO

*** PLSC 431a or b / GLBL 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 439b / GLBL 263b, Challenges of Young Democracies Ana De La O

Challenges faced by young democracies, such as organizing free and fair elections, controlling government corruption, building an accountable system of governance, sustaining development, and curtailing conflict and violence. Factors that lead to the consolidation of democratic politics or to stagnation and a return to nondemocratic political systems. SO

*** PLSC 444a / EAST 344a, Governing China** Daniel Mattingly

Study of the politics of contemporary China, with a focus on recent research. Topics include elite politics, technology, economic growth, trade, repression, propaganda, protest, the military, and foreign policy. SO

*** PLSC 445a / GLBL 244a, The Politics of Fascism** Staff

Study of the rise of fascism in Europe in the 1930s and its 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. SO

*** PLSC 450b / GLBL 341b, The Geopolitics of Democracy** Staff

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 112E, 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 455a, Big Data, AI, and Political Science: Applications to Russian Politics** Staff

This cross-disciplinary course focuses on two broad questions. First: how do politicians use new technologies to influence politics? Second: how do scholars use new technologies to study politics? It uses Russia as a laboratory to explore these questions. The course consists of four parts. It starts with a review of contemporary Russia and pays attention to the quantitative studies of its economy and politics. Next, the course provides a non-technical introduction to Big Data and AI algorithms. Finally, it outlines the applications of the new technologies to the study of Russian politics. Prerequisites: A prior Yale statistics course (e.g., PLSC 425, S&DS 242); programming experience in R. A course on research design in the social sciences is helpful, but not required.

*** PLSC 458a / AFST 304a / MMES 304a, Modern North Africa in Flux** Staff

Study of the politics of modern North Africa (Morocco, Algeria, Tunisia, and to a limited degree, Libya and Mauritania), including colonialism; state-formation and early nationalism; the cultivation of authoritarian regimes; modern authoritarian politics; civil-military relations; democratization; civil society; protest, dissent, social and movement mobilization; oil and rentierism; Islamism and the politics of religion; linkages to the Mashreq; and the dynamics of foreign intervention. Readings and approach to politics are cross-disciplinary, integrating political science, anthropological, historical, religious, as well as gender/race studies Prerequisite: MMES 191 or permission of the instructor.

PLSC 463b, 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 471a and PLSC 472b, 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 474b, Directed Reading and Research for Junior Intensive Majors** David Simon

For juniors preparing to write yearlong senior essays as intensive majors. The student acquires the methodological skills necessary in research, identifies a basic reading list pertinent to the research, and prepares a research design for the project. 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** Maria Jose Hierro

Presentation and discussion of students' research proposals, with particular attention to choice of topic and research design. Each student frames the structure of the essay, chooses research methods, begins the research, and presents and discusses a draft of the introductory section of the essay. Enrollment limited to Political Science majors writing a yearlong senior essay.

*** PLSC 491a or b, The Senior Essay** David Simon

Each student writing a yearlong senior essay establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 490, advises the student about preparation of the essay and changes to successive drafts. Enrollment limited to Political Science majors writing a yearlong senior essay.

*** PLSC 493b, Senior Essay for Intensive Majors** David Simon

Each student in the intensive major establishes a regular consultation schedule with a department member who, working from the prospectus prepared for PLSC 490, advises the student about preparation of the essay and changes to successive drafts, as well as reporting the student's progress until submission of the final essay. Enrollment limited to Political Science intensive majors.

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 246b / FILM 241b, Polish Communism and Postcommunism in Film**

Krystyna Illakowicz

The Polish film school of the 1950s and the Polish New Wave of the 1960s. Pressures of politics, ideology, and censorship on cinema. Topics include gender roles in historical and contemporary narratives, identity, ethos of struggle, ethical dilemmas, and issues of power, status, and idealism. Films by Wajda, Munk, Polanski, Skolimowski, Kieslowski, Holland, and Kedzierzawska, as well as selected documentaries. Readings by Milosz, Andrzejewski, Mickiewicz, Maslowska, Haltoff, and others. Readings and discussion in English. HU

Punjabi (PNJB)

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 125b, Intensive Elementary Portuguese** Staff

An intensive beginning course in Portuguese that covers in one term the material taught in PORT 110 and 120. Admits to PORT 130. Basic vocabulary and fundamentals of grammar and phonology through practice speaking, reading, and writing, and listening with stress on audio-lingual proficiency. Advanced students and speakers of other

Romance languages, with permission of instructor. Qualifies students for summer study abroad in Brazil (L3-L4). L1, L2 2 Course cr

PORT 130a, Intermediate Portuguese I Giseli Tordin

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 150b, Advanced Practice in Portuguese** Staff

Advanced conversation and composition, with an introduction to Luso-Brazilian literature and culture. After PORT 140 or equivalent. May be repeated for credit. L5 RP

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 350b / LITR 252b, Machado de Assis** Kenneth David Jackson

The place of Machado de Assis in world literature explored through close reading of his collected short stories in translation. Focus on Machado's hybrid literary world, skeptical critique of empire in Brazil, psychological and narrative constructions. Readings and discussion in English; reading of texts in Portuguese for Portuguese majors. WR, HU TR

PORT 351b / LITR 286b, Pessoa, Lispector, Rosa, Saramago Kenneth David Jackson

Study of works in translation by four contemporary masters in the Portuguese language, Fernando Pessoa, Clarice Lispector, João Guimarães Rosa and José Saramago. These authors radically experiment with prose in order to question notions of identity, existence, and meaning. WR, HU

*** PORT 352a / CPLT 657a / LITR 256a / PORT 652a, Clarice Lispector: The Short Stories** Kenneth David Jackson

This course is a seminar on the complete short stories of Clarice Lispector (1920-1977), a master of the genre and one of the major authors of twentieth-century Brazil known for existentialism, mysticism and feminism. WR, HU TR

*** PORT 385a / LAST 385a / LITR 260a, Brazilian Novel of the 21st Century** Kenneth David Jackson

Changing narratives, themes, styles, and aesthetic ideals in current Brazilian prose and poetry. The writers' attempts to express or define a personal, national, and global consciousness influenced by the return of political democracy to Brazil. Focus on readings published within the last five years. Readings and discussion in English; texts available in Portuguese. WR, HU TR

*** PORT 471a and PORT 472b, Directed Reading or Directed Research** Kenneth David Jackson

Individual study for qualified students under the supervision of a faculty member selected by the student. Approval of the director of undergraduate studies is required.

*** PORT 491a and PORT 492b, The Senior Essay** Kenneth David Jackson

A research project designed under a faculty director, resulting in a substantial paper written in Portuguese, submitted to the DUS and a second designated reader.

Psychology (PSYC)

PSYC 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** 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

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 127a or b / CHLD 127a or b / EDST 127a or b, 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** Ann Close and Carla Horwitz

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 Frank Keil

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 141a / NSCI 141a, The Criminal Mind Arielle Baskin-Sommers

Theoretical and empirical study of the development of criminal behavior, including constitutional, social, and neurobiological elements. Personality and psychopathological factors associated with criminal behavior; theoretical and psychobiological explanations of crime; the biological/environment interaction; the impact of psychobiological models for policy and intervention. SO

PSYC 150b / EDST 160b, Social Psychology Maria Gendron

Theories, methodology, and applications of social psychology. Core topics include the self, social cognition/social perception, attitudes and persuasion, group processes, conformity, human conflict and aggression, prejudice, prosocial behavior, and emotion. SO

PSYC 160a / NSCI 160a, 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 182a / CGSC 282a / PHIL 182a, 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 200b, Statistics Ilker Yildirim

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** Jennifer Hirsch

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 237b, Research Methods in Cognitive Psych Staff

*** 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, Research Methods in Cognitive Neuroscience** Staff

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. SC

PSYC 303b / NSCI 355b, Social Neuroscience Molly Crockett

Exploration of the psychological and neural mechanisms that enable the formation, maintenance, and dissolution of social relationships. Topics include the neuroscience of how we form impressions and decide whether to instigate relationships with others; how we build relationships through trust, cooperation, attachment, conflict, and reconciliation; and group-level processes including intergroup bias, moral judgment, and decision making. Prerequisite: PSYC 110 or permission of instructor. SC

PSYC 315a / CGSC 315a, The Modern Unconscious John Bargh

The notion of the unconscious mind traced from the early 1800s through Freud to present-day cognitive science, with a focus on the past thirty years. The power and function of the unconscious as a pervasive part of normal everyday human functioning. Readings mainly from cognitive and social cognitive psychology but also philosophy of mind and evolutionary biology. SO

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 318b / LING 220b, General Phonetics Staff

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 326a, Psychotherapy Mary O'Brien

Psychotherapy is designed to introduce students to a broad range of evidence-based techniques for enhancing psychological functioning. We discuss theoretical and empirical readings, treatment manuals, videos of experts demonstrating therapeutic techniques, and relevant TED talks. Additionally, we engage in experiential learning and practice applying techniques in our daily lives. This course begins with a discussion of the importance of scientific evaluation of psychotherapy. Next, we explore multicultural competence in psychotherapy and consider ways to tailor each therapeutic approach to optimize the relevance and effectiveness for diverse populations. Techniques for establishing a therapeutic alliance are discussed and practiced, followed by exploration of therapeutic approaches from Cognitive Behavioral Therapy (CBT), Acceptance and Commitment Therapy (ACT), Self-Compassion and Growth Mindset research, Dialectical Behavior Therapy (DBT), Psycho-educational Family Therapy, and Couples and Group Therapy. Prerequisite: PSYC 180. SO

PSYC 327b / LING 227b, Language and Computation I Robert Frank

Design and analysis of computational models of language. Topics include finite state tools, computational morphology and phonology, grammar and parsing, lexical semantics, and the use of linguistic models in applied problems. Prerequisite: prior programming experience or permission of instructor. QR, SO

*** PSYC 328b / EDST 328b, Learning in the School-Age Child: Core Mechanisms**

Kristi Lockhart

This course focuses on empirically supported principles of learning that are used with K to 8th grade children (and also adolescents and adults) to enhance learning outcomes. We look at twenty-six (A to Z) core mechanisms used to promote learning. Each mechanism is explored from a theoretical, research-based, and practical perspective. Studies conducted in cognitive and perceptual psychology, social psychology, behavioral psychology as well as cultural psychology have contributed to the knowledge of these mechanisms. We discuss how the mechanisms work, what problems they overcome, and the positive (as well as negative) ways in which they can be implemented. Prerequisite: PSYC 110 or credit for AP Psychology. SO

PSYC 330a, Psychology and the Law Kristi Lockhart

Contributions of psychological theory and research to our understanding of the law and the criminal justice system. Topics include criminality, eyewitness testimony, lie detection, jury decision making, the death penalty, the insanity defense, civil

commitment, prisons, repressed memories, children as witnesses and defendants, and the role of psychologists as expert witnesses and trial consultants. SO

*** PSYC 332a / CGSC 300a / LING 300a / LING 700a / PSYC 309 / PSYC 632a, The Cognitive Science of Sign Languages** Maria Pinango and Muye Zhang

Natural sign languages like American Sign Language have all of the structure and complexity of spoken languages. They are learned and processed like spoken languages, and activate neural structures that maximally overlap with those activated by spoken languages. These findings have not only had important implications for the sociopolitical status of Deaf people, as a native, American minority community but also have caused linguists and psychologists to re-evaluate their most fundamental theories of language representation and processing in the mind and brain. The course introduces you to the analysis of sign languages at different levels of linguistic structure and related aspects of cognition in the visual modality. The primary goal is to encourage you as linguists, psychologists, and cognitive scientists to consider how natural sign languages can and must inform your linguistic theories (linguistics), models of language and cognition (psychology), and technological applications of language processing (computer science/artificial intelligence). We also consider the ways in which signing communities/Deaf culture interact with the hearing world often as marginalized minority groups and reflect upon access to language and information as a basic human right. Some background in linguistic structure, cognitive science, any signed language, or permission of the instructor is preferred. 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 350b / CHLD 350b / EDST 350b, Autism and Related Disorders** Fred Volkmar and James McPartland

Weekly seminar focusing on autism and related disorders of socialization. A series of lectures on topics in etiology, diagnosis and assessment, treatment and advocacy, and social neuroscience methods; topics cover infancy through adulthood. Supervised experience in the form of placement in a school, residence, or treatment setting for individuals with autism spectrum disorders. Details about admission to the course are explained at the first course meeting. Prerequisite: an introductory psychology course. SO

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. SC

*** PSYC 372a / 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.

*** PSYC 405b, Social Emotions** Margaret Clark

The nature and function of emotions in social context. How emotions such as happiness, sadness, fear, and anger shape how we relate to others; how the ways in which we relate to others shape our experience and expression of these emotions. The nature and functions of additional emotions that seem to arise only within the context of social relationships: feelings of hurt, guilt, gratitude, empathic joy, and empathic sadness. SO

*** PSYC 408a, 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 410b / PHIL 410b, The Self Over Time: Psychological and Philosophical Approaches** Paul Bloom and Laurie Paul

What makes someone the same person over time? Philosophers and psychologists have long been fascinated by identity and the nature of the self. Philosophers ask: are there really such things as individuals who endure over time, from cradle to grave? Or is this an illusion—is a single life nothing but a string of related individuals? If so, is it rational to value who you are now over who you might become in the distant future? In any case, how can someone undergo profound change yet remain the same person? Psychologists explore beliefs and inclinations. What is our natural understanding of personal identity and the self, and how does this change through development? How does this understanding connect to how we think about moral responsibility, love, gratitude, and guilt? What can neuroscience and cognitive science tell us about the nature of a persisting self? In this course, we explore the nature of personal identity and see what happens when philosophy meets psychology. While the course begins with introductory material, we quickly get to contemporary debates of real interest.

Prerequisite: Some background in Psychology, Philosophy, or related disciplines. Permission of instructor is required.

*** PSYC 425b / CGSC 425b, Social Perception** Brian Scholl

Connections between visual perception, among the earliest and most basic of human cognitive processes, and social cognition, among the most advanced forms of higher-level cognition. The perception of animacy, agency, and goal-directedness; biological motion; face perception (including the perception of facial attractiveness); gaze processing and social attention; 'thin-slicing' and 'perceptual stereotypes'; and social and cultural influences on perception. SO

*** PSYC 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 429a, Psychology of Prejudice, Stereotyping, and Discrimination** Jennifer Richeson

Examination of the social psychology of stereotyping, prejudice, and discrimination. Specifically, the processes of mind and brain that give rise to both positive and negative relations between members of different societal groups. PSYC 110, PSYC 200 (or equivalent), PSYC 235 (or equivalent), PSYC 150 (recommended)

*** PSYC 430a, Topics in Cultural Psychology** Maria Gendron

Overview of theory and research in cultural psychology, including the role of culture in social, cognitive, and health domains. Principles of the acquisition, transmission, and evolution of culture. Specialized topics include culture in non-human animals, and the intersection between culture and globalization and technology. Prerequisite: PSYC 110. SO

*** PSYC 431a, Human Skill Learning** Staff

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, 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 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, Computational Models of Human Behavior** Staff
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. SC

*** PSYC 477b / EDST 377b, Psychopathology and the Family** Kristi Lockhart
The influence of the family on development and maintenance of both normal and abnormal behavior. Special emphasis on the role of early childhood experiences. Psychological, biological, and sociocultural factors within the family that contribute to variations in behavior. Relations between family and disorders such as schizophrenia, depression, anorexia nervosa, and criminality. Family therapy approaches and techniques. 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.

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*** PSYC 499a or b, Senior Essay** Staff

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.

Religious Studies (RLST)

*** RLST 022a / ENGL 031a, Religion and Science Fiction** Maria Doerfler

Survey of contemporary science fiction with attention to its use and presentation of religious thought and practice. Focus on the ways in which different religious frameworks inform the literary imagination of this genre, and how science fiction in turn creates religious systems in both literature and society. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. HU

RLST 100a / MMES 191a, Introduction to World Religions Gerhard Bowering
Introduction to the literature, ideals, concepts, practices, rituals, and institutions of four major world religions as they have appeared in history: Hinduism, Buddhism, Christianity, and Islam. A historical survey combined with a phenomenological treatment of principal topics. HU

*** RLST 101a, Politics of Black Religion** Nicole Turner

This course explores black religions as sites of political engagement and as the object of political concern in the context of national formation. In particular, the course explores how Africans kidnapped into the transatlantic slave trade, Africans enslaved in the Americas, and their emancipated descendants used religions to resist dehumanization of enslavement and to foster communities of hope and love. Further, this course explores the complications of forming religious community within the confines of race, slavery, colonialism, and freedom including gender, class, and social conflicts. Finally, the course explores how scholars in various disciplines have created black religions as objects of study. Course materials include biographies, autobiographies, primary accounts of religious life and records of religious organizations. Students come away from the course with an enhanced sense of the complexities of black religious life and the evolution of black religions as central social and political agents in black life and the black freedom struggle. Class discussions and analyses will fill your toolbox with both methodological approaches to primary sources and technical tools for writing.

*** RLST 104a, Memory, Culture, and Religion** Stephen Davis

This course investigates the constructive role that cultural memory plays in the shaping of religious identity and practice. In addition to the study of cognitive, sociological, and

political theories and their application, students explore topics from the ancient Greco-Roman world and the New Testament to contemporary history, politics, and media culture. By the end of the semester, students are equipped to think in multilateral ways about how transpersonal forms of memory and memory practices have shaped cultural and religious identity from antiquity to the present day. 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 116a, Monasticism in Comparative Perspective** Hwansoo Kim

One of the most common themes of monasticism around the world from antiquity to the present is the idea that people who undertake the monastic lifestyle are in some sense separate from “the world” or society at large, and consequently that monastic lifestyles constitute an alternative to the norms that structure most people’s lives. This seminar explores the ways in which monastics – both individually and communally – have negotiated their status as “separate” through a variety of social, religious, economic, artistic, and political practices. Throughout the course, we pose the question: how have monastics constructed, maintained, and at times refashioned their identities in different settings? Readings include both primary sources in translation and secondary scholarship, and are supplemented where possible with visual materials, documentary films, and web-based research. The course may include a field trip to an active monastic community, where students will be asked to reflect on the continuities and ruptures of monastic traditions in a modern setting. This seminar is suitable for students interested in having their first exposure to comparative approaches in the academic study of religion. It also fulfills the comparative study of religions requirement for Religious Studies majors. HU

*** RLST 117b, What Didn't Make It into the Bible** Maria Doerfler

Over two billion people alive today consider the New Testament to be sacred scripture. But how did the books that made it into the bible get there in the first place? Who decided what was to be part of the bible and what wasn't? How did these decisions affect the structure of nascent Christian communities, their relationship to surrounding Greco-Roman and Jewish society, and the subsequent development of Christian churches? How would the history of the world's largest organized religion look differently if a given book didn't make the final cut and another one did? Hundreds of ancient Christian texts are not included in the New Testament. This course focuses on these excluded writings and uses them to help reconstruct the earliest Christian communities. We explore Gnostic gospels, hear of a five-year-old Jesus throwing temper tantrums while killing (and later resurrecting) his classmates, peruse ancient Christian romance novels, tour heaven and hell, read the garden of Eden story told from the perspective of the snake, and learn how the world will end. In critically examining these ancient narratives and the communities that wrote them, students

learn about the content and history of the New Testament, better appreciate the diversity of formative Christianity, understand the historical context of the early church, examine the earliest social forms of Christianity, and explore the politics behind what did and did not make it into the bible. Students previously enrolled in RLST 007 are not eligible to enroll in this course. WR, HU

*** RLST 121b / EALL 296b / EAST 391b, 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 136a, The History and Contemporary (Ab)uses of the New Testament** Laura Nasrallah

The course introduces students to the historical context of New Testament texts, to the processes of its becoming scripture, and to a variety of approaches for its interpretation (evangelical, feminist, historical critical, queer, African American, etc.). We'll discuss how the New Testament is used today in politics and culture – by political candidates, in debates about sexuality, in arguments about the environment. 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 147b / JDST 235b / MMES 235b / NELC 231b, Introduction to Judaism in the Ancient World: From Temple to Talmud** Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; the synagogue; faith in reason; Sabbath and festivals; history and its redemption. No prior background in Jewish history assumed. 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 175a, 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 180a / HIST 342a / SAST 280a, Mughal India, 1500–1800 Supriya Gandhi
Exploration of religion and the state in Mughal India, focusing on the period between 1500–1800. Topics include sacred sovereignty, orthodoxy, Sufism, vernacular literary and religious cultures, and the early colonial encounter. HU

*** RLST 201b / HIST 232Jb / HUMS 443b / JDST 270b / MMES 342b, Medieval Jews, Christians, and Muslims In Conversation** Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Cultural grids and expectations each imposed on the other; the rhetoric of otherness – humans or devils, purity or impurity, and animal imagery; and models of religious community and power in dealing with the other when confronted with cultural differences. Counts toward either European or Middle Eastern distributional credit within the History major, upon application to the director of undergraduate studies. WR, HU RP

RLST 202b / HIST 345b / JDST 265b / MMES 148b, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

Jewish culture and society in Muslim lands from the time of the Prophet Muhammad to that of Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as

a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; and the Jews in the Ottoman Empire. HU

*** RLST 208b, Religion and Heritage** Stephanie Machabee

This seminar introduces students to how religion, heritage, and identity intersect in the twentieth and twenty-first centuries. In particular, the course asks: What are the politics of calling a religious site or religious object “heritage?” What role do archaeology and museums have in creating, proving, or rejecting narratives of the past? What motivates the destruction of religious sites, and what justifies their preservation? When and why does the international community decide to intervene in the preservation and management of heritage? We explore the definition, history, and theory behind the term “heritage” and examine how heritage discourses and institutions deal with religion and religious identity at local, national, and global levels.

HU

*** RLST 211b / EALL 213b / HUMS 292b / PHIL 205b, Philosophy, Religion, and Literature in Medieval China** Lucas Bender

Exploration of the rich intellectual landscape of the Chinese middle ages, introducing students to seminal works of Chinese civilization and to the history of their debate and interpretation in the first millennium. No previous knowledge of China is assumed. Instead, the course serves as a focused introduction to Chinese philosophy, religion, and literature. HU

*** RLST 217b, Health, Science, and Religion** Cody Musselman

This course examines the intersection of health, science, and religion primarily within the American context. The readings point students towards the historical roots of contemporary health and wellness issues. Our critical approach investigates how each of our key concepts—health, science, and religion—were and are constructed with respect to race, class, gender, the state, the self, and modernity. HU

*** RLST 224b / NELC 224b, Zoroastrianism** Kayla Dang

Surveys the history of Zoroastrianism, one of the world’s oldest continuous religious traditions, from its origins in the first millennia BC to the present day. Readings in primary sources in English translation and secondary readings in modern scholarship.

*** RLST 226a / MMES 370a / SOCY 368a, Transnational Islam and Muslim Communities** Staff

This seminar explores key themes, concepts, and discussions on Islamic movements and Muslim communities living in the West. It examines the relationships between Muslim communities and the state/wider society within global and transnational processes. Students gain a comprehensive understanding of diversity and complexity of transnational Islamic mobilizations through readings and discussions of representative case studies. The seminar begins with a historical and anthropological account of locating Muslim communities in the West and proceeds with the discovery of key themes and debates. Throughout the term, students explore key issues around Islamophobia and radicalization, governance of Muslim practices, ethno-religious and cultural diversity of Muslim communities, gender and sexuality, as well as the ways in which these shape perceptions, policies and public debates in the ‘host’ countries. SO

*** RLST 233a / ENGL 346a / HUMS 253a, Poetry and Faith** Christian Wiman

Issues of faith examined through poetry, with a focus on modern Christian poems from 1850 to the present. Some attention to poems from other faith traditions, as well as to secular and antireligious poetry. HU

*** RLST 249a / GMAN 254a / JDST 335a / PHIL 274a, Jewish Philosophy** Paul Franks

Introduction to Jewish philosophy, including classical rationalism of Maimonides, classical kabbalah, and Franz Rosenzweig's inheritance of both traditions. Critical examination of concepts arising in and from Jewish life and experience, in a way that illuminates universal problems of leading a meaningful human life in a multicultural and increasingly globalized world. No previous knowledge of Judaism is required. WR, HU

*** RLST 251a / AFST 128a / ARCG 128a / EGYPT 128a / NELC 129a, Magic and Ritual in Ancient Egypt and the Near East** John Darnell

Introduction to ancient Egyptian magic and rituals with an overview on the use of magic and discussion of the different rituals and festivals attested in Ancient Egypt and the Near East. HU

*** RLST 260a / AMST 451a / HIST 174Ja, Religion, War, and the Meaning of America** Harry Stout

The relationship between religion and war in American history from colonial beginnings through Vietnam. The religious meanings of Americans at war; the mutually reinforcing influences of nationalism and religion; war as the norm of American national life; the concept of civil religion; biblical and messianic contexts of key U.S. conflicts. HU

*** RLST 272b, Mapping Black Christianity** Nicole Turner

This course merges research in African American religious history with the creation of an interpretive archive using digital mapping and deep mapping practices. We explore the politics of mapping, geography, and race before delving into a place-based exploration of black religious communities during the late 19th century. The course aims to investigate the extant archives of black Christian communities of the post-emancipation South: newspapers, convention and church minutes, encyclopedias and autobiographies and narratives, while applying strategies of historical analysis to explore the nature of the formation and transformation of African American religious community. The course also examines concepts of race, place, and power and how religion inflects these conceptions. The main project is to create a contribution to the mapping of black religion by exploring a single primary source in depth and then developing both summary text, curating supporting archival images, reports and other digital material culture, and a map. Emphasis on method: archival research, digital humanities, spatial analysis and politics of space and place.

*** RLST 277a or b / PHIL 202a or b, Existentialism** Noreen Khawaja

Introduction to key problems in European existentialism. Existentialism considered not as a unified movement, but as a tradition of interlocking ideas about human freedom woven through the philosophy, religious thought, art, and political theory of late modern Europe. Readings from Kierkegaard, Nietzsche, Heidegger, Gide, Heidegger, Fanon, Sartre, de Beauvoir, Césaire. HU

*** RLST 281b, Morality and Its Critics** Sarah Zager

This course considers the diverse array of critiques that have been leveled at how 'ethics' has been discussed in the Western philosophical tradition. Some of these critiques come from within the philosophical tradition itself—Friedrich Nietzsche argued that the regnant Christian morality of his day amounted to a 'slave morality,' Elizabeth Anscombe argued that the enterprise of 'modern moral philosophy' was simply nonsensical, and Bernard Williams worried that it asked us to have 'one thought too many.' Others critiqued moral philosophy from the outside: some argued that it relied on sexist or racist assumptions that undermined its efforts to articulate a vision of the good and the right, and some even suggested that the discipline of 'ethics' should be replaced with ethnographic approaches that asked individual agents to explain their own ethical choices. In this course, we ask: What do these different critiques, drawn from disciplines including philosophy, religious studies, and even literature, have in common? How can 'ethics' respond to them? What parts of 'ethics' are not worth salvaging? HU

RLST 287a / MMES 391a, Islamic Theology and Philosophy Frank Griffel

Historical survey of major themes in Muslim theology and philosophy, from teachings of the Qur'an to contemporary Muslim thought. The systematic character of Muslim thought and of the arguments given by thinkers; reason vs. revelation; the emergence of Sunnism and Shi'ism; the reaction of Muslim theology (from 1800) to the challenges of the West. HU

*** RLST 303a / PHIL 311a, The End of Metaphysics** Nancy Levene

Exploration of metaphysics in light of the supposition that it is at an end. Readings from classics and critics in philosophy, religion, and literature. WR, HU

*** RLST 333a / AMST 321a / ENGL 285a / FILM 334a, Mormonism** Kathryn Lofton and John Peters

For some observers, Mormonism is an epithet, a poison, a problem; for others, Mormonism is a practice, a purpose, the bread of life. It's both wave and particle. It's radical and conservative. It's insane and mundane. It's deeply weird and definitionally conventional. This is not a course that decides where one ought to sit on these oppositional terms. We ask instead what makes a subject so inspiring to opposition. We do not consider Mormonism a subject *of* study as much as a prompt to ask what it is to study anything. This course, the first of its kind at Yale, does not reflect the recent efflorescence of Mormon Studies as an academic subfield as much as it reacts to that intellectual excitement. We consider Mormonism as an indicative problem in the history of interpretation. WR, HU

*** RLST 334a / WGSS 279a, Queer Religion** Wendy Mallette

This interdisciplinary seminar engages a range of methods and theoretical approaches to queer studies and religion. The course explores questions including: what is the relationship between queer life and religious life? Is religion ever queer? Is queerness ever religious? What do scholars mean when they label religion (or other objects of study) as queer or queer-able? What assumptions about race, class, and gender do contemporary usages of queer entail? What are the possibilities and limits of queer methods and practices? Topics include: queer methods and genealogies, HIV/AIDS and affect, lesbian feminism and exoduses, performance and humor, sodomy and orientalism, vocations and orientations. HU

RLST 375b, Hindu Nationalism Supriya Gandhi

This course analyzes the development of Hindu nationalism from the nineteenth to the twenty-first centuries. Students interrogate the emergence of Hinduism as a religion, before exploring the reform and revivalist movements in the nineteenth century that paved the way for the articulation of Hindu nationalism. Students also read from key writings of several Hindu nationalist thinkers of the twentieth century and investigate the historical and social contexts leading to the emergence of Hindu nationalism as a major political force. Topics include: colonialism, modernity, the idea of Hinduism, nationalist ideologies, gender, and religious violence. HU, SO

RLST 402b / PHIL 326b, The Philosophy of Religion John Pittard

The relation between religion and ethics, traditional arguments for the existence of God, religious experience, the problem of evil, miracles, immortality, science and religion, and faith and reason. HU

*** RLST 405b / JDST 392b / NELC 382b, Mishnah Seminar: Tractate Megillah** Steven Fraade

Study of rabbinic texts treating rules for the public recitation and translation of the Scroll of Esther on the holiday of Purim and of other sacred scriptures and translations throughout the year, with special attention to the relation between law and ritual and the narrativity of both. EMWAR area of concentration designations: STHJ, RabJud, ScrInterp. Prerequisite: reading fluency in ancient Hebrew. L5, HU

*** RLST 422b / EGYPT 147b, Egyptian Monastic Literature in Coptic** Stephen Davis

Readings in the early Egyptian classics of Christian asceticism in Sahidic Coptic, including the desert Fathers and Shenute. Prerequisite: EGYPT 127 or equivalent. Counts as L4 if taken after EGYPT 137 or equivalent. L3

*** RLST 423a / EGYPT 137a, Gnostic Texts in Coptic** Daniel Bohac

Reading, translation, and analysis of Gnostic and Valentinian literature from Nag Hammadi, in several dialects of Coptic. Prerequisite: EGYPT 127 or equivalent. Counts as L4 if taken after EGYPT 147 or equivalent. L3

*** 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.

*** 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 490b, 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 & East Europe Studies (RSEE)

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 240b / CZEC 246b / FILM 364b, Milos Forman and His Films** Karen von Kunes

An in-depth examination of selected films by Milos Forman and representatives of the New Wave, *cinéma vérité* in Czech filmmaking. Special attention to Forman's artistic and aesthetic development as a Hollywood director in such films as *Hair*, *One Flew over the Cuckoo's Nest*, *Ragtime*, and *Amadeus*. Screenings and discussion in English. HU

*** RSEE 241a / HIST 240Ja, Government, Law, and Society in Modern Russia, 1853-1953** Sergei Antonov

Russian political culture from the Crimean War to the death of Stalin. Special attention to continuities, as well as changes, across the revolutionary divide of 1917, and to comparing official policies with daily experiences of ordinary Russians. Changing ideologies and ruling styles of tsars and early Soviet leaders (esp. Lenin, Trotsky, and Stalin) and relations with aristocratic and bureaucratic elites; political dissent and protest, including popular and state-imposed violence; the problem of legality and the rule of law. All discussions and readings in English. WR, HU TR

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 337a / RUSS 337a, The Invention of Tradition in Post-Soviet Nation States** Katerina Clark

The breakup of the Soviet Union in 1991 resulted in a number of independent countries that had never been countries before, or not for several centuries. In the ensuing

decades politicians, historians, and culture makers in each of these countries produced narratives that claim a separate national identity and chart its history over a long stretch of time though in many instances the country as a geopolitical unit was a Soviet fabrication. The course looks at the countries of Central Asia, Russia, and Ukraine. It discusses how each of the countries covered has generated revised accounts of the past that disaggregate ethnic, linguistic, or cultural imbrications with neighboring countries.

It also considers the after effects of empire in this process. As much as possible course materials will be available in Russian, but all will be available in English translation.

HU

RSEE 350a / ENGL 198a / FILM 394a / LITR 409a / WGSS 394a, Internet Cultures, Histories, Networks, and Practices Marijeta Bozovic

Examination, through the lenses of histories, network studies, and cultural studies, of how human beings have seemingly overnight learned to use and depend on computer networks for various kinds of work, military operations, pursuits of scientific knowledge, religious proselytizing, political organization, searches for mates and social communities, illegal activities, and infinite varieties of play. HU

RSEE 390b / HIST 237b / RUSS 241b, Russian Culture: The Modern Age Sergei Antonov

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. Readings and discussion in English. HU

*** 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.

Russian (RUSS)

RUSS 110a, First-Year Russian I Julia Titus

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 Julia Titus

Continuation of RUSS 110. After RUSS 110 or equivalent. L2 RP 1½ Course cr

RUSS 122a, Russian for Heritage Learners I Julia Titus

A comprehensive Russian course for native speakers of Russian or other Slavic languages whose formal education has been in English. Overview of Russian grammar, focusing on the writing system, cases, conjunction, and syntax. Readings from Russian prose, film screenings, discussion, and regular practice in translation and composition.

L1, L2

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 142b, Russian for Heritage Learners II** Julia Titus

Continuation of RUSS 122. Further development of reading and writing skills. Expansion of vocabulary. After RUSS 122 or equivalent. L3, L4

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 175b / HUMS 175b, Reading the Russian Revolution** Constantine Muravnik

The course explores the complex political and social landscape of the Russian Revolution of 1917 through the multiple and shifting perspectives of its main participants from Nicholas II to Lenin. All of the participants of the Revolution understood the immense significance of the changes taking place in front of them in 1917; many took detailed notes of conversations, actions, and events in which they participated or which they witnessed. Later, many reworked these notes into meticulous memoirs and histories. The expected subjectivity of these documents, as well as the contradictory nature of the opinions expressed in them – but generally, not the facts – highlight the complexity of the situation they describe. The readings chosen for the course represent the entire political spectrum of the Russian Revolution from the extreme right to extreme left. They chronologically document the precipitous progression of the events starting with the murder of Rasputin, carried out by the Monarchists and one member of the royal family on the eve of 1917, and ending with the Bolshevik coup d'état in October 1917. They trace the gradual shift of the epicenter of the Revolution from right to left until the Revolution ends or succeeds (it depends on the point of view) in Lenin's gaining full control over the country on the brink of the Civil War. Prerequisites: Six semesters of Russian or permission of the instructor. L5, HU RP

RUSS 220a / HSAR 221a, 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 241b / HIST 237b / RSEE 390b, Russian Culture: The Modern Age Sergei Antonov

An interdisciplinary exploration of Russian cultural history, focusing on literature, art, religion, social and political thought, and film. Conceptions of Russian nationhood; the myths of St. Petersburg; dissent and persecution; the role of social and cultural elites; the intelligentsia; attitudes toward the common people; conflicting appeals of rationality, spirituality, and idealism; the politicization of personal life; the impact of the Bolshevik Revolution and its aftermath. Readings and discussion in English. HU

*** RUSS 250b, Nineteenth-Century Russian Literature** Molly Brunson

Introduction to major texts of the nineteenth-century Russian literary tradition. Works by Pushkin, Gogol, Lermontov, Turgenev, Dostoevsky, Tolstoy, and Chekhov examined in their social and historical contexts. Emphasis on the authors' use of genre, language, and literary devices to explore pressing questions posed by Russian modernity. Readings and discussion in English. WR, HU TR

*** RUSS 252a, Modernism and Revolution** Jinyi Chu

In the early 20th century the Russian Empire of the tsars transformed into the Stalinist state. The course traces this transition by exploring brilliant literary creations of writers such as Bely, Bulgakov, Babel, and Platonov. How did the social tumult of this era give birth to Russian modernism and revolutionary culture? Topics include the

radical changes in the lives of Russian gentry and peasants, terrorist and revolutionary movements, civil war, Soviet internationalism, Stalinist terror, a transition to socialist economy, and the Russia's identity between Europe and Asia. Probing into the salient literary responses to devastations and upheavals, students gain an in-depth understanding of 20th-century Russia's artistic and political ferment. All readings and class discussions in English. WR, HU TR

RUSS 260b / LITR 202b, Nabokov and World Literature Marijeta Bozovic
Vladimir Nabokov's writings explored in the context of his life story and of the structures and institutions of literary life in Russian émigré circles. Themes of exile, memory, and nostalgia; hybrid cultural identities and cosmopolitan elites; language and bilingualism; the aims and aesthetics of émigré and diasporic modernism in novels and other media. Additional readings from works of world literature inspired and influenced by Nabokov. Readings and discussion in English. HU

*** RUSS 310b / THST 310b, Analysis through Action: Text Analysis and Improvisation** David Chambers

This studio course, designed primarily for actors, directors, and dramaturgs combines rigorous and detailed text analysis with 'études': in-class improvisational explorations of scenes, characters, and textual situations. The text work informs the improvisations, and vice-versa. Developed from the very last workshops of Stanislavsky, this process has evolved over generations into the contemporary avant-garde theater of major European and Russian directors but is barely known in the US. Prior completion of THST 210 (Performance Concepts) suggested but not required. HU RP

*** RUSS 337a / RSEE 337a, The Invention of Tradition in Post-Soviet Nation States**
Katerina Clark

The breakup of the Soviet Union in 1991 resulted in a number of independent countries that had never been countries before, or not for several centuries. In the ensuing decades politicians, historians, and culture makers in each of these countries produced narratives that claim a separate national identity and chart its history over a long stretch of time though in many instances the country as a geopolitical unit was a Soviet fabrication. The course looks at the countries of Central Asia, Russia, and Ukraine. It discusses how each of the countries covered has generated revised accounts of the past that disaggregate ethnic, linguistic, or cultural imbrications with neighboring countries.

It also considers the after effects of empire in this process. As much as possible course materials will be available in Russian, but all will be available in English translation.

HU

*** RUSS 490a or b, The Senior Essay** Jinyi Chu

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.

Statistics and Data Science (S&DS)

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 112E, 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 Ethan Meyers and 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 Elena Khusainova and 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 110b, An Introduction to R for Statistical Computing and Data Science Jay Emerson

Introduction to R language, widely-accepted for advanced statistical computing and graphics, used by the data science industry as well as in a wide range of academic disciplines. It is a useful complement (concurrently or in advance) to many courses in S&DS. No prior experience with R is necessary. Meets for the first half of the term only. ½ Course cr

S&DS 123b / CPSC 123b / PLSC 351b / S&DS 523b, YData: An Introduction to Data**Science** John Lafferty and Elena Khusainova

Computational, programming, and statistical skills are no longer optional in our increasingly data-driven world; these skills are essential for opening doors to manifold research and career opportunities. This course aims to dramatically enhance knowledge and capabilities in fundamental ideas and skills in data science, especially computational and programming skills along with inferential thinking. YData is an introduction to Data Science that emphasizes the development of these skills while providing opportunities for hands-on experience and practice. YData is accessible to students with little or no background in computing, programming, or statistics, but is also engaging for more technically oriented students through extensive use of examples and hands-on data analysis. Python 3, a popular and widely used computing language, is the language used in this course. The computing materials will be hosted on a special purpose web server. QR

*** S&DS 150b, Data Science Ethics** Elisa Celis

In this course, we introduce, discuss, and analyze ethical issues, algorithmic challenges, and policy decisions that arise when addressing real-world problems via the lens of data science. We grapple with the normative questions of what constitutes bias, fairness, discrimination, or ethics when it comes to data science and machine learning in applications such as policing, health, journalism, and employment. We incorporate technical precision by introducing quantitative measures that allow us to study how algorithms codify, exacerbate and/or introduce biases of their own, and study analytic methods of correcting for or eliminating these biases. Lastly, we study the social implications of these decisions, and understand the legal, political and policy decisions that could be used to govern data-driven decision making by making them transparent and auditable. We read critical commentary by practitioners, state-of-the-art technical papers by data scientist and computer scientists, and samples of legal scholarship, moral and ethical philosophy, readings in sociology, and policy documents. We often ground our discussions around recent case studies, controversies, and current events. Prerequisites: One from S&DS 238, S&DS 241, S&DS 242, or the equivalent; and one from S&DS 230, ECON 131, or the equivalent. Suggested courses: one from: CPSC 470, S&DS 365, ECON 429, CPSC 365, CPSC 366, or equivalent; and one from: EP&E 215, PHIL 175, PHIL 177, SOCY 144, PLSC 262, PLSC 320, or equivalent. SO

*** S&DS 160b / AMTH 160b / MATH 160b, The Structure of Networks** Ronald Coifman

Network structures and network dynamics described through examples and applications ranging from marketing to epidemics and the world climate. Study of social and biological networks as well as networks in the humanities. Mathematical graphs provide a simple common language to describe the variety of networks and their properties. QR

*** S&DS 173b, YData: Analysis of Baseball Data** Ethan Meyers

The fields of data science aim to extract insights from large data sets that often contain random variation. Baseball is a game that contains a high degree of randomness, and because professional baseball has been played since the 19th century, a large amount of data has been collected about players' performance. In this class we use baseball data to understand key concepts in data science including data visualization, data wrangling, and statistical inference. To understand these concepts, we analyze data

include season-level statistics going back to the 1870's, play-by-play statistics going back to the 1930's and pitch trajectory statistics going back to 2006. The course uses the Python programming language and is paced to be accessible to students who have previously taken or are currently enrolled in S&DS 123. QR

S&DS 220b, Introductory Statistics, Intensive Joseph Chang

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 S230E, 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 Harrison Zhou

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 and Winston Lin

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 262b / AMTH 262b, 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 principle 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 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 314b / PLSC 353b, Introduction to Causal Inference** Winston Lin

Introduction to causal inference with applications to the social and health sciences. Topics include randomized experiments, matching and propensity score methods, sensitivity analysis, instrumental variables, and regression discontinuity designs. Mathematical problems, data analysis in R, and critical discussions of published applied research. Prerequisite: S&DS 242 and some programming experience in R. QR

S&DS 315a / PLSC 340a, Measuring Impact and Opinion Change Joshua Kalla

This course introduces students to measuring impact. Political campaigns, marketers, governments, and non-profit organizations regularly try to produce opinion change through TV, radio, online ads, mail, and door-to-door canvassing. Are these efforts successful at producing opinion change? In this course, we learn how to use experiments and natural experiments to measure the impact of opinion change efforts, and how to be appropriately skeptical of findings that claim to measure impact. This course also teaches data analysis skills in R. Prerequisite: A prior statistics course at Yale (e.g., PLSC 425, S&DS 242) and programming experience in R. QR

S&DS 351b / EENG 434b / MATH 251b, Stochastic Processes Joseph Chang

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 355a, 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 361b / AMTH 361b, Data Analysis Elena Khusainova

Selected topics in statistics explored through analysis of data sets using the R statistical computing language. Topics include linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. After S&DS 242 and MATH 222 or 225, or equivalents. QR

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 365a or b, Applied Data Mining and Machine Learning Sahand Negahban

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 411b, Selected Topics in Statistical Decision Theory Harrison Zhou

Review of recent developments in statistical decision theory including nonparametric estimation, high dimensional (non)linear estimation, low rank and sparse matrices estimation, covariance matrices estimation, graphical models, and network analysis.

Prerequisite: S&DS 410.

*** S&DS 425a or b, Statistical Case Studies** Staff

Statistical analysis of a variety of statistical problems using real data. Emphasis on methods of choosing data, acquiring data, assessing data quality, and the issues posed by extremely large data sets. Extensive computations using R statistical software.

Prerequisites: 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 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.

South Asian Studies (SAST)

*** SAST 226b / HIST 314Jb, The Environmental History of South and Southeast Asia**

Sunil Amrith

This is a research and writing seminar on the environmental history of South and Southeast Asia. We examine a range of approaches to studying the major environmental transformations in a region that is home to a significant part of the world's population. Students write a substantial primary source-based research paper by the end of the course. WR, HU

*** SAST 266b / ARCH 271b / HSAR 266b / MMES 126b, 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. Field trip to the Metropolitan Museum of Art in New York. HU

SAST 280a / HIST 342a / RLST 180a, Mughal India, 1500–1800 Supriya Gandhi

Exploration of religion and the state in Mughal India, focusing on the period between 1500–1800. Topics include sacred sovereignty, orthodoxy, Sufism, vernacular literary and religious cultures, and the early colonial encounter. HU

SAST 281b / ECON 325b / EP&E 321b / GLBL 322b / PLSC 185b, Economics of

Developing Countries: Focus on South Asia Zachary Barnett-Howell

Analysis of current problems of developing countries. Emphasis on the role of economic theory in informing public policies to achieve improvements in poverty and inequality,

and on empirical analysis to understand markets and responses to poverty. Topics include microfinance, education, health, agriculture, intrahousehold allocations, gender, and corruption. Prerequisites: introductory microeconomics and introductory econometrics. 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 334a / ER&M 433a / HIST 363Ja, Mobile South Asians and the Global Legal Order** Rohit De

South Asians make up the largest population of overseas migrants in the world, close to 33 million in 2017 and a diaspora that is almost double that number. This course looks at the unprecedented mobility of South Asians from the mid-19th century until now as merchants, indentured labor, students, pilgrims, professionals, domestic workers, political exiles, refugees, and economic migrants, through the lens of state attempts to control movement and individual resistance, subversion, and adaptation to such controls. Focusing on the legal consciousness of South Asian migrants and the emergence of South Asian nations as political players on the global stage, this class traces how South Asian mobility led to the forging of a new global order, over migration, multiculturalism, Islamic law, civil liberties, labor law, and international law. WR, HU

*** SAST 344b / PLSC 377b / WGSS 397b, Political Economy of Gender in South Asia**

Sarah Khan

This course focuses on the political and economic underpinnings and implications of gender inequality in South Asia. We draw on evidence from Bangladesh, Pakistan, and India to guide our theoretical and empirical inquiry into the following broad questions: What is gender, and what approaches do social scientists use to study gender inequality? How does gender inequality manifest in different social, economic, and political spheres e.g. the household, the labor market, the electorate, the government? What are the cultural and structural drivers of gender inequality? How effective are different approaches to tackling gender inequality in South Asia? Previous course work in statistical data analysis is helpful, but not required. SO

*** SAST 384b / ARCH 324b / URBN 324b, The City Before and After the Tubewell**

Anthony Acciavatti

What do such disparate cities as New Delhi, Jakarta, Mexico City, and Phoenix all have in common? In short, each city relies on a fantastic technology that few people know anything about but has transformed the shape and life of cities and their hinterlands: the tubewell. Technologies for drawing up groundwater, tubewells are used in places where municipal water supply is non-existent, unreliable, or often polluted. A minor technology with a global reach, the tubewell is to the city what the elevator was to the skyscraper in the booming American metropolis of the early twentieth century. In this course we look at how tubewells and other decentralized technologies have radically transformed urban and agricultural spaces across the globe since the nineteenth century

to the present. We watch how people exult before these technologies; we witness how governments and philanthropies as well as farmers and townspeople appropriate them for radically different ends. And we consider why. HU

*** SAST 469a / HSAR 414a, Visual Storytelling in South Asia** Subhashini Kaligotla

This seminar explores the polyglot variety of visual narration in South Asia. We examine the lives of exemplary individuals like the Buddha, the epic story of Rama, and royal biography and autobiography. We consider stories told through stone, in the medium of paint, and in print, film, graphic books, and contemporary media. We experience story telling in sumptuous courtly settings and in temples, monasteries, and other sacred spaces. Weekly readings and discussions analyze the handling of narrative ambiguity and absence, double meaning and punning, the treatment of space and place, representations of sex, desire, and love, and the visual construction of political persona, power, and nation. The course is ultimately interested in how South Asian narratives unsettle and expand the notion of representation.

Prerequisite: one introductory course in Art History. HU

Bosnian-Serbian-Croatian (SBCR)

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

*** SCIE 030a and SCIE 031b, Current Topics in Science** Staff

A series of modules in lecture and discussion format addressing scientific issues arising in current affairs. Topics are selected for their scientific interest and contemporary relevance, and may include global warming, human cloning, and the existence of extrasolar planets. Credit for SCIE 030 upon completion of SCIE 031; one course credit is awarded for successful completion of the year's work. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. SC ½ Course cr per term

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 120b / LING 125b, Introductory Sanskrit II Aleksandar Uskokov

Continuation of SKRT 110. Focus on the basics of Sanskrit grammar; readings from classical Sanskrit texts written in Devanagari script. After SKRT 110. L2 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 140b / LING 148b, Intermediate Sanskrit II Aleksandar Uskokov

Continuation of SKRT 130, focusing on Sanskrit literature from the *kavya* genre. Readings include selections from the *Jatakamala* of Aryasura and the opening verses of Kalidasa's *Kumarasambhava*. After SKRT 130 or equivalent. L4

* SKRT 150b, Advanced Sanskrit: Readings in Indian Philosophy and Aesthetics

Aleksandar Uskokov

This advanced language course introduces the jargon of the philosophical disciplines (theory of knowledge, metaphysics, philosophy of mind and language, philosophical theology, hermeneutics) and aesthetics in the several systems of learning in ancient and classical India, across the traditions of Hinduism, Buddhism, and Jainism. Additionally, the course introduces topics of philosophical significance in foundational texts such as the Upaniṣads, portions of the *Mahābhārata* and the *Purāṇas*, and the Buddhist *sūtra* literature. Special attention is given to matters of style, scholastic techniques, and advanced morphology and syntax. The course, thus, combines advanced language instruction with learning intellectual and cultural content, and it facilitates training in primary research in one of the classical languages of South Asia. Prerequisite: SKRT 140 or equivalent, or instructor permission. L5

* 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; *nāṭaka* 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

Slavic Languages and Literatures (SLAV)

* **SLAV 485a or b, Directed Reading or Individual Research in Slavic Languages and Literatures** Jinyi Chu

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.

Sinhala (SNHL)

Sociology (SOCY)

SOCY 100b, Introduction to Population Studies Emma Zang

This course offers an introduction to population studies/demography. Population studies cover all aspects related to human populations. The topics that demographers or population scientists study range from health disparities in the United States, the impact of AIDS on population health in Africa, migration patterns from Latin America, the reasons behind sex-selective abortions in Asia, the implications of low fertility in Europe, and the socioeconomic impact of COVID19. Understanding population dynamics is crucial to professionals in a diversity of careers and industries. For example, city planners, environmental engineers, and health policy experts all use demographic expertise about population growth, migration patterns, and health and longevity in decisions on issues such as how many schools a city should build, how much water a region needs over twenty years, and what type of public health initiatives would best serve a community. Professionals in business also rely on demographic knowledge to make decisions about which markets to enter, what products are needed, and how to best market their products. In this course, students explore the key concepts and measures used to study population dynamics. SC, SO

SOCY 101a, 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 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 126b / HLTH 140b, Health of the Public Nicholas Christakis

Introduction to the field of public health. The social causes and contexts of illness, death, longevity, and health care in the United States today. How social scientists, biologists, epidemiologists, public health experts, and doctors use theory to understand

issues and make causal inferences based on observational or experimental data. Biosocial science and techniques of big data as applied to health. 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 138a / ANTH 140a / ER&M 241a, The Corporation Douglas Rogers

Survey of the rise, diversity, and power of the capitalist corporation in global contexts, with a focus on the 20th and 21st centuries. Topics include: the corporation as legal entity and the social and cultural consequences of this status; corporations in the colonial era; relationships among corporations, states, and non-governmental organizations in Western and non-Western contexts; anti-corporate critique and response; corporate social responsibility; and race, gender, and indigeneity. HU, SO

SOCY 144a / EDST 144a / ER&M 211a / EVST 144a, Race, Ethnicity, and Immigration

Grace Kao

Exploration of sociological studies and theoretical and empirical analyses of race, ethnicity, and immigration, with focus on race relations and racial and ethnic differences in outcomes in contemporary U.S. society (post-1960s). Study of the patterns of educational and labor market outcomes, incarceration, and family formation of whites, blacks (African Americans), Hispanics, and Asian Americans in the United States, as well as immigration patterns and how they affect race and ethnic relations. SO

SOCY 145a, Inequality and Social Change in China Emma Zang

This course offers an introduction to major social and economic issues in contemporary China. It provides a survey of the ongoing reforms and the Chinese society in transition with a focus on selected policy issues. In most weeks, the first session is reserved for

a lecture by the instructor or a guest lecturer, and the second session is reserved for student-led discussions of pre-circulated questions. SO

SOCY 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 190s. 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 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 162b / EDST 162b, Methods in Quantitative Sociology** Staff

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 168a, Computational Sociology** Staff

The combination of digital (and digitized) data, computationally-driven analytical techniques, and groundbreaking scholarship has given rise to the field of computational social science (CSS). Some CSS research engages core sociological theories and questions, which, in turn, is helping to develop computational sociology. This course provides an introduction into computational sociology. During the course, we review recent scholarship in computational sociology and CSS, learn the skills necessary for conducting original computational sociology research, and discuss the new, imaginative, and previously unconsidered questions, project designs, and logics of inference afforded by computational sociology. Topics include digital data collection, the use of historical and archival data, neural networks, text and image analysis, and digital experiments. QR, SO

*** SOCY 169b, Visual Sociology** Philip Smith

Introduction to themes and methods in visual sociology. The role and use of visual information in social life, including images, objects, settings, and human interactions. Ethnographic photography, the study of media images, maps and diagrams, observation and coding of public settings, unobtrusive measures, and the use of internet resources. so

*** SOCY 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 202a, 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 221a or b / MGRK 236a or b / PLSC 138a or b, The Euro Crisis** Paris Aslanidis

Examination of how Europe continues to struggle with repercussions of the Great Recession and the impact of the Eurozone crisis in countries such as Portugal, Ireland, Spain, and, especially, Greece. Topics include the euro as a viable common currency; why and how the Eurozone crisis erupted and spread; and whether this catastrophe could have been averted. 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 234b, Inequality, Economic Mobility & Public Policy Rourke O'Brien

This course provides an introduction to the sociological analysis of economic inequality and social mobility with a focus on the contemporary United States. We begin with an overview of core concepts in the study of inequality and mobility including measurement and recent trends. We then proceed by examining the role of institutions – including the family, schools, neighborhoods, labor markets, and the criminal justice system – in mitigating, maintaining, or reproducing inequalities within and between groups. We also critically evaluate public policy proposals aimed at reducing inequality and promoting economic mobility. so

*** SOCY 319a / AFAM 390a / ER&M 419a, Ethnography of the African American Community** Elijah Anderson

An ethnographic study of the African American community. Analysis of ethnographic and historical literature, with attention to substantive, conceptual, and methodological issues. Topics include the significance of slavery, the racial ghetto, structural poverty, the middle class, the color line, racial etiquette, and social identity. SO

*** SOCY 341a, Poverty and Social Welfare Policy in the United States** Rourke O'Brien

Formation and effectiveness of anti-poverty policies from a sociological and public policy perspective. Consideration of who is poor and who deserves federal assistance. Topics include: origins of the modern social safety net; the federal government's role in constructing and implementing anti-poverty policy; realities of low-wage work; the 'culture of poverty;' and employment- and family-based policy strategies for alleviating poverty. Applied understanding of quantitative social science research methods is helpful, but not required.

*** SOCY 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 368a / MMES 370a / RLST 226a, Transnational Islam and Muslim Communities** Staff

This seminar explores key themes, concepts, and discussions on Islamic movements and Muslim communities living in the West. It examines the relationships between Muslim communities and the state/wider society within global and transnational processes. Students gain a comprehensive understanding of diversity and complexity of transnational Islamic mobilizations through readings and discussions of representative case studies. The seminar begins with a historical and anthropological account of locating Muslim communities in the West and proceeds with the discovery of key themes and debates. Throughout the term, students explore key issues around Islamophobia and radicalization, governance of Muslim practices, ethno-religious and cultural diversity of Muslim communities, gender and sexuality, as well as the ways in which these shape perceptions, policies and public debates in the 'host' countries. SO

*** SOCY 389a / GLBL 215a / LAST 386a / MGRK 237a / PLSC 375a, Populism** Paris Aslanidis

Investigation of the nature of the populist phenomenon and its impact on politics, society, and the economy in various regions of the world. Conceptual and methodological analyses are supported by comparative assessments of various empirical

instances, from populist politicians such as Hugo Chavez and Donald Trump, to populist social movements such as the Tea Party and Occupy Wall Street. SO

*** SOCY 390a / ER&M 360a / HLTH 370a / HSHM 432a / WGSS 390a, 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 396b / EDST 240b, Cities, Suburbs, and School Choice** Sarah Camiscoli
The changing dynamic between cities and suburbs and the role of individuals and institutions in promoting desegregation or perpetuating segregation since the mid-twentieth century. The government's role in the expansion of suburbs; desegregating schools; the rise of school choice through magnets and charters; the effects of inner-ring suburban desegregation and of urban gentrification on the landscape of education reform. Recommended preparation: EDST 110. Preference to Education Studies Scholars. SO

*** SOCY 491a and SOCY 492b, Senior Essay and Colloquium for Nonintensive Majors**
Jonathan Wyrzten

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**
Jonathan Wyrzten

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.

Spanish (SPAN)

*** SPAN 110a, 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, 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, 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, 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 150a, Advanced Oral and Written Communication in Spanish Maria Vazquez

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 / LAST 223a, 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 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 243a / LAST 243a, Advanced Spanish Grammar** Staff

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 246b, Introduction to the Cultures of Spain Staff

Study of various aspects of Spanish culture, including its continuing relation to the societies of Latin America. Examination of Spanish politics, history, religions, art forms, music, and literatures, from ancient times to the present. Primary sources and critical studies are read in the original. L5, HU

*** SPAN 266a / LAST 266a, Studies in Latin American Literature I** Rolena Adorno

Cultural encounters in the New World as interpreted by authors of native American (Aztec and Inca) cultural traditions, the Spanish conquistadors and friars who encountered them and their heirs, and the Mexican creole nun (the now-world-famous Sor Juana Inés de la Cruz) who gave voice to some of their traditions as she created a space for her own writing in the literary world. Their resonance and legacy today. L5, HU

SPAN 267b / LAST 267b / LITR 258b, Studies in Latin American Literature II

Roberto Gonzalez Echevarria

An introduction to Latin American literature from the nineteenth century to the present. Works by Borges, García Márquez, Paz, Neruda, Cortázar, and others. L5, HU

*** SPAN 324b, Lorca: Poetry and Plays** Noel Valis

A reading of several Lorca plays and selected poetry and an examination of the Lorca legend. Topics include Lorca's place in Spanish and world literature; myths and realities of Lorca as a cultural icon; sexuality and gender in the plays and poetry; and social issues and aesthetic practices. Open to students who have placed into L5 courses or who have successfully completed an L4 course in Spanish. Counts toward the Spanish major. L5, HU

*** SPAN 343a / LAST 343a, Humor in Contemporary Spanish American Narrative**

Anibal González-Pérez

With the use of theoretical and philosophical discussions of humor, examination of how contemporary Spanish American narrative deploys humor for a variety of purposes: from social satire and critical reflection to the promotion of harmony among individuals and social groups. Authors include Bryce Echenique, Luis Rafael Sánchez, Cabrera Infante, and Augusto Monterroso. Conducted in Spanish. Open to 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, HU

*** SPAN 351a, Travelers in Latin American Fiction** Anibal González-Pérez

Narratives about the reactions of Latin American travelers and migrants to different societies, customs, and languages. Topics include differentiating travelers, exiles, and

migrants; theories of tourism; theories of migration; Latin Americans in the United States and Europe; and Latin Americans in Asia and Africa. Readings from a variety of short stories and novels. L5, HU

*** SPAN 392b / LAST 391b / LITR 289b, Literature of the Americas, North and South**
 Rolena Adorno

Readings of U.S. and Latin American short stories and novels to explore related themes and narrative structures. Topics include the literary dialogue between Anglo and Latin American writers and their comparative treatments of history, myth, memory, and war. Paired readings of Poe and Cortázar; Bierce and Fuentes; Crane and Borges; and Faulkner's *Absalom, Absalom!* and García Márquez's *One Hundred Years of Solitude*. Conducted in English; a section in Spanish available depending on demand. Readings of Latin American texts in Spanish for Spanish and Literature majors. Prerequisite: SPAN 140, 142, 145, or equivalent. HU

*** SPAN 478a and SPAN 479b, Directed Readings and/or Individual Research** Rolena Adorno

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** Staff

A research project completed under faculty supervision and resulting in a paper of considerable length, in Spanish.

Special Divisional Major (SPEC)

Study of the City (STCY)

*** STCY 176b / ARCH 230b / URBN 230b, Introduction to the Study of the City**
 Alexander Garvin

An examination of forces shaping American cities and strategies for dealing with them. Topics include housing, commercial development, parks, zoning, urban renewal, landmark preservation, new towns, and suburbs. The course includes games, simulated problems, fieldwork, lectures, and discussion. SO

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

Tamil (TAML)

Tibetan (TBTN)

Theater and Performance Studies (THST)

*** THST 092b / AFST 092b, African Rhythm in Motion** Staff

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 097a, Anatomy in Motion** Staff

The connection between advances in human anatomy and kinesiology – the science of human movement – and dance practices from the early 1900s to the present. Study of seminal texts and practical exercises that drove the research of Frederick M. Alexander, Mabel Elsworth Todd, Barbara Clark, and Lulu Sweigard and the application of their ideas in contemporary movement practices today. Topics include the synthesis of dance and science; the reeducation of alignment, posture and balance; the use of imagery; and the unification of mind and body. No prior dance experience required. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. 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 099a / FILM 045a, Dance on Film** Emily Coates

An examination of dance on film from c. 1920 to the present, including early Hollywood pictures, the rise of Bollywood, avant-garde films of the postwar period, translations of stage choreography to screen, music videos, and dance film festivals. The impact of industry, circulation and audience, aesthetic lineages, and craft in the union of the two mediums. Students develop an original short film for a final class project. No prior dance or filmmaking experience necessary. Enrollment limited to first-year students. Preregistration required; see under First-Year Seminar Program. WR, HU

THST 110a and THST 111b, Survey of Theater and Drama Shilarna Stokes

An introduction to theater history, plays, aesthetic theories, and performance techniques. From antiquity to the Restoration period in the fall and continuing through to the present in the spring. HU

*** THST 210b, Introduction to Performance Concepts** Staff

A studio introduction to the basic techniques of acting, including the actor's vocabulary and performance tools. Improvisation, performance exercises, and scene work based on Stanislavsky, Vakhtangov, Michael Chekhov, Strasberg, Adler, Meisner, and Hagen. Admission by audition. Open to Theater Studies majors only. Required for Theater Studies majors in the year immediately following THST 110, 111. 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 213a, 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 course seeks to show potential theater studies majors 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.

*** THST 214b / ENGL 241b, English Comic Drama, 1660-1800** Jill Campbell

An exploration of the distinctive wit, social functions, conditions of theatrical production, and changing forms of comic drama in Britain from the reopening of the theaters in 1660 to 1800. Particular attention to the construction of gender and sexuality in these plays, including the figures of the effeminate fop and male and female libertines; sexual harassment and coercion; same-sex and opposite-sex eroticism; and the interplay between sexual and verbal pleasures. Other topics to include representations of labor and social class; the shaping force of imperial trade on life in London; and 18th-century theories of laughter. Plays by William Wycherley, Aphra Behn, William Congreve, John Gay, Henry Fielding, Hannah Cowley, Oliver Goldsmith, and Richard Sheridan. WR, HU

*** THST 215a / ENGL 434a, Writing Dance** Brian Seibert

The esteemed choreographer Merce Cunningham once compared writing about dance to trying to nail Jello-O to the wall. This seminar and workshop takes on the challenge. Taught by a dance critic for the New York Times, the course uses a close reading of exemplary dance writing to introduce approaches that students then try themselves, in response to filmed dance and live performances in New York City, in the widest possible variety of genres. No previous knowledge of dance is required. WR, HU

*** THST 224a / MUSI 228a, Musical Theater Performance I** Annette Jolles

The structure and meaning 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. For singers, pianists, and directors. Prerequisites: MUSI 211 and 219, or with permission of instructor. Admission by audition only. May be repeated for credit. For audition information e-mail dan.egan@yale.edu. HU RP

*** THST 226b / MUSI 229b, Musical Theater Performance II** Maria-Christina Oliveras

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 230b, Advanced Acting and Scene Study** Joan MacIntosh

Combination of exercises and scene study to deepen the understanding and playing of action. Admission by audition. Open to junior and senior Theater Studies majors only. May be taken more than once. Prerequisite: THST 211.

*** THST 235b / ART 235b, Dance Theater** Emily Coates

A studio-based introduction to movement vocabularies, physical techniques, and choreographic repertoire from post-1950 modern and postmodern dance theater to the present. Through a historical survey of major aesthetic shifts in dance, the course focuses on building the essential skills of a dance artist: the heightened awareness of time and space, the ability to read and translate diverse choreographic ideas, and the ability to question in motion. Open to students of all levels and majors. HU

*** 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. WR, 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 300a, The Director and the Text I** Toni Dorfman

Basic exercises in approaching dramatic or other literary texts from the director's perspective. Particular attention to the many roles and functions of the director in production. Rehearsal and production of workshop scenes. Open to junior and senior Theater Studies majors, and to nonmajors with permission of the instructor. Prerequisite: THST 210. HU RP

*** THST 310b / RUSS 310b, Analysis through Action: Text Analysis and Improvisation** David Chambers

This studio course, designed primarily for actors, directors, and dramaturgs combines rigorous and detailed text analysis with 'études': in-class improvisational explorations of scenes, characters, and textual situations. The text work informs the improvisations, and vice-versa. Developed from the very last workshops of Stanislavsky, this process has evolved over generations into the contemporary avant-garde theater of major European and Russian directors but is barely known in the US. Prior completion of THST 210 (Performance Concepts) suggested but not required. HU RP

*** 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. HU RP

*** THST 318b / MUSI 340b, Analyzing, Directing, and Performing Early Opera** Grant Herreid and Toni Dorfman

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 319a / AFAM 313a, Embodying Story** Renee Robinson

The intersection of storytelling and movement as seen through historical case studies, cross-disciplinary inquiry, and studio practice. Drawing on eclectic source materials from different artistic disciplines, ranging from the repertory of Alvin Ailey to

journalism, architectural studies, cartoon animation, and creative processes, students develop the critical, creative, and technical skills through which to tell their own stories in movement. No prior dance experience necessary. 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. Emphasis on developing an individual voice. Scenes read and critiqued in class. Admission by application, with priority to Theater Studies majors. A writing sample and statement of purpose should be submitted to the instructor before the first class meeting.

*** THST 324b, Playwright-Director Laboratory** Toni Dorfman

An exploration of the collaboration between the director and the playwright in the creation of new work. Particular attention to the shaping of dramatic action, structure, and characters. Short scenes are written, staged, critiqued, and revised. Prerequisites: THST 210; for directors: THST 300; for playwrights: THST 320, 321; or with permission of instructor. RP

*** THST 329a / ENGL 361a, Theater Now** Marc Robinson

Study of the drama and performance created in the last ten years, with special attention to work produced in 2019-2020. Readings from published and unpublished American and British plays, contemporary criticism and theory, interviews, and essays by the artists themselves. Videos of works created by experimental theater companies. May include attendance at productions in New York City and New Haven. HU

*** THST 330b / HUMS 320b / LITR 324b, Representations of the Underworld** Toni Dorfman

What is the underworld? What questions have different ideas about the underworld posed about mortality, freedom, and goodness? Topics include dreams, hell, ghosts, the unconscious, and string theory. Sophomore standing required. HU

*** THST 333b / MUSI 472b, Stephen Sondheim and the American Musical Theater Tradition** Dan Egan

The musical theater of Stephen Sondheim, both as a popular phenomenon of the contemporary Broadway stage and in relation to models and forms employed in the past. HU RP

*** THST 335b / AFST 435b, West African Dance: Traditional to Contemporary** Staff

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 340b, Ballet Now** Staff

A practical investigation of seminal ballets in the repertory of New York City Ballet. Tracing a sweeping history of artistic innovation from the early twentieth century to the present, this course covers the technique and aesthetic details that constitute New York City Ballet's style and follow the ways that these stylistic strengths are applied

and transformed in the contemporary ballets of the 21st century. Repertory excerpts move through foundational works by George Balanchine and Jerome Robbins to ballets created in the past fifteen years by some of the most prominent ballet choreographers working today. Prior dance training required. Admission is by audition during the first class meeting. HU

*** 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 348a, Making the Avant-Garde** David Chambers

This course looks at the rise of the late twentieth-century avant-garde theatre (and a touch of dance), with a concentration on radical ensemble work. Each meeting concentrates on one group or artist, drawn from the “downtown” New York artists/ensembles and several European groups that emerged from the 1960s to 2000. Each class requires reading and video viewing focused on the actual “making” of productions by these artists: their artistic philosophies, cultural contexts, and performance techniques. HU RP

*** THST 360b / AFAM 361b / WGSS 341b, Black Queer Performance Studies** Tav Nyong'o

How do race, gender, and sexuality intersect in performance? How have gender nonconformity and sexual dissidence been enacted in African American and black diasporic aesthetic forms? What theories and methods have been developed within black studies, queer studies, and performance studies for approaching these questions politically, historically, and artistically? This course draws primarily on post-1945 American and British theater and performance history. HU

*** THST 376b, Digital Media in Performance** Nathan Roberts

Practical and theoretical innovations in contemporary theater and performance brought about by new technologies and forms of information exchange in the late twentieth and early twenty-first centuries. Exploration of how the live body on stage is reconfigured and reimagined through technological intervention. Priority to majors in Theater Studies, in Art, and in Computing and the Arts. Students must preregister during the reading period of the preceding term.

*** THST 378b / GMAN 341b, Performance and Theater** Katrin Truedstedt

What does it mean to perform a role? What does it take to enter a public realm and to be recognized in a role? And how can one play with the expectations of performing a certain self? This course turns to the rich history of theatrical forms and theories of performance and performativity to gain new perspectives on these fundamental questions. Topics include the history of theater, drama, and play from Greek tragedy to Shakespeare, Brecht, and contemporary performances; conceptions of performance, performativity, theatricality, and antitheatricality; speech act theory; subjectivity and authority; performance in the context of race, class, and gender; and the re-entry of the body within the theatrical play. The course combines an introduction to major plays with a historical overview of theatrical forms and a theoretical exploration of performance studies. The course thus practices an instance of “literature in context”

studies. While a history of theatrical forms is not the primary goal of the course, it serves as an introduction to that history through the lens of performance studies. HU

*** THST 380b / AMST 370b, The History of Dance** 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. WR, HU

*** THST 387b, Choreography in Practice and Theory** Irene Hultman Monti

A seminar and workshop in dance-theater composition. Focus on the history of dance composition, tools for generating and interpreting movement, basic choreographic devices, and dance in dialogue with media, music, and other art forms. Choreographic projects developed over the course of the term are presented in a final performance. Admission by application. May be repeated for credit. HU RP

*** 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 and Kimberly Jannarone

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.' It features thematic research presentations by performance studies scholars and practitioners from Yale and surrounding regions. Students enrolled for credit complete weekly readings based on that week's scholarship, as well as weekly written responses and a final paper that they present a portion of at the final meetings of the PSWG. HU RP

*** THST 412b, Libretto Writing for Musical Theater** Marsha Norman

Practical instruction in book writing for musical theater combined with close reading of historical and contemporary examples of the genre. Weekly exercises focus on issues of craft, creativity, and collaboration. RP

*** THST 414a, Lyric Writing for Musical Theater** Michael Korie

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.

Limited enrollment. Interested students should write to dan.egan@yale.edu for application requirements. May not be repeated for credit. HU RP

*** THST 441a / WGSS 413a, Feminist Theater and Performance** Deborah Margolin and Elise Morrison

Introduction to a range of works by feminist scholars, activists, playwrights, and performers who have used theatrical performance as a means by which to critique and reimagine cultural representations of gender and sexuality. Mapping out of

significant theories, debates, and performance strategies that emerged out of the feminist movement(s) of the twentieth and early twenty-first centuries. Students research, perform, and critically engage with historical and contemporary examples of feminist performance work. HU

*** THST 450b / AFAM 451b / ANTH 445b / WGSS 442b, Black Women Moving and the Ethnography of Embodiment** Aimee Cox

In this course we explore the theory and methods employed by Black women ethnographers, artists, and activists invested in transforming the traditional norms of the academic disciplines and creative contexts in which they operate. These boundary erasing, rule breaking women challenge us to think expansively and act courageously in our efforts to not only dream a new world but bring that world into fruition. The life and work of anthropologist/dancer/choreographer/activist Katherine Dunham (1909–2006) provides the framework through which we think through the strategies contemporary scholar-artists employ in their social justice practices, while the concept of movement is our theoretical and methodological foundation for engaging with the work of historical and contemporary Black women change agents. We ask how movement functions in the work of Dunham and these contemporary scholar-artists in terms of: the moving and/or dancing body; movement and migration across geographic territories and imagined space; and participation in social movements. Inspired by the techniques these women have developed for re-imagining the possibilities for moving as an act of social change, we experiment with creating our own embodied artistic practices and research methods. Students should anticipate a holistic experience that requires an openness to physical activity and choreography (accessible to all) as one of our primary tools for both analyzing the multi-media course texts, as well as constructing our own boundary crossing projects. SO

*** THST 452a, Acting: Constructing a Character** Gregory Wallace

This course is a studio based exploration of the internal and external preparation an actor must undergo in order to effectively render the moment-to-moment life of a given character. This course is meant to promote a rigorous investigation of how the actor uses the self as the foundation for transformation. The class consists of close readings, research presentations, rehearsals, and the occasional performance of characters drawn from a selection of classic American plays. Admission by audition during the first class session. Open to all majors. 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 460a, Research and Collaboration Studio** Shilarna Stokes

Intended for juniors in the major as preparation for the senior thesis, this course situates artistic collaborations in a critical framework and explores a range of relevant approaches to research. Each week students work with one another to imagine and rehearse plays and performance projects, workshop proposals, and study the

collaborative process through readings and exercises. Culminating projects apply two or more research approaches to the development of a new performance work or to an original interpretation of an existing text. Priority admission for juniors in the major. Open to others by permission of the instructor. Prerequisites: THST 110, THST 111, and THST 210. HU

*** THST 471a or b, 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** Dan Egan and Nathan Roberts

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.

Turkish (TKSH)

TKSH 110a, Elementary Modern Turkish I Staff

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 Staff

Continuation of TKSH 110. Prerequisite: TKSH 110 or permission of instructor. L2 1½ Course cr

TKSH 130a, Intermediate Turkish I Staff

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 Staff

Continuation of TKSH 130. Prerequisite: TKSH 130. L4 1½ Course cr

TKSH 150a, Advanced Turkish I Staff

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 140. L5 RP

TKSH 151b, Advanced Turkish II Staff

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)

Urban Studies (URBN)

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 230b / ARCH 230b / STCY 176b, Introduction to the Study of the City**

Alexander Garvin

An examination of forces shaping American cities and strategies for dealing with them. Topics include housing, commercial development, parks, zoning, urban renewal, landmark preservation, new towns, and suburbs. The course includes games, simulated problems, fieldwork, lectures, and discussion. 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 place them within their historical and theoretical context. HU RP

*** URBN 324b / ARCH 324b / SAST 384b, The City Before and After the Tubewell**

Anthony Acciavatti

What do such disparate cities as New Delhi, Jakarta, Mexico City, and Phoenix all have in common? In short, each city relies on a fantastic technology that few people know anything about but has transformed the shape and life of cities and their hinterlands: the tubewell. Technologies for drawing up groundwater, tubewells are used in places where municipal water supply is non-existent, unreliable, or often polluted. A minor technology with a global reach, the tubewell is to the city what the elevator was to the skyscraper in the booming American metropolis of the early twentieth century. In this course we look at how tubewells and other decentralized technologies have radically transformed urban and agricultural spaces across the globe since the nineteenth century to the present. We watch how people exult before these technologies; we witness how governments and philanthropies as well as farmers and townspeople appropriate them for radically different ends. And we consider why. HU

*** URBN 341b / ARCH 341b / GLBL 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 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 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.

Aerospace Studies (USAF)

*** USAF 101a, Heritage and Values of the U.S. Air Force I** Staff

Introduction to the U.S. Air Force and how it works as a military institution, including an overview of its basic characteristics, missions, and organizations. Students attend one 50-minute lecture and one 110-minute laboratory each week. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** USAF 202a, The Evolution of U.S. Air and Space Power** Staff

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** Staff

Advanced study of leadership concepts and ethics, management and communication skills, and Air Force personnel and evaluation systems. Emphasis on the enhancement of leadership skills. Case studies and exercise of leadership and management techniques in a supervised environment. For enrollment credit only; cannot be applied toward the 36-course-credit requirement for the Yale bachelor's degree. Grades earned in this course do not count toward GPA or eligibility for General Honors.

*** USAF 401a, National Security, Leadership Responsibilities and Commissioning Preparation I** Staff

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.

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 220b / ER&M 209b / LITR 279b, Introduction to Vietnamese Culture, Values, and Literature Quang Van

Introduction to Vietnamese culture and values. Topics include cultural and national identity, aesthetics, the meaning of life, war, and death. Selected readings from Zen poems, folklore, autobiographies, and religious and philosophical writings. Course is taught in English and is an alternative to Western perspectives. Readings in translation. No previous knowledge of Vietnamese required. HU TR

Women's Gender and Sexuality Studies (WGSS)

*** 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 125a / AFAM 115a, "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 194b / ENGL 194b, 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 in Arabia and the South Pacific; Caribbean sexual morality; and the salon cultures of expatriate Paris. WR, HU

*** WGSS 206a, Transnational Approaches to Gender & Sexuality** Evren Savci

Examination of transnational debates about gender and sexuality as they unfold in specific contexts. Gender as a category that can or cannot travel; feminist critiques of

liberal rights paradigms; globalization of particular models of gender/queer advocacy; the role of NGOs in global debates about gender and sexuality. WR

*** WGSS 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 220a / PLSC 220a / PLSC S220, Gender Politics** Andrea Aldrich

Exploration of theoretical and empirical work in political science to study the relationship between gender and politics in the United States and around the world. Topics include women's representative in legislative and executive branch politics in democratic regimes; the impact of gender stereotypes on elections and public opinion; conditions that impact the supply and demand of candidates across genders; and the underrepresentation of women in political institutions. WR, SO

*** 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 230b / ANTH 230b, Evolutionary Biology of Women's Reproductive Lives**

Claudia Vaggia

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 245a / FILM 243a / MGRK 218a, Family in Greek Literature and Film**

George Syrimis

The structure and multiple appropriations of the family unit, with a focus on the Greek tradition. The influence of aesthetic forms, including folk literature, short stories, novels, and film, and of political ideologies such as nationalism, Marxism, and totalitarianism. Issues related to gender, sibling rivalry, dowries and other economic factors, political allegories, feminism, and sexual and social violence both within and beyond the family. WR, HU TR

*** 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 266b / ENGL 165b, Gender, Class, and Narrative Form in the Victorian Novel

Ruth Yeazell

A selection of nineteenth-century novels, with particular attention to questions of gender, class, and narrative form. Authors chosen from the Brontës, Gaskell, Dickens, Collins, Eliot, Trollope, and Hardy. WR, HU

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 279a / RLST 334a, Queer Religion** Wendy Mallette

This interdisciplinary seminar engages a range of methods and theoretical approaches to queer studies and religion. The course explores questions including: what is the relationship between queer life and religious life? Is religion ever queer? Is queerness ever religious? What do scholars mean when they label religion (or other objects of study) as queer or queer-able? What assumptions about race, class, and gender do contemporary usages of queer entail? What are the possibilities and limits of queer methods and practices? Topics include: queer methods and genealogies, HIV/AIDS and affect, lesbian feminism and exoduses, performance and humor, sodomy and orientalism, vocations and orientations. 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 305a / AFAM 315a, Black Feminist Theory** Roderick Ferguson

This course is designed to introduce you to some of the major themes in black feminist theory. The course does so by presenting classic texts with more recent ones to give you a sense of the vibrancy of black feminist theory for addressing past and present concerns. Rather than interpret black feminist theory as a critical formation that simply puts race, gender, sexuality, and class into conversation with one another, the course apprehends that formation as one that produced epistemic shifts in how we understand politics, empire, history, the law, and literature. This is by no means an exhaustive list of the areas into which black feminism intervened. It is merely a sample of some of the most vibrant ideological and discursive contexts in which black feminism caused certain epistemic transformations. SO

*** WGSS 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 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 325a / ER&M 324a, Asian Diasporas since 1800** Quan Tran

Examination of the diverse historical and contemporary experiences of people from East, South, and Southeast Asian ancestry living in the Americas, Australia, Africa, the Middle East, Asia, and Europe. Organized thematically and comparative in scope, topics include labor migrations, community formations, chain migrations, transnational connections, intergenerational dynamics, interracial and ethnic relations, popular cultures, and return migrations. HU, SO

*** 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 341b / AFAM 361b / THST 360b, Black Queer Performance Studies** Tav Nyong'o

How do race, gender, and sexuality intersect in performance? How have gender nonconformity and sexual dissidence been enacted in African American and black diasporic aesthetic forms? What theories and methods have been developed within black studies, queer studies, and performance studies for approaching these questions

politically, historically, and artistically? This course draws primarily on post-1945 American and British theater and performance history. 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 352b / ENGL 259, Feminist and Queer Literary Methods** Margaret Homans

This course explores feminist and queer literary criticism and theory, the use of feminist and queer literary methods across disciplines, and the uses of literary evidence in gender and sexuality studies. Rather than covering a particular period or genre of literature, the course uses a selection of primary texts in English from Shakespeare to the present, from multiple literary genres (fiction, poetry, drama, memoir, creative nonfiction), and from popular culture and non-literary sources as well as canonical texts. Most of the reading, however, will be in literary criticism and theory and in scholarly writing that makes use of literary methods. Topics include the power of narrative and of representation to create norms; the intersectional gender politics of language, including issues of access, code-switching, and appropriation; the uses of narrative as a scholarly tool and of narrative methods across disciplines; historicisms and presentisms; and art as activism. Students learn to do research in literary criticism and theory, and practice thinking broadly about the cultural work that literature does and about the uses of literary methods and practices in other fields. Formerly ENGL 359. WR, HU

*** WGSS 372b, 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 378b / ANTH 381b, 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 390a / ER&M 360a / HLTH 370a / HSHM 432a / SOCY 390a, 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 394a / ENGL 198a / FILM 394a / LITR 409a / RSEE 350a, Internet Cultures, Histories, Networks, and Practices Marijeta Bozovic

Examination, through the lenses of histories, network studies, and cultural studies, of how human beings have seemingly overnight learned to use and depend on computer networks for various kinds of work, military operations, pursuits of scientific knowledge, religious proselytizing, political organization, searches for mates and social communities, illegal activities, and infinite varieties of play. HU

*** WGSS 397b / PLSC 377b / SAST 344b, Political Economy of Gender in South Asia** Sarah Khan

This course focuses on the political and economic underpinnings and implications of gender inequality in South Asia. We draw on evidence from Bangladesh, Pakistan, and India to guide our theoretical and empirical inquiry into the following broad questions: What is gender, and what approaches do social scientists use to study gender inequality? How does gender inequality manifest in different social, economic, and political spheres e.g. the household, the labor market, the electorate, the government? What are the cultural and structural drivers of gender inequality? How effective are different approaches to tackling gender inequality in South Asia? Previous course work in statistical data analysis is helpful, but not required. SO

*** WGSS 398a, Junior Research Seminar** Eda Pepi

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 405b / EALL 211b / EAST 241b / LITR 174b, Women and Literature in Traditional China Kang-I Chang

A study of major women writers in traditional China, as well as representations of women by male authors. The power of women's writing; women and material culture; women in exile; courtesans; Taoist and Buddhist nuns; widow poets; cross-dressing women; the female body and its metaphors; footbinding; notions of love and death; the aesthetics of illness; women and revolution; poetry clubs; the function of memory in women's literature; problems of gender and genre. All readings in translation; no knowledge of Chinese required. Some Chinese texts provided for students who read Chinese. Formerly CHNS 201. HU TR

*** WGSS 413a / THST 441a, Feminist Theater and Performance** Deborah Margolin and Elise Morrison

Introduction to a range of works by feminist scholars, activists, playwrights, and performers who have used theatrical performance as a means by which to critique and reimagine cultural representations of gender and sexuality. Mapping out of significant theories, debates, and performance strategies that emerged out of the feminist movement(s) of the twentieth and early twenty-first centuries. Students research, perform, and critically engage with historical and contemporary examples of feminist performance work. HU

*** WGSS 430b / ANTH 441b / MMES 399b / MMES 430b, 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

*** WGSS 431a / ANTH 451a, 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 432a / PHIL 444a, Social Ontology** Robin Dembroff

Study of conceptual and methodological foundations of social ontology, as well as particular topics within social ontology, such as the nature of gender and race. Prerequisites: at least one, but preferably two philosophy courses. HU

*** WGSS 442b / AFAM 451b / ANTH 445b / THST 450b, Black Women Moving and the Ethnography of Embodiment** Aimee Cox

In this course we explore the theory and methods employed by Black women ethnographers, artists, and activists invested in transforming the traditional norms of the academic disciplines and creative contexts in which they operate. These boundary erasing, rule breaking women challenge us to think expansively and act courageously in our efforts to not only dream a new world but bring that world into fruition. The life and work of anthropologist/dancer/choreographer/activist Katherine Dunham (1909–2006) provides the framework through which we think through the strategies contemporary scholar-artists employ in their social justice practices, while the concept of movement is our theoretical and methodological foundation for engaging with the work of historical and contemporary Black women change agents. We ask how movement functions in the work of Dunham and these contemporary scholar-artists in terms of: the moving and/or dancing body; movement and migration across geographic territories and imagined space; and participation in social movements. Inspired by the techniques these women have developed for re-imagining the possibilities for moving as an act of social change, we experiment with creating our own embodied artistic practices and research methods. Students should anticipate a holistic experience that requires an openness to physical activity and choreography (accessible to all) as one of our primary tools for both analyzing the multi-media course texts, as well as constructing our own boundary crossing projects. SO

*** WGSS 457b / HIST 176Jb / HSHM 465b, Reproductive Health, Gender & Power in the U.S.** Ziv Eisenberg

This seminar examines women’s and men’s reproductive health in the United States from the 19th century to the present. How have gender norms and social power structures shaped medical knowledge, scientific investigation, political regulation, and private reproductive experiences? What do the lessons of the history of reproductive health tell us about contemporary policy, legal and economic debates? Topics include abortion, activism, childbirth, contraceptives, eugenics, feminism, fertility,

medicalization, pregnancy, reproductive science and technology, sexual health, social justice, and sterilization. WR, HU

*** 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 490a or b, The Senior Colloquium** Andrew Dowe

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** Andrew Dowe

Independent research on, and writing of, the senior essay.

Wolof (WLOF)

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 Oluseye Adesola

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 Oluseye Adesola

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 Staff

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 Staff

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** Staff

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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The map provides a comprehensive overview of the Yale University campus. It features a grid of streets including Canner Street, Cottage Street, Lawrence Street, Edwards Street, Bishop Street, Humphrey Street, Bradley Street, Groves Street, and Audubon Street. Key buildings and landmarks are labeled, such as the Sterling Chemistry Building, the Kline Geology Lab, the Peabody Museum, the School of Engineering, and the Groves Street Cemetery. A compass rose in the top right corner indicates North is towards the top right. The map also shows various parking areas, including the Peabody Museum parking lot and the Groves Street parking lot.

Continued on next page

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, 221 Whitney Avenue, 4th Floor, 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 Office of the Vice President for Human Resources and Administration, PO Box 208322, 2 Whitney Avenue, Suite 810, New Haven CT 06520-8322, or by calling the Yale Police Department at 203.432.4400, the University will provide this information to any applicant for admission, or prospective students and employees may 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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