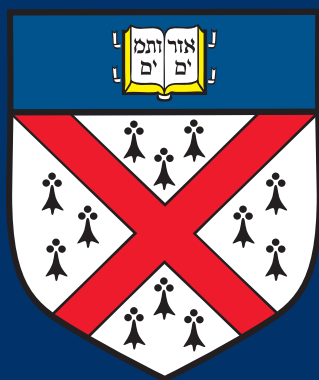


Yale College
Programs of Study
Fall and Spring Terms

2010—2011



BULLETIN OF YALE UNIVERSITY

Series 106 Number 9 August 1, 2010

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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.

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Building Abbreviations

AKW	Arthur K. Watson Hall	LFOP	Leitner Observatory and Planetarium
BASS	Bass Center for Molecular and Structural Biology	LGH	Abby and Mitch Leigh Hall
BASSLB	Bass Library	LOM	Leet Oliver Memorial Hall
BCMM	Boyer Center for Molecular Medicine	LORIA	Loria Center
BCT	Becton Engineering and Applied Science Center	LUCE	Henry R. Luce Hall
BK	Berkeley College	LWR	Lanman-Wright Memorial Hall
BM	Charles W. Bingham Hall	MC	Morse College
BML	Brady Memorial Laboratory	MEC	Malone Engineering Center
BR	Branford College	ML	Mason Laboratory
BRBL	Beinecke Rare Book and Manuscript Library	OML	Osborn Memorial Laboratories
C	Connecticut Hall	PC	Pierson College
CC	Calhoun College	PH	Phelps Hall
CRB	Class of 1954 Chemistry Research Building	PM	Peabody Museum of Natural History
CSC	Child Study Center	PWG	Payne Whitney Gymnasium
D	Durfee Hall	RDH	Rudolph Hall
DAVIES	Davies Auditorium, Becton Center	RKZ	Rosenkranz Hall
DC	Davenport College	SB	Sage Hall
DL	Dunham Laboratory	SCL	Sterling Chemistry Laboratory
EAL	Electron Accelerator Laboratory	SDQ	Sterling Divinity Quadrangle
EM	Edwin McClellan Hall	SHM	Sterling Hall of Medicine
ES	Ezra Stiles College	SLB	Sterling Law Buildings
ESC	Class of 1954 Environmental Science Center	SM	Silliman College
F	Farnam Hall	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
HGS	Hall of Graduate Studies	ST	Street Hall
JE	Jonathan Edwards College	STOECK	Stoeckel Hall
JWG	Josiah Willard Gibbs Research Laboratories	SY	Saybrook College
K	Kirtland Hall	TAC	The Anlyan Center
KBT	Kline Biology Tower	TC	Trumbull College
KCL	Kline Chemistry Laboratory	TD	Timothy Dwight College
KGL	Kline Geology Laboratory	UT	University Theatre
KRN	Kroon Hall	V	Vanderbilt Hall
L	Lawrance Hall	W	Welch Hall
LC	Linsly-Chittenden Hall	WLH	William L. Harkness Hall
LEPH	Laboratory of Epidemiology and Public Health	WNSL	Wright Laboratory
		WNSL-W	Wright Laboratory West
		YCBA	Yale Center for British Art
		YUAG	Yale University Art Gallery

Yale College Calendar with Pertinent Deadlines

This calendar includes a partial summary of deadlines given in chapters I and II, along with those in the Yale College online publication *Undergraduate Regulations*. Unless otherwise specified, references are to sections in chapter II of this bulletin, and deadlines fall at 5 p.m.

FALL TERM 2010

Aug. 25	W	Residences open to upperclassmen, 9 a.m.
Aug. 27	F	Residences open to freshmen, 9 a.m. Required registration meetings for freshmen, 8 p.m.
Aug. 31	T	Required registration meetings for upperclassmen.
Sept. 1	W	Fall-term classes begin.
Sept. 10	F	Final deadline to apply for a fall-term Leave of Absence (section J). Withdrawal from Yale College on or before this date entitles a student to a full rebate of fall-term tuition (<i>Undergraduate Regulations</i>).
Sept. 13	M	Course schedules due for the Class of 2014.*
Sept. 14	T	Course schedules due for the Classes of 2013 and 2012.*
Sept. 15	W	Course schedules due for the Class of 2011.* All students planning to complete degree requirements at the end of the fall term must file a petition by this date. (See section K for penalties resulting from failure to meet this deadline.)
Sept. 25	SA	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of fall-term tuition (<i>Undergraduate Regulations</i>).
Oct. 15	F	Deadline to apply for a spring-term 2011 Term Abroad (section K). Deadline to complete applications for financial aid for the spring term, for students not enrolled in the 2010 fall term (<i>Undergraduate Regulations</i>).
Oct. 22	F	Midterm. Last day to withdraw from a fall-term course without having the course appear on the transcript (sections F and B). Deadline to apply for double credit in a single-credit course (section K). Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition (<i>Undergraduate Regulations</i>).

*Late schedules from all classes are fined and may not include the Credit/D/Fail option. See chapter II, sections B and E.

Nov. 5	F	Last day to convert from the Credit/D/Fail option in a fall-term course to a letter grade (section B).
Nov. 19	F	Fall recess begins, 5:20 p.m.
Nov. 29	M	Classes resume. Last day to relinquish on-campus housing for the spring term without charge (<i>Undergraduate Regulations</i>).
Dec. 3	F	Classes end; reading period begins. Last day to withdraw from a fall-term course (sections F and B).
Dec. 10	F	Reading period ends. Deadline for all course assignments, including term papers. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
Dec. 11	SA	Final examinations begin, 9 a.m. [†]
Dec. 18	SA	Examinations end, 5:30 p.m.; winter recess begins.
Dec. 19	SU	Residences close, 12 noon.

SPRING TERM 2011

Jan. 5	W	Residences open, 9 a.m.
Jan. 9	SU	Required freshman registration meetings, 9 p.m.
Jan. 10	M	Spring-term classes begin. Registration for sophomores, juniors, and seniors.
Jan. 14	F	Friday classes do not meet; Monday classes meet instead.
Jan. 17	M	Martin Luther King, Jr., Day; classes do not meet.
Jan. 19	W	Course schedules due for the Class of 2014.* Final deadline to apply for a spring-term Leave of Absence (section J). Withdrawal from Yale College on or before this date entitles a student to a full rebate of spring-term tuition (<i>Undergraduate Regulations</i>).
Jan. 20	TH	Course schedules due for the Classes of 2013 and 2012.*
Jan. 21	F	Course schedules due for the Class of 2011.* Last day for students in the Class of 2011 to petition for permission to complete the requirements of two majors.
Feb. 4	F	Withdrawal from Yale College on or before this date entitles a student to a rebate of one-half of spring-term tuition (<i>Undergraduate Regulations</i>).

[†]Please note that examinations will be held on Saturday and Sunday, December 11, 12, and 18, 2010.

*Late schedules from all classes are fined and may not include the Credit/D/Fail option. See chapter II, sections B and E.

Mar. 4	F	Midterm. Spring recess begins, 5:20 p.m. Last day to withdraw from a spring-term course without having the course appear on the transcript (sections F and B). Deadline to apply for double credit in a single-credit course (section K). Withdrawal from Yale College on or before this date entitles a student to a rebate of one-quarter of the term's tuition (<i>Undergraduate Regulations</i>).
Mar. 5	SA	Deadline to apply for a fall-term 2011 Term Abroad or a 2011–2012 Year Abroad (section K).
Mar. 21	M	Classes resume.
Mar. 28	M	Last day to convert from the Credit/D/Fail option in a spring-term course to a letter grade (section B).
Apr. 25	M	Classes end; reading period begins. Monday classes do not meet; Friday classes meet instead. Last day to withdraw from a spring-term course (sections F and B).
Apr. 30	SA	Applications for fall-term Leaves of Absence due (section J).
May 2	M	Reading period ends. Deadline for all course assignments, including term papers. This deadline can be extended only by a Temporary Incomplete authorized by the student's residential college dean.
May 3	T	Final examinations begin, 9 a.m. [†]
May 10	T	Examinations end, 5:30 p.m.
May 11	W	Residences close for underclassmen, 12 noon.
May 13	F	Deadline to complete applications for financial aid for the fall and spring terms, 2011–2012 (<i>Undergraduate Regulations</i>).
May 23	M	University Commencement.
May 24	T	Residences close for seniors, 12 noon.

[†]Please note that examinations will be held on Saturday and Sunday, May 7 and 8, 2011.

Yale College Officers and Deans of the Residential Colleges

Administrative Officers

Richard C. Levin, Ph.D., President of the University

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

Mary Miller, Ph.D., Dean of Yale College

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Susan E. Cahan, Ph.D., Associate Dean for the Arts

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

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W. Marichal Gentry, M.S.W., Associate Dean; Dean of Student Affairs; Dean of

Freshman Affairs

Judith D. Hackman, Ph.D., Associate Dean for Assessment

John R. Meeske, B.A., Associate Dean for Student Organizations and

Physical Resources

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

William A. Segraves, Ph.D., Associate Dean for Science Education

Rodney T. Cohen, Ed.D., Assistant Dean; Director of Afro-American Cultural Center

Saveena Dhall, Ed.M., Assistant Dean; Director of Asian American Cultural Center

Rosalinda V. Garcia, M.A., Assistant Dean; Director of Latino Cultural Center

Pamela Y. George, M.S., Assistant Dean of Academic Affairs

Alfred E. Guy, Jr., Ph.D., Assistant Dean;

Director of Yale College Writing Center

Philip Jones, M.S., Assistant Dean; Director of Undergraduate Career Services

George G. Levesque, Ph.D., Assistant Dean of Academic Affairs;

Director of Seminar Office

Theodore C. Van Alst, Jr., Ph.D., Assistant Dean; Director of Native American

Cultural Center

William Whobrey, Ph.D., Assistant Dean; Dean of Yale Summer Session and

Special Programs

Kirk Hooks, M.S.W., Special Assistant for Intercultural and Intergroup Relations

Laurie H. Ongley, Ph.D., Managing Editor of Yale College Publications

Jill Carlton, Ph.D., Registrar

Eileen Quinn, J.D., Senior Deputy Registrar

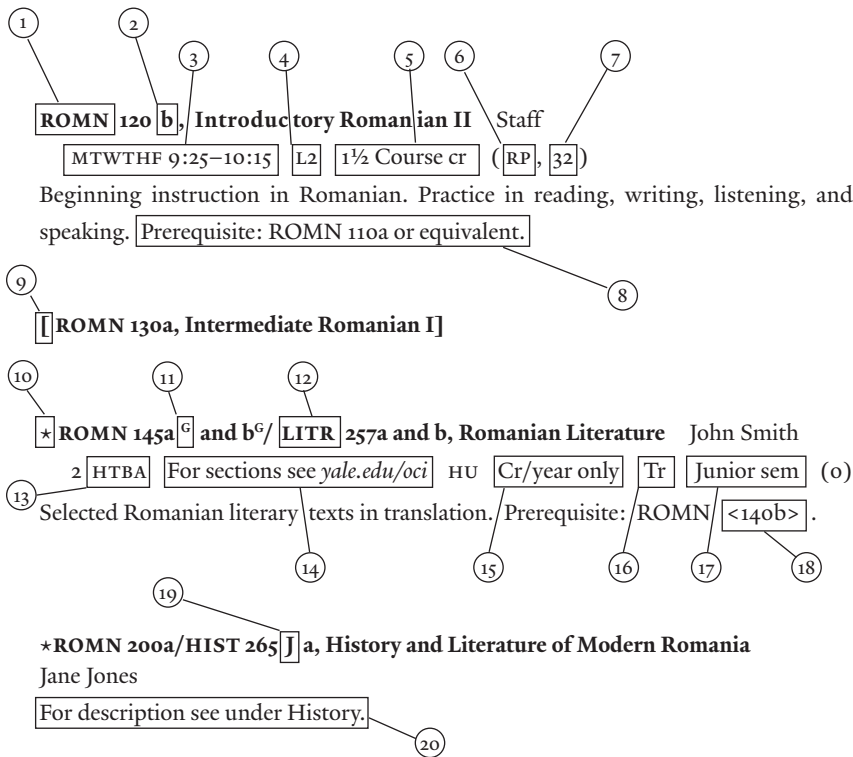
Admissions and Financial Aid Officers

Jeffrey B. Brenzel, Ph.D., Dean of Undergraduate Admissions
Margit A. Dahl, B.A., Director of Undergraduate Admissions
Amin Abdul-Malik, B.A., Associate Director of Undergraduate Admissions
Peter C. Chemery, M.A., Associate Director of Undergraduate Admissions
Alfie Daniels, B.A., Associate Director of Undergraduate Admissions
Debra Johns, M.A., Associate Director of Undergraduate Admissions
Marcia L. Landesman, J.D., Associate Director of Undergraduate Admissions
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Rebekah Westphal, M.A., Associate Director of Undergraduate Admissions
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Diane Frey, Director of Student Financial Services Center
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Deans of the Residential Colleges

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Branford College, Hilary Fink, Ph.D.
Calhoun College, Leslie Woodard, M.A.
Davenport College, Craig Harwood, Ph.D.
Timothy Dwight College, John Loge, M.A.
Jonathan Edwards College, Kyle Farley, Ph.D.
Morse College, Joel Silverman, Ph.D.
Pierson College, Amerigo Fabbri, Ph.D.
Saybrook College, Paul S. McKinley, M.F.A.
Silliman College, Hugh M. Flick, Jr., Ph.D.
Ezra Stiles College, Camille Lizarribar, J.D., Ph.D.
Trumbull College, Jasmina Beširević-Regan, Ph.D.

Key to Course Listings



- Subjects are listed by three- or four-letter abbreviations in capitals. A list of subject abbreviations precedes chapter III.
- Fall-term courses are indicated by the letter “a,” spring-term courses by the letter “b.” A course designated “a or b” (e.g., ECON 150a or b) is the same course given in both fall and spring terms.
- Days and times the course meets.
- 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 chapter I and section A of chapter II.)
- The course earns the specified amount of course credit. Most courses earn one course credit per term; variations are noted.
- Classes or other meetings are held during reading period. (See chapter II, section G.) If RP does not appear in the data line, classes or other meetings will not be held during reading period.
- Examination group number. Final examination times are given on page 12.

8. Prerequisites and recommendations are listed at the end of the course description.
9. Courses in brackets are not offered during the current year but are expected to be given in the succeeding academic year.
10. A student must obtain the instructor's permission before taking a course marked by a star. All seminars are starred.
11. Open to both undergraduate and graduate students. Undergraduates electing these courses, unless already accepted into the Program for the Simultaneous Award of the Bachelor's and Master's Degrees, must enroll under the undergraduate number.
12. A course with multiple titles, i.e., with two or more departments in the title line (such as ITAL 310a/LITR 183a), counts toward the major in each department where it appears. The meeting time and course description appear under only one department. Students indicate on the course schedule which department should appear on their transcripts. Cross-listed courses appear in departments other than their own (e.g., SPAN 223b is listed in Latin American Studies). Such courses may count toward the major of the cross-listing department.
13. Hour or hours to be arranged. 1 HTBA after a specific meeting time usually denotes a discussion section.
14. For multisection courses, meeting times of individual sections are listed in Online Course Information, www.yale.edu/oci.
15. A student must complete the full year satisfactorily to receive credit. (See chapter II, section C.)
16. Literature course with readings in translation.
17. The abbreviations Junior sem, Senior sem, Fr sem, Amer, Core, Pre-1800, Pre-1900, and PreInd indicate Junior seminar, Senior seminar, Freshman seminar, American, Core course, Pre-1800 course, Pre-1900 course, and Preindustrial, respectively. Courses with these designations are applied toward the requirements of certain majors; descriptions of such requirements are included in program descriptions in chapter III.
18. A course number in angle brackets indicates a course that is not currently listed or bracketed but that has been offered within the past three years.
19. A capital J or L following the course number denotes a History junior seminar or a science laboratory, respectively.
20. "For description see under" refers the reader to the department in which full course information appears. The line is used when the location of the full listing is not apparent from the course abbreviation, as, for example, with a multiple-titled course.

Changes in course information after May 4, 2010, as well as information regarding the required and recommended textbooks for courses in Yale College, appear on line at www.yale.edu/oci. The *Yale College Programs of Study* is also published on line at yalecollege.yale.edu/content/yale-college-programs-study-0. The YCPS Web site offers continually updated course listings, links to departmental Web sites, and links to other Yale online resources.

Final Examination Schedules

Rules governing the conduct of final examinations are given in section G of chapter II. (See “Reading Period” and “Final Examinations.”)

An examination group number appears in the data line for each course in chapter III. 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; (69) introductory mathematics.

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

Courses in group (0) usually have no regular final examination, concluding instead with a term essay or other final exercise. Instructors of such courses may schedule a regular final examination based on the course starting time.

Final examination dates and times for 2010–2011 are:

2010		9 a.m.	2 p.m.	7 p.m.	2011		9 a.m.	2 p.m.	7 p.m.
Dec. 11	SA	(32)	(22)		May 3	T	(69)	(34)	
Dec. 12	SU		(63)		May 4	W	(61)	(26)	
Dec. 13	M	(61)	(34)		May 5	TH	(24)	(37)	
Dec. 14	T	(24)	(26)		May 6	F	(33)	(27)	(31)
Dec. 15	W	(69)	(23)	(31)	May 7	SA	(23)	(64)	
Dec. 16	TH	(36)	(27)		May 8	SU		(63)	
Dec. 17	F	(33)	(37)		May 9	M	(36)	(22)	
Dec. 18	SA	(64)			May 10	T	(32)		

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 section H of chapter II, “Postponement of Final Examinations.”)

Subject Abbreviations

ACCT	Accounting	INDN	Indonesian
AFAM	African American Studies	INTS	International Studies
AFST	African Studies	ITAL	Italian
AKKD	Akkadian	JAPN	Japanese
AMST	American Studies	JDST	Judaic Studies
AMTH	Applied Mathematics	KREN	Korean
ANTH	Anthropology	LAST	Latin American Studies
APHY	Applied Physics	LATN	Latin
ARBC	Arabic	LING	Linguistics
ARCG	Archaeological Studies	LITR	Literature
ARCH	Architecture	MATH	Mathematics
ART	Art	MB&B	Molecular Biophysics and Biochemistry
ASTR	Astronomy	MCDB	Molecular, Cellular, and Developmental Biology
BENG	Biomedical Engineering	MENG	Mechanical Engineering
BRST	British Studies	MGRK	Modern Greek
CENG	Chemical Engineering	MMES	Modern Middle East Studies
CGSC	Cognitive Science	MUSI	Music
CHEM	Chemistry	NELC	Near Eastern Languages and Civilizations
CHLD	Child Study Center	OPRS	Operations Research
CHNS	Chinese	PERS	Persian
CLCV	Classical Civilization	PHIL	Philosophy
CLSS	Classics	PHYS	Physics
CPAR	Computing and the Arts	PLSC	Political Science
CPSC	Computer Science	PLSH	Polish
CZEC	Czech	PORT	Portuguese
DRST	Directed Studies	PSYC	Psychology
EAST	East Asian Studies	RLST	Religious Studies
ECON	Economics	RSEE	Russian and East European Studies
E&EB	Ecology and Evolutionary Biology	RUSS	Russian
EENG	Electrical Engineering	SAST	South Asian Studies
EGYP	Egyptian	SCIE	Science
ENAS	Engineering and Applied Science	SKRT	Sanskrit
ENGL	English Language and Literature	SLAV	Slavic Languages and Literatures
ENVE	Environmental Engineering	SOCY	Sociology
EP&E	Ethics, Politics, and Economics	SPAN	Spanish
ER&M	Ethnicity, Race, and Migration	SPEC	Special Divisional Major
EVST	Environmental Studies	STAT	Statistics
F&ES	Forestry & Environmental Studies	STCY	Study of the City
FILM	Film Studies	SWAH	Kiswahili
FREN	French	TAML	Tamil
G&G	Geology and Geophysics	THST	Theater Studies
GMAN	Germanic Languages and Literatures	TKSH	Turkish
GMST	German Studies	TPRP	Teacher Preparation and Education Studies
GREK	Greek	VIET	Vietnamese
HEBR	Hebrew	WGSS	Women's, Gender, and Sexuality Studies
HIST	History	YORU	Yorùbá
HLTH	Health Studies	YPKU	Yale–Peking University
HNDI	Hindi	ZULU	isiZulu
HSAR	History of Art		
HSHM	History of Science, History of Medicine		
HUMS	Humanities		

A Message from the Dean of Yale College

We officially call this book *Yale College Programs of Study*, but generations of students and faculty have known this volume simply as the Blue Book. A compendium of roughly 2,000 courses to be offered in Yale College in 2010–2011, the Blue Book is a book to use. Turn down pages you wish to return to; bend the spine so it opens to subjects you find yourself called to. Let this book be your key to the renowned faculty at Yale, through whose courses you will develop the intellectual knowledge, skills, and sense of citizenship that will serve you all the days of your lives.

Of course, a collection of individual courses does not constitute an education. We count on you, our students, with the counsel of faculty and deans, Yale's distributional requirements, and your own interests and passions, to shape your liberal education in ways that will help 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 perusing the pages of this bulletin 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. This book 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.

Mary Miller
Dean of Yale College
Sterling Professor of History of Art

I. YALE COLLEGE

Yale College, founded in 1701, is a coeducational undergraduate institution offering instruction in the liberal arts and sciences to about 5,200 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.

The Undergraduate Curriculum

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 in certain foundational skills—writing, quantitative reasoning, and foreign language—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 for the reason that these competences mature and deepen. The best high school writer is still not the writer he or she could be; students who do not use their mathematics or foreign 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.

ADVISING

What students ultimately derive from four years at Yale depends in large measure on careful planning of a program of study. It would be imprudent for beginning students to map out a fixed schedule of courses for the next eight terms. Yet it is important that they think ahead, and make their plans while keeping in mind the principles outlined in this bulletin.

Yale College does not prescribe a program of study, believing that students who select their courses are inevitably more engaged in them – a first precondition for serious learning. As students shape their educational goals, they should seek informed advice. The best advising comes when students and faculty members develop relationships out of shared intellectual interests. For incoming students, who have not yet formed such relationships, Yale College furnishes a special constellation of advising revolving around the residential college dean. Representatives from academic departments, the Health Professions Advisory Board, Undergraduate Career Services, and the Center for International Experience offer presentations to freshmen during their first days at college. Incoming students also confer with individual faculty advisers, who can listen to students' interests, aims, and concerns and offer general guidance. Advisers do not mandate a particular set of courses, as the responsibility for choosing a program is the student's, but each student should make use of all the advice available in order to plan the most effective program.

Distributional Requirements

The distributional requirements, described below, are intended to assure 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, and represent the least that an educated person should seek to know. 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 foreign 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 the broad range of human thought, expression, and endeavor – cultivates an educated recognition of the greatest accomplishments of the past and enriches the capacity to participate fully in the life of our time. Exploration of

other civilizations, ancient and modern, gives students insight into the experiences of others and informs critical examination of their own culture. Those who create or perform works of art experience firsthand the joy and discipline of artistic expression. By rigorously and systematically examining the value and purpose of all that surrounds them, students of the humanities and arts can acquire essential preparation for many different kinds of careers. But independently of any particular application, study of these subjects fosters understanding of, and delight in, the reach and sweep of the human spirit.

Area requirement in the sciences (two course credits) 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. These include an ability to evaluate the opinions of experts, to distinguish special pleading and demagoguery from responsible science, and to realize which things are known and which unknown — which are knowable and which unknowable — to science. The theoretical inquiry, experimental analysis, and firsthand problem solving inseparable from studying a science give rise to new modes of thought. To know science is to appreciate a thousand intricacies in nature and the universe, which are hidden from casual observation but which, once revealed, lend richness to everyday life.

Area requirement in the social sciences (two course credits) Insights attained through the social sciences take on a critical significance at a time when the world's population is increasing rapidly and diverse cultures are coming into closer contact and sometimes into conflict. One major field of inquiry in the social sciences is international and area studies. Those who have been educated in the United States ought especially to acquire knowledge of cultures outside North America and western Europe, as well as broaden their understanding of the societies they know. Questions of class, gender, and identity are also central to work in the social sciences, whose methods test for connections between the familiar and the exotic, the traditional and the contemporary, the individual and the group, the predicted result and the anomalous outcome. Social science theories propose explanations for the entire range of human phenomena, from governments and economies to social organizations, communicative systems, cultural practices, and individual psychology.

Skills requirement in foreign 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 foreign language, regardless of the level of proficiency at the time of matriculation. Depending on their preparation, students take one, two, or three terms of foreign 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 foreign language distributional requirement are listed under "Distributional Requirements" in chapter II, section A.

Skills requirement in quantitative reasoning (two course credits) The mental rigor resulting from quantitative study has been celebrated since ancient times, and applications of quantitative methods have proven critical to many different disciplines. Mathematics and statistics are basic tools for the natural and the social sciences, and they have become 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 Computer Science. Such courses may also be found in Astronomy, Biology, Chemistry, Economics, Engineering, Environmental Studies, Geology and Geophysics, Philosophy, Physics, and Psychology.

Skills requirement in writing (two course credits) The ability to write well is one of the hallmarks of a liberal education 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. Over 150 courses, spanning approximately 40 different academic programs, give special attention to writing. Such courses, designated WR in this bulletin, 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.

Major Programs

All candidates for a bachelor's degree in Yale College must elect one of the major programs listed at the beginning of chapter III. The requirements for a major are described in general terms in the sections below, and in more detail preceding the course listings of each department or program in chapter III. Students plan a schedule of courses in their major in consultation with a representative of the department or program concerned, and must secure the consultant's written approval. 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.

Students seeking the B.S. or the B.A. degree with a major in science 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 should have their schedules approved by the director of undergraduate studies or the adviser designated by the department. Students seeking the B.A. degree with a major in a field other than a science typically declare their major at the beginning of the junior year. In the sophomore year these students' schedules are signed by a sophomore adviser, chosen by the student, with whom the program has been discussed.

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. A list of the more than seventy possible majors in Yale College is given at the beginning of chapter III. The department or program concerned sets the requirements for each major, which are explained in chapter III.

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 described above, 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 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 of two or more term courses taken in the freshman and sophomore years.

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 in chapter III. A Special Divisional Major may not be offered as one of two majors.

The Residential Colleges

The most conspicuous advantage of a university is that it presents students with a great breadth of learning and gives them access to scholars who are engaged not only in communicating knowledge but also in discovering it. But the potential disadvantages of a large university are that its size and complexity may discourage communication, and that teachers and students may become less of a challenge to each other. In such an event, the discovery of new knowledge suffers as much as do teaching and learning.

In order to mitigate such disadvantages as it grew from a small college into a modern research university, Yale established residential colleges. Initially made possible through gifts from Edward Stephen Harkness, B.A. 1897, the colleges are more than living quarters; they are small communities of men and women whose members know one another well and learn from one another. Each college has its own dining hall, library, common rooms, extracurricular activity spaces, and intramural athletic teams, and each college celebrates the progress of the academic year with various festivities, concerts, and dramatic presentations.

There are twelve colleges: Berkeley, Branford, Calhoun, Davenport, Timothy Dwight, Jonathan Edwards, Morse, Pierson, Saybrook, Silliman, Ezra Stiles, and Trumbull. At the head of each college is a resident master; and in each college a dean advises students on both academic and nonacademic matters. Associated with the master and the dean as fellows are about fifty additional members of the University drawn from different departments and schools. A few fellows reside in the college; others have offices there.

In the summer before arrival, each freshman is assigned to one of the twelve residential colleges. Most freshmen reside in a quadrangle known as the Old Campus. Whether freshmen live there or elsewhere on campus, they participate fully in the life of their residential college. All freshmen and sophomores are required to live on campus, and most juniors and seniors choose to do so. Whether they live on campus or off, students normally remain members of the same college throughout their undergraduate careers.

International Experience

While students can be introduced to the dynamics of a globalizing world through the course offerings at Yale, 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.

Students may seek advice about summer or term-time study abroad and fellowship funding from the Center for International Experience, www.yale.edu/yalecollege/international. Summer courses abroad are offered by Yale Summer Session, www.yale.edu/summer, and by eligible outside programs through Summer Abroad, www.yale.edu/yalecollege/studyabroad. Advice about internships abroad is available from Undergraduate Career Services, www.yale.edu/career. Students may search for all grants and fellowships at Yale that

support international activities at <http://studentgrants.yale.edu>. Students on financial aid may be eligible for summer funding through the International Summer Award program, www.yale.edu/yalecollege/international/funding/isa.

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 and, most significantly, to speak, write, and learn in a foreign language. 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 chapter II, section K. Additional information is available from the Center for International Experience, www.yale.edu/yalecollege/international.

YALE-IN-LONDON

The Yale-in-London program offers spring-term courses in British culture and society 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 at www.yale.edu/yaleinlondon, or from the Yale-in-London office at the Yale Center for British Art, or by e-mail 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, each lasting six weeks. There are two courses in each session, with topics in history, history of art, architecture, literature, and drama. The courses are open to undergraduates and carry full Yale course credit, although enrollment in Yale-in-London summer session does not count as a term of enrollment in Yale College. Overnight field trips may be included. Accommodations are provided in University of London dormitories. Course descriptions and further information are available at www.yale.edu/yaleinlondon, or from the Yale-in-London office at the Yale Center for British Art, or by e-mail to yaleinlondon@yale.edu.

PEKING UNIVERSITY–YALE UNIVERSITY JOINT UNDERGRADUATE PROGRAM

Established in 2006, the Peking University–Yale University Joint Undergraduate Program in Beijing provides Yale students the unique opportunity to study and live with Chinese students on the Peking University campus. The program is open to Yale College sophomores, juniors, and, in some cases, first-term seniors, and to Peking University Yuanpei College students. The program accepts students from all majors for the fall or spring term

or for the academic year. A term at Peking University carries full Yale course credit and counts as a term of enrollment. No prior Chinese language knowledge is necessary for Yale participants, although each student is required to take a Chinese language course at the appropriate level while in the program. All other courses, in a variety of disciplines, are taught in English by Yale and Peking University faculty members. Students with advanced proficiency in Chinese may take courses offered in Chinese for Peking University students. Students from both universities live as roommates in a residence hall on the Peking University campus. Further information is available on the program's Web site at www.yale.edu/iefp/pku-yale.

THE MACMILLAN CENTER

The Whitney and Betty MacMillan Center for International and Area Studies is the University's principal institution for encouraging and coordinating teaching and research on international affairs and on societies and cultures around the world. The MacMillan Center brings together scholars from relevant schools and departments to provide comparative and problem-oriented teaching and research on regional, international, and global issues. It awards nearly 500 student fellowships and grants each year; brings visiting scholars to Yale; and sponsors lectures, conferences, workshops, seminars, and films.

The MacMillan Center oversees eight undergraduate majors: African Studies; East Asian Studies; Ethnicity, Race, and Migration; International Studies; Latin American Studies; Modern Middle East Studies; Russian and East European Studies; and South Asian Studies. For details about majors and programs, consult www.yale.edu/macmillan.

Yale Summer Session

Yale Summer Session offers courses in the humanities, social sciences, and sciences. Several summer courses, including language courses, are taught abroad. Courses in the Summer Session are in most cases similar to courses offered during the regular academic year, but in a more concentrated and intensive form. Yale College students may, if they wish, 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 at www.yale.edu/summer.

Special Programs

DIRECTED STUDIES

Directed Studies is a selective freshman interdisciplinary program in Western civilization. Students in Directed Studies take three yearlong courses—literature, philosophy, and historical and political thought—in which they read central works of the Western tradition.

One hundred twenty-five freshmen are admitted to the program each year. The Freshman Web site (yalecollege.yale.edu/content/directed-studies-ds) describes the program and explains the application procedure. Additional information is available at www.yale.edu/directedstudies.

PERSPECTIVES ON SCIENCE AND ENGINEERING

Perspectives on Science and Engineering is a lecture and discussion course designed to supplement the standard academic program of a selected group of freshmen who have unusually strong backgrounds in science and mathematics. It explores a broad range of topics and exposes students to questions at the frontiers of science. It also highlights the interdependence of the various fields of science and raises issues about the relation between science and society. Participants attend biweekly lectures by distinguished members of the Yale science faculty. In the intervening weeks, groups of students and faculty participants discuss the previous lecture.

Enrollment is limited to about sixty freshmen who, having applied, are selected on the basis of outstanding records in mathematics and natural science. The Freshman Web site (yalecollege.yale.edu/content/perspectives-science-and-engineering-0) provides further information and explains the application procedure.

FRESHMAN SEMINAR PROGRAM

The Freshman Seminar program offers first-year students the opportunity to enroll in small classes with some of Yale's most eminent faculty members. Roughly forty-five freshman seminars across a wide range of subjects are offered every year, in both fall and spring terms. Some seminars provide an introduction to a particular field of study; others take an interdisciplinary approach to a variety of topics. Whatever the subject and method of instruction, all seminars are designed with freshmen in mind and provide a context for developing relationships with faculty members and peers.

Current seminar offerings are listed in chapter III. A description of the program and application procedures can be viewed at yalecollege.yale.edu/content/freshman-seminars.

RESIDENTIAL COLLEGE SEMINARS

The Residential College Seminar program, instituted in 1968, is devoted to the development within the residential colleges of innovative courses that fall outside departmental structures. Courses arise through the joint initiative of students and members of the faculty who are fellows of the residential colleges. The instructors for the seminar program are drawn in part from the faculty of Yale College, the professional schools, and other academic institutions in the New York and New England areas. Individuals outside academic life may also serve as instructors: writers, artists, participants in government and the public sector, and experts from the arts and the media. The college seminars encourage innovation and experimentation within the framework of academic excellence that characterizes the Yale curriculum.

Most of the seminars in the Residential College Seminar program are supported by grants from the Old Dominion Foundation. Descriptions of the seminars are found at yalecollege.yale.edu/content/residential-college-seminar-program.

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 in chapter III under DeVane Lecture Course. Supplementary meetings are held for students taking the lectures for credit.

FRANCIS WRITER-IN-RESIDENCE

The Francis Writer-in-Residence in Yale College is a distinguished writer of nonfiction who teaches either one or two term 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 2010–2011 is Anne Fadiman.

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 2010–2011 is Louise Glück.

YALE JOURNALISM INITIATIVE

The Yale Journalism Initiative brings a distinguished writer to campus each term to teach an advanced journalism seminar, ENGL 467a or b. Students who complete the seminar may apply to become Yale Journalism Scholars, a distinction that provides access to summer support for internships, career counseling with a journalism specialist in the Writing Center, and invitations to meet professional journalists at events both on and off campus. The visiting journalists for 2010–2011 are Steven Brill (fall 2010) and Jill Abramson (spring 2011). For more information on the initiative or on becoming a Journalism Scholar, see www.yale.edu/writing/journalism.

UNDERGRADUATE PROGRAM FOR TEACHER PREPARATION

The Teacher Preparation and Education Studies program offers students an opportunity to explore educational issues while enabling them to meet the requirements for certification to teach in early childhood settings or in public secondary schools. See under Teacher Preparation and Education Studies in chapter III.

CENTER FOR LANGUAGE STUDY

The Center for Language Study (CLS), www.cls.yale.edu, provides resources and support to students of foreign languages and, through its Office of English Language Programs, to students who are nonnative speakers of English. The CLS offers specialized programs for independent and discipline-specific language study, such as the Directed Independent Language Study (DILS) program for the study of languages not taught at Yale, the Fields

program, and peer tutoring in foreign languages. The CLS facilities, including its study rooms and multimedia labs, are open to all language learners at Yale, whether or not they are formally enrolled in language courses.

EXPOSITORY WRITING

The Yale College Writing Center supports a range of courses and tutoring services to help undergraduates improve their writing. The English department offers several courses specifically designed to prepare students for writing throughout the University, and other departments in the humanities, social sciences, and sciences complement this offering with courses (designated WR in chapter III of this bulletin) that give special attention to the conventions and expectations of writing in particular disciplines.

Beyond the regular departmental offerings, the Writing 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 Writing Center Web site offers information on using sources effectively and avoiding plagiarism.

The Yale College Writing Center is maintained through the continuing support of the Bass family, the Newhouse Foundation, and other foundations. Its mission is to encourage excellence in writing and the use of writing for learning throughout the College. More detailed information is available from the Writing Center Web site at www.yale.edu/writing.

SCIENCE AND QUANTITATIVE REASONING

The Yale College Science and Quantitative Reasoning Center oversees programs for the enrichment of education in the sciences and quantitative disciplines. In addition to supporting faculty in the enhancement of teaching, the Center provides tutoring services and programs that enable students to participate in faculty-mentored research and engineering projects.

The Residential College Math and Science Tutoring program offers tutoring in the residential colleges to all Yale College students. Tutoring is available at scheduled times and on a walk-in basis, and is provided in all areas of math and science as well as in economics. Information about tutoring can be found at each residential college dean's office and on the Residential College Math and Science Tutoring Web site at www.yale.edu/mstutor.

To assist students who require more personalized or longer-term support than can be provided by the Residential College Math and Science Tutoring program, the Science and Quantitative Reasoning Center also administers a Science and QR Tutoring program. This program provides individual tutoring to undergraduates in the full range of science and quantitative disciplines, including economics. Any student enrolled in Yale College who is experiencing academic difficulty in a course, as confirmed by the instructor, is eligible for up to ten hours of tutoring per course each term free of charge. Further information is

available at each residential college dean's office, at the Science and Quantitative Reasoning Center, and at yalecollege.yale.edu/content/tutoring-and-academic-support.

RESOURCE OFFICE ON DISABILITIES

To ensure that all students have an equal opportunity to make the most of their Yale education, the Resource Office on Disabilities facilitates individual accommodations for students with disabilities, and works to remove physical and attitudinal barriers to their full participation in the University community. The Office provides technical assistance, information, and disability awareness training to any member of the Yale community.

Current and prospective students with disabilities are encouraged to contact the Resource Office on Disabilities in person at 35 Broadway (rear entrance), room 222, or by mail at Resource Office on Disabilities, Yale University, P.O. Box 208305, New Haven, CT 06520-8305. Voice callers may reach staff at 432-2324 or 432-2325. Further information is available on the Web at www.yale.edu/rod.

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

Yale College students with appropriate qualifications may enroll in courses in the Graduate School of Arts and Sciences. Such enrollment requires permission of the course's instructor and of the director of graduate studies of the department in which the course is offered.

A limited number of students of demonstrated ability 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. Students apply to this program through their director of undergraduate studies. Details of the requirements are listed in chapter II, section K.

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 under the respective headings in chapter III.

ELI WHITNEY STUDENTS PROGRAM

The Eli Whitney Students program is designed for individuals with high academic potential who cannot regularly enroll for full-time study, but who seek to obtain a bachelor of arts or bachelor of science degree from Yale College. The program enrolls a small number of students who have demonstrated leadership and maturity and who enrich Yale College through their life experience, sense of purpose, and character.

A minimum of eighteen course credits from Yale as a matriculated student is required, and the degree must be completed within seven years. The program is described more fully in chapter II, section M. Additional information is available at www.yale.edu/admit/other/whitney/index.html.

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, carry no course credit, and 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 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 or the Peking University–Yale University Joint Undergraduate Program, are also not included in the calculation. Further information about the criteria for election and about the Yale chapter can be found at www.yale.edu/pbk/home.

PRIZES

For a list of the numerous prizes open annually to students in Yale College, consult www.yale.edu/secretary/prizes.

Miscellaneous

Expenses and expected patterns of payment are described in the *Undergraduate Regulations*, published by the Yale College Dean's Office on the Web at yalecollege.yale.edu/content/undergraduate-regulations. The *Undergraduate Regulations* also provides details of student coverage in the Yale Health Plan. Information about programs designed to assist families in financing a Yale education is included in the Yale College Viewbook, available from the Office of Undergraduate Admissions, Yale University, P.O. Box 208234, New Haven, CT 06520-8234, and on the Web at www.yale.edu/admit/freshmen/financial_aid.

II. 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. 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, except in the Eli Whitney Students program.

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 chapter I.

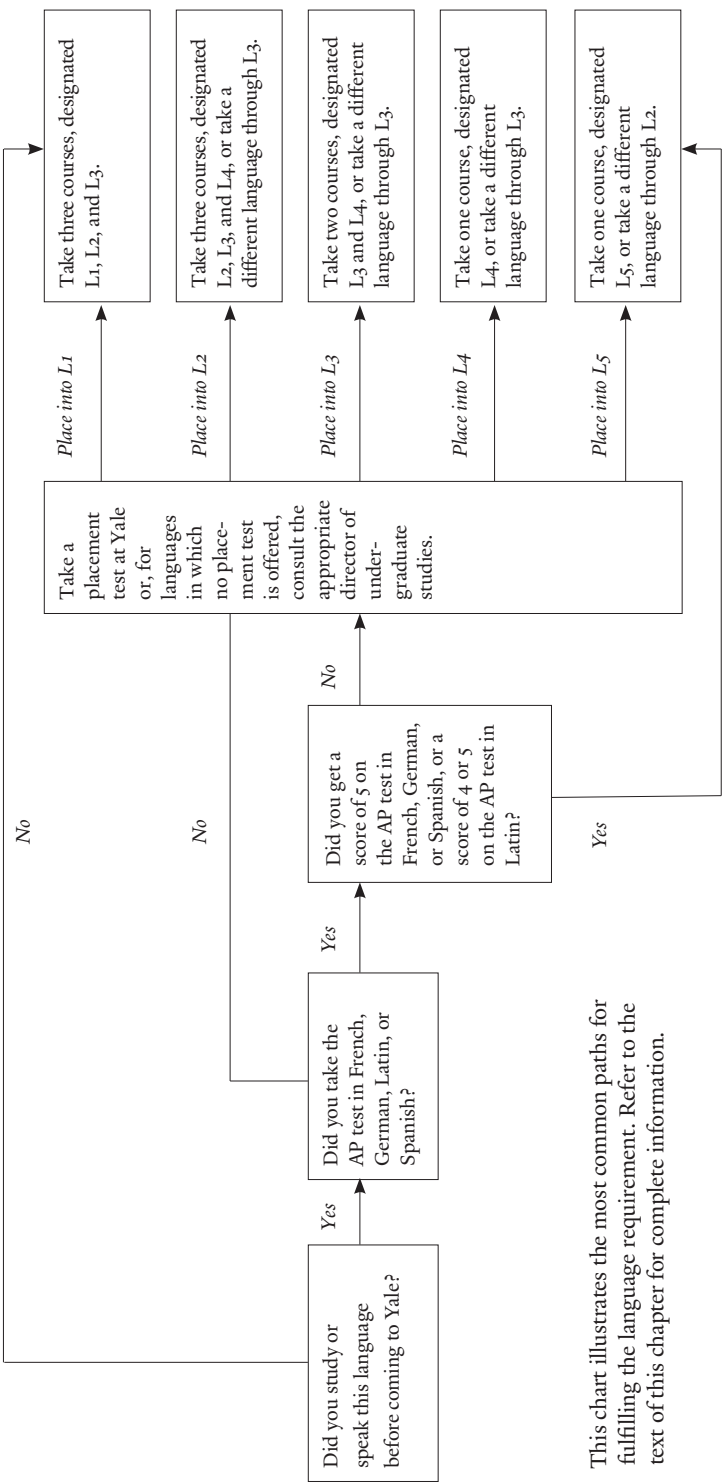
1. **Distributional requirements for the freshman, sophomore, and junior years** Students must partially fulfill the distributional requirements during the freshman, sophomore, and junior years in order to be eligible for promotion.

Distributional requirements for the freshman 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.

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 by the end of the sixth term of enrollment in order to be eligible for promotion to senior standing.

COMMON PATHS TOWARD FULFILLMENT OF THE LANGUAGE REQUIREMENT



This chart illustrates the most common paths for fulfilling the language requirement. Refer to the text of this chapter for complete information.

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 in chapter III of this bulletin, 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 Registrar's Office optimizes the use of each student's completed courses toward fulfillment of the distributional requirements.

3. **Foreign language distributional requirement** All students are required to engage in the study of a foreign language while enrolled in Yale College. The most common paths to fulfillment of the foreign language distributional requirement are illustrated in the chart on page 30.

Students who matriculate at Yale with no previous foreign language training must complete three terms of instruction in a single foreign language. This requirement is fulfilled by the completion of courses designated L1, L2, and L3 in chapter III of this bulletin. Students who have taken the Advanced Placement examination in French, German, or Spanish and who present scores of 5, or who have taken the Advanced Placement examination in Latin and who present scores of 4 or 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 in chapter III of this bulletin. Alternatively, they may successfully complete instruction in a different foreign language through the level designated L2.

Students who have studied a foreign language before matriculating at Yale but who have not achieved a score of 5 on the Advanced Placement test in French, German, or Spanish, or a score of 4 or 5 on the Advanced Placement test in Latin, must take a placement test offered by the appropriate language department. Dates and times of placement tests are given in the *Calendar for the Opening Days of College* and in the departmental program descriptions in chapter III of this bulletin. 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 in chapter III of this bulletin), or whether they qualify for language courses beyond the fourth term of study (L5).

Students who place into the first term of a foreign language must complete three terms of instruction in that language, designated L1, L2, and L3 in chapter III of this bulletin.

Students who matriculate at Yale able to place into the second term of a foreign language must successfully complete three terms of instruction in that language, designated L2, L3, and L4 in chapter III of this bulletin. Alternatively, they may successfully complete instruction in a different foreign language through the level designated L3.

Students who matriculate at Yale able to place into the third term of a foreign language must successfully complete two terms of instruction in that language, designated

L3 and L4 in chapter III of this bulletin. Alternatively, they may successfully complete instruction in a different foreign language through the level designated L3.

Students who matriculate at Yale able to place into the fourth term of a foreign language must successfully complete one term of instruction in that language, designated L4 in chapter III of this bulletin. Alternatively, they may successfully complete instruction in a different foreign language through the level designated L3.

Students who matriculate at Yale able to place into the fifth term of a foreign language must successfully complete one term of instruction in that language, designated L5 in chapter III of this bulletin. Alternatively, they may successfully complete instruction in a different foreign language through the level designated L2.

Students who demonstrate by examination at Yale that they are native speakers of a language other than English must successfully complete instruction in a third language, neither English nor the native language, through the level designated L2. Alternatively, students in this category who present a secondary school transcript showing that the language of instruction was other than English may fulfill the foreign language requirement by completing ENGL 114a or b, 120a or b, or 450b.

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 foreign 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 in chapter III. 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 O, “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 or the Peking University–Yale University Joint Undergraduate Program. Study abroad opportunities are described in chapter I under the heading “International Experience.”

Intensive language courses provide the equivalent of a full year of instruction in a single term. A course designated L1–L2 in chapter III of this bulletin fulfills both the L1 and the L2 levels of the foreign 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, Arabic, Chinese, Czech, hieroglyphic Egyptian, French, German, ancient Greek, modern Greek, biblical Hebrew, modern Hebrew, Hindi, Indonesian, isiZulu, Italian, Japanese, Kiswahili, Korean, Latin, Persian, Polish, Portuguese, Russian, Sanskrit, Spanish, Syriac, Tamil, Turkish, Vietnamese, and Yorùbá. Students wishing to fulfill the foreign 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 (including American Sign Language) 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 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 freshman, 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 Nondegree 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 freshman 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 freshman year. See section O, "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 freshman, 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 freshman year** If, with the permission of the residential college dean, a freshman 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 two skills categories (foreign 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 mid-term 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 shall 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 shall 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 in chapter III. 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, or in the Peking University–Yale University Joint Undergraduate Program in Beijing, 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 P, “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. For a student to exceed eight terms of enrollment usually means that another student cannot be admitted to Yale; a petition for a ninth term will therefore be approved only in extraordinary circumstances. 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 Regulations” in the Yale College online publication *Undergraduate Regulations*).

Graduation in fewer than eight terms of enrollment is possible: see section P, “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.”

B. Grades

LETTER GRADES

The letter grades in Yale College are as follows:

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

CREDIT/D/FAIL OPTION

In order to encourage academic exploration and to promote diversity in students' programs, the Yale College Faculty has provided that students may elect a certain number of courses on a Credit/D/Fail basis.

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 offered in Yale College during the fall and spring terms are available for election under the Credit/D/Fail option. Courses in Yale Summer Session may not be taken under the Credit/D/Fail option.
3. **Total number of courses** A student may offer as many as four course credits earned on the Credit/D/Fail basis toward the bachelor's degree.
4. **Number of courses 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.
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 nor toward satisfaction of the distributional requirements for the bachelor's degree.
6. **Requirements of the major** Program descriptions in chapter III of this bulletin specify whether or not courses taken on the Credit/D/Fail basis count toward the requirements of particular majors.
7. **Credit/year only courses** A Cr/year only course may be taken under the Credit/D/Fail option for one term while the other term of the yearlong course is taken for a letter grade. For Cr/year only courses in which a student receives a separate letter grade for each of the two terms, each term of the course will be governed by the enrollment option the student elected for that term. For Cr/year only courses 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 yearlong course; that is, students will receive either the mark of CR for both terms of the course or a letter grade for both terms of the course, depending on the option elected for the second term of the course.
8. **Course schedules** Students must indicate on their course schedules at the beginning of a term the use they wish to make during that term of the Credit/D/Fail option. 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 a student must elect at least two courses,

representing at least two course credits, for letter grades. If a student indicates on the course schedule more than two course credits being taken on the Credit/D/Fail option, the registrar will record only the first two of them, in the order in which they are listed, as being taken on that basis, and the student will not be permitted to take the others on the Credit/D/Fail option.

9. **Late course schedules** Because a decision to employ the Credit/D/Fail option in a course must be declared at the beginning of the term on the student's course schedule, and because conversion from a letter grade to the Credit/D/Fail option is not possible for students who submit their schedules on time, a student who submits the schedule after the date on which it is due may not employ the Credit/D/Fail option in any course during that term. See "Enrollment in Courses" in section E. The only exception to this rule may be in the case of a student who for some valid and extraordinary reason cannot submit the course schedule on time and who has the permission of the residential college dean and the registrar to submit it late. If the college dean approves, such a student may employ the Credit/D/Fail option only by submitting to the college dean by the date on which the course schedule is due (as published in the calendar at the beginning of this bulletin) a written statement specifying the course (or courses) that the student wishes to take on the Credit/D/Fail basis.
10. **Registration withheld** In order to employ the Credit/D/Fail option, students whose registration is being withheld by the Office of Student Financial Services or any other administrative office of the University must submit their schedules on time, before the deadline indicated on the student's course schedule and listed in the calendar at the beginning of this bulletin.
11. **Conversion to a letter grade** Until November 5, 2010, in the fall term (two weeks after midterm), and until March 28, 2011, in the spring term (a week after the date of the resumption of classes following spring recess), a student who has elected a course on the Credit/D/Fail basis may choose to receive a letter grade in that course by filing the appropriate form in the office of the residential college dean. After these dates such conversion is not possible. If a student converts from the Credit/D/Fail option to a letter grade before the deadline, the option may not again be resumed even if the student desires to do so before the deadline.
12. **Conversion from a letter grade to Credit/D/Fail** A course once elected for a letter grade may not subsequently be converted to a course taken on the Credit/D/Fail basis.
13. **Courses selected after the deadline** A student who for any reason has been granted extraordinary permission by the Committee on Honors and Academic Standing to elect a new course after the deadline for submitting a course schedule may not employ the Credit/D/Fail option in that course. A change of level in courses in which the subject is taught in an ordered progression is not considered the election of a new course.
14. **Acceleration credit** Work completed under the Credit/D/Fail option cannot yield acceleration credit (see yalecollege.yale.edu/content/acceleration or appendix A of the *Freshman Handbook*).

15. **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 under “Honors” in chapter I).
16. **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” in chapter I).
17. **Independent study** It is expected that course credit earned in independent study, directed reading or research, tutorial courses, or the like, will not be taken on the Credit/D/Fail basis.

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 Cr/year only course 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 (for Withdrew) appears on the transcript in association with the course. See paragraph 5 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. **Withdrawal from courses before midterm** If a student has elected a course on the course schedule but formally withdraws from it before midterm (October 22, 2010, in

the fall term; March 4, 2011, in the spring term), the student's transcript will contain no indication of that course after the withdrawal has been recorded by the registrar. See "Withdrawal from Courses," section F.

5. **Withdrawal from courses after midterm** If a student enrolled in a 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. 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 deadline (December 3, 2010, in the fall term, and April 25, 2011, in the spring term) is not possible. See "Withdrawal from Courses," section F.
6. **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 "Postponement of Final Examinations" and "Work Incomplete at the End of Term" in section H.
7. **Withdrawal from Yale College** Whether a student withdraws from Yale College for personal, medical, academic, or disciplinary reasons, the entry placed in each case on the student's transcript is the word "Withdrew" together with the date of the withdrawal.
8. **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; "tracks" or programs within majors may not appear on transcripts. The majors approved by the faculty are listed in this bulletin at the beginning of chapter III under "Majors in Yale College."
9. **Distribution of grade reports** The Registrar's Office sends grade reports to students each term from six to eight weeks after the close of the term. At registration each year, a student is given the opportunity to declare whether his or her grades may be released to certain other parties. If the student gives permission for grades to be released to a guardian or to parents, after the fall term of that year the Registrar's Office will send a grade report to them. After the spring term, the Registrar's Office sends a grade report to each student at the student's home address, and this report may be shared with parents if the student wishes. If a student gives permission for grades to be released to a secondary school or Alumni Schools Committee, grade reports will be furnished to them only upon specific request of the school or the committee. Upon written request of the student, the Registrar's Office will also send a copy of the grade report to any additional person or agency designated by the student.

10. **Early access to grade reports** Early access to recorded grades is available on line 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 University Student Information Systems.
11. **Transcript orders** Transcripts may be ordered either at the Registrar's Office, 246 Church Street, or on the Web at www.yale.edu/sfas/registrar/index.html#transcripts. In each transcript order, the charge for the first transcript is \$7, with a charge of \$3 for each additional transcript ordered at the same time to the same address. Each fall the registrar provides in each student's registration packet, free of charge, an unofficial copy of the student's academic record to date. This record may serve as a convenient aid in discussions with the student's adviser of the student's academic plans during the coming year.

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** A few courses in Yale College, including intensive language or research courses, award two course credits for a single term's work.
2. **Yearlong courses** There are a few yearlong courses in which two course credits are awarded upon the satisfactory completion of both terms of the course; other courses, 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 course may be permitted to continue the course 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 course may receive course credit routinely for that term's work, except in those courses marked Cr/year only. (See "Key to Course Listings" at the beginning of this bulletin.)

Note that completion of a modern foreign language course numbered 110a or b does not award credit unless and until the subsequent term, numbered 120a or b, is also successfully completed. Except in intensive, double-credit courses in which the equivalent of one year of language study is covered in one term, credit may not be given in any circumstance for the first term only of an introductory modern foreign language; neither instructors nor departments have the authority to make an exception to this rule. With some exceptions, credit will be given for successful completion of the second term only of an introductory modern foreign language, or for the first term only or the second term only of an intermediate modern foreign language.

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 Cr/year only 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 (Withdrew) in that course. Similarly, a student enrolled for four or more course credits may withdraw from one or more courses as described above, but at no time may any student carry a schedule of courses that will earn fewer than two course credits 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.
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. 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.

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 freshman 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 the following: failure, in a term or over two or three successive terms, to receive credit for three courses from which the student did not formally withdraw. "Successive terms" means successive terms in which the student enrolls, whether or not broken by a withdrawal or by a leave of absence. See "Dismissal for Academic Reasons" and "Makeup of Course Deficiencies for Promotion or Academic Good Standing" in section I.

E. Registration and Enrollment in Courses

REGISTRATION

Every student is required to register at the beginning of each term in which he or she is to be enrolled in courses at Yale College.

1. **Fall-term registration** To register for the fall term, all freshmen must attend a registration meeting with their residential college dean and freshman counselor on Friday, August 27, 2010. Upperclassmen must attend the registration meeting conducted by

the office of the residential college dean on Tuesday, August 31, 2010. 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, freshmen are required to attend a registration meeting in their residential college at 9 p.m. on Sunday, January 9, 2011. Sophomores, juniors, and seniors are required to pick up registration materials from the office of the residential college dean no later than 5 p.m. on the first day of classes, Monday, January 10, 2011. Students whose registration is being temporarily withheld by an administrative office of the University are nonetheless required to report for spring-term registration as given immediately above.
3. **Late registration** A student who, for reasons other than incapacitating illness, 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 to a fine of \$50.

ENROLLMENT IN COURSES

Enrollment in courses can be accomplished only by the submission of an approved course schedule or, in amendment of the course schedule, by the submission of 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 shall appear on the student's transcript unless a student formally withdraws from a course before midterm. 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. **Deadline for submitting schedules** Every student must submit a 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 calendar at the beginning of this bulletin. 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 3 and 4 below.

2. **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 (October 22, 2010, in the fall term; March 4, 2011, in the spring term), 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.

3. **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.
4. **Credit/D/Fail option** A student who submits a course schedule after the date on which it is due may not employ the Credit/D/Fail option in any course during that term. (See "Credit/D/Fail Option" in section B, paragraph 9.)
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. **Starred courses** Election of a starred course requires that a student secure the permission of the instructor and, where appropriate, the director of undergraduate studies. If a student enters a starred course on the course schedule without the appropriate permission, the instructor may direct the registrar to drop the student from the class.

8. **Prerequisites** Students are expected to have met the prerequisites published in course descriptions in this bulletin. If a student wishes to elect a course for which prerequisites are indicated but has not met those prerequisites, it is the student's responsibility to secure the permission of the instructor and, where appropriate, the director of undergraduate studies before enrolling. The registrar may drop the student from the class if the student has not met the prerequisites for enrollment.
9. **Teaching evaluations** For the advancement of teaching in Yale College, anonymous teaching evaluations are made available through the Yale University Student Information Systems. Students are expected to participate in this evaluation process for any Yale College course in which they are enrolled. Students who withdraw from a course after midterm are invited but not required to participate.
10. **Selection of a less advanced course in the same subject** In certain subjects, such as mathematics, foreign languages, and the sciences, knowledge of the subject is acquired in an ordered progression. That is, the concepts and skills introduced in one course are necessary, or prerequisite, for mastery of the material in subsequent courses in that field. Occasionally a student, having completed an intermediate or advanced course in a subject, may take a less advanced one in that same subject. In such a case, although the student obviously cannot receive course credit for both courses, each course will appear on the student's transcript with the grades earned; however, the student will receive course credit only for the more advanced course. A student may sometimes be permitted to complete an intermediate or advanced course without having first completed a less advanced course in a subject; in such a case, the student does not receive course credit for the less advanced course by virtue of having completed the more advanced course.
11. **Repeated enrollment in the same course** Courses may not be repeated for credit, except for courses marked "May be taken more than once" or "May be repeated for credit." On some rare occasions, a student may take the same course over again, or may take a course with the same content as another course the student has already passed. In such cases, the student receives credit for the course only once. Should a student take the same or an equivalent course twice, each course with its grade appears on the transcript. The student receives course credit for the higher grade if one is earned; in such an event, course credit is not given for the lower grade. Note, however, that both grades are included in the calculation of a student's grade point average (GPA) and in the calculation for General Honors.
12. **Placement in foreign language courses** Students placed by a language program or by their score on the Advanced Placement examination into a particular level of a foreign 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 foreign language earns no course credit for the completion of an L1 or L2 course in that language. Should a student complete a foreign language course at a level lower than the placement, the lower-level course with its grade appears on the transcript but earns no credit toward graduation.

13. **Use of vertebrate animals** If the satisfactory completion of a course will require the use of vertebrate animals in experiments, the student must be notified of that requirement at the first meeting of the course. If a student objects on ethical grounds to participating in the animal usage in question, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged.
14. **Field trips** If the satisfactory completion of a course will require participation in a field trip, students should understand that there are inherent risks, including the risks of travel, involved in such an activity. If a student objects to assuming these risks, it is the student's responsibility to discuss the matter with the faculty member in charge and not to enroll in the course if no alternative acceptable to the faculty member can be arranged. Yale College's policies regarding field trips can be found at yalecollege.yale.edu/content/academic-field-trip-policies.

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 registered will be recorded as F on their transcripts and may open them to the penalties described under "Academic Warning" and "Dismissal for Academic Reasons" in section I.

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. **Withdrawal before midterm** If a student formally withdraws from a course by midterm (October 22, 2010, in the fall term; March 4, 2011, in the spring term), then after the registrar has recorded the withdrawal, the transcript will contain no indication of that course.
4. **Withdrawal after midterm** If a student formally withdraws from a 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. The deadlines for such withdrawals are December 3, 2010, in the fall term, and April 25, 2011, in the spring 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 foreign languages or in mathematics, is not considered a course withdrawal and does not result in the recording of a W.

5. **Withdrawal after the deadlines** 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 the University Health Services 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.
6. **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 "General Regulations concerning Grades and Transcripts" in section B. See also "Work Incomplete at the End of Term" and "Postponement of Final Examinations" in section H.
7. **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.
8. **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 (Withdrawn). 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 5 above.

G. Reading Period and Final Examination Period

1. **Due dates for course work** It is expected that instructors will require all course assignments, including term papers, to be submitted at the latest by the last day of reading period. (For the dates of the reading period and final examination period, consult the calendar at the beginning of this bulletin.) Instructors do not have the authority to give permission for this deadline to be extended beyond the end of the term; only the residential college dean has this authority (see "Work Incomplete at the End of Term" in section H). 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 chapter III by the abbreviation “RP” in the data line.

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.

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 due at the latest before the beginning of the final examination period, 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 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 and is indicated by the examination group number included in the course listing in this bulletin. Examination group numbers are assigned particular days and times within the final examination period. These may be found tabulated on the page “Final Examination Schedules” at the front of this bulletin. If the instructor of a course with the examination group number zero decides to offer a final examination, it must be administered at the time defined by the meeting time of the course. If the meeting time of a course is changed from that published for the course in this bulletin, the time of the examination is defined by the new meeting time.
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 shown on the final examination schedule. 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 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 group number, a take-home examination for that course is due on the day on which the final examination has been scheduled. If a course has not been assigned a final examination group number, 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” at the front of this bulletin.) 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. Fall-term grades are due by 5 p.m. on January 3, 2011; spring-term grades are due within one week of the end of the final examination period; grades for seniors in the spring term are due within forty-eight hours of the end of the final examination period.

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 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. It is generally expected that the student will submit course work in person, either to the instructor or to a person explicitly designated by the instructor, such as a teaching fellow or an administrative assistant. Students who submit course work in a manner other than in person, directly to an appropriate individual (e.g., place it under a door or in a box in a hallway), do so at their own risk. 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 e-mail account unless they have explicitly authorized such electronic submission in the syllabus for the course 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 below in “Work Missed during the Term” and in “Postponement of Final Examinations,” 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 is the instructor's. 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, 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, 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, not 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 "General Regulations concerning Grades and Transcripts" in section B, and "Withdrawal from Courses," section F.

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 saving data on removable disks 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, 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 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" at the beginning of this bulletin and paragraph 4 in section G, "Reading Period and Final Examination Period."

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 the University Health Services 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 underclassmen who miss

*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 examination group numbers; 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 group number assigned to it. See "Final Examination Schedules" at the beginning of this bulletin. Occasionally an instructor may arrange an option for an alternative final examination in addition to the regularly scheduled examination. (See paragraph 5 in section G, "Reading Period and Final Examination Period.") 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.

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 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 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 also carry authorization for 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 foreign 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 recommendation, made by 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 (see "Requirements for Academic Good Standing" in section D) 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. 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.
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 (see section D), or a student who has failed to meet the minimum standards for promotion (see section D), may be dismissed unless permitted by the Committee on Honors and Academic Standing to repair the deficiency. See "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. **Readmitted students** A student readmitted to Yale College who does not, in the first or second term following readmission, pass all the courses completed in that term will be dismissed for academic reasons. See "Readmission" in section J.

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 O, “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, Withdrawal, and Readmission

LEAVE OF ABSENCE

Any 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. (See “Requirements for Academic Good Standing” in section D.) 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 tenth day of the term in the fall. See paragraph 3 below.
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 tenth day of the term in the spring. See paragraph 3 below.
3. **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” in the section “Financial Regulations” in the Yale College online publication *Undergraduate Regulations*.

4. **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 Bills” in the section “Financial Regulations” in the *Undergraduate Regulations*.
5. **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.
6. **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 P, “Acceleration Policies.”
7. **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 the University Health Services before the student’s return from the leave of absence.
8. **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 the Student Financial Services Center before leaving Yale; see “Rebates of Undergraduate Charges” in the section “Financial Regulations” in the *Undergraduate Regulations*.
9. **Health coverage** A student on a leave of absence is eligible to retain coverage by the Yale Health Plan during the time of the leave, but the student must take the initiative to apply for continued membership in the Yale Health Plan by completing an application form and paying the fee for membership. See “Leave of Absence” in the section “University Health Services” in the *Undergraduate Regulations*. Application forms and details about medical coverage while on leave of absence may be obtained from the Member Services Department of the Yale Health Plan.

MEDICAL WITHDRAWAL

A withdrawal for medical reasons must be authorized by the director of the University Health Services or the chief of the Mental Health and Counseling department, or by their official designees within the Health Services. If a student under the care of a non–University Health Services physician wishes to withdraw for medical reasons, that physician should submit sufficient medical history to the director of the University Health Services for

a final decision on the recommendation. A student planning to return to Yale should discuss the requirements for readmission with the residential college dean or the chair of the Committee on Readmission.

Yale College reserves the right to require a student to withdraw for medical reasons when, on recommendation of the director of the University Health Services or the chief of the Mental Health and Counseling department, the dean of Yale College determines that the student is a danger to self or others because of a serious medical problem, or that the student has refused to cooperate with efforts deemed necessary by the University Health Services to determine if the student is such a danger.

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 readmission. Also, students in academic good standing who fail to register in a term will be withdrawn for personal reasons.

REBATES OF UNDERGRADUATE CHARGES

For information on financial rebates on account of withdrawal from Yale College, consult the section “Financial Regulations” in the *Undergraduate Regulations*.

READMISSION

During the time that a student who has withdrawn is away from Yale College, the Committee on Readmission expects him or her to have been constructively occupied and to have maintained a satisfactory standard of conduct.

Students whose withdrawal was for either academic reasons or 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. Students whose withdrawal had been authorized as medical by the director of the University Health Services must normally remain away at least one full term before a return to Yale College, not including the term in which the withdrawal occurred. The period of withdrawal for disciplinary reasons is set by the Yale College Executive Committee at the time the student's enrollment is suspended.

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 (see section I), 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. 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 two years or more, 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 Readmission or the applicant's residential college dean. In some cases, the Committee on Readmission may require more than two courses or courses in a specific subject area. All such course work must be completed no later than the opening of the term to which the student has applied to be readmitted, but no earlier than two years before the date that term begins.

Interviews with members of the committee are required of all applicants. The committee cannot approve a student's return to Yale College until after the necessary interviews have taken place. These may include meetings for any applicant with the chair of the committee, the applicant's residential college dean, and any other member of the committee, including a member of the University Health Services staff. Interviews are normally conducted just prior to the beginning of the term to which the student is seeking readmission.

As an integral part of the application for readmission, students who withdrew for medical reasons must obtain a recommendation from the Yale University Health Services. Such a recommendation must come from either the director of the Health Services or the chief of the Mental Health and Counseling department, or from their official designees within the Health Services; no such recommendation can be made in the absence of documentation provided to the Yale University Health Services that the student has had successful treatment from an appropriate health clinician.

Inquiries about readmission should be directed to the chair of the Committee on Readmission, Yale College Dean's Office, 110 SSS, Yale University, P.O. Box 208241, New Haven, CT 06520-8241. The first inquiry about readmission to a fall term should come no later than the previous April 30, and applications must be submitted in person or by receipted mail by June 1. The first inquiry concerning readmission to a spring term should come no later than the previous September 30, and applications must be submitted in person or by receipted mail by November 1. These deadlines are strictly enforced.

While the majority of students who apply for readmission do return to Yale College, readmission is not guaranteed to any applicant. Since the committee seeks to readmit 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 an applicant to defer his or her return until a time later than the one originally proposed.

Students who are readmitted to Yale College are expected to be complete and passing in all their courses at the conclusion of each of the two terms following their readmission. A student who fails to meet this condition is ordinarily required to withdraw after his or her record has been reviewed by the Committee on Honors and Academic Standing. A student is eligible to be readmitted only once; a second readmission may be considered only under unusual circumstances, ordinarily of a medical nature.

For complete information about readmission to Yale College, consult the brochure "General Information concerning Readmission to Yale College," available from the Committee on Readmission. For information about the U.S. Military Leave Readmissions Policy, see yalecollege.yale.edu/content/readmission-yale-college.

K. Special Arrangements

YEAR OR TERM ABROAD

In recognition of the value of international study, Yale College encourages students to spend a term or an academic year studying in an approved program abroad. In order to participate in a Year or Term Abroad, students must have the approval of the Yale College Committee on the Year or Term Abroad and have been accepted into an approved and accredited study-abroad program. Students in any major may apply. Please note that 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, and that a year abroad may be taken only during the junior year. Within the limits of the eligibility requirements given below, other combinations of terms of study abroad may be permitted with the approval of the Committee on the Year or Term Abroad. Students are limited to a total of two terms abroad for full Yale credit and financial aid transfer. To be eligible, students must be in academic good standing as a junior or second-term sophomore, as appropriate, to begin an approved term or year abroad and be able to return to enrollment at Yale in academic good standing (see “Requirements for Academic Good Standing” in section D). Students must also have at least a B average at the time of their application and demonstrate sufficient competence in the language of the host country to do university-level course work. In general, by the time that they go abroad students 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. Study in an English-speaking country or participation in any other program abroad in which instruction is in English is permitted when the student articulates clear academic objectives for such a program. Applicants may petition the committee for an exception to eligibility requirements if they believe they have compelling reasons for the exception.

Application forms for a Year or Term Abroad are available on the Web site of the Center for International Experience, www.yale.edu/yalecollege/international. A complete application includes all of the following: the application form; an approval form from the student’s director(s) of undergraduate studies; an evaluation form from the student’s residential college dean; a foreign language evaluation form (if applicable); and a statement concerning the proposed course of study. Students on Yale financial aid must also submit a Year Abroad Budget for Financial Aid Applicants to the appropriate office. 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. Students must provide a copy of their acceptance letter to the committee before departure.

Applications for permission to study abroad in the spring term of the academic year 2010–2011 are due on October 15, 2010. Applications for study in the fall term of the academic year 2011–2012 or for the full academic year 2011–2012 are due on March 5, 2011. Early applications that meet all requirements as listed in this bulletin are reviewed on a rolling basis until the final deadline.

Applications for programs or universities abroad are available directly from the sponsoring institutions. Information about specific programs, including course descriptions,

addresses and telephone numbers of the programs, and evaluations from past Yale participants, can be found at the Center for International Experience. 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.

In 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.

A list of programs which have had the approval of the committee in the past and in which Yale students have participated with success is available on the Web site of the Center for International Experience. Students applying to enroll in programs not previously reviewed or approved by the committee may be required to furnish informational literature about the program, course syllabi, or a letter of support from a Yale faculty member familiar with the program. The committee evaluates programs primarily on the quality and structure of their academic offerings. Study abroad advisers are available in the Center for International Experience to assist students in selecting an appropriate program.

1. **Course credits** 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. What the committee considers a full program of study varies from program to program. Students should consult with the Center for International Experience to ensure that they are enrolled in a full program abroad.

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

2. **Course credit from outside Yale** Enrollment in the Year or Term Abroad program is the only arrangement by which students may offer 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

*Study during the academic year at the Paul Mellon Centre 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 under "Yale-in-London" in chapter I and under British Studies in chapter III. Likewise, study during the academic year in the Peking University–Yale University Joint Undergraduate Program in Beijing is equivalent to enrollment in Yale College and is not considered a Year or Term Abroad. For details, see under Peking University–Yale University Joint Undergraduate Program in chapter III.

apply up to two other course credits from outside Yale toward the 36-course-credit requirement.

3. **Evidence of course work** To be awarded credit toward degree requirements, students must submit to the committee such evidence of their achievement as transcripts or other official academic records, wherever possible. Students should also be prepared to provide on their return to Yale copies of all course work, syllabi, and letters from instructors describing the nature and quality of their work.
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. Petitions for credit toward the distributional requirements should be directed to the director of study abroad; petitions for credit toward major requirements should be directed to the relevant director of undergraduate studies.
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 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 Readmission”). In some cases, such students will have to withdraw from Yale College if the deadline for requesting a leave has passed, or they have already taken two terms of leave, or 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 P, “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. For information about financial aid support, consult a counselor in the Student Financial Services Center, 246 Church Street, 432-2700.

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 P, “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 student’s 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 master and dean. Such might be the case, for example, of a student who because of a leave of absence did not qualify for graduation with the class in Yale College with which he or she entered as a freshman. 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 the Yale Health Plan 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 “Leave of Absence” in section J.

TWO MAJORS

A student must petition the Committee on Honors and Academic Standing for permission to complete the requirements of two major programs. Application forms are available from the residential college deans. 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 should include the approval of 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.

SPECIAL DEPARTMENTAL MAJOR

In special cases, a department or program may recommend to the Committee on Honors and Academic Standing that a student be awarded from four to six course credits for a two-term senior essay or project. The request for such an arrangement, with supporting information, must come from the director of undergraduate studies as early as possible before the beginning of the student's next-to-last term of enrollment. A student in the Special Departmental Major must, in addition to the senior project, complete at least three regular term courses during the last two terms of enrollment. Students who are interested in pursuing a Special Departmental Major should consult the appropriate director of undergraduate studies.

CERTIFICATE OF EXCLUSION FOR SUBSEQUENT ENROLLMENT IN A PREVIOUSLY OVERCROWDED COURSE

A student who has attempted in good faith to enroll in a lecture course but who has been prevented by overcrowding from doing so may claim a priority for enrollment in the course the next time the course is offered by the same instructor by securing the instructor's signature on a Certificate of Exclusion from an Overcrowded Course. A copy of this certificate may be obtained from the office of the residential college dean. It must also be signed by the college dean and will be retained for the student by the college dean. When the course is next offered, the student may retrieve the certificate from the college dean and present it to the instructor of the course. A Certificate of Exclusion may be issued only because of overcrowding; it may not be issued because a particular section of a course is filled when there is room in another section of the course; it may not be used to claim admission to any particular section of the course; it may be employed only at the next time that the course is offered, and not subsequently; it is not applicable to courses in which enrollment is determined by audition or other evaluation of the student's work; and it is not transferable.

DOUBLE CREDIT FOR A SINGLE-CREDIT COURSE

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

1. **Deadline** Permission must be requested by midterm, i.e., October 22, 2010, in the fall term, and March 4, 2011, in the spring term.
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, 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 curriculum. If the subject can be pursued through independent study in an existing tutorial course in a department

(e.g., HIST 494a or b, PLSC 471a and 472b), 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, 110 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 before 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.

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. Permission to exceed this limit 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 must enroll under the undergraduate number, unless already accepted into the program for the simultaneous award of the bachelor's and master's degrees. A student may request to elect a graduate or professional school course, other than those designated independent study, by means of a form downloaded from www.yale.edu/sfas/registrar. Such requests should be made as early as possible in the term in which enrollment is sought and not later than one month after the first day of classes of the term. Forms that are submitted after this date will be accepted only by exceptional action of the Committee on Honors and Academic Standing and will be subject to a fine of at least \$50, with increases of \$5 daily according to lateness. The form must be completed by the student and signed by the course instructor. For enrollment in a course in the Graduate School of Arts and Sciences, the form must also be signed by the director of graduate studies in the department in which the course is offered. For enrollment in a course in any of the professional schools of the University, the form must also be signed by the appropriate agent of the dean or the registrar of the school in which the course is offered. Note 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.

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. More than four such credits may be taken, and they will appear for credit on the student's transcript, but they must be offered in excess of the 36-course-credit requirement. Courses taken in the Graduate School of Arts and Sciences are not included in this four-credit restriction.

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.

Courses in performance in the School of Music may be taken only after completion of MUSI 360a or b, 361a or b, and MUSI 460a or b, 461a or b, 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 the section entitled "Individual Instruction in Performance" under Music in chapter III. Nonperformance courses in the School of Music may be taken for credit without previous completion of MUSI 360a or b, 361a or b, and MUSI 460a or b, 461a or b; 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, work incomplete at the end of term, and double credit in a single-credit course. 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

A limited number of students of distinguished ability 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. Students must apply to their department for admission to the program through their director of undergraduate studies no later than the first day of classes of their third-to-last term in Yale College. 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 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. The director of the Program for the Simultaneous Award of the Bachelor's and Master's Degrees is Dean George Levesque.

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. (Particular deadlines and specific grade requirements for the programs for the two degrees in Biology, Chemistry, Economics, Mathematics, and Molecular Biophysics and

Biochemistry are listed under the headings for those departments in chapter III. Nominations from these departments also require confirmation by the joint committee.)

Prior to admission to the program, students enrolling in a course that carries both an undergraduate and a graduate number must do so under the undergraduate number. Students planning to apply to the program who enroll in such a course may petition at the time of their enrollment in the course to have it converted to the graduate number on the academic record if they are subsequently admitted to the program. The petition, which is made to the director of the program, must be accompanied by certification that the course instructor has accepted the student's proposal to complete the course at its graduate level.

2. **Program requirements** Yale will award the master's degree and the bachelor's degree simultaneously only in a single department or program that confers both degrees. A student in the Special Divisional Major or any other major that does not have an exact counterpart in the Graduate School is not eligible for the combined degree program. A student cannot qualify for the simultaneous award of a bachelor's degree in one department or program and a master's in another.

Specific requirements for the award of degrees will be determined by each department. Normally a student is expected to complete the requirements of the undergraduate major in addition to eight or more courses in the Graduate School. For all students in the program, graduate work must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the major during their last four terms at Yale and at least two undergraduate 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.

3. **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.
4. **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.

COURSES IN YALE SUMMER SESSION

There is no limit on the number of courses in Yale Summer Session that a student may offer toward the requirements 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 in Yale Summer Session toward such acceleration. See “Acceleration by the Early Accumulation of Thirty-Six Course Credits All Earned at Yale” in section P.

Courses successfully completed in Yale Summer Session may, with the permission of the student’s director of undergraduate studies, be counted toward the requirements of the student’s major program. They may also be counted toward any of the distributional requirements. The Credit/D/Fail option may not be used in Summer Session courses. There are no auditing privileges in Yale Summer Session.

Unless the Registrar’s Office is instructed in writing to the contrary, courses completed in Yale Summer Session will be entered on the Yale College record. Once a course in Yale Summer Session has been entered on or removed from the Yale College transcript in response to a student’s request, that action cannot subsequently be reversed by the student. When a Summer Session course is entered on a student’s Yale College transcript, both the course and the grade are recorded; the course may not be recorded without the grade. If a Summer Session course is entered on the Yale College transcript, it will be included in the calculation of the student’s eligibility for General Honors and Distinction in the Major. For further information about Summer Session courses and transcripts, refer to the Summer Session Web site at www.yale.edu/summer.

YALE-IN-LONDON SUMMER PROGRAM

Courses in the summer program at the Paul Mellon Centre 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 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 “Acceleration by the Early Accumulation of Thirty-Six Course Credits All Earned at Yale” in section P.

DIRECTED INDEPENDENT LANGUAGE STUDY

With the approval of the director of the Center for Language Study, a student may study a language not taught at Yale through the program in Directed Independent Language Study. Students may not apply to study a language being offered at the same time by Yale at the requested level. Students accepted into the program work on their own time, but on a schedule and with materials approved by the director of the Center for Language

Study; they must meet regularly with a conversation partner; and they are tested at the end of the term in speaking, listening, reading, and writing. The director will approve only those proposals for which adequate materials, conversation partners, and testing can be arranged. Directed Independent Language Study does not earn Yale College course credit, nor does it appear on the transcript. Interested students should apply to the Center for Language Study.

AUDITING

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

1. Students enrolled full time in Yale College or in one of the graduate or professional schools of the University may audit courses without charge. The permission of the instructor is required.
2. Members of the Yale faculty and emeritus faculty may audit courses without charge. The permission of the instructor is required.
3. Spouses or partners of full-time Yale faculty members, or of emeritus faculty, or of students enrolled full time in the University may audit courses without charge. Permission is required of the instructor and of Dean William Whobrey.
4. Employees of the University and their spouses or partners may audit courses without charge in accordance with applicable personnel policies. Permission is required of the instructor, of the employee's supervisor, and of Dean William Whobrey.

No other persons are permitted to audit courses in Yale College except for those accepted through the Association of Yale Alumni Auditing program. The Alumni Auditing program is administered separately from the general auditing program, and different rules may apply. Information is available at www.yale.edu/admit/other/nondegree/alumni/index.html.

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 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 visit the Yale College Special Programs Office, 55 Whitney Avenue, Suite 430.

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, which include the foreign language requirement. Upon their arrival at Yale, transfer students should consult carefully with the director of the transfer program in order to ascertain their status with regard to the distributional requirements, especially the foreign 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. Under no circumstances may a transfer student earn fewer than eighteen course credits at Yale or accelerate by the 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 evaluation 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 evaluation of transfer credits must petition the Yale College 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 under "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 course credit for work completed outside Yale only for studies completed before matriculation at Yale; transfer students may not receive course credit for any outside courses taken after they have enrolled in Yale College. An exception is made for transfer students who earn credit on

a Year or Term Abroad. Transfer students may attend a Year or Term Abroad provided that they enroll in Yale College proper 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 freshman, sophomore, or junior years, but they must fulfill the distributional requirements for the bachelor's degree. See paragraph 1 above. Transfer students are not eligible for the award of acceleration credit or for acceleration by use of acceleration credits.
8. **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 nondegree 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 courses for credit. The Eli Whitney Students program is for enrollment for the degree of Bachelor of Arts (B.A.) or Bachelor of Science (B.S.) only. Like all others enrolled in Yale College, students in this program are required to comply with the academic regulations.

To qualify for the bachelor's degree through the Eli Whitney Students program, a student must successfully complete at least thirty-six course credits or the equivalent, earning at least eighteen of the thirty-six credits at Yale while enrolled in the Eli Whitney Students program. As many as eighteen course credits earned at another college or university or in the Nondegree Students program at Yale may be transferred toward the requirements for the bachelor's degree. Such credit will be awarded for academic courses that were taken at an accredited institution and that were similar in content to Yale College 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. Once a student has matriculated at Yale as a candidate for the bachelor's degree, as many as two course credits earned at another institution may be transferred to the student's Yale record, provided that the student earns no fewer than eighteen course credits at Yale. The regulations governing the transfer of such credits are given in section O, "Credit from Other Universities." The thirty-six course credits completed at Yale or elsewhere must meet the distributional requirements as described in chapters I and II. Students admitted prior to 2009 fulfill distributional requirements according to regulations for the Class of 2008, as listed in previous editions of this bulletin.

Candidates for a bachelor's degree must fulfill the requirements of one of the major programs listed at the beginning of chapter III. See "Major Programs" in chapter I.

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.

At the end of each term, the records of all Eli Whitney students will be reviewed; a student who does not have at least a C average for that term will be placed on Academic Warning and may not be permitted to enroll in a subsequent term.

2. **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 admitted since the fall term 2007 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 “Normal Program of Study” in section C. Students admitted prior to the fall term 2007 may normally enroll for no more than a total of six course credits during an academic year (exclusive of enrollment in Yale Summer Session). As an exception, a student may petition the director to enroll for a total of eight course credits in an academic year; such permission, if granted, will be granted one time only.
3. **Tuition and financial aid** Tuition for the 2010–2011 academic year for Eli Whitney students admitted before the fall term 2007 is \$2,940 per course credit; these students are not eligible for financial aid. Tuition for the 2010–2011 academic year for Eli Whitney students admitted since the fall term 2007 is \$4,367 per course credit; these students are eligible to apply for financial aid. 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.
4. **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 Undergraduate Career Services and fellowships through the Center for International Experience. Eli Whitney students are entitled to purchase gymnasium membership and Yale Health Plan coverage. Students in the Eli Whitney program are not eligible for undergraduate housing and they may not serve as freshman counselors.
5. **Regulations** Eli Whitney students are governed by the academic regulations of Yale College, wherever appropriate, and by the rules contained in the *Undergraduate Regulations*. In disciplinary matters, Eli Whitney students are subject to the jurisdiction of the Yale College Executive Committee.
6. **Leave of absence and withdrawal** See section J, “Leave of Absence, Withdrawal, and Readmission.” All regular deadlines and policies apply.
7. **Year or Term Abroad** With the approval of the director of the Eli Whitney Students program, the department of their major, 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 full academic year or for either a fall or a spring term. An Eli Whitney student must comply with all deadlines and requirements of the Committee on the Year or Term Abroad. See “Year or Term Abroad” in section K. To be eligible to apply, an Eli Whitney student must have accumulated, before enrolling abroad, at least sixteen course credits but no more than twenty-two course credits toward the 36-course-credit

requirement and have a B average in course work at Yale. 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 and may not receive degree credit for any other work done at another university after their matriculation at Yale.

8. **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 can 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 at www.yale.edu/admit/other/whitney/index.html.

N. Nondegree Students Program

The Nondegree 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. This program offers non-resident students who are unable to attend college full time the opportunity to enroll in Yale College courses for credit. The Nondegree 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 others enrolled in Yale College, students in this program are required to comply with the academic regulations.

Nondegree 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 Nondegree Students program.

1. **Academic requirements** Nondegree 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 nondegree 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 tenth day of the term in question. A leave of absence can 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. **Registration and enrollment** All nondegree students register for courses with Dean William Whobrey, 55 Whitney Avenue, Suite 430, 432-2430. In general, admission to limited-enrollment courses is not available to nondegree students. Auditing is not permitted in the Nondegree Students program. Nondegree students are not eligible for enrollment in individual tutorial courses; nor are they eligible, while in the Nondegree 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 or to the particular professional school in whose courses they wish to enroll.
3. **Credit/D/Fail option** Nondegree 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 Dean William Whobrey no later than September 15 for the fall term and January 24 for the spring term. Nondegree 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 Nondegree Students program.
4. **Tuition** The tuition for nondegree students during 2010–2011 is \$4,367 per course credit; Yale employees and their spouses 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. Yale provides no financial assistance for nondegree 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 (Friday, October 22, for fall 2010, and Friday, March 4, for spring 2011) 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 of this chapter. Please note that payments completed after the registration deadline may be subject to late payment fees. Late payments will be accepted (with the addition of a late payment fee) no later than September 25, 2010, for fall 2010, and February 6, 2011, for spring 2011. 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** Nondegree 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 membership and Yale Health Plan coverage. Nondegree students are not eligible for undergraduate housing and they may not serve as freshman counselors.
6. **Regulations** Nondegree students are governed by the academic regulations of Yale College and by the rules contained in the *Undergraduate Regulations*. In disciplinary matters, nondegree 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 nondegree 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 Nondegree 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 nondegree 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 nondegree 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 nondegree student, but may be a part-time nondegree 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 nondegree 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 nondegree 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 Nondegree 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 nondegree students before their first term of enrollment at Yale.
10. **Application deadlines** For students not currently enrolled in another college, applications are due on October 1, 2010, for spring term 2011, and on May 1, 2011, for fall term 2011. For students who are currently enrolled in another college, the deadline is October 1, 2010, for the spring term and July 1, 2011, for the fall term. Yale employees require permission of their supervisors to apply. Nondegree enrollment may begin in either the fall or the spring term.

Further information and application forms are available at www.yale.edu/admit/other/nondegree/index.html.

O. 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. Forms on which to request the award of credit for study that has been completed elsewhere are available at the offices of the residential college deans. 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. 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 "Courses in Yale Summer Session" in section K. Similarly, courses taken in the Yale College program at the Paul Mellon Centre in London, or in the Peking University–Yale University Joint Undergraduate Program in Beijing, are Yale courses and do not count as outside credit.

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 undergraduate studies in the subject of a course taken elsewhere 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, nor 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 appropriate director of undergraduate studies.

As a regular exception to this rule, students who earned credits while still enrolled in secondary school as members of the Nondegree 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.
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; students should consult with the residential college dean to be directed to the appropriate authority for such approval. Credit from outside Yale may not be applied toward the distributional requirements for the freshman year. 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.
6. **The foreign language requirement and courses taken elsewhere** Students who have taken a course in a foreign 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 foreign 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.
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 foreign 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.

Students receiving credit for foreign 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 points 5 and 7 above).

9. **Summer Abroad** Students who wish to receive credit for summer study abroad with outside programs must apply for approval well in advance of their summer study. Information about the application process, including deadlines and a list of eligible programs, is available at the Center for International Experience, 55 Whitney Avenue, 3rd floor, and on the Web at www.yale.edu/yalecollege/studyabroad. Students receiving credit for foreign study on a Summer 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 points 5 and 7 above).
10. **Transfer students** Students admitted by transfer from another college or university may receive course credit from outside Yale only for work done before matriculation at Yale; transfer students may not receive course credit for any outside courses taken after they have enrolled in Yale College. An exception may under certain circumstances be made in the case of course credits earned by transfer students on a Year or Term Abroad. See section L, "Transfer Students." Transfer students must enroll in Yale College proper for at least four terms, and earn therein at least eighteen course credits.
11. **Correspondence courses, internships, and the like** Course credit cannot be given for a course taken by correspondence even if it is sponsored by another university, including accredited four-year institutions granting a bachelor's degree. It also cannot be given for such programs as internships, field studies, workshops, or "distance learning" arrangements, 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. **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, 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 toward the distributional requirements only are listed without grades and with the designation "for distributional credit only." Courses that are applied toward the requirements of a major program only 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, the entry may not subsequently be removed at the student's request.
13. **Acceleration** See section P, "Acceleration Policies."

P. 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 or a fall or spring term at the Peking University–Yale University Joint Undergraduate Program in Beijing is, in fact, a term of enrollment in Yale College, and credits earned in either 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 “Courses in Yale Summer Session” and “Yale-in-London Summer Program” in section K.
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 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’s 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 yalecollege.yale.edu/content/acceleration or appendix A of the *Freshman Handbook*. 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 Chair of the Committee on Advanced Placement and Acceleration, Registrar's Office, 246 Church Street, 432-2331.

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:

<i>Acceleration by One Term</i>	<i>Minimum Total Credits</i>	<i>Minimum Yale Course Credits</i>	<i>Activated Acceleration Credits</i>
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

<i>Acceleration by Two Terms</i>	<i>Minimum Total Credits</i>	<i>Minimum Yale Course Credits</i>	<i>Activated Acceleration Credits</i>
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 points 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 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 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 "Leave of Absence" in section J; a student who has received long-term loans through Yale or who is receiving financial aid from Yale should particularly note paragraph 8 under "Leave of Absence."

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 the University Health Services 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 "Courses in Yale Summer Session" and "Yale-in-London Summer Program" in section K.
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 freshman year. See section O, "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, as does attendance at the Peking University–Yale University Joint Undergraduate Program in Beijing. Attendance at the Paul Mellon Centre during the summer, however, does not count as a term of enrollment. See "Yale-in-London Summer Program" in section K.)

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 "Year or Term Abroad" in section K. 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 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:

<i>Terms of Acceleration</i>	<i>Total Terms at Yale</i>	<i>Terms on YA/TA</i>	<i>Acceleration Credits</i>	<i>Minimum Course Credits Earned at Yale</i>	<i>Maximum Course Credits Earned on YA/TA</i>
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 freshman, 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 nondegree 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 nondegree students. Because such students will have graduated, they will not be eligible for financial aid. See section N, "Nondegree 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.

Q. 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

A subject marked with an asterisk may be taken only as a second major.

African Studies (B.A.)	French (B.A.)
American Studies (B.A.)	Geology and Geophysics (B.A. or B.S.)
Anthropology (B.A.)	German (B.A.)
Applied Mathematics (B.A. or B.S.)	German Studies (B.A.)
Applied Physics (B.S.)	Greek, Ancient and Modern (B.A.)
Archaeological Studies (B.A.)	History (B.A.)
Architecture (B.A.)	History of Art (B.A.)
Art (B.A.)	History of Science, History of Medicine (B.A.)
Astronomy (B.A.)	Humanities (B.A.)
Astronomy and Physics (B.S.)	International Studies*
Biology (B.A. or B.S.)	Italian (B.A.)
Chemistry (B.A. or B.S.)	Japanese (B.A.)
Chinese (B.A.)	Judaic Studies (B.A.)
Classical Civilization (B.A.)	Latin American Studies (B.A.)
Classics (Greek) (B.A.)	Linguistics (B.A.)
Classics (Greek and Latin) (B.A.)	Literature (B.A.)
Classics (Latin) (B.A.)	Mathematics (B.A. or B.S.)
Cognitive Science (B.A.)	Mathematics and Philosophy (B.A.)
Computer Science (B.A. or B.S.)	Mathematics and Physics (B.S.)
Computer Science and Mathematics (B.A. or B.S.)	Modern Middle East Studies (B.A.)
Computer Science and Psychology (B.A.)	Molecular Biophysics and Biochemistry (B.A. or B.S.)
Computing and the Arts (B.A.)	Music (B.A.)
East Asian Studies (B.A.)	Near Eastern Languages and Civilizations (B.A.)
Economics (B.A.)	Philosophy (B.A.)
Economics and Mathematics (B.A.)	Physics (B.S.)
Electrical Engineering and Computer Science (B.S.)	Physics and Philosophy (B.A.)
Engineering	Political Science (B.A.)
Biomedical Engineering (B.S.)	Portuguese (B.A.)
Chemical Engineering (B.S.)	Psychology (B.A. or B.S.)
Electrical Engineering (B.S.)	Religious Studies (B.A.)
Engineering Sciences (Chemical) (B.S.)	Russian (B.A.)
Engineering Sciences (Electrical, Environmental, or Mechanical) (B.A. or B.S.)	Russian and East European Studies (B.A.)
Environmental Engineering (B.S.)	Sociology (B.A.)
Mechanical Engineering (B.S.)	South Asian Studies*
English (B.A.)	Spanish (B.A.)
Environmental Studies (B.A.)	Special Divisional Major (B.A. or B.S.)
Ethics, Politics, and Economics (B.A.)	Statistics (B.A. or B.S.)
Ethnicity, Race, and Migration*	Theater Studies (B.A.)
Film Studies (B.A.)	Women's, Gender, and Sexuality Studies (B.A.)

Accounting

ACCT 170a or b, Financial Accounting Laurance Schiffrès

MW 9–10:15 (32)

Contemporary accounting and corporate financial reporting. Preparation, interpretation, and analysis of the earnings statement; the statement of financial position and the statement of cash flows. Open to seniors and juniors as space allows.

African American Studies

Director of undergraduate studies: Edward Rugemer, Rm. 103, 81 Wall St., 432-1170, edward.rugemer@yale.edu

FACULTY OF THE DEPARTMENT OF AFRICAN AMERICAN STUDIES

Professors Elizabeth Alexander, Elijah Anderson, David Blight, Hazel Carby, Kamari Clarke, Glenda Gilmore, Ezra Griffith, Jonathan Holloway, Matthew Jacobson, Gerald Jaynes, Christopher L. Miller, Patricia Pessar (*Adjunct*), Joseph Roach, Robert Stepto, John Szwed (*Emeritus*), Robert Thompson, Emilie Townes, Michael Veal

Associate Professor Terri Francis

Assistant Professors Jafari Allen, GerShun Avilez, Khalilah Brown-Dean, Crystal Feimster, Paige McGinley, Naomi Pabst, Anthony Reed, Edward Rugemer

Lecturers Kathleen Cleaver, Flemming Norcott, Deborah Thomas

The African American Studies major examines, from numerous disciplinary perspectives, the experiences of people of African descent in Black Atlantic societies including the United States, the Caribbean, and Latin America. Students in the department explore the historical, cultural, political, economic, and social development of Black Atlantic societies. The major demands that students acquire both an analytic ability rooted in a traditional discipline and interdisciplinary skills of investigation and research.

African American Studies offers training of special interest to those considering admission to graduate or professional schools and careers in education, journalism, law, business management, city planning, international relations, politics, psychology, publishing, 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 for a broad liberal arts perspective that complements specialized knowledge of a field.

African American Studies can be taken either as a primary major or as one of two majors in consultation with the director of undergraduate studies. Appropriate majors to combine with African American Studies might include, but are not limited to, American Studies, Anthropology, Economics, English, Ethnicity, Race, and Migration, History, History of Art, Music, Political Science, Psychology, Sociology, Theater Studies, and foreign languages. Regulations concerning the completion of two majors can be found in chapter II, section K, of this bulletin.

Requirements of the major The major in African American studies requires twelve term courses including a yearlong history sequence (AFAM 160a, 162b), one course in the humanities relevant to African American studies (e.g., AFAM 253b, 279a, 292b, 294a, 295b, 304b, 408a, or 427a), one course in the social sciences relevant to African American studies (e.g., AFAM 280a, 333b, or 347a), the junior seminar (AFAM 410b), the senior colloquium (AFAM 480a), and the senior essay (AFAM 491a or b). These courses examine ideas and problems that may originate in many fields but that have a common concern – the black experience. The distribution of requirements is intended to provide students with a broad interdisciplinary experience. Students are strongly encouraged to complete the history sequence by the end of their sophomore year.

Area of concentration Students majoring in African American Studies are required to choose an area of concentration comprising 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, sociology, American studies, history, or English language and literature. (This strategy is especially helpful for students planning to fulfill the requirements of two majors.) Students can also construct interdisciplinary areas of concentration that span traditional departments and encompass broader theoretical frameworks such as race and ethnicity, cultural studies, 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 required courses in African American Studies may be counted among the five electives in the area of concentration.

Junior seminar In their junior year students must take the junior seminar (AFAM 410b, *Interdisciplinary Approaches to African American Studies*). This course provides majors with theoretical and methodological bases for the work they will do during their research-oriented senior year.

Senior requirement Senior majors participate in a colloquium (AFAM 480a) that gives them an opportunity to exchange ideas with each other and with more advanced scholars; students submit a prospectus, compile a working bibliography, begin or continue research, and write the first eight to ten pages of the senior essay. After completing the colloquium, each student carries out the remaining research and writing of a senior essay (AFAM 491b or, in exceptional cases, 491a) 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 throughout the Black Atlantic diaspora. The particular research problem and design are to be worked out in each case with a faculty adviser.

Procedures Students considering a program of study in African American Studies should consult the director of undergraduate studies as early as possible. Areas of concentration and schedules for majors must be approved by the director of undergraduate studies.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required AFAM 160a, 162b, 410b

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

Substitution permitted Relevant course with DUS permission

Senior requirement Senior colloq (AFAM 480a) and senior essay (AFAM 491a or b)

***AFAM 019a/ENGL 006a, Representing U.S. Slavery** Anthony Reed

For description see under English Language & Literature.

***AFAM 026a/ENGL 007a, The Black Arts Movement** GerShun Avilez

For description see under English Language & Literature.

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

For description see under History.

AFAM 160a/HIST 184a, African American History, 1500–1888 Edward Rugemer

For description see under History.

AFAM 162b/AMST 162b/HIST 187b, African American History: From Emancipation to the Present Jonathan Holloway

MW 10:30–11:20, 1 HTBA HU (33)

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.

AFAM 167b/AMST 317b/WGSS 167b, African American Women's History

Crystal Feimster

TTH 11:35–12:25, 1 HTBA HU (0)

The history of African American women from the eighteenth century to the present. Themes include work, family, community, sexuality, politics, religion, and culture.

AFAM 253b/MUSI 265b, Jazz in Transition, 1960–1980 Michael Veal

For description see under Music.

***AFAM 279a/AMST 273a/WGSS 342a, Black Women's Literature** Naomi Pabst

M 3:30–5:20 HU (0)

Examination of black women's literary texts from the post–civil rights era. Exploration of the ways writers construct and contest the cultural, ideological, and political parameters of black womanhood. Topics include narrative strategy, modes of representation, and textual depictions of the intersections of race, gender, sexuality, color, ethnicity, nationality, class, and generation. Texts placed within the context of black women's literary legacies.

***AFAM 280a/JDST 290a/PLSC 268a, Black and Jewish Community Politics**

Khalilah Brown-Dean

For description see under Political Science.

AFAM 282b/ECON 280b, Poverty under Postindustrial Capitalism Gerald Jaynes

TTH 2:30–3:45 SO (o)

Political economy of contemporary social welfare policy as it has been affected by economic restructuring, the development of the underclass, and the effects of immigration on the economy and its social structure. After two terms of introductory economics.

***AFAM 283a/PLSC 241a, Voting Rights and Representation** Khalilah Brown-Dean

For description see under Political Science.

***AFAM 292b/AMST 292b, Interracial Literature** Naomi Pabst

M 3:30–5:20 HU (o)

Examination of interracial and black subjectivity as represented within a selection of postemancipation literary texts. Focus on black/white color line crossing, the trope of the tragic mulatto, and theories of difference and hybridity.

***AFAM 294a/ENGL 294a, African American Literature I: 1740–1900** Robert Stepto

M 1:30–3:20 HU (o)

The literary reaction to slavery; the evolution in form from slave narratives to autobiographies and fictions; the incorporation of folk and popular materials into formal literature. Authors include Phyllis Wheatley, Jupiter Hammon, Frederick Douglass, Harriet Jacobs, Frances Ellen Watkins Harper, Charles Chesnutt, Paul Laurence Dunbar, and James Weldon Johnson.

***AFAM 295b/AMST 295b/ENGL 295b, African American Literature II: 1900–1970**

Robert Stepto

TTH 1–2:15 HU (o)

An examination of modern African American literature, including poetry, fiction, and plays. Topics include canon formation and genre practices; literary presentations of migration and urbanization, and racial and gender representation and identity; the literary “renaissances” of the twentieth century; and book art and decoration. Authors include Paul Laurence Dunbar, Richard Wright, Gwendolyn Brooks, Lorraine Hansberry, Langston Hughes, Zora Neale Hurston, Toni Morrison, and August Wilson.

AFAM 296b/AMST 296b/ENGL 296b/WGSS 292b, African American Literature III: 1970 to the Present Elizabeth Alexander

MW 1–2:15, 1 HTBA HU (o)

A survey of African American literature since 1970. Authors include Toni Morrison, Alice Walker, Rita Dove, Yusef Komunyakaa, Anna Deavere Smith, Danzy Senna, and others. Topics include black feminist literature, black gay and lesbian literature, developments in literary criticism and theory, and contemporary black drama.

***AFAM 302a/ENGL 332a, Music and Poetics in the African Diaspora** Anthony Reed

For description see under English Language & Literature.

***AFAM 304b/AMST 309b/WGSS 309b, Toni Morrison** Naomi Pabst

W 3:30–5:20 WR, HU (o)

Analysis of Toni Morrison’s speeches, interviews, essays, and eight novels. Examination of race, gender, class, sexuality, identity, and memory in Morrison’s work.

***AFAM 319a, Technology and the Black Experience** Stephanie Greenlea

TH 3:30–5:20 HU (o)

Relationships among race, class, gender, and the technological artifacts in a digitizing world. Interdisciplinary case studies on video games, Facebook and MySpace, black music, Afrofuturist fiction, biomedicine, and blogging.

***AFAM 333b/ANTH 315b, Critical Ethnography: Methods, Ethics, Poetics**

Jafari Allen

For description see under Anthropology.

***AFAM 345a/ENGL 370a, Law, Race, and Narrative** GerShun Avilez

TH 9:25–11:15 HU (o)

The interconnection of social policy, law, and race in the work of nineteenth- and twentieth-century African American writers. The enduring fascination that law and justice have held for writers; the narrative dimensions of law. Authors may include Harriett Wilson, Charles Chesnutt, Richard Wright, and Lorraine Hansberry.

***AFAM 347a, Caribbean Lives: Psychosocial Aspects** Ezra Griffith

W 2:30–4:20 SO (o)

A study of the development over time of individuals living in the English-speaking Caribbean. Attention both to the portraiture of the lives and to the psychosocial context in which the individuals lived. Discussion of the unique elements in Caribbean life that facilitated or inhibited the developmental process.

***AFAM 368a/AMST 321a, Interraciality and Hybridity** Naomi Pabst

W 3:30–5:20 HU (o)

Examination of mixed-race matters in both literary and critical writings, primarily within the black/white schema. Historical and current questions of black and interracial identity; the contemporary “mixed race movement” and the emerging rubric of “critical mixed race studies”; historical genealogy of interraciality and hybridity. Analysis of long-standing debates on race mixing in the realms of legal classification, transracial adoption, census taking, grassroots movements, the discursive, the ideological, and the popular.

***AFAM 383b/AFST 476b/FREN 376b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher L. Miller

For description see under French.

***AFAM 387b/AMST 398b/MUSI 398b, The Electric Music of Miles Davis**

Michael Veal

For description see under Music.

***AFAM 389b/ENGL 371b/WGSS 389b, Sexuality in African American Literature and Popular Culture** GerShun Avilez

TH 9:25–11:15 HU (o)

Sexual imagery and content in African American literature and popular culture. Ways that artists and social critics understand the relationship between sexual identity and racial identity. Writers and artists include Alice Walker, Gayl Jones, Spike Lee, Marlon Riggs, Essex Hemphill, Patricia H. Collins, Mark Anthony Neal, and Audre Lorde.

***AFAM 406b^G/AMST 405b^G/ENGL 405b, Autobiography in America** Robert Stepto
For description see under American Studies.

***AFAM 408a^G/AMST 460a^G/ENGL 443a^G, African American Poets of the Modern Era**
Robert Stepto

W 1:30–3:20 HU (o)

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.

***AFAM 410b/WGSS 410b, Interdisciplinary Approaches to African American Studies**
Deborah Thomas

TH 1:30–3:20 HU, SO Junior sem (o)

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.

***AFAM 421a/ER&M 234a/PLSC 263a, Race and Ethnicity in American Politics**
Khalilah Brown-Dean

For description see under Political Science.

***AFAM 427a/HIST 125Ja, Rise and Fall of Atlantic Slavery** Edward Rugemer
For description see under History.

***AFAM 471a and 472b, Independent Study: African American Studies**
Edward Rugemer

HTBA (o)

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** Deborah Thomas

TH 1:30–3:20 (o)

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** Edward Rugemer

HTBA (o)

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 Languages

(See under *African Studies*.)

African Studies

Director of undergraduate studies: Ann Biersteker, 309A LUCE, 432-9902, ann.biersteker@yale.edu; director of the Program in African Languages: Kiarie Wa’Njogu, 309B LUCE, 432-0110, john.wanjogu@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF AFRICAN STUDIES

Professors Lea Brilmayer (*Law School*), Kamari Clarke (*Anthropology*), John Darnell (*Near Eastern Languages & Civilizations*), Owen Fiss (*Law School*), Robert Harms (*History*), Andrew Hill (*Anthropology*), Roderick McIntosh (*Anthropology*), Christopher L. Miller (*French*), Nicoli Nattrass (*Ethics, Politics, & Economics*) (*Visiting*), Stephen Ndegwa (*African Studies*) (*Visiting*), Lamin Sanneh (*History, Divinity School*), Jeremy Seekings (*Global Affairs*) (*Visiting*), Ian Shapiro (*Political Science*), Robert Thompson (*History of Art*), Christopher Udry (*Economics*), Michael Veal (*Music*), David Watts (*Anthropology*), Elisabeth Wood (*Political Science*)

Associate Professors Ann Biersteker (*Adjunct*) (*Linguistics*), Sarah Weiss (*Music*)

Assistant Professors Christopher Blattman (*Political Science*), Michael McGovern (*Anthropology*)

Lecturers Maxwell Amoh (*African Studies*), Lacina Coulibaly (*Theater Studies*), Anne-Marie Foltz (*Public Health*), Graeme Reid (*Women’s, Gender, & Sexuality Studies*), David Simon (*Political Science*)

Senior Lectors II Sandra Sanneh, Kiarie Wa’Njogu

Senior Lecturer Matuku Ngame

Lecturer Oluseye Adesola

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.

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 program in African Studies consists of thirteen term courses including (1) a course in African history and one in anthropology; (2) two years of an African language (Arabic, Kiswahili, Yorùbá, or isiZulu), unless waived by examination; (3) four term courses in one of the following disciplines: 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; and (4) the junior seminar on research methods, AFST 401a. Students are expected to focus their studies on research in a particular discipline.

The required courses represent the core of the program and are intended to expose the student both to the interdisciplinary nature of African studies and to the methodologies currently being brought to bear on the study of African cultures and societies. Students are encouraged to include upper-level courses, especially those centering on research and methodology.

Senior requirement Senior majors enroll in AFST 490a, a colloquium that gives them an opportunity to exchange ideas with each other and to give presentations on their research. In the course, students also prepare a prospectus, compile a bibliography, and write a draft chapter of the senior essay. After completing the colloquium, each student carries out the remaining research and writing of the senior essay in AFST 491b under the guidance of a faculty adviser.

A preliminary statement indicating the topic to be addressed and the name of the faculty adviser must be submitted to the director of undergraduate studies by the end of the second week of the fall term in the senior year. Students should also inform the director of undergraduate studies of their preferred second reader by this time.

Language requirement African Studies majors are required to complete two years of college-level study of an African language or the equivalent, and they are encouraged to continue beyond this level. For the major's 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.

Program in African Languages The language program offers instruction in three major languages from sub-Saharan Africa: Kiswahili (eastern and central Africa), Yorùbá (West 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 for information.

Procedure Students planning to major in African Studies should consult the director of undergraduate studies as early as possible.

M.A. program The African Studies program does not offer the simultaneous award of the B.A. and M.A. degrees. However, 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 13 term courses (incl senior req)

Distribution of courses 1 course in African hist; 1 course in anthropology; 2 years of an African lang; 4 term courses in area of concentration

Specific course required AFST 401a

Senior requirement Senior colloquium (AFST 490a) and senior essay (AFST 491a or b)

*AFST 110a^G, Introduction to an African Language I Kiarie Wa'Njogu

HTBA L1 1½ Course cr (50)

Beginning instruction in an African language other than those regularly offered. Courses offered depend on availability of instructors. Methodology and materials vary with the language studied. Credit only on completion of AFST 120b. Students may also study an African language through the noncredit Directed Independent Language Study program, described in chapter I of this bulletin.

*AFST 120b^G, Introduction to an African Language II Kiarie Wa'Njogu

HTBA L2 1½ Course cr (50)

Continuation of AFST 110a. After AFST 110a.

AFST 159a/PLSC 159a, Africa in International Relations David Simon

For description see under Political Science.

AFST 180b^G/ER&M 250b, Nigeria and Its Diaspora Oluseye Adesola

MW 4-5:15 SO (0)

Nigerians in the modern diaspora, both those who endured forced migration and those who migrated voluntarily. Specific reference to the Igbos and the Yorùbás. The preservation and maintenance of Nigerian culture, history, dance, literature, traditional education, theater, politics, art, music, film, religion, and folklore, especially in African American and Nigerian American contexts.

***AFST 323b/ANTH 239b/SOCY 191b/WGSS 323b, HIV and AIDS in Africa**

Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

***AFST 328b/INTS 328b/PLSC 158b, Nationalism** Keith Darden

For description see under Political Science.

AFST 334b/HIST 334b, History of Africa Robert Harms

For description see under History.

AFST 340a/HIST 340a, Africa in the Era of the Slave Trade Robert Harms

For description see under History.

AFST 347b/PLSC 347b, Post-Conflict Politics David Simon

For description see under Political Science.

AFST 356b/INTS 326b/LAST 412b/PLSC 356b, Collective Action and Social Movements Elisabeth Wood

For description see under Political Science.

***AFST 360a/EP&E 365a/INTS 347a/PLSC 417a, The Political Economy of AIDS in Africa** Nicoli Natrass and staff

For description see under International Studies.

***AFST 363b/ANTH 358b/WGSS 363b, Beauty, Fashion, and Self-Styling**
Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

AFST 370a, State Transformation, Conflict, and Development in Africa

Stephen Ndegwa

MW 9–10:15 SO (32)

Political, economic, and social changes in Africa over the last two decades, including both the destructive and the constitutive conflict they have engendered. Development policy implications presented by the transformed African states; theoretical significance of the unfolding history, with a focus on contemporary state building.

AFST 385b/PLSC 385b, Introduction to African Politics Ato Kwamena Onoma

For description see under Political Science.

***AFST 389b/MMES 181b/PLSC 389b, Middle East Exceptionalism** Adria Lawrence and staff

For description see under Political Science.

***AFST 398a/ER&M 398a/INTS 398a, Race and Class in Comparative Perspective**

Jeremy Seekings

For description see under International Studies.

***AFST 401a^G, Research Methods in African Studies** Ann Biersteker

W 1:30–3:20 Junior sem (o)

Disciplinary and interdisciplinary research methodologies in African studies, with emphasis on field methods and archival research in the social sciences and humanities. Research methodologies are compared by studying recent works in African studies.

***AFST 412a/FREN 412a/LITR 265a/MMES 162a/WGSS 412a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev
For description see under French.

***AFST 420b/EP&E 246b/LAST 406b/PLSC 430b, The Politics of Development Assistance** David Simon
For description see under Political Science.

***AFST 421b^G, Comparative Perspectives on African Literatures** Ann Biersteker
W 1:30–3:20 HU (o)
Introduction to a wide range of topics in African literature through English translations of works composed both in African and in European languages. Readings include poetry, novels, plays, essays, nonliterary texts, and autobiographies. Consideration of the symbiotic relationship between printed text and oral performance and between composition and transmission.

***AFST 435a/THST 335a, West African Dance: Traditional to Contemporary**
Lacina Coulibaly
For description see under Theater Studies.

***AFST 447a/PLSC 447a, The Rwandan Genocide in Comparative Context**
David Simon
For description see under Political Science.

***AFST 476b/AFAM 383b/FREN 376b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher L. Miller
For description see under French.

***AFST 487a/HIST 387Ja, West African Islam: Jihad Tradition and Its Pacifist Opponents** Lamin Sanneh
For description see under History.

***AFST 490a^G, African Studies Colloquium** Ann Biersteker
T 1:30–3:20 HU, SO (o)
Students conduct research for the senior essay, give presentations on their research, and prepare a bibliography, a prospectus, and a draft chapter of the senior essay. Discussion of model essays and other examples of writing.

***AFST 491a or b, The Senior Essay** Staff
HTBA (o)
Independent research on the senior essay. 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.

SWAH 110a^G, Beginning Kiswahili I Kiarie Wa'Njogu
MTWTHF 9:25–10:15 L1 1½ Course cr (32)
A beginning course with intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken language and conversation. Credit only on completion of SWAH 120b.

SWAH 120b^G, Beginning Kiswahili II Kiarie Wa’Njogu

MTWTHF 9:25–10:15 L2 1½ Course cr (32)

Continuation of SWAH 110a. Texts provide an introduction to the basic structure of Kiswahili and to the culture of the speakers of the language. Prerequisite: SWAH 110a.

SWAH 130a^G, Intermediate Kiswahili I Kiarie Wa’Njogu

MTWTHF 11:35–12:25 L3 1½ Course cr (34)

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 120b.

SWAH 140b^G, Intermediate Kiswahili II Kiarie Wa’Njogu

MTWTHF 11:35–12:25 L4 1½ Course cr (34)

Continuation of SWAH 130a. After SWAH 130a.

SWAH 150a^G, Advanced Kiswahili I Kiarie Wa’Njogu

WF 11:35–12:50 L5 (0)

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 140b.

SWAH 160b^G, Advanced Kiswahili II Ann Biersteker

TTH 1–2:15 L5 (0)

Continuation of SWAH 150a. After SWAH 150a.

SWAH 170b^G, Topics in Kiswahili Literature Ann Biersteker

TTH 11:35–12:50 L5, HU (0)

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 160b.

YORU 110a^G, Beginning Yorùbá I Oluseye Adesola and staff

HTBA L1 1½ Course cr (61)

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. Credit only on completion of YORU 120b.

YORU 120b^G, Beginning Yorùbá II Oluseye Adesola

MTWTHF 10:30–11:20 L2 1½ Course cr (33)

Continuing practice in using and recognizing tone through dialogues. More emphasis is placed on simple cultural texts and role playing. Prerequisite: YORU 110a.

YORU 130a^G, Intermediate Yorùbá I Oluseye Adesola

MTWTHF 11:35–12:25 L3 1½ Course cr (34)

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 120b.

YORU 140b⁶, Intermediate Yorùbá II Oluseye Adesola

MTWTHF 11:35–12:25 L4 1½ Course cr (34)

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 130a.

YORU 150a⁶, Advanced Yorùbá I Oluseye Adesola

WF 4–5:15 L5 (37)

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 140b.

YORU 160b⁶, Advanced Yorùbá II Oluseye Adesola

WF 4–5:15 L5 (37)

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 150a.

YORU 170b⁶, Topics in Yorùbá Literature and Culture Oluseye Adesola

TTH 4–5:15 L5, HU (27)

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 160b.

ZULU 110a⁶, Beginning isiZulu I Sandra Sanneh

MTWTHF 11:35–12:25 L1 1½ Course cr (34)

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. Credit only on completion of ZULU 120b.

ZULU 120b⁶, Beginning isiZulu II Sandra Sanneh

MTWTHF 11:35–12:25 L2 1½ Course cr (34)

Development of communication skills through dialogues and role-play. Texts and songs drawn from traditional and popular literature. Students research daily life in selected areas of South Africa. Prerequisite: ZULU 110a.

ZULU 130a⁶, Intermediate isiZulu I Sandra Sanneh

MTWTHF 9:25–10:15 L3 1½ Course cr (32)

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 120b.

ZULU 140b^C, Intermediate isiZulu II Sandra Sanneh

MTWTHF 9:25–10:15 L4 1½ Course cr (32)

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 130a.

ZULU 150a^C, Advanced isiZulu I Sandra Sanneh

MW 2:30–3:45 L5 (37)

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 140b.

ZULU 160b^C, Advanced isiZulu II Sandra Sanneh

MW 2:30–3:45 L5 (37)

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 150a.

Akkadian

(See under *Near Eastern Languages and Civilizations*.)

American Studies

Director of undergraduate studies: Kathryn Dudley, 233 HGS, 432-1188, kathryn.dudley@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF AMERICAN STUDIES

Professors Jean-Christophe Agnew (*History*), Elizabeth Alexander (*African American Studies, English*), Ned Blackhawk (*History*), David Blight (*History, African American Studies*), Jon Butler (*History, Religious Studies*), Alicia Schmidt Camacho, Hazel Carby (*African American Studies*), George Chauncey (*History*), Edward Cooke, Jr. (*History of Art*), John Demos (*Emeritus*) (*History*), Michael Denning (*English*), Wai Chee Dimock (*English*), Kathryn Dudley (*Anthropology*), John Mack Faragher (*History*), Glenda Gilmore (*History*), Inderpal Grewal (*Women's, Gender, and Sexuality Studies*), Dolores Hayden (*Architecture*), Jonathan Holloway (*African American Studies, History*), Amy Hungerford (*English*), Matthew Jacobson (*Chair*) (*African American Studies, History*), Daniel Kevles (*History*), Mary Lui (*History*), Joanne Meyerowitz (*History*), Charles Musser (*Film Studies*), Alexander Nemerov (*History of Art*), Patricia Pessar (*Adjunct*) (*Anthropology*), Stephen Pitti (*History*), Sally Promey (*Divinity School*), Joseph Roach (*English, Theater Studies*), Michael Roemer (*School of Art*), Stephen Skowronek (*Political Science*), Robert Stepto (*English, African American Studies*), Harry Stout (*Religious Studies, History*), Michael Veal (*Music, African American Studies*), John Warner (*History of Medicine*), Michael Warner (*English*), Laura Wexler (*Women's, Gender, & Sexuality Studies*)

Associate Professor Caleb Smith (*English*)

Assistant Professors Crystal Feimster (*African American Studies*), Zareena Grewal (*Ethnicity, Race, & Migration*), Kathryn Lofton (*Religious Studies*), Paige McGinley (*Theater Studies*), Alyssa Mt. Pleasant (*History*), Naomi Pabst (*African American Studies*), Birgit Brander Rasmussen, Kariann Yokota

Senior Lecturers James Berger, Ron Gregg (*Film Studies*)

Lecturers Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Lourdes Gutiérrez Nájera (*Ethnicity, Race, & Migration*), Michael Kerbel (*Film Studies*), Rani Neutill (*Ethnicity, Race, & Migration*), Joel Silverman, Rebecca Tannenbaum (*History*), Deborah Thomas (*African American Studies*)

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 foundation lecture courses, seminars, other American Studies courses, and classes 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 or the sophomore adviser 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 two foundation courses in cultural history (AMST 188a, 189a, 190a, or 191b), 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 director of undergraduate studies. One of these four courses must address material produced before the Civil War. 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 upper-level seminars (AMST 400–490, excluding 471a and 472b) during their junior year. At least one of the seminars must fall within the student's area of concentration, described below. Students are expected to produce a significant paper of twenty to twenty-five pages in each of the seminars. Students may elect to take AMST 390a or b, an interdisciplinary methods course, in place of one of the required upper-level seminars. Sophomores contemplating a junior term abroad are urged to take either AMST 390b or an upper-level seminar in the spring term of their sophomore year.

Area of concentration Each American Studies major selects an area of concentration, normally in the fall of the junior year, from five possible choices: (1) national formations, (2) the international United States, (3) material cultures and built environments, (4) politics and American communities, and (5) visual, audio, literary, and performance cultures. A 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 man-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 may also petition the director of undergraduate studies to develop an independent concentration.

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 an upper-level seminar within the area of concentration (AMST 400–490, excluding 471a and 472b). 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.

Second, the student may complete a one-term senior project or essay (AMST 491a or b). The product should be a thirty-page essay or its equivalent in another medium. All students writing a one-term senior essay participate in a proseminar on theory and method. To apply for admission to AMST 491a or b, a student should submit a prospectus, signed by the faculty adviser, to the director of undergraduate studies.

Third, the student may enroll in the intensive major (AMST 493a, 494b) and work independently for two terms. The intensive major offers an opportunity for significant original research leading to a substantial senior project. AMST 493a, 494b 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 method. One term of the two-term project may count as a course in the area of concentration. To apply for admission to AMST 493a, 494b, a student should submit a prospectus, signed by the faculty adviser, to the director of undergraduate studies.

As a multidisciplinary program, American Studies draws on the resources of other departments and programs in the University. The following list of 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 14 term courses (incl senior req)

Distribution of courses 2 courses from AMST 188a, 189a, 190a, 191b; 1 course in American lit; 1 course preparatory for work in area of concentration; 1 course from preceding in pre–Civil War; 5 addtl courses in area of concentration for letter grades, one in a related non-American subject (one of the concentration courses may be one term of two-term senior project); 2 junior sems; 2 electives

Substitution permitted AMST 390a or b for 1 junior sem; other substitutions with DUS permission

Senior requirement 1 upper-level sem or 1 term of independent research (AMST 491a or b) related to area of concentration leading to essay or equivalent

Intensive major Same, except two-term senior project (AMST 493a, 494b) replaces AMST 491a or b

FOUNDATION COURSES

[AMST 188a/HIST 115a, *The Colonial Period of American History*]

AMST 189a/HIST 105a, *The Formation of Modern American Culture, 1750–1876*

Kariann Yokota

TTH 11:35–12:50, 1 HTBA HU (24)

An introduction to the cultural, social, and political history of the United States from the era of the Revolution through the Civil War and Reconstruction, with special attention to the emergence of a national culture and its relationship to the subcultures of different regions, races, genders, and classes.

[AMST 190a/HIST 112a, *The Formation of Modern American Culture, 1876–1919*]

AMST 191b/HIST 106b, *The Formation of Modern American Culture, 1920 to the*

Present Matthew Jacobson

TTH 11:35–12:50 HU (24)

An introduction to the cultural history of the United States in the modern and postmodern eras, with special attention to the development of the culture industries, the popular cultures of working peoples, and the political and social meanings of cultural conflict.

NATIONAL FORMATIONS

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

For description see under History.

AMST 002a, *American Consumer Culture in the Twentieth Century

Jean-Christophe Agnew

TTH 1–2:15 WR, HU Fr sem (o)

An interdisciplinary introduction to twentieth-century American consumer culture, exploring the rise (and fall) of mass consumption and its impact on the experience of family, faith, citizenship, community, gender, race, ethnicity, and politics. Topics include

the changing moral valuations of consumption; the effect of consumerism on ritual life; the Americanization of immigrants and the marketing of race and ethnicity; consumer culture's reciprocal relations with literature and the arts; the politics of consumer resistance; suburbanization; and the consumer model of citizenship. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***AMST 004b, Narrations of Native America** Alyssa Mt. Pleasant

MW 2:30–3:45 WR, HU Fr sem (o)

Introduction to contemporary and historic writing by American Indian authors of nonfiction and fiction. Focus on the varied ways American Indians have employed literacy and recorded oratory as means to document, interpret, represent, and comment on their histories and experiences. Use of materials from the Beinecke Library. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

AMST 133a/ER&M 187a/HIST 107a, Introduction to American Indian History

Alyssa Mt. Pleasant

For description see under History.

AMST 141b/HIST 141b, The American West John Mack Faragher

For description see under History.

AMST 162b/AFAM 162b/HIST 187b, African American History: From Emancipation to the Present Jonathan Holloway

For description see under African American Studies.

AMST 213a/ER&M 286a/HIST 128a, Mexicans, Mexican Americans, and the U.S.-Mexico Borderlands since 1848 Stephen Pitti

For description see under History.

AMST 221b/ER&M 247b/HIST 117b, The Peoples of Early America Ned Blackhawk

For description see under History.

***AMST 258b, Wilderness in the North American Imagination** Staff

2 HTBA HU (o)

The idea of wilderness in American history, art, film, public policy, and literature, from the Puritans to the present. Authors include Thoreau, Faulkner, Jack London, Mary Rowlandson, Aldo Leopold, and Rachel Carson. A weekend field trip is held early in the term.

AMST 270a/HIST 170a, Women in America: From the Colonial Period to 1900

Rebecca Tannenbaum

For description see under History.

AMST 271b/HIST 171b/WGSS 201b, Women in America: The Twentieth Century

Joanne Meyerowitz

For description see under History.

AMST 272a/ER&M 282a/HIST 183a, Asian American History, 1800 to the Present

Mary Lui

MW 10:30–11:20, 1 HTBA HU (33)

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.

AMST 317b/AFAM 167b/WGSS 167b, African American Women's History

Crystal Feimster

For description see under African American Studies.

***AMST 325b/ER&M 322b/HIST 155Jb, Indian-Colonial Relations in Comparative Perspective** Alyssa Mt. Pleasant

T 2:30–4:20 WR, HU (o)

Intensive survey of American Indian nations and their relationships with colonial regimes. Regional studies are brought together into a continental examination of the structure and significance of colonialism for American Indian peoples up to the early nineteenth century. Emphasis on colonial regimes operating within the political boundaries of the contemporary United States.

***AMST 340a, American Biography** Joel Silverman

TH 1:30–3:20 HU (o)

Analysis of the genre and methods of biography, with a focus on texts from the twentieth-century United States. Ways in which each text reflects the concerns and tensions of its time and constructs a particular American identity.

***AMST 405b^c/AFAM 406b^c/ENGL 405b, Autobiography in America** Robert Stepto

M 1:30–3:20 WR, HU (o)

A study of autobiographical writings from Mary Rowlandson's Indian captivity narrative (1682) to the present. Classic forms such as immigrant, education, and cause narratives; prevailing autobiographical strategies involving place, work, and photographs. Authors include Franklin, Douglass, Jacobs, Antin, Kingston, Uchida, Balakian, Als, and Karr.

***AMST 419a/ER&M 450a/HIST 152Ja, Land, Homelands, and American Indian Histories** Alyssa Mt. Pleasant

T 1:30–3:20 WR, HU (o)

Investigation of American Indian nations' relationships with their homelands, from creation traditions through the colonial period to late twentieth-century land claims litigation. Significant themes include American Indians' inscription of meaning onto the landscapes they know as their homelands, and contestation over these lands in the post-contact period.

***AMST 422a/ER&M 435a/HIST 151Ja, Writing Tribal Histories** Ned Blackhawk

For description see under History.

***AMST 459b/HIST 157Jb, Topics in Southern California History**

John Mack Faragher

For description see under History.

***AFAM 410b/WGSS 410b, Interdisciplinary Approaches to African American Studies**

Deborah Thomas

For description see under African American Studies.

ER&M 200a, Introduction to Ethnicity, Race, and Migration

Alicia Schmidt Camacho

THE INTERNATIONAL UNITED STATES

AMST 193b/HIST 122b, Origins of U.S. Global Power Jenifer Van Vleck

For description see under History.

***AFAM 347a, Caribbean Lives: Psychosocial Aspects** Ezra Griffith

MATERIAL CULTURES AND BUILT ENVIRONMENTS

AMST 215a/HSAR 215a, Nationalism, Style, and Taste: Nineteenth-Century American Decorative Arts and Domestic Architecture Edward Cooke, Jr.

For description see under History of Art.

***AMST 391b/ER&M 363b, Ethnicity, Race, and Material Culture** Kariann Yokota

T 2:30–4:20 HU (o)

Ways that members of ethnic, racial, and religious groups have used objects to articulate their identities. Cultural expressions ranging from food to fashion as they have created a shared sense of belonging across racial, class, and geographic divides, while also serving as markers to separate groups. Political meanings of quintessentially American objects as varied as the Lincoln Memorial, homespun, Cadillacs, and Coca-Cola.

***AMST 424a, An Introduction to the Cultural History of Things** Kariann Yokota

W 3:30–5:20 HU (o)

An introduction to the use of goods and objects—from eighteenth-century tea sets to twentieth-century television sets—as primary sources in cultural history. Examination of the various ways material culture has been understood by historians, theorists, archaeologists, marketers, collectors, museums, and consumers.

POLITICS AND AMERICAN COMMUNITIES

***AMST 006a, Violence and Justice in America** John Mack Faragher

TTH 1–2:15 WR, HU Fr sem (o)

The problem of violence and justice in American society, history, and culture. Introduction to the disciplinary approaches in social science, history, and cultural criticism that comprise the interdisciplinary practice of American Studies. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

AMST 111a/HIST 129a/RLST 111a/WGSS 111a, Sexuality and Religion

Kathryn Lofton

For description see under Religious Studies.

AMST 115b/ANTH 115b/WGSS 115b, Gender in a Transnational World

Inderpal Grewal

For description see under Women's, Gender, & Sexuality Studies.

AMST 135a/HIST 127a/WGSS 200a, U.S. Lesbian and Gay History George Chauncey

For description see under History.

AMST 192b/ER&M 190b, Work and Daily Life in Global Capitalism

Michael Denning

TTH 1–2:15 WR, HU (26)

An introduction to the worlds of twentieth-century capitalism, from Ford to Sony and from Unilever to Microsoft, with particular attention to transformations in work and daily life. Topics include the metal-working cities and industrial plantations of the first decades of the century; the social and cultural upheavals of global depression and world war; the midcentury challenges of communism, social democracy, and decolonization; the rise of service economies and the shifts in women's work; the popular uprisings and cultural revolutions of the 1960s and 1970s; and the conflicts over globalization and neoliberalism in the last quarter century.

***AMST 262b/ER&M 232b, Comparative Ethnic Studies** Birgit Brander Rasmussen

TH 1:30–3:20 SO (o)

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.

***AMST 305a/ER&M 381a, U.S.-Mexico Borderlands** Lourdes Gutiérrez Nájera

For description see under Ethnicity, Race, & Migration.

***AMST 321a/AFAM 368a, Interraciality and Hybridity** Naomi Pabst

For description see under African American Studies.

***AMST 392a/RLST 311a^c, Religion and Popular Culture** Kathryn Lofton

For description see under Religious Studies.

***AMST 395b/ER&M 391b, Radical California** Stephen Pitti

T 1:30–3:20 HU (o)

A survey of twentieth-century California history and culture, with attention to civil rights movements, immigrant communities, the rise of Hollywood, the New Right, popular music, labor activism, and environmental politics. Focus on Los Angeles and San Francisco, with some attention to the Central Valley.

***AMST 429b^c/ANTH 404b^c, American Communities** Kathryn Dudley

W 1:30–3:20 SO (o)

Consideration of the concept of community and an examination of various kinds of communities – ranging from those defined by social proximity to those defined by a common experience or ideology – that are part of the American experience, in order to understand the value Americans place on community itself, and the ways in which the pull of individualism exacts a toll on that commitment.

***AMST 467a/ER&M 415a, Investigating the Present** Alicia Schmidt Camacho

For description see under Ethnicity, Race, & Migration.

***AMST 468b/PLSC 251b^c, Progressivism: Theory and Practice** Stephen Skowronek

For description see under Political Science.

***PLSC 268a/AFAM 280a/JDST 290a, Black and Jewish Community Politics**

Khalilah Brown-Dean

For description see under Political Science.

VISUAL, AUDIO, LITERARY, AND PERFORMANCE CULTURES

AMST 211b/ER&M 210b, Race and Gender in American Literature

Birgit Brander Rasmussen

MW 11:35–12:25, 1 HTBA HU (34)

The role of literature in constructing representations of America as an idea, a nation, a colonial settlement, and a participant in world affairs. What kind of place America is and who belongs there; the consequences of America's history for its national literature. Emphasis on the ways texts represent and contest social concepts of race and gender difference.

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

M 1:30–3:20 HU (0)

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.

AMST 246a/ENGL 289a, Hemingway, Fitzgerald, Faulkner Wai Chee Dimock

For description see under English Language & Literature.

AMST 247a/HIST 147a/HLTH 170a/HSBM 202a⁶, Media and Medicine in Modern America John Warner, Gretchen Berland

For description see under History of Science, History of Medicine.

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

TH 1:30–3:20 HU (0)

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. The differences and the 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.

AMST 261b/ENGL 291b, The American Novel since 1945 Amy Hungerford

For description see under English Language & Literature.

***AMST 273a/AFAM 279a/WGSS 342a, Black Women's Literature** Naomi Pabst

For description see under African American Studies.

***AMST 277a/ER&M 284a, Introduction to Chicano and Latino Literatures**

Birgit Brander Rasmussen

T 1:30–3:20 HU (26)

Historical, political, and aesthetic roots of Chicano and Latino literature in short stories, novels, poetry, plays, essays, literary criticism, and the performance genres of spoken word, theater, and film.

***AMST 292b/AFAM 292b, Interracial Literature** Naomi Pabst

For description see under African American Studies.

***AMST 295b/AFAM 295b/ENGL 295b, African American Literature II: 1900–1970**

Robert Stepto

For description see under African American Studies.

AMST 296b/AFAM 296b/ENGL 296b/WGSS 292b, African American Literature**III: 1970 to the Present** Elizabeth Alexander

For description see under African American Studies.

***AMST 301b/ENGL 299b/FILM 311b, East Asia in U.S. Literature and Film**

R. John Williams

For description see under English Language & Literature.

***AMST 309b/AFAM 304b/WGSS 309b, Toni Morrison** Naomi Pabst

For description see under African American Studies.

***AMST 315a/ER&M 312a, Colonial Visions and Contemporary Revisions**

Birgit Brander Rasmussen

W 1:30–3:20 HU (RP, O)

American literature from the colonial period paired with contemporary texts to examine how contemporary writers use, critique, revise, or speak back to colonial narratives. Contemporary authors include Eduardo Galeano, Toni Morrison, and Arthur Miller, who revisit histories of conquest, enslavement, and settler colonialism.

***AMST 319a/FILM 427a, American Documentary Films** Michael Roemer

M 2:30–5:20 HU (RP, O)

The documentary film from Flaherty to cinéma-vérité and beyond. Films examined for aesthetic value as well as social and political relevance. Emphasis on individual films and filmmakers. Screenings in class. Enrollment limited to juniors and seniors majoring in American Studies or in Film Studies.

***AMST 326a/CHNS 265a/ER&M 300a/FILM 435a/LITR 258a, Chinese Diaspora and the Americas in Fiction and Film** Jing Tsu

For description see under East Asian Languages & Literatures.

***AMST 341a/FILM 420a/HSAR 413a, American Visual Culture, 1941–1945**

Alexander Nemerov

For description see under History of Art.

***AMST 358a, Animals in Modern American Fiction** James Berger

M 3:30–5:20 HU (RP, O)

Literary portrayals of animals 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.

***AMST 370b/THST 380b, The History of Dance** Emily Coates

For description see under Theater Studies.

***AMST 381a/ARCH 351a, Poets' Landscapes** Dolores Hayden

W 9:25–11:15 WR, HU (O)

Introduction to techniques American poets have used to create memorable places and ground their work. Depictions of landscapes and buildings in New England, Chicago and the Midwest, New York and New Jersey, and Los Angeles. Attention to poems from a national automotive landscape as well as narrative poems about cities. Readings from the works of Frost, Dickinson, Bishop, Lowell, Merrill, Wilbur, Pinsky, Dickey, Wright, Trethewey, Collins, and others.

***AMST 393b^G/FILM 415b, Digital Documentary and the Internet** Charles Musser, Joshua Glick

For description see under Film Studies.

***AMST 398b/AFAM 387b/MUSI 398b, The Electric Music of Miles Davis** Michael Veal

For description see under Music.

***AMST 404a/ANTH 302a/WGSS 380a, Gender and Sexuality in Media and Popular Culture** Laura Wexler, Inderpal Grewal

For description see under Women's, Gender, & Sexuality Studies.

***AMST 406a, The Spectacle of Disability** James Berger

TH 9:25–11:15 WR, HU (RP, O)

Examination of how people with disabilities are represented in U.S. literature and culture. How these representations, along with the material realities of disabled people, frame society's understanding of disability; the consequences of such formulations. Various media, including fiction, nonfiction, film, television, and memoirs, viewed through a wide range of analytical lenses.

***AMST 416b/FILM 438b, U.S. Cinema from 1960 to the Mid-1970s** Michael Kerbel

F 1:30–3:20 HU (RP, O)

An examination of significant developments in American narrative cinema from 1960 to the mid-1970s through close analysis of representative films. Topics include the decline of the studio system; Hollywood's departures from traditional genres, themes, structures, and styles; the treatment of previously forbidden subjects; the influence of avant-garde, documentary, and international film; the director's ascendancy; representations of race, ethnicity, gender, and sexuality; relations between films and American politics, society, and culture.

***AMST 437a^G/ER&M 411a, Recording Vernacular Musics** Michael Denning

TTH 1–2:15 HU (O)

Introduction to the cultural study of vernacular musics in the era of sound recording. The rise of the music industry from sheet music to MP3s. Ethnographic field recording and twentieth-century revivals of folk musics; popular urban music cultures of ports and industrial cities; and global circulation of commercial vernacular musics from jazz, tango, and hula to salsa and hip-hop.

***AMST 460a^G/AFAM 408a^G/ENGL 443a^G, African American Poets of the Modern Era** Robert Stepto

For description see under African American Studies.

***AFAM 294a/ENGL 294a, African American Literature I: 1740–1900** Robert Stepto

For description see under African American Studies.

***ENGL 363b, American Literature in the Shadow of Wars** Wai Chee Dimock

MUSI 265b/AFAM 253b, Jazz in Transition, 1960–1980 Michael Veal

For description see under Music.

THE JUNIOR SEMINAR

***AMST 390a or b, The Junior Seminar** Staff

2 HTBA HU, SO (o)

An interdisciplinary course in American history, literature, arts, and society, organized around a common core of texts. Topics vary by term.

INDIVIDUAL RESEARCH AND SENIOR PROJECT COURSES

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

Kathryn Dudley

HTBA (o)

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 491a or b, Senior Project** Staff

HTBA (o)

Independent research and proseminar on a one-term senior project. For requirements see under “Senior requirement” in the text above.

***AMST 493a and 494b, Senior Project for the Intensive Major** Kathryn Dudley

HTBA (o)

Independent research and proseminar on a two-term senior project. For requirements see under “Senior requirement” in the text above.

Anthropology

Director of undergraduate studies: David Watts, Rm. 210, 10 Sachem St., 432-9597,
david.watts@yale.edu

FACULTY OF THE DEPARTMENT OF ANTHROPOLOGY

Professors Richard Bribiescas (*Chair*), Richard Burger, Kamari Clarke, †Michael Dove, Kathryn Dudley, J. Joseph Errington, Andrew Hill, Marcia Inhorn, William Kelly, Enrique Mayer, Roderick McIntosh, Catherine Panter-Brick, †Patricia Pessar (*Adjunct*), Eric Sargis, †James Scott, Helen Siu, Kalyanakrishnan Sivaramakrishnan, Anne Underhill, David Watts, †Harvey Weiss

Associate Professors Bernard Bate, †Nora Groce

Assistant Professors Jafari Allen, Brenda Bradley, Sean Brotherton, Narges Erami, Erik Harms, Karen Hébert, William Honeychurch, Michael McGovern, Karen Nakamura, Douglas Rogers

Lecturers †Carol Carpenter, †Graeme Reid

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

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, 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, including introductory or intermediate courses in at least three subfields of anthropology, a senior essay, and either three or four advanced courses (not including ANTH 471a, 472b, or 491a or b), depending on which option they choose for their senior essay. 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 311b). 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 (e.g., ANTH 267b) and that introduce them to laboratory methods. Those who concentrate in archaeology are strongly encouraged to take the yearlong sequence in field and laboratory methods (ANTH 277a, 278La, 279Lb).

Three term courses may be selected from other departments, with approval by the director of undergraduate studies. Majors are not required to present 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 Biology, Geology and Geophysics, Psychology, and Forestry & Environmental Studies; cognates for sociocultural anthropology can be found in Sociology, American Studies, and History. Appropriate areas of cross-disciplinary concentrations include such topics as area studies (e.g., Africa), anthropological approaches to law and health, gender and sexuality studies, evolutionary biology, and geology.

Senior essay All majors are required to complete a substantial paper during the senior year, either in a seminar or in ANTH 491a or b. 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. Beginning with the Class of 2012, 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 491a or b. Regardless of the term in which the essay is written, a student pursuing this option must choose a topic and identify an Anthropology faculty adviser by the third week of the fall term of the senior year. The student should also inform the director of undergraduate studies 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 471a or 472b and completed in ANTH 491a or b. 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 471a or 472b; approval is required before the student registers for ANTH 471a or 472b, typically in the fall term of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 course credits (incl senior essay)

Distribution of courses At least 1 intro survey or intermediate course in each of 3 subfields; 3 or 4 advanced courses (not incl ANTH 471a, 472b, 491a or b); up to 3 cognate courses in other depts or programs with DUS approval

Senior requirement Senior essay

Archaeology 171a, 215b, 277a, 278La, 279Lb, 301a, 375b, 429b, 473b, 476a, 482b

Biological anthropology 116a, 182b, 242b, 267b, 270a, 329b, 456a, 464a, 475a

Sociocultural anthropology 110b, 115b, 207a, 209b, 234b, 239b, 245b, 254a, 302a, 308b, 311b, 315b, 327b, 358b, 382a, 404b, 408a, 414b, 438a, 474b

Linguistic anthropology 120a, 298a, 419a

INTRODUCTORY COURSES

ANTH 110b, An Introduction to Cultural Anthropology Michael McGovern

MW 2:30–3:45 SO (37)

Cultural anthropologists study cosmology, tacit knowledge, and ways of knowing the world in specific social settings. Sociocultural specificity helps to explain human solutions to the

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.

ANTH 115b/AMST 115b/WGSS 115b, Gender in a Transnational World

Inderpal Grewal

For description see under Women's, Gender, & Sexuality Studies.

ANTH 116a, Our Place in Nature: Introduction to Biological Anthropology

Richard Bribiescas

MW 11:35–12:50 SC, SO (34)

Introduction to human and primate evolution, primate behavior, and human biology. Topics include a review of principles of evolutionary and population biology, the evolution of primates and people, and current thinking about the evolution of human behavior.

ANTH 120a, Language, Culture, and Identity J. Joseph Errington

MWF 10:30–11:20 SO (0)

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.

SURVEY COURSES

ANTH 170b, Chinese Culture, Society, and History Helen Siu

TTH 11:35–12:50 SO (24)

Anthropological explorations of basic institutions in traditional and contemporary Chinese society. Topics include kinship and marriage, religion and ritual, economy and social stratification, state culture, socialist revolution, and market reform.

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

TTH 1–2:15 SO (26)

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.

ANTH 182b, Primate Ecology and Social Behavior David Watts

MW 2:30–3:45 SO (37)

Socioecology of primates compared with that of other mammals, emphasizing both general principles and unique primate characteristics. Topics include life-history strategies, feeding ecology, mating systems, and ecological influences on social organization.

ANTH 207a/ER&M 340a, Peoples and Cultures of Latin America Enrique Mayer

TTH 11:35–12:50; disc. T 7–7:50 p.m. (24)

Ethnic, class, and cultural diversity in Latin America, with an emphasis on economic, religious, and health issues. Attention to the situation of Latin American immigrants in the United States. One discussion section conducted in Spanish.

INTERMEDIATE COURSES

ANTH 209b, After the Soviet Union Douglas Rogers

TTH 1–2:15 SO (0)

Changes in the lives of former Soviet citizens following the Soviet Union's disintegration in 1991. Transformations in politics, culture, religion, gender, consumption patterns, and national identity, as well as how these issues are interconnected. Such changes viewed as windows onto global transformations of knowledge, power, and culture at the turn of the twenty-first century.

ANTH 215b/ARCG 215b, Archaeology of China Anne Underhill

TTH 11:35–12:50 SO (o)

Archaeology of China, one of the world's oldest and most enduring civilizations, from the era of early humans to early empires. Methods of interpreting remains from prehistoric and historic period sites.

***ANTH 234b/WGSS 234b, Disability and Culture** Karen Nakamura

TTH 11:35–12:50 SO (RP, o)

Exploration of disability from a cross-cultural perspective, using examples from around the globe. Disability as it relates to identity, culture, law, and politics. Case studies may include deafness in Japan, wheelchair mobility in the United States, and mental illness in the former Soviet republics.

***ANTH 239b/AFST 323b/SOCY 191b/WGSS 323b, HIV and AIDS in Africa**

Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

ANTH 242b, Human Evolutionary Biology and Life History Richard Bribiescas

MW 11:35–12:50 SC, SO (34)

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.

ANTH 245b/EVST 250b, Nature and Globalization Karen Hébert

TTH 1–2:15 SO (o)

Examination of contemporary human relations to nature. Origins and consequences of the predominant ways humans interact with and conceive of the environment. Case studies explore histories, theories, and experiences of resource production and consumption, development and conservation, environmental management and governance, and climate change and ecological risk.

ANTH 254a, Japan: Culture, Society, Modernity Karen Nakamura

TTH 11:35–12:50 SO (24)

Introduction to Japanese society and culture. The historical development of Japanese society; family, work, and education in contemporary Japan; Japanese aesthetics; and psychological, sociological, and cultural interpretations of Japanese behavior.

ANTH 267b/ARCG 267b, Human Evolution Andrew Hill

TTH 11:35–12:50 SO (24)

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

ANTH 270a, Evolution and Human Behavior David Watts

MW 4–5:15 SO (o)

A critical overview of evolutionary accounts of the behavior of modern humans. Background on the evolution of social behavior, foraging, and mating systems, with examples from various nonhuman species. Detailed examination of evolutionary hypotheses about selected aspects of human behavior, such as mate choice and intergroup aggression, and associated controversies.

***ANTH 277a^c/ARCG 277a^c, Archaeological Field Techniques** Roderick McIntosh

W 2:30–4:30 SO (o)

An introduction to the practice and techniques of modern archaeology, including methods of excavation, recording, mapping, dating, and ecological analysis. Must be taken concurrently with ANTH 278La.

***ANTH 278La^c/ARCG 278La^c, Archaeology Laboratory I** Roderick McIntosh

HTBA SO (o)

Instruction in the field at an archaeological site in Connecticut in stratigraphy, mapping, artifact recovery, and excavation strategy. Must be taken concurrently with ANTH 277a.

***ANTH 279Lb^c/ARCG 279Lb^c, Archaeology Laboratory II** Roderick McIntosh

W 2:30–5:30 SO (o)

A practical introduction to processing and analysis of excavated artifacts. Emphasis on familiarity with a range of methods and materials. Intensive study and written report on one group of artifacts.

***ANTH 298a/ER&M 298a/WGSS 298a, The Anthropology of Oratory and Rhetoric**

Bernard Bate

MW 2:30–3:45 WR, SO (o)

Study of the relationship between language and political practice in ethnographic literature and in rhetorical analyses of classic and contemporary American oratory. Exploration of how language use, as both mode of social practice and object of ideology and political organization, can be understood as constitutive of political relations and social organization generally. Enrollment limited to 35.

ADVANCED COURSES, INCLUDING SEMINARS, READING COURSES, AND RESEARCH COURSES

***ANTH 301a^c/ARCG 301a^c, Foundations of Modern Archaeology**

Richard Burger

W 1:30–3:20 SO (o)

Discussion of how method, theory, and social policy have influenced the development of archaeology as a set of methods, an academic discipline, and a political tool. Background in the basics of archaeology equivalent to one introductory course is assumed.

***ANTH 302a/AMST 404a/WGSS 380a, Gender and Sexuality in Media and Popular Culture** Laura Wexler, Inderpal Grewal

For description see under Women's, Gender, & Sexuality Studies.

***ANTH 308b^c/WGSS 308b, Queer Ethnographies** Karen Nakamura

T 1:30–3:20 SO (RP, o)

Exploration of both classic and contemporary ethnographies of gender and sexuality. Emphasis on understanding anthropology's contribution to and relationship with gay and lesbian studies and queer theory.

***ANTH 311b, Anthropological Theory** Bernard Bate

MW 2:30–3:45 SO (o)

Key texts in the theoretical development of sociocultural anthropology. Theorists include Emile Durkheim, Marcel Mauss, A. R. Radcliffe-Brown, Bronislaw Malinowski, E. E. Evans-Pritchard, Claude Lévi-Strauss, Mary Douglas, Clifford Geertz, Sherry Ortner, Michele Rosaldo, and Talal Asad.

***ANTH 315b/AFAM 333b, Critical Ethnography: Methods, Ethics, Poetics**

Jafari Allen

T 1:30–3:20 SO (o)

Critique of theoretical, methodological, and aesthetic models in critical ethnography, drawn mostly from race theory, postcolonial theory, queer theory, and feminisms. Use of these models in students' own research practice.

***ANTH 327b^c, Socialisms and Postsocialisms** Douglas Rogers

W 1:30–3:20 SO (o)

Key themes, topics, and debates in the anthropology of socialist and postsocialist societies. The contributions of ethnographic studies to emergent interdisciplinary conversations. Primary regional emphasis on Eastern Europe and the former Soviet Union; some consideration of socialism and postsocialism as global and transnational phenomena.

***ANTH 329b^c, Primate Evolution** Eric Sargis

TTH 2:30–3:45 SO (27)

The evolutionary history of primates from their origin to extant species. Focus on controversies in taxonomy, phylogeny, and functional morphology of fossil and living primates. Recommended preparation: ANTH 116a or an introductory biology course.

***ANTH 358b/AFST 363b/WGSS 363b, Beauty, Fashion, and Self-Styling**

Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

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

T 1:30–3:20 SO (o)

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.

***ANTH 382b/EVST 345b/F&ES 384b, Environmental Anthropology** Carol Carpenter

For description see under Environmental Studies.

***ANTH 404b^c/AMST 429b^c, American Communities** Kathryn Dudley

For description see under American Studies.

***ANTH 408a^c, Politics and Culture in Contemporary Indonesia** J. Joseph Errington

W 1:30–3:20 SO (RP, o)

Local ethnographic perspectives on social dynamics before and after the fall of Indonesia's New Order regime. Topics include religion and politics, gender and social change, modernization and identity.

***ANTH 414b^c, Urban Anthropology and Global History** Helen Siu

W 1:30–3:20 SO (RP, o)

Analysis of urban life in historical and contemporary societies. Topics include capitalist and postmodern transformations; class, gender, ethnicity, and migration; and global landscapes of power and citizenship.

***ANTH 419a^c/SAST 300a, Language and the Public Sphere** Bernard Bate

T 1:30–3:20 WR, SO (o)

Exploration of the relationship between language and the public sphere. Consideration of the theoretical perspectives of Jürgen Habermas, Benedict Anderson, Hannah Arendt, and Michael Warner. Ethnographic and historical examination of eighteenth- and nineteenth-century America and Europe, nineteenth- and twentieth-century Arabia, and India from the third to the twentieth centuries.

***ANTH 429b^c/ARCG 429b^c, Visualization beneath the Earth** William Honeychurch

W 2:30–4:20 SO (o)

Techniques of data collection and analysis for subsurface remote sensing, including ground-penetrating radar, resistivity, and magnetometry. Applications in archaeology, geology, and urban planning.

***ANTH 438a^c, Culture, Power, Oil** Douglas Rogers

T 1:30–3:20 SO (o)

Study of the production, circulation, and consumption of petroleum in order to explore topics in globalization, empire, cultural performance, natural resource extraction, and the nature of the state. Case studies include the United States, Saudi Arabia, Nigeria, Venezuela, and the former Soviet Union.

***ANTH 456a^c/ARCG 456a^c, Reconstructing Human Evolution: An Ecological Approach** Andrew Hill

W 1:30–3:20 SO (o)

Methods for obtaining data relevant to ecological factors that have affected human evolutionary change, such as changes in climate, competition with other animals, and availability and kinds of food supply. Evaluation of techniques for obtaining ecological data in such fields as geology, paleobotany, and paleozoology. Ethnographic, primatological, and other biological models of early human behavior.

***ANTH 464a^c/ARCG 464a^c, Human Osteology** Eric Sargis

TTH 2:30–3:45 SO (o)

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.

***ANTH 471a and 472b, Readings in Anthropology** Eric Sargis [F], David Watts [Sp]

HTBA (o)

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 473b^c/ARCG 473b^c/EVST 473b/NELC 188b^c, Civilizations and Collapse**
Harvey Weiss

TH 2:30–4:20 HU, SO (o)

Collapse documented in the archaeological and early historical records of the Old and New Worlds, including Mesopotamia, Mesoamerica, the Andes, and Europe. Analysis of politicoeconomic vulnerabilities, resiliencies, and adaptations in face of abrupt climate change; anthropogenic environmental degradation; resource depletion; “barbarian” incursions; and class conflict.

***ANTH 474b^c, Anthropologies of Insurgency** Michael McGovern

T 9:25–11:15 SO (o)

An anthropological viewpoint applied to insurgency and to the interlinked categories of rebel, bandit, and freedom fighter. Specific instances of illegal use of force in their socio-cultural and historic settings subjected to sociological and micropolitical analysis; consideration of insurgency from the actors' points of view.

***ANTH 475a^c, Issues in Primate Behavioral Ecology** David Watts

TH 2:30–4:20 (o)

Examination of current and historically important topics in the study of primate behavioral ecology, including mating systems, sexual selection, and influences on reproductive success; feeding competition, predation, group living, and the evolution of social relationships; life history strategies; and insights gained by combining behavioral data with noninvasive hormonal and genetic sampling. Prerequisite: ANTH 270a or a comparable course in Biology.

***ANTH 476a^c/ARCG 476a^c, GIS and Spatial Analysis for Archaeology**

William Honeychurch

T 1:30–3:20 SO (o)

Introduction to the use of geographical information systems (GIS) in anthropology, with attention to archaeological applications. Examples from theoretical, analytical, and geographical contexts; introduction to current software.

***ANTH 482b/ARCG 482b, Advanced Archaeological Theory** Roderick McIntosh

W 7–8:50 p.m. SO (RP, o)

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.

***ANTH 491a or b, The Senior Essay** David Watts

HTBA (o)

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 fall term,

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.

COURSE OF INTEREST IN ANOTHER DEPARTMENT

***SOCY 160a, Methods of Inquiry** Julia Adams

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

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.

Applied Mathematics

Director of undergraduate studies: Daniel Spielman, 201 AKW, 436-1264, daniel.spielman@yale.edu; senior coordinator: Andrew Barron, 24 Hillhouse Ave., 432-0634, andrew.barron@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF APPLIED MATHEMATICS

Professors Donald Andrews (*Economics, Statistics*), James Aspnes (*Computer Science*), Andrew Barron (*Statistics*), Donald Brown (*Economics*), Joseph Chang (*Statistics*), Ronald Coifman (*Mathematics*), Gustave Davis (*School of Medicine*), Eric Denardo (*Operations Research*), Julie Dorsey (*Computer Science*), Stanley Eisenstat (*Computer Science*), Michael Fischer (*Computer Science*), Igor Frenkel (*Mathematics*), John Hartigan (*Emeritus*) (*Statistics*), Theodore Holford (*Public Health*), Roger Howe (*Mathematics*), Peter Jones (*Mathematics*), A. Stephen Morse (*Electrical Engineering*), Steven Orszag (*Mathematics*), Peter Phillips (*Economics, Statistics*), David Pollard (*Statistics*), Nicholas Read (*Applied Physics, Physics*), Vladimir Rokhlin (*Computer Science, Mathematics*), Holly Rushmeier (*Computer Science*), Herbert Scarf (*Economics*), Martin Schultz (*Computer Science*), Mitchell Smooke (*Mechanical Engineering, Applied Physics*), Daniel Spielman (*Computer Science*), Hongyu Zhao (*School of Medicine*), Steven Zucker (*Computer Science, Biomedical Engineering*)

Associate Professors Eugenio Culurciello (*Electrical Engineering*), John Emerson (*Statistics*), Josephine Hoh (*School of Medicine*), Hannes Leeb (*Statistics*), Sekhar Tatikonda (*Electrical Engineering, Statistics*)

Assistant Professors Lisha Chen (*Statistics*), Mokshay Madiman (*Statistics*)

J. W. Gibbs Assistant Professors Dan Kushnir, Adam Marcus, Neta Rabin, Andrew Wells

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 applications, there are a few essential 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 Engineering and Applied Science. Courses applying mathematics may be drawn from participating programs in Astronomy, the biological sciences (Biology, Molecular Biophysics and Biochemistry), Chemistry, Computer Science, Economics, the various programs in engineering (Biomedical, Chemical, Electrical, Environmental, and Mechanical Engineering, as well as Applied Physics), Geology and Geophysics, Mathematics, Operations Research, Physics, and Statistics. The Applied Mathematics degree program requires a three-course concentration in a field in which mathematics is used.

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.

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 120a or b and MATH 222a or b or 225a or b, or equivalents. It may also be satisfied by MATH 230a, 231b. Computer programming skills are also required and may be acquired by taking ENAS 130b or CPSC 112a or b.

Details of individual programs must be worked out in consultation with the director of undergraduate studies, whose signed permission is required.

Requirements of the major for 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 194a or b or MATH 246a or b)
2. A course in probability (STAT 241a or 238a)
3. A course in data analysis (STAT 361a or 230b)
4. A course in discrete mathematics (AMTH 244a or CPSC 202a)
5. Courses in at least three of the following areas: (a) optimization (AMTH 437a) or linear programming (AMTH 235a); (b) stochastic processes (STAT 251b); (c) statistics (STAT 242b); (d) algorithms (CPSC 365b) or numerical computation (ENAS 440a, 441b, or CPSC 440b); (e) graphs and networks (AMTH 462a); (f) game theory (ECON 351a); (g) signals, dynamics, applications of differential or difference equations, or time series (AMTH 342a, ENAS 391a, EENG 310b, 397b, 436b, or ECON 136b) or applied functional analysis (AMTH 260b); (h) image or vision analysis (BENG 445a or CPSC 475b) or information theory (AMTH 364b); (i) computational biology (AMTH 464a or 465b)
6. At least three courses in a field of concentration involving the application of mathematics to that field, at least two of which are advanced courses. Programs in science, engineering, computer science, statistics, economics, and operations research 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. degree below. Details of a student's program to satisfy the concentration requirement must be worked out in consultation with, and approved by, the director of undergraduate studies

7. Senior seminar (AMTH 490b) or special project completed during senior year (AMTH 491a or b)

A maximum of one course credit taken Credit/D/Fail may be counted toward the requirements of the major.

The B.S. degree program In addition to the courses indicated for the B.A. major, the B.S. degree, which totals fourteen term courses beyond the prerequisites, must also include:

1. Topics in analysis (MATH 300b) or introduction to analysis (MATH 301a)
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 director of undergraduate studies

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.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120a or b and MATH 222a or b or 225a or b, or equivalents; ENAS 130b or CPSC 112a or b

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 194a or b or MATH 246a or b; STAT 238a or 241a; STAT 361a or 230b; AMTH 244a or CPSC 202a; *B.S.* — same, plus MATH 300b or 301a

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

Senior requirement Senior sem (AMTH 490b) or special project (AMTH 491a or b)

INTRODUCTORY COURSES

AMTH 110a, Introduction to Quantitative Thinking: The Pleasures of Counting

Adam Marcus

MWF 1:30–2:20 QR (36)

Methods of quantitative inference and modeling are introduced via applications from a variety of different fields. Possible topics include data encryption, codes, scaling phenomena, traffic flow, warfare, and population growth. Some use of computing software such as Mathematica or MATLAB. No prior acquaintance with calculus or computing assumed.

AMTH 222a or b/MATH 222a or b, Linear Algebra with Applications Jaejeong Lee and staff

For description see under Mathematics.

INTERMEDIATE AND ADVANCED COURSES

AMTH 235a/OPRS 235a, Optimization Eric Denardo

For description see under Operations Research.

AMTH 237a/OPRS 237a, Stochastic Models of Decision Making Eric Denardo

For description see under Operations Research.

AMTH 244a/MATH 244a, Discrete Mathematics Matthew Hirn

For description see under Mathematics.

AMTH 260b/MATH 260b, Basic Analysis in Function Spaces Ronald Coifman

For description see under Mathematics.

***AMTH 342a/EENG 442a^G, Linear Systems** A. Stephen Morse

For description see under Electrical Engineering.

AMTH 361a^G/STAT 361a^G, Data Analysis Jing Zhang

For description see under Statistics.

AMTH 364b^G/EENG 454b^G/STAT 364b^G, Information Theory Andrew Barron

For description see under Statistics.

***AMTH 437a/EENG 437a, Optimization Techniques** A. Stephen Morse

MW 2:30–3:45 QR (37)

Fundamental theory and algorithms of optimization, emphasizing convex optimization. The geometry of convex sets, basic convex analysis, the principle of optimality, duality. Numerical algorithms: steepest descent, Newton's method, interior point methods, dynamic programming, unimodal search. Applications from engineering and the sciences. Prerequisites: MATH 120a or b and 222a or b, or equivalents. May not be taken after AMTH 237a.

AMTH 462a^G/CPSC 462a^G, Graphs and Networks Daniel Spielman

TTH 2:30–3:45 QR (0)

A mathematical examination of graphs and their applications in the sciences. Families of graphs include social networks, small-world graphs, Internet graphs, planar graphs, well-shaped meshes, power-law graphs, and classic random graphs. Phenomena include connectivity, clustering, communication, ranking, and iterative processes. Prerequisites: linear algebra and discrete mathematics; a course in probability is recommended.

AMTH 465b/MCDB 361b^G, Systems Modeling in Biology Thierry Emonet and staff

For description see under Biology.

***AMTH 480a or b, Directed Reading** Daniel Spielman

HTBA (0)

Individual study for qualified students who wish to investigate an area of applied mathematics not covered in regular courses. A student must be sponsored by a faculty member who sets the requirements and meets regularly with the student. Requires a written plan of study approved by the faculty adviser and the director of undergraduate studies.

***AMTH 490b, Senior Seminar and Project** Andrew Barron

W 3:30–5:20 (o)

Under the supervision of a member of the faculty, each student works on an independent project. Students participate in seminar meetings at which they speak on the progress of their projects. Some meetings may be devoted to talks by visiting faculty members or applied mathematicians.

***AMTH 491a or b, Special Projects** Daniel Spielman

HTBA (o)

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project. May be taken more than once for credit.

Applied Physics

Director of undergraduate studies: Robert Grober, 415 BCT, 432-9653,
robert.grober@yale.edu

FACULTY OF THE DEPARTMENT OF APPLIED PHYSICS

Professors Charles Ahn, †Sean Barrett, Hui Cao, Richard Chang (*Emeritus*), Michel Devoret, Paul Fleury, †Steven Girvin, †Leonid Glazman, Robert Grober, Victor Henrich, Arvid Herzenberg (*Emeritus*), †Marshall Long, †Tso-Ping Ma, Simon Mochrie, Daniel Prober, Nicholas Read, †Mark Reed, Robert Schoelkopf, †Ramamurti Shankar, †Mitchell Smooke, A. Douglas Stone, †John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

Associate Professors †Jack Harris, Sohrab Ismail-Beigi, †Karyn Le Hur

†A joint appointment with primary affiliation in another department.

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, forming 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.

Introductory courses During the freshman year, students interested in Applied Physics should start by taking courses in mathematics, and 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 Freshman Web site at yalecollege.yale.edu/content/class-2014).

The recommended sequence in mathematics for students interested in Applied Physics or Electrical or Mechanical Engineering is MATH 115a or b, ENAS 151a or b, MATH 222a or b, and ENAS 194a or b. Either MATH 120a or b or MATH 230a, 231b is an acceptable alternative to ENAS 151a or b, and MATH 225a or b is an acceptable alternative to MATH 222a or b. Similarly, PHYS 301a may be substituted for ENAS 194a or b and MATH 222a or b.

The recommended starting courses in physics are PHYS 200a and 201b. These courses should be taken in the freshman 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 260a and 261b instead. Students who are less well prepared in physics and mathematics may choose to take PHYS 180a and 181b during their freshman year, or PHYS 200a and 201b during their sophomore year after they have taken more mathematics courses. Two laboratory courses, such as PHYS 205La or Lb and 206La or Lb, should be taken at some time during the freshman or sophomore year.

Because computers are ubiquitous in the practical applications of physics, students interested in Applied Physics should also take a course on the use of computers early in their studies. ENAS 130b, Introduction to Computing for Engineers and Scientists, is recommended; a comparable course in computer science may be substituted with the approval of the director of undergraduate studies.

The multiplicity of choices facing students interested in this general area indicates the importance of informed advice for freshmen. Students should consult freely with directors of undergraduate studies 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 major in Applied Physics requires eight courses beyond the introductory sequence. Two of these must be APHY 471a, 472b. All majors are also required to take APHY 322b, 439a, and PHYS 420a, 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 321b, 448a, 449b, EENG 320a, and 325b. A student interested in the physics of materials and/or nanoscience might choose from APHY 448a, 449b, CHEM 225b, 450b, and MENG 285b. Many other concentrations are possible.

Senior requirement Seniors must complete an independent research project, taken as APHY 471a and 472b. The independent research project is under the supervision of a faculty member in Applied Physics, engineering, or the departments of Physics, Computer Science, or Geology and Geophysics. 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 project coordinator as early as possible to discuss available options and general requirements.

A well-prepared student interested in solid-state and/or quantum electronics might elect the following course sequence:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
PHYS 200a	ENAS 194a	APHY 439a	APHY 448a
ENAS 151a		EENG 320a	APHY 471a
		PHYS 420a	
PHYS 201b	APHY 322b	APHY 472b	APHY 449b
PHYS 205Lb	PHYS 206Lb		
MATH 222b	ENAS 130b		

A student starting physics in the sophomore year might elect:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
MATH 115a	PHYS 200a	APHY 439a	APHY 448a
	PHYS 205La	PHYS 420a	APHY 471a
	ENAS 194a		EENG 320a
MATH 120b	PHYS 201b	APHY 322b	APHY 449b
ENAS 130b	PHYS 206Lb	APHY 472b	
	MATH 222b		

A typical program in physics of materials and/or nanoscience for a well-prepared student might be:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
PHYS 200a	CHEM 118a	APHY 439a	APHY 448a
PHYS 205La		CHEM 227a	APHY 471a
ENAS 151a			PHYS 420a
PHYS 201b	APHY 322b	APHY 472b	APHY 449b
PHYS 206Lb	MATH 222b	ENAS 130b	
ENAS 194b	CHEM 225b		

A typical program in physics of materials and/or nanoscience for a student starting physics in the sophomore year might be:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CHEM 118a	PHYS 180a	APHY 439a	APHY 448a
MATH 115a	PHYS 205La	MATH 222a	APHY 471a
	CHEM 227a		PHYS 420a
CHEM 225b	MATH 120b	APHY 322b	APHY 472b
	PHYS 181b	ENAS 130b	CHEM 450b
	PHYS 206Lb		
	ENAS 194b		

Approval of programs 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 director of undergraduate studies as early as possible, and in any case by the end of the sophomore year.

REQUIREMENTS OF THE MAJOR

Prerequisites PHYS 180a, 181b, or 200a, 201b, with appropriate math coreqs and 2 lab courses as specified; ENAS 151a or b or MATH 120a or b; MATH 222a or b and ENAS 194a or b, or PHYS 301a; ENAS 130b

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

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

Specific courses required APHY 322b, 439a, PHYS 420a, or equivalents

Substitution permitted Any relevant course approved by DUS

Senior requirement APHY 471a and 472b

*APHY 050a/PHYS 050a, Science of Modern Technology Daniel Prober

TTH 2:30–3:45 SC Fr sem (RP, O)

Examination of the science behind selected advances in modern technology. 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, 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 freshmen. Preregistration required; see under Freshman Seminar Program.

*APHY 060b/ENAS 060b/PHYS 060b, Energy Technology and Society Paul Fleury

For description see under Engineering & Applied Science.

*APHY 110a or b/ENAS 110a or b, The Technological World Victor Henrich

For description see under Engineering & Applied Science.

APHY 321b^C/EENG 401b^C, Semiconductor Silicon Devices and Technology

Tso-Ping Ma

For description see under Electrical Engineering.

APHY 322b, Electromagnetic Waves and Devices Michel Devoret

TTH 1–2:15 QR, SC (26)

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 180a, 181b, or 200a, 201b.

APHY 439a^C/PHYS 439a, Basic Quantum Mechanics Robert Schoelkopf

TTH 2:30–3:45 QR, SC (27)

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 181b or 201b, PHYS 301a, or equivalents, or permission of instructor.

APHY 448a^C/PHYS 448a, Solid-State Physics I Paul Fleury

TTH 1–2:15 QR, SC (26)

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 322b, 439a.

APHY 449b^c/PHYS 449b, Solid-State Physics II Daniel Prober

TTH 2:30–3:45 QR, SC (27)

The second term of the sequence described under APHY 448a.

APHY 458a^c/PHYS 458a^c, Principles of Optics with Applications Hui Cao

TTH 11:35–12:50 QR, SC (24)

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 430b.

***APHY 471a and 472b, Special Projects** Robert Grober

HTBA (o)

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. These courses may be taken at any appropriate time in the student's career; they may be taken more than once. Permission of the faculty adviser and of the director of undergraduate studies is required.

Arabic

(See under *Near Eastern Languages and Civilizations*.)

Archaeological Studies

Director of undergraduate studies: Roderick McIntosh, Rm. 207, 51 Hillhouse Ave., 432-6649, roderick.mcintosh@yale.edu

COUNCIL ON ARCHAEOLOGICAL STUDIES

Anthropology Richard Burger (*Chair*), Andrew Hill, William Honeychurch, Roderick McIntosh, Eric Sargis, Anne Underhill

Classics, History of Art Milette Gaifman, Diana Kleiner

Geology & Geophysics Leo Hickey, Ronald Smith, Karl Turekian

History of Art Edward Cooke, Jr., Mary Miller, Lillian Tseng

Near Eastern Languages & Civilizations John Darnell, Karen Foster, Eckart Frahm, Colleen Manassa, Harvey Weiss

This special interdepartmental 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 Street, or to the director of undergraduate studies.

The major in Archaeological Studies provides a program of interdepartmental offerings covering prehistoric, early historic, and medieval 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 physical science), while emphasizing substantive studies. These include: (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 the prehistoric, early historic, and medieval cultures of the Old and New Worlds, including the iconography of ancient cultures, the relationship between art and society in ancient cultures, ancient writing systems, and American historical archaeology.

Requirements of the major The major consists of thirteen term courses including the senior project. The following seven courses are normally required: an introductory survey; the field techniques course ARCG 277a; the laboratory courses ARCG 278La and 279Lb; an advanced laboratory course; a theory course; and the senior research project ARCG 491a or b. Undergraduate majors should also acquire summer experience in the field or laboratory. The remaining six courses required for the major must be distributed among the six subject areas represented by the departments and programs offering courses double-titled with Archaeological Studies, with three of those six courses falling in different departments and programs. The departments and programs are: Anthropology, Classics, Environmental Studies, Geology and Geophysics, History of Art, and Near Eastern Languages and Civilizations. Some courses may be applied to categories other than the ones in which they are listed below, upon application to the director of undergraduate studies. For three of the six archaeology electives students may, with permission of the director of undergraduate studies, substitute three courses from other departments in areas related to their research.

Students majoring in Archaeological Studies normally devote at least one summer to archaeological research in the field or the laboratory, or complete a summer field course in archaeology. Members of the Council faculty currently direct archaeological field projects in Syria, Egypt, Peru, Mali, Mongolia, and Guatemala. Qualified majors are encouraged to apply for research positions with these projects.

Senior requirement The final requirement for the major is a senior research project (ARCG 491a or b) in some field of archaeology, preferably one involving more than one area or discipline.

Students majoring in Archaeological Studies should consult with the director of undergraduate studies at the beginning of each term.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 13 term courses (incl senior project)

Specific courses required ARCG 277a, 278La, 279Lb

Distribution of courses 1 intro survey; 1 advanced lab; 1 theory course; at least 1 course in each of 3 areas; 3 addtl courses in archaeology from related programs

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

Senior requirement Research project (ARCG 491a or b)

ANTHROPOLOGY

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

For description see under Anthropology.

ARCG 215b/ANTH 215b, Archaeology of China Anne Underhill

For description see under Anthropology.

ARCG 267b/ANTH 267b, Human Evolution Andrew Hill

For description see under Anthropology.

***ARCG 277a^G/ANTH 277a^G, Archaeological Field Techniques** Roderick McIntosh

For description see under Anthropology.

***ARCG 278La^G/ANTH 278La^G, Archaeology Laboratory I** Roderick McIntosh

For description see under Anthropology.

***ARCG 279Lb^G/ANTH 279Lb^G, Archaeology Laboratory II** Roderick McIntosh

For description see under Anthropology.

***ARCG 301a^G/ANTH 301a^G, Foundations of Modern Archaeology** Richard Burger

For description see under Anthropology.

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

For description see under Anthropology.

***ARCG 429b^G/ANTH 429b^G, Visualization beneath the Earth** William Honeychurch

For description see under Anthropology.

***ARCG 456a^G/ANTH 456a^G, Reconstructing Human Evolution: An Ecological**

Approach Andrew Hill

For description see under Anthropology.

***ARCG 464a^G/ANTH 464a^G, Human Osteology** Eric Sargis

For description see under Anthropology.

***ARCG 473b^G/ANTH 473b^G/EVST 473b/NELC 188b^G, Civilizations and Collapse**

Harvey Weiss

For description see under Anthropology.

***ARCG 476a^G/ANTH 476a^G, GIS and Spatial Analysis for Archaeology**

William Honeychurch

For description see under Anthropology.

***ARCG 482b/ANTH 482b, Advanced Archaeological Theory** Roderick McIntosh

For description see under Anthropology.

CLASSICS

ARCG 252b/CLCV 175b/HSAR 252b, Roman Architecture Diana Kleiner

For description see under History of Art.

ENVIRONMENTAL STUDIES

ARCG 226b/EVST 226b, Global Environmental History Harvey Weiss

For description see under Environmental Studies.

GEOLOGY AND GEOPHYSICS

ARCG 230a/G&G 230a, Stratigraphy Leo Hickey

For description see under Geology & Geophysics.

ARCG 467a/G&G 467a^G, Geochemical Approaches to Archaeology Karl Turekian

For description see under Geology & Geophysics.

HISTORY OF ART

ARCG 170a/CLCV 170a/HSAR 250a, Roman Art: Empire, Identity, and Society

Diana Kleiner

For description see under History of Art.

ARCG 212a/HSAR 351a, Art and Archaeology in China Lillian Tseng

For description see under History of Art.

ARCG 237a/HSAR 237a/NELC 108a, Ancient Painting and Mosaics Karen Foster

For description see under History of Art.

ARCG 239b/HSAR 239b^G/HUMS 252b/NELC 104b, Art of the Ancient Near East and Aegean Karen Foster

For description see under History of Art.

ARCG 243b/CLCV 160b/HSAR 243b, Greek Art and Architecture

Milette Gaifman

For description see under History of Art.

***ARCG 424b/CLCV 230b/HSAR 424b, eClavdia: Women in Ancient Rome**

Diana Kleiner

For description see under History of Art.

NEAR EASTERN LANGUAGES AND CIVILIZATIONS

***ARCG 001a/NELC 001a, Egypt and Northeast Africa: A Multidisciplinary Approach**

Colleen Manassa

For description see under Near Eastern Languages & Civilizations.

***ARCG 244b^G/NELC 109b^G, The Age of Akhenaton** John Darnell, Karen Foster, Colleen Manassa

For description see under Near Eastern Languages & Civilizations.

ADVANCED RESEARCH COURSES

*ARCG 471a and 472b, Directed Reading and Research in Archaeology

William Honeychurch [F], Roderick McIntosh [Sp]

HTBA (o)

Qualified students may pursue special reading or research under the guidance of an instructor. A written statement of the proposed research must be submitted to the director of undergraduate studies for approval.

*ARCG 491a or b, Senior Research Project in Archaeology Roderick McIntosh

HTBA (o)

Required of all students majoring in Archaeological Studies. Supervised investigation of some archaeological topic in depth. The course requirement is a long essay to be submitted as the student's senior essay. The student should present a prospectus and bibliography to the director of undergraduate studies no later than the third week of the term. Written approval from the faculty member who will direct the reading and writing for the course must accompany the prospectus.

Architecture

Director of undergraduate studies: Bimal Mendis, 328 RDH, 432-8325,
bimal.mendis@yale.edu

MEMBERS OF THE SCHOOL OF ARCHITECTURE TEACHING IN YALE COLLEGE

Professors Kent Bloomer (*Adjunct*), Turner Brooks (*Adjunct*), Peggy Deamer, Alexander Garvin (*Adjunct*), Steven Harris (*Adjunct*), Dolores Hayden, Alan Plattus, Alexander Purves (*Emeritus*)

Associate Professors Michelle Addington, Keller Easterling, Eeva-Liisa Pelkonen

Assistant Professors Emmanuel Petit, Elihu Rubin (*Visiting*)

Lecturers Victor Agran, Karla Britton, Susan Farricielli, Daniel Sherer

Critics Andrei Harwell, Adam Hopfner, Joyce Hsiang, Bimal Mendis, Dean Sakamoto, Thomas Zook

Application to the Architecture major for the Class of 2012 and subsequent classes Yale College students must apply to enter the major during the spring term of their sophomore year, after taking ARCH 150a, 154b, and 249b. An application to the major must be submitted to the office of the director of undergraduate studies no later than 4 p.m. on March 28, 2011, in Room 328 RDH (third floor). Applications must include the following information: name, address, telephone number, courses related to architecture already taken, and a statement of purpose. Portfolios representative of course work for ARCH 150a, 154b, and 249b must also be submitted for review as part of the application process by May 2, 2011. Applicants must stipulate their first, second, and third choices for the three concentrations in the major. The concentrations, described below, are design; history, theory, and criticism; and urban studies. Although qualified students and students who have fulfilled

the prerequisites may be admitted into the Architecture major, they will not necessarily be admitted to their first-choice concentration. Applicants will be notified in writing regarding acceptance to the major by May 30, 2011. The major is usually limited to between twenty and twenty-five students in the junior year and between twenty and twenty-five students in the senior year, with a maximum of sixteen students in the design concentration for each year. Under exceptional circumstances students may petition the director of undergraduate studies in writing by March 21, 2011, if they wish to change concentrations. Students will be notified by the end of the spring term of the result of such a petition.

Introduction to architecture for the Class of 2012 and subsequent classes Introductory courses are ARCH 150a, 154b, and 249b. They are open to all Yale College students except freshmen, and are required for those interested in the Architecture major prior to application. Freshmen may consider courses such as a freshmen seminar, ARCH 260a, 261b, or STCY 176b.

The standard major 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 urban studies, and leads to a bachelor of arts degree.

The *design concentration* 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. Teaching formats include lectures, studio workshops, and individual presentations that culminate in a senior project design studio. The *history, theory, and criticism concentration* is intended to establish a broad historical and intellectual framework for the study of architecture. An interdisciplinary approach is encouraged through additional courses taken in various fields of humanities and social sciences. Normally these interdisciplinary courses address subjects closely linked to architectural history, theory, and criticism. Such courses may include archaeology, history of religion, aesthetics, philosophy, or visual culture. Permission of the director of undergraduate studies 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. History, theory, and criticism majors are urged to study a foreign language, and a term abroad is encouraged. The *urban studies 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.

Requirements of the major for the Class of 2011 Students majoring in Architecture are required to take sixteen course credits. Majors are expected to take a core of eight course credits and to base their studies in one of three areas of concentration: (1) design, (2) history, theory, and criticism, or (3) urban studies.

The core of courses required for all concentrations includes three prerequisites: ARCH 150a, 152a, and 154b. The remaining five course credits are taken after the student is accepted into the major. The core courses for the design concentration and for the history, theory, and

criticism concentration are ARCH <249a>, 250a, 251b, and either HSAR 112a or 115b. The core courses for the urban studies track are ARCH <249a>, 250a, 251b, and either ARCH 345b or 385a.

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

1. ARCH 450a, Senior Studio
2. One basic science course from PHYS <150a>, 180a, 200a, or ARCH 161b, or a calculus course
3. Two courses in History of Art including one survey course and one architecture history course, approved by the director of undergraduate studies (before senior year)
4. Two electives chosen from the following: ARCH 162b, <340a>, 341a, <350b>; STCY 176b; or any introductory studio art course approved by the director of undergraduate studies
5. ARCH 494b (the senior requirement)

For the history, theory, and criticism concentration, the following additional courses are required:

1. One course from ARCH <340a>, 345b, <350b>, STCY 176b
2. One basic science course from PHYS <150a>, 180a, 200a, or ARCH 161b, or a calculus course
3. Two courses in art history, chosen from one survey course, one architecture history course, and one optional elective with the approval of the director of undergraduate studies
4. Two theory courses chosen from ARCH 162b or courses in Anthropology or Classics (classical civilization, classical art and archaeology, or history of Greece and Rome), with the approval of the director of undergraduate studies
5. ARCH 490a and 491b (the senior requirement)

For the urban studies concentration, the following additional courses are required:

1. One course from ARCH <340a>, 341a, <350b>, STCY 176b
2. One course in political science, economics, statistics, or PHYS <150a>, 180a, 200a, ARCH 161b, or a calculus course
3. Four electives from Architecture, American Studies, Anthropology, Classics (classical civilization or history of Greece and Rome), Environmental Studies, Ethics, Politics, and Economics, History, History of Art, or Sociology, with the approval of the director of undergraduate studies
4. ARCH 495a and 491b (the senior requirement)

Requirements of the major for the Class of 2012 and subsequent classes Students majoring in Architecture are required to take fifteen course credits. Majors are expected to take three prerequisites in their sophomore year, complete a core of five course credits by their junior year, and base their studies in one of three areas of concentration: (1) design, (2) history, theory, and criticism, or (3) urban studies.

The courses for all concentrations include three prerequisites: ARCH 150a, 154b, and 249b. The core of five course credits required for all three concentrations include the studio courses ARCH 250a and 251b (to be taken during the junior year after the student is accepted into the major) and the history of architecture surveys ARCH 260a and 261b (to

be completed by the end of the junior year). The electives are categorized under four broad subject areas: history and theory of architecture, urbanism and landscape, materials and technology, and structures and computation.

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

1. ARCH 450a, Senior Studio
2. ARCH 494b (the senior requirement)
3. One elective in history and theory of architecture chosen from the following: ARCH 341a, 431b, or other relevant course in History of Art approved by the director of undergraduate studies
4. One elective in urbanism and landscape chosen from the following: ARCH <340a>, 344a, 345b, <350b>, 351a, 385a; STCY 176b; or other relevant course approved by the director of undergraduate studies in American Studies, Ethics, Politics, and Economics, Environmental Studies, or Political Science
5. One elective in materials and technology chosen from the following: ARCH 162b, 163b, or other relevant course in Environmental Studies approved by the director of undergraduate studies
6. One elective in structures and computation chosen from the following: ARCH 161b, PHYS 170a, 180a, 200a, a calculus course, or other relevant course approved by the director of undergraduate studies

For the history, theory, and criticism concentration, the following additional courses are required:

1. ARCH 490a and 491b (the senior requirement)
2. Four electives in history and theory of architecture, chosen from the following: ARCH 341a, 431b, or other relevant courses in History of Art approved by the director of undergraduate studies
3. One elective in urbanism and landscape chosen from the following: ARCH <340a>, 344a, 345b, <350b>, 351a, 385a; STCY 176b; or other relevant course approved by the director of undergraduate studies in American Studies, Ethics, Politics, and Economics, Environmental Studies, or Political Science

For the urban studies concentration, the following additional courses are required:

1. ARCH 495a and 491b (the senior requirement)
2. Four electives in urbanism and landscape chosen from the following: ARCH <340a>, 344a, 345b, <350b>, 351a, 385a; STCY 176b; or other relevant courses approved by the director of undergraduate studies in American Studies, Ethics, Politics, and Economics, Environmental Studies, or Political Science
3. One elective in history and theory of architecture chosen from the following: ARCH 341a, 431b, or other relevant course in History of Art approved by the director of undergraduate studies

Digital media orientation All Architecture students are required to complete orientation sessions in digital media workshop and materials laboratory. Students enrolled in ARCH 249b 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 or the director of digital media, John Eberhart (432-9655, john.eberhart@yale.edu).

Library orientation The Architecture program requires all students to complete a ninety-minute introductory library research session. Students enrolled in ARCH 249b 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 Holly Hatheway (432-6219, holly.hatheway@yale.edu). Questions should be addressed to the director of undergraduate studies.

Shop orientation The Architecture program requires all majors to complete a three-hour woodshop and materials lab orientation session. Students enrolled in ARCH 249b must take this session during the first week of the spring term of the sophomore year. Access to the woodshop and materials lab will not be allowed until the orientation has been completed. Questions should be addressed to the director of undergraduate studies or to the shop coordinator, Josh Rowley (432-7234, josh.rowley@yale.edu).

Senior requirement Seniors in the design track take the senior project design studio (ARCH 494b). Seniors in the history, theory, and criticism track take ARCH 490a, the senior research colloquium, and 491b, the senior project. Seniors in the urban studies track take ARCH 495a, the senior research colloquium in urban studies, and 491b, the senior project. Proposals for senior projects and essays are submitted in the fall term for review and approval by the senior project coordinator, and then distributed to faculty members for review before the faculty members agree to become senior advisers. Senior essays and projects (ARCH 491b) are due to the office of the director of undergraduate studies by Friday, April 22, 2011. In the spring term, all seniors must submit a portfolio of their work to the office of the director of undergraduate studies by Tuesday, May 3, 2011. For all majors, this portfolio must be representative of the student's design work including prerequisites and the senior project. History, theory, and criticism majors and urban studies majors must also include a copy of the senior essay and other appropriate texts.

Studio courses in architecture Reviews may require more class time than that announced in course descriptions.

REQUIREMENTS OF THE MAJOR

Prerequisites *Class of 2011*—ARCH 150a, 152a, 154b; *Class of 2012 and subsequent classes*—ARCH 150a, 154b, 249b

Number of courses *Class of 2011*—16 course credits (incl prereqs and senior req); *Class of 2012 and subsequent classes*—15 course credits (incl prereqs and senior req)

Specific courses required *Class of 2011—All concentrations*—ARCH <249a>, 250a, 251b; *Design*—ARCH 450a; HSAR 112a or 115b; 1 from PHYS <150a>, 180a, 200a, ARCH 161b, or a calculus course; *History, theory, and criticism*—HSAR 112a or 115b; 1 from ARCH <340a>, 345b, <350b>, STCY 176b; 1 from PHYS <150a>, 180a, 200a, <ARCH 161b>, or a calculus course; *Urban studies*—ARCH 345b or 385a; 1 from ARCH <340a>, 341a, <350b>, STCY 176b; *Class of 2012 and subsequent classes—All concentrations*—ARCH 250a, 251b, 260a, 261b; *Design*—ARCH 450a

Distribution of courses *Class of 2011—Design*—2 courses in art hist as specified; 2 electives as specified; *History, theory, and criticism*—2 or 3 courses in art hist as specified; 2 theory courses as specified; *Urban studies*—1 course in pol sci, econ, stat, architecture, physics, or calculus as specified; 4 electives approved by DUS; *Class of 2012 and subsequent classes—Design*—1 elective in history and theory of architecture, 1 elective in urbanism and landscape, 1 elective in materials and technology, 1 elective in structures and computation, all approved by DUS; *History, theory, and criticism*—4 electives in history and theory of architecture, 1 elective in urbanism and landscape, all approved by DUS; *Urban studies*—4 electives in urbanism and landscape, 1 elective in history and theory of architecture, all approved by DUS

Other Orientation sessions in digital media, library, and shop

Senior requirement *All concentrations*—portfolio representative of design work, including prerequisites and the senior requirement; *Design*—ARCH 494b; *History, theory, and criticism*—ARCH 490a and 491b; *Urban studies*—ARCH 495a and 491b

***ARCH 001a, Architecture and Utopia** Peggy Deamer

MW 11:35–12:50 HU Fr sem (o)

The relationship between utopian thought and architecture. Architectural visions of utopia. The idea of designing the perfect social environment as inspiration for architects. Utopian thinking as a point of contention among architectural theorists, either for allowing us to avoid the difficulty of reality or for giving an image of hope in compromised times. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

[ARCH 003b, Making an American Architecture]

***ARCH 150a, Introduction to Architecture** Alexander Purves

MWF 9:25–10:15 HU (o)

Lectures and readings in the language of architecture. Architectural vocabulary, elements, functions, and ideals. Notebooks and projects required. Not open to freshmen.

[ARCH 152a, Introduction to Spatial Language in Design]

***ARCH 154b, Drawing Architecture** Victor Agran

W 2:30–4:20 (o)

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. Not open to freshmen. Required for all Architecture majors in the Class of 2012 and subsequent classes.

[ARCH 161b, Introduction to Structures]

***ARCH 162b, Materials in Architecture** Susan Farriacielli

F 10:30–11:20; lab F 12–3 (o)

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 163b, Environment, Energy, Building Deborah Addington

TTH 11:35–12:50 (o)

An introduction to energy and environmental issues faced by the discipline of architecture. Global environmental issues, basic principles of energy generation and energy use, and fundamental climatic precursors and patterns. The complexity of developing solutions that address a wide range of local and global concerns. Recommended preparation: college-level physics.

ARCH 249b, The Analytic Model Emmanuel Petit

TTH 9–10:15 (o)

Introduction to the history and practice of architectural analysis. Students produce drawings, models, and diagrams of significant architectural works in order to facilitate a comprehensive understanding of specific architects, buildings, and contexts. Description of a variety of approaches and the reciprocal relationship between analysis and design. Required for all Architecture majors in the Class of 2012 and subsequent classes.

***ARCH 250a, Methods and Form in Architecture I** Peggy Deamer, Bimal Mendis

MW 1–2:50, 1 HTBA 1½ Course cr (o)

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.

***ARCH 251b, Methods and Form in Architecture II** Dean Sakamoto, Joyce Hsiang

MW 12:30–2:20, 1 HTBA 1½ Course cr (o)

Continuation of ARCH 250a.

ARCH 260a, History of Architecture I: Antiquity to the Renaissance Peggy Deamer

TTH 11:35–12:50, 1 HTBA HU (o)

The first half of a two-term sequence in the history of architecture. Architecture and urbanism from Greek and Roman antiquity through the late Renaissance. 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 and as a response to changes in history and culture. Emphasis on Western locations, with selections from other parts of the world.

ARCH 261b, History of Architecture II: The Eighteenth Century to the Millennium

Eeva-Liisa Pelkonen

TTH 11:35–12:25, 1 HTBA HU (o)

Modern architecture and urbanism from the eighteenth century to the end of the twentieth. Genesis and meaning of architectural form, applying national, cultural, and international contexts.

ARCH 341a^G/INTS 342a^G, Globalization Space Keller Easterling

MW 10:30–11:20, 1 HTBA HU (o)

The role of global infrastructures and spatial products in transnational politics. Case studies include a resort in North Korea, golf courses in China, information technology

campuses in South Asia, high-speed rail in Saudi Arabia, cable and satellite networks in Africa, and automated ports. Discussion of the political dispositions and parastate functions of these spaces.

***ARCH 344a, Urban Life and Landscape** Elihu Rubin

T 1:30–3:20 HU (o)

The built environment as a text tool for constructing narratives of human activity, aspiration, and struggle. Methods of viewing the ordinary landscape of the twentieth-century American city: pulling apart its historical layers, examining social meanings, and observing its function today. Modes of inquiry include video, public presentations, field trips, photography, and writing.

ARCH 345b, Civic Art: Introduction to Urban Design Alan Plattus and staff

W 9:30–11, 1 HTBA HU (o)

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.

***ARCH 351a/AMST 381a, Poets' Landscapes** Dolores Hayden

For description see under American Studies.

ARCH 385a/EP&E 285a/HIST 152a/PLSC 279a/SOCY 149a, New Haven and the American City Alan Plattus, Elihu Rubin

For description see under Political Science.

ARCH 431b, Architecture and Religion Karla Britton

TF 4–5:15 WR, HU (o)

The historical evolution of sacred building in the twentieth and twenty-first centuries. Relations between a building, its cultural environment, and its cult. The influence of religion in contemporary civic life as manifest in the design and construction of prominent religious buildings. Examination of mosques, synagogues, temples, and churches. Perspectives from philosophy, comparative religion, liturgical studies, and architectural theory and practice.

***ARCH 450a, Senior Studio** Turner Brooks, Adam Hopfner

MW 1–2:50, 1 HTBA 1½ Course cr (o)

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. Exercises required. To be taken before ARCH 491b or 494b. Enrollment limited to Architecture majors.

***ARCH 471a or b, Individual Tutorial** Bimal Mendis

HTBA (o)

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.

***ARCH 490a, Senior Research Colloquium** Karla Britton

HTBA (o)

Examination of the skills, topics, and preparation required for the research that students in the history, theory, and criticism track undertake for their senior project. Under the guidance of the instructor and members of the Architecture faculty and visitors, students present and define their proposals, complete basic readings, and seek criticism of individual research agendas.

***ARCH 491b, Senior Project** Elihu Rubin, Karla Britton

HTBA (o)

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. Students in the design track may also petition to pursue an independent design project with an adviser for a total of 1.5 credits.

***ARCH 494b, Senior Project Design Studio** Steven Harris

MW 3:30–5:20 1½ Course cr (o)

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.

***ARCH 495a, Senior Research Colloquium for Urban Studies** Karla Britton

TH 11:35–12:50, 2 HTBA (o)

Development of frameworks and urban strategies for senior projects and/or papers through identification and elaboration of a research topic that synthesizes the interdisciplinary course work of the urban studies curriculum with individual interests. Requirements include proposal drafts, case study research, analyses, and graphic illustrations.

COURSES RELEVANT TO THE MAJOR IN OTHER DEPARTMENTS

CLCV 205a/HIST 205a, Introduction to Ancient Greek History Donald Kagan

For description see under Classics.

CLCV 206a/HIST 217a, Introduction to Roman History: The Republic

William Metcalf

For description see under Classics.

STCY 176b, Introduction to the Study of the City Alexander Garvin

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 open to the Credit/D/Fail option. Students are admitted on the basis of their previous course work and previous performance.

Art

(DRAWING, FILMMAKING, GRAPHIC DESIGN, PAINTING, PHOTOGRAPHY, PRINTMAKING, AND SCULPTURE)

Director of undergraduate studies: Clint Jukkala, 122 GREEN, 432-2608, art.dus@yale.edu

MEMBERS OF THE SCHOOL OF ART TEACHING IN YALE COLLEGE

Professors Gregory Crewdson (*Adjunct*), Rochelle Feinstein, Samuel Messer (*Adjunct*), Robert Reed, Jr., Michael Roemer (*Adjunct*), Robert Storr

Assistant Professors Clint Jukkala, Marie Lorenz

Senior Critics John Gambell, Jessica Helfand, Pamela Hovland, Henk van Assen

Critics Siobhan Liddell, Sandra Luckow

Lecturers Jonathan Andrews, Anna Betbeze, Julian Bittiner, Scott Braun, Alice Chung, Jon Conner, Benjamin Donaldson, Daphne Fitzpatrick, Brent Howard, Lisa Kereszi, Elke Lehmann, John Lehr, Dan Michaelson, Alexandra Rudensky, Scott Stowell, Jeffrey Stuker

The program in Art offers courses in a variety of media that provide a background in visual arts as part of a liberal education and as a preparation for graduate study and professional work.

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 will be given to School of Art students and declared Art majors. The director of undergraduate studies and members of the Art faculty will be present for counseling on Tuesday, August 31, adjacent to the School of Art Gallery at Holcombe T. Green, Jr., Hall, 1156 Chapel Street, between 10:30 a.m. and 2 p.m. 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, when each instructor will determine the class enrollment. Classes begin on Wednesday, September 1. For courses beginning in the spring term, counseling will be held on Monday, January 10, 2011, adjacent to the School of Art Gallery, from 12 to 1:30 p.m.; Art classes begin on Tuesday, January 11, 2011. All Art majors are required to register with the director of undergraduate studies at the beginning of each term at the time and place listed above in order to be enrolled or to continue in the major.

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 terms of introductory (100-level) courses. Four introductory courses must have been completed at the time of the sophomore review. Visual Thinking (ART 111a or b) and Basic Drawing (ART 114a or b) 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 director of undergraduate studies.

Requirements of the major The Art major requires fourteen course credits, including the following: (1) five prerequisite courses at the 100 level (including Basic Drawing and

Visual Thinking); (2) five courses at the 200 level or above; (3) the Junior Seminar (ART 395a) or Critical Theory in the Studio (ART 201b); (4) the Senior Project (ART 495a or b); and (5) two term courses in the history of art. Suggested program guidelines and specific requirements for the various areas of concentration are available from the director of undergraduate studies.

Art majors are eligible for the Ellen Battell Stoeckel Fellowship for study at the Yale University Summer School of Music and Art at 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.

Some Art courses may be repeated for credit, with permission of both the instructor and the director of undergraduate studies. Course credits in studio art earned at other institutions may be applied toward the requirements of the major, at the discretion of the director of undergraduate studies and subject to a faculty review process.

All Art majors are charged a facilities access and user fee of \$200 per term. Additional materials fees are levied in individual courses, as specified at the end of the course description.

REQUIREMENTS OF THE MAJOR

Prerequisites Favorable faculty review of work done in studio courses before end of sophomore year; ART 111a or b and 114a or b; 3 other 100-level term courses

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

Specific course required ART 395a or 201b

Distribution of courses 5 upper-level courses; 2 courses in history of art

Senior requirement Senior project (ART 495a or b)

Unless otherwise indicated, spring-term classes in Art begin on Tuesday, January 11, 2011.

INTRODUCTORY COURSES

***ART 001a, Studies in Visual Biography** Jessica Helfand

M 1–2:15, W 1–3:15 Fr sem (RP, o)

Study of diaries, journals, and scrapbooks as authoritative examples of visual autobiography. Social history and visual methods, focusing on American and British cultural life between the world wars. Exercises in collecting, collage, and composition; methods of visually navigating space, time, and memory; discussion of the asynchronous nature of biography. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ART 002b, Paper** Staff

T 1–3:15, TH 1–2:15 Fr sem (RP, o)

Paper as a material for making art. How paper is made; myriad ways that it is used in the collections of Yale's galleries and libraries. Creation of paper objects to explore the formal properties of sculpture, including volume, mass, line, and structure. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ART 111a or b, Visual Thinking** Anna Betbeze and staffHTBA For sections see www.yale.edu/oci HU (RP, O)

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 art and to the study of art history and popular culture. Projects address all four major concentrations (graphic design, printing/printmaking, photography, and sculpture). Materials fee: \$25. Open to all undergraduates. Required for Art majors.

***ART 114a or b, Basic Drawing** Robert Reed, Jr., and staffHTBA For sections see www.yale.edu/oci HU (RP, O)

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

***ART 116b, Color** Clint Jukkala

TTH 10:30–12:20 HU (RP, O)

Study of the interaction of color, ranging from fundamental problem solving to individually initiated expression. The collage process is used for most class assignments. Materials fee: \$25.

***ART 120a or b, Introductory Sculpture** Scott Braun and staffHTBA For sections see www.yale.edu/oci HU (RP, O)

Exploration of the range of sculpture. Topics include current genres and issues in contemporary sculpture. Attention to understanding and articulating formal structure, both physical and conceptual. Group discussion complements the studio work. Shops and studio are available during days and evenings throughout the week. Materials fee: \$75. Enrollment limited to 12.

***ART 122a, Mold Making and Casting** Jon Conner

T 2:30–6:30 HU (RP, O)

Instruction in the practical aspects of mold making and casting in a variety of materials and techniques. Discussion of contemporary issues in art and culture, including the use of traditional principles in sculpture in an age of mass production. Methods include waste molds, piece molds, life casts, and flexible molds. Materials fee: \$75.

***ART 130a or b, Painting Basics** Anna Betbeze and staff

HTBA [F]; TTH 3:30–5:20 [SP] HU (RP, O)

An introduction to basic painting issues, including the conventions of pictorial space and the language of color. Class assignments and individual projects explore technical, conceptual, and historical issues central to the language of painting. Materials fee: \$75. Intended for students not majoring in Art and for Art majors outside the painting concentration. Students who intend to pursue the painting concentration or take multiple courses in painting should take ART 230a and/or 231b.

***ART 132a or b, Introductory Graphic Design** Henk van Assen, Julian BittinerHTBA For sections see www.yale.edu/oci HU (RP, O)

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.

***ART 136a or b, Introductory Photography** Alexandra Rudensky and staff

HTBA For sections see www.yale.edu/oci HU (RP, o)

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.

***ART 138a or b, Digital Photography** John Lehr and staff

HTBA For sections see www.yale.edu/oci HU (RP, o)

An introductory exploration of the transition of photographic processes and techniques into digital formats. Students produce original work using a digital camera. Introduction to a range of tools including color correction, layers, making selections, and inkjet printing. Assignments include weekly critiques and a final project. Materials fee: \$150.

***ART 141a and 142b, The Language of Film Workshop** Michael Roemer, Sandra Luckow

M 9–12:30 [F]; M 1:30–5 [SP] (RP, o)

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. The fall term emphasizes the writing and production of short dramatic scenes. Materials fee: \$150. Priority to majors in Art and Film Studies. Prerequisite for Film Studies majors: FILM 150a.

***ART 201b, Critical Theory in the Studio** Jeffrey Stuker

W 10:30–12:20 HU (o)

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.

***ART 210a, Sculpture as Object** Daphne Fitzpatrick

MW 10:30–12:20 HU (RP, o)

Introduction to concepts of design and form in sculpture. The use of wood, including both modern and traditional methods of carving, lamination, assemblage, and finishing. Fundamentals of metal processes such as welding, cutting, grinding, and finishing may be explored on a limited basis. Group discussion complements the studio work. Shops and studio are available during days and evenings throughout the week. Materials fee: \$75. Enrollment limited to 12.

INTERMEDIATE COURSES

***ART 223a and 224b, Figure Drawing** Samuel Messer and staff

MW 10:30–12:20 [F]; MW 1:30–3:20 [SP] (RP, o)

A study of the human figure, using a range of approaches. Emphasis on observation, anatomy, and spatial structure. Historical examples from cave painting to contemporary art. Materials fee: \$75 per term.

***ART 230a and 231b, Introductory Painting** Robert Reed, Jr.

MWF 10:30–12:20 (RP, o)

An introduction to concepts and techniques in painting through observational study, with emphasis on the language of color and the articulation of space. Study of pictorial syntax in historical painting; mastery of materials and techniques. Materials fee: \$75 per term. Enrollment limited to 15. Prerequisite or corequisite: ART 114a or b.

***ART 237a, Intermediate Photography** Lisa Kereszi

WF 1:30–3:20 HU (RP, o)

A class in black-and-white photography extending the concerns of ART 136a or b. Introduction to the use of medium-format cameras. Specialized topics include night photography, the use of flash, developing roll film, basic digital scanning, and grayscale printing techniques. Survey of the rich tradition of handheld photography and the production of artists such as Lartigue, Brassai, Diane Arbus, Lee Friedlander, and Robert Adams. Materials fee: \$150. Prerequisite: ART 136a or b or equivalent.

ART 243a, Letterform Design Tobias Frere-Jones

M 1:30–5:20 (RP, o)

Procedure for building typeface design; aesthetic issues presented by single letters. Principles of letterform rendering and spacing, optical mechanics, visual interrelationships, and cultural signals. Use of the type-design program FontLab to digitize letterforms on screen and turn them into usable fonts. Some attention to historical sources. Prerequisite: An introductory course in graphic design. May be taken concurrently with ART 264a.

***ART 245a, Digital Drawing** Staff

HTBA (RP, o)

Digital techniques and concepts as they expand the possibilities of traditional drawing. Topics include vector and bitmap imaging, the stylus and the scanner, printing and projection, and the creation of studies for other artworks. The second half of the course is focused on individual development and exploration. Materials fee: \$150. Enrollment limited. Prerequisite: ART 111a or b or ART 114a or b or permission of instructor.

***ART 264a, Typography in Graphic Design I** Alice Chung

MW 3:30–5:20 (RP, o)

An intermediate course concentrating on the fundamentals of typography, with emphasis on the way 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 132a or b.

***ART 265b, Typography in Graphic Design II** Henk van Assen

T 8:25–12:20 (RP, 0)

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 264a.

***ART 330a and 331b, Painting Studio I** Staff

M 3:30–7:20, W 3:30–5:20 (RP, 0)

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 230a or 231b.

***ART 338a, Intermediate Digital Photography** John Lehr

WF 1:30–3:20 (0)

Exploration of both the technical and conceptual aspects of digital photography. Range of tools includes advanced film scanning, working with RAW files, masks, compositing and grayscale, and color inkjet printing. Students produce original work, with special attention to ways in which their technical decisions can clarify their artistic intentions. Prerequisite: ART 138a or b.

***ART 341a or b, Intermediate Fiction Film Workshop** Michael Roemer [F], Jonathan Andrews [Sp], and staffHTBA For sections see www.yale.edu/oci (RP, 0)

In the first half of the term, students write, stage, and edit three dramatic scenes, each four to five minutes long. During the second half they create somewhat longer projects. Focus on writing short dramatic scenes with a concrete understanding of the way they will be acted, directed, and photographed. Materials fee: \$150. Enrollment limited to 8. Priority to majors in Art and in Film Studies. Prerequisites: ART 141a or 142b, and FILM 150a.

***ART 342b, Intermediate Documentary Film Workshop** Sandra Luckow

HTBA HU (RP, 0)

The storytelling potential of the film medium explored through the making of documentary art. Focus 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 considered using examples of the students' work. Limited enrollment. Priority to majors in Art and in Film Studies. Prerequisites: ART 141a or 142b, and FILM 150a.

***ART 345a and 346b, Intermediate Sculpture** Staff

MW 10:30–12:20 [F]; T 1:30–5:20 [SP] (RP, 0)

Further investigation into the history of sculpture and questions pertinent to contemporary art. Exploration of new techniques and materials along with refinement of familiar skills. Focus on helping students become self-directed in their work. Individual and group discussion and visits to museums and galleries. Materials fee: \$75 per term. Enrollment limited to 12. Prerequisite: ART 120a or b or equivalent, or permission of instructor.

***ART 355b, Silkscreen Printing** Marie Lorenz

TTHF 10:30–12:20 HU (RP, O)

Presentation of a range of techniques in silkscreen and photo-silkscreen, from hand-cut stencils to prints using four-color separation. Students create individual projects in a workshop environment. Materials fee: \$150. Prerequisite: ART 114a or b or equivalent.

***ART 356a, Printmaking I** Marie Lorenz

TTHF 1:30–3:20 (RP, O)

Instruction in a diverse range of printmaking media. Students develop work in linocut, woodcut, collograph, drypoint, and etching. Methods in both color and black and white. Materials fee: \$150. Prerequisite: ART 114a or b or equivalent.

***ART 359b, Lithography** Marie Lorenz

TTHF 3:30–5:20 (RP, O)

Basic techniques of stone and plate lithography. Students create prints utilizing drawing and/or photo-based imagery. Materials fee: \$150. Prerequisite: ART 114a or b or equivalent. Recommended preparation: basic knowledge of Adobe Photoshop.

***ART 367a and 368b, Intermediate Graphic Design** Alice Chung, Pamela Hovland

MW 1:30–3:20 [F]; F 12:30–4:20 [SP] (RP, O)

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 per term. Prerequisite: ART 132a or b.

***ART 379b, View Camera Photography** John Lehr

WF 1:30–3:20 (RP, O)

A concentrated study of operations required in the use of stand cameras, or view cameras. Student work is discussed in regular critiques. Review of a significant photographic tradition. Introduction to various methods of contact printing, including platinum printing and other alternative processes. Students are encouraged to employ any previous digital training. Materials fee: \$150. Prerequisite: ART 237a or permission of instructor.

***ART 395a, Junior Seminar** Jeffrey Stuker

W 1:30–3:20 (RP, O)

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. Required for Art majors.

ADVANCED COURSES***ART 402b, Advanced Photography** Lisa Kereszi

WF 10:30–12:20 (RP, O)

An exploration of the practice of photography, either analog or digital. Student work is discussed in regular critiques, and lectures are framed around the aesthetic concerns that the work provokes. Materials fee: \$150. Prerequisites: ART 379b, and, for those working digitally, ART 138a or b. Required for Art majors concentrating in photography.

***ART 430a and 431b, Painting Studio II** Clint Jukkala [F], Rochelle Feinstein [Sp]

M 3:30–7:20, W 3:30–5:20 (RP, O)

Development of individual themes through independent studio practice and projects. Studio work and discussion of pertinent topics in historical and contemporary painting. Senior Art majors in the painting concentration are encouraged to take ART 431b in conjunction with ART 495b. May be taken more than once. Materials fee: \$75 per term. Prerequisites: ART 330a, 331b.

***ART 442a and 443b/FILM 483a and 484b, Advanced Fiction Film Workshop**

Jonathan Andrews

M 1:30–4:20 (O)

A yearlong workshop designed primarily for Art and Film Studies majors 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 Studies. Prerequisite: ART 341a or b.

***ART 445a and 446b, Advanced Sculpture** Staff

MW 10:30–12:20 [F]; T 1:30–5:20 [SP] (RP, O)

Self-directed work in sculpture. Group discussion of student projects, with readings, slides, and videos that address current art practices. Regular individual and group critiques. Materials fee: \$75 per term. Enrollment limited to 12. Prerequisite: ART 345a or 346b or equivalent, or permission of instructor.

[ART 457b, Printmaking II]***ART 468a and 469b, Advanced Graphic Design** Julian Bittiner, Henk van Assen, and staff

T 1:30–5:20 [F]; W 1:30–5:20 [SP] (RP, O)

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. No prior technical experience required. Prerequisite: ART 367a or 368b or permission of instructor.

***ART 471a and 472b, Independent Projects** Clint Jukkala

HTBA (RP, O)

Independent work that would not ordinarily be accomplished within existing courses, designed by the student in conjunction with a School of Art faculty member. A course proposal must be submitted on the appropriate form for approval by the director of undergraduate studies and the faculty adviser. Expectations of the course include regular meetings, end-of-term critiques, and a graded evaluation.

***ART 495a or b, Senior Project** Clint Jukkala

HTBA [F]; T 7–9 p.m. [SP] (RP, O)

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. Required for Art majors.

Art History

(See under *History of Art*.)

Astronomy

Director of undergraduate studies: Richard Larson, 260 JWG, 432-3015,
astro.dus@yale.edu

FACULTY OF THE DEPARTMENT OF ASTRONOMY

Professors Charles Bailyn, †Charles Baltay, Sarbani Basu, Paolo Coppi, Pierre Demarque (*Emeritus*), Debra Fischer, Jeffrey Kenney (*Chair*), Richard Larson, Priyamvada Natarajan, †Peter Parker, Sabatino Sofia (*Emeritus*), †C. Megan Urry, William van Altena (*Emeritus*), Pieter van Dokkum, Robert Zinn

Associate Professor †Richard Easther

Assistant Professors Hector Arce, Marla Geha, †Daisuke Nagai, †Nikhil Padmanabhan, Frank van den Bosch

Lecturer Michael Faison

†A joint appointment with primary affiliation in another department.

The Department of Astronomy offers courses both for the nonscientist interested in learning about modern astronomy and for the student wishing to prepare for graduate work in astronomy or a related science. The department offers two degree programs: the B.A. degree program in Astronomy and the B.S. degree program in Astronomy and Physics.

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, including ASTR 110a, 120b, and 130a, are intended for students who do not plan to major in the sciences but who desire a broad, nontechnical introduction to astronomy. These courses have no prerequisites, and a student may elect any or all of them and take them in any order. Courses with numbers between 150 and 199, including ASTR 155a, 160a, and 170b, are also intended for students who do not plan to major in the sciences, but they provide a more in-depth treatment and assume a somewhat stronger high school science background. ASTR 155a provides a hands-on introduction to astronomical observing, while ASTR 160a and 170b provide an introduction to topics in modern astrophysics and cosmology. For students with good preparation in high school mathematics and physics, ASTR 210b and 220a provide a more intensive introduction to astronomy with emphasis on topics of current interest, and ASTR 255a provides a more quantitative introduction to astronomical research techniques. These courses may be taken independently of each other.

Courses numbered 300 and above are open to students at the sophomore and higher levels who already have an elementary acquaintance with astronomy, and mathematics and physics as described in the course prerequisites. For advice about astronomy courses, students should consult the director of undergraduate studies.

In addition to the normal undergraduate courses, graduate courses in astronomy are open to qualified undergraduates who already have 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.

B.A. degree program in Astronomy The B.A. degree program is designed for students who may not intend to do graduate work in astronomy but who are interested in the subject as a basis for a liberal education or as a background for a career in 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. The prerequisites for the B.A. program are: either PHYS 170a and 171b, or 180a and 181b, or 200a and 201b; and MATH 112a or b and 115a or b. Ten term courses are required beyond these prerequisites, including the senior requirement. Five courses in astronomy must be completed, four of which must be numbered 200 or above, including ASTR 255a or 355b; ASTR 310a, or both ASTR 210b and 220a (ASTR 170b may substitute for 220a in the latter case); and a senior project or essay (ASTR 490a or 491b). Also required are MATH 120a or b or ENAS 151a or b and four additional courses in the natural or applied or mathematical sciences, at least two of which must have college-level prerequisites; these may include additional astronomy courses. The senior requirement consists of a senior essay or independent research project carried out for one term under the supervision of a faculty member (ASTR 490a or 491b).

Before entering the junior year, the student should consult the director of undergraduate studies.

B.S. degree program in Astronomy and Physics This program is designed to provide a strong background in astronomy and in the relevant physics for students interested in graduate study or a career in astronomy, physics, or a related science.

Prerequisite to the B.S. degree program is work in fundamental physics and mathematics. A student planning to major in Astronomy and Physics should complete this work by the end of the sophomore year. The prerequisites for the B.S. program are: one of the introductory physics sequences (PHYS 180a, 181b, or 200a, 201b, or 260a, 261b); one of the physics laboratory sequences (PHYS 165La, 166Lb or 205La or Lb, 206La or Lb); and the mathematics sequence MATH 112a or b, 115a or b, and either MATH 120a or b or ENAS 151a or b. ASTR 155a may be substituted for one term of the physics laboratory sequence.

Beyond the prerequisites, twelve term courses are required in astronomy, physics, and mathematics. In astronomy, the student should complete at least six courses including ASTR 255a or 355b; ASTR 310a; ASTR 320b or a more advanced astrophysics course with the permission of the director of undergraduate studies; a two-term senior project (ASTR 490a and 491b); and one additional astronomy course numbered 200 or above. In physics, the student should complete at least four courses numbered 400 or above, normally PHYS 410a, 420a, 430b, and either 439a or 440b; the sequence PHYS 401a, 402b, 440b, and 441a

may also fulfill this requirement. With the permission of the director of undergraduate studies, ASTR 440b may be substituted for PHYS 430b. In mathematics, the student should complete one course in mathematics numbered 200 or above, or PHYS 301a or ENAS 194a or b; and either an additional course in mathematics numbered 200 or above or a course in statistics or computing. The senior requirement consists of an independent research project in astronomy carried out for two terms under the supervision of a faculty member (ASTR 490a and 491b).

Before entering the junior year, the student should arrange a specific program of study in consultation with the director of undergraduate studies in Astronomy, whose approval of the program is needed, and should then also consult the director of undergraduate studies in Physics.

REQUIREMENTS OF THE MAJOR

ASTRONOMY, B.A.

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

Number of courses 10 term courses beyond prereqs, incl senior req

Distribution of courses 5 term courses in astronomy, 4 of them numbered 200 or above; 5 addtl courses in science or math, at least 2 with college-level prereqs (may include addtl astronomy courses)

Specific courses required ASTR 255a or 355b; ASTR 310a, or both 210b and 220a; MATH 120a or b or ENAS 151a or b

Substitution permitted ASTR 170b for 220a

Senior requirement Senior essay or senior research project (ASTR 490a or 491b)

ASTRONOMY AND PHYSICS, B.S.

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

Number of courses 12 term courses beyond prereqs, incl senior req

Distribution of courses 6 term courses in astronomy numbered 200 or above; 4 courses in physics numbered 400 or above, as specified; 2 courses in math or mathematical methods in science, as specified

Specific courses required ASTR 255a or 355b; ASTR 310a, 320b

Substitution permitted ASTR 155a for 1 term of prereq physics lab; a more advanced astrophysics course for ASTR 320b, with DUS permission; MENG 361a for 1 physics course numbered 400 or above

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

*ASTR 030a, Search for Extraterrestrial Life Hector Arce

TTH 4–5:15 SC Fr sem (o)

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 freshmen. Preregistration required; see under Freshman Seminar Program.

ASTR 110a, Planets and Stars Michael Faison

MW 2:30–3:45 QR, SC (37)

For non–science majors. An 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.

ASTR 120b, Galaxies and the Universe Jeffrey Kenney

MW 2:30–3:45 QR, SC (37)

For non–science majors. 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.

ASTR 130a, Life in the Universe Debra Fischer

MW 1–2:15 SC (36)

For non–science majors. An introduction to the astronomical and physical conditions that were conducive to life on Earth and the searches for similar conditions and for intelligent life elsewhere in the universe. Detailed survey of the objects making up the solar system as determined from astronomical observations and in situ planetary probes. No prerequisite other than a working knowledge of elementary algebra.

ASTR 135b, Archaeoastronomy Michael Faison

TTH 11:35–12:50 SC (0)

For non–science majors. 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.

ASTR 155a, Introduction to Astronomical Observing Michael Faison

T 2:30–3:45 SC ½ Course cr (0)

A hands-on introduction to the techniques of astronomical observing. 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.

ASTR 160a, Frontiers and Controversies in Astrophysics Marla Geha

TTH 9:25–10:15, 1 HTBA QR, SC (22)

For non–science majors. A detailed study of three fundamental areas in astrophysics that are currently subjects of intense research and debate: (1) planetary systems around stars other than the sun; (2) pulsars, black holes, and the relativistic effects associated with them; (3) the age and ultimate fate of the universe. No prerequisite other than a working knowledge of elementary algebra.

ASTR 170b, Introduction to Cosmology Frank van den Bosch

TTH 4–5:15 QR, SC (27)

An introduction to modern cosmological theories and observations. Topics include aspects of special and general relativity; curved space-time; the Big Bang; inflation;

primordial element synthesis; the cosmic microwave background; the formation of galaxies; and large-scale structure. Prerequisite: a strong background in high school mathematics and physics.

ASTR 210b, Stars and Their Evolution Sarbani Basu

MW 1–2:15 QR, SC (36)

An intensive introduction to stars. Star formation, 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. Prerequisite: a strong background in high school mathematics and physics.

ASTR 220a, Galaxies and Cosmology Pieter van Dokkum

MW 1–2:15 QR, SC (36)

An intensive introduction to extragalactic astronomy. The structure and contents of galaxies, evolution of galaxies, observational cosmology, and the history of the universe. Prerequisite: a strong background in high school mathematics and physics.

ASTR 255a/PHYS 295a, Research Methods in Astrophysics Charles Bailyn

MW 1–2:15 QR, SC (RP, O)

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.

ASTR 310a, Galactic and Extragalactic Astronomy Richard Larson

TTH 4–5:15 QR, SC (27)

Basic properties of stars and their distribution in space; stellar populations and the structure of our galaxy; external galaxies and their structure and distribution in the universe; evolution of galaxies; galaxy interactions and active galactic nuclei; introduction to cosmology. Prerequisites: MATH 115a or b and PHYS 201b or equivalents.

ASTR 320b, Physical Processes in Astronomy Paolo Coppi

MW 2:30–3:45 QR, SC (37)

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 120a or b and PHYS 201b or equivalents, or permission of instructor. Previous experience with computer programming recommended. Taught in alternate years.

ASTR 343b/PHYS 343b, Gravity, Astrophysics, and Cosmology Nikhil Padmanabhan

For description see under Physics.

ASTR 355b^G, Observational Astronomy Pieter van Dokkum

MW 1–2:15 QR, SC (RP, O)

Optics for astronomers. Design and use of optical telescopes, photometers, spectrographs, and detectors for astronomical observations. Introduction to error analysis, concepts of signal-to-noise, and the reduction and analysis of photometric and spectroscopic observations. Prerequisite: one astronomy course numbered above 200, or permission of instructor. Previous experience with computer programming recommended.

[ASTR 360b^G, Interstellar Matter and Star Formation]**ASTR 380b^G, Stellar Populations** Robert Zinn

3 HTBA QR, SC (RP, 50)

The stellar populations of our galaxy and galaxies of the Local Group. Topics include the properties of stars and star clusters, stellar evolution, and the structure and evolution of our galaxy. Prerequisites: PHYS 201b and MATH 120a or b, and one astronomy course numbered above 200. Taught in alternate years.

[ASTR 418b^G, Stellar Dynamics]**ASTR 420a^G, Computational Methods for Astrophysics** Paolo Coppi

3 HTBA QR (RP, 0)

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 320b, MATH 120a or b, 222a or b or 225a or b, and 246a or b.

ASTR 430a^G, Galaxies Frank van den Bosch

3 HTBA QR, SC (RP, 0)

A survey of the contents, structure, kinematics, dynamics, and evolution of galaxies; galaxy interactions and the environments of galaxies; properties of active galactic nuclei. Prerequisites: PHYS 201b and MATH 120a or b, and one astronomy course numbered above 200. Taught in alternate years.

***ASTR 440b^G, Radiative Processes** Debra Fischer

3 HTBA QR, SC (RP, 0)

Applications to astrophysics and geophysics of the theory of radiation fields. Specific examples from stellar physics; stellar and planetary atmospheres; other astrophysical and geophysical processes. Prerequisites: MATH 120a or b and PHYS 201b. Taught in alternate years.

ASTR 450a^G, Stellar Astrophysics Sarbani Basu

3 HTBA QR, SC (50)

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 201b and MATH 120a or b. Taught in alternate years.

[ASTR 465b^G, The Evolving Universe]**[ASTR 470b^G, Cosmology]*****ASTR 490a and 491b, Independent Project in Astronomy** Consult the director of undergraduate studies

HTBA (0)

Independent project supervised by a member of the department with whom the student meets regularly. The project must be approved by the instructor and by the director of undergraduate studies; the student is required to submit a complete written report on the project at the end of the term.

Biochemistry

(See under *Molecular Biophysics and Biochemistry* and under *Biology*.)

Biology

Directors of undergraduate studies: Leo Buss (Ecology and Evolutionary Biology), 326B OML, 432-3837, karen.broderick@yale.edu, www.eeb.yale.edu;
Douglas Kankel (Molecular, Cellular, and Developmental Biology), 754 KBT, 432-3839, crystal.adamchek@yale.edu, www.biology.yale.edu

FACULTY OF THE DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY

Professors Leo Buss, †Peter Crane, Michael Donoghue, †Vivian Irish, †Kenneth Kidd, Nancy Moran, Howard Ochman, Jeffrey Powell, Richard Prum, †Oswald Schmitz, †David Skelly, Stephen Stearns, †J. Rimas Vaišnys, Günter Wagner

Associate Professors Walter Jetz, David Post, Paul Turner

Assistant Professors Suzanne Alonzo, Antonia Monteiro, Thomas Near, Melinda Smith, Jeffrey Townsend, David Vasseur

Lecturers Gisella Caccone, Marta Martínez Wells

FACULTY OF THE DEPARTMENT OF MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY

Professors Sidney Altman, Ronald Breaker, John Carlson, †Lynn Cooley, Craig Crews, Stephen Dellaporta, Xing-Wang Deng, Paul Forscher, Jo Handelsman, †Mark Hochstrasser, Vivian Irish, Douglas Kankel, †Michael Kashgarian, †Paula Kavathas, Haig Keshishian, †Perry Miller, Mark Mooseker, †Jon Morrow, Timothy Nelson, L. Nicholas Ornston, Thomas Pollard, Shirleen Roeder, Joel Rosenbaum, †Alanna Schepartz, Frank Slack, †Hugh Taylor, Robert Wyman

Associate Professors Scott Holley, Christine Jacobs-Wagner, Elke Stein, David Wells, Weimin Zhong

Assistant Professors †Sreeganga Chandra, Thierry Emonet, Martín García-Castro, Valerie Horsley, †Matthew Rodeheffer

Lecturers Carol Bascom-Slack, Brett Berke, Emile Boulpaep, Iain Dawson, Akiko Iwasaki, Mary Klein, Harvey Kliman, Maria Moreno, Kenneth Nelson, †Aruna Pawashe, Barry Piekos, Mark Saltzman, William Segraves, Joseph Wolenski

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

The major in Biology is offered jointly by the Departments of Ecology and Evolutionary Biology (EEB) and Molecular, Cellular, and Developmental Biology (MCDB), providing students with opportunities to take courses in both departments. There are two principal areas of concentration in the major and two directors of undergraduate studies.

The science of biology is extremely broad, ranging across the domains of molecules, cells, 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 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 pharmaceuticals, the practice of medicine, and the scientific bases for understanding the history and complexity of the environment and the need for its protection.

The major in Biology offers two areas of concentration. Area of concentration I, ecology and evolutionary biology, is intended for students wishing to concentrate in the basic sciences underlying ecological, evolutionary, organismal, computational, conservation, and environmental biology. Area of concentration II, molecular, cellular, and developmental biology, offers programs for students wishing to concentrate on molecular biology and genetics and their applications to problems in cell biology, development, neurobiology, and certain aspects of computational biology. Interdisciplinary opportunities are available within Area II in the biotechnology and neurobiology tracks.

Students who are primarily interested in plant science are invited to consult with an appropriate faculty member.

The Biology major offers opportunities for independent research in both laboratory and field work. With approval, research can be conducted under the supervision of faculty members in any Yale department. Some programs for study abroad are available to Biology majors and are especially appropriate for those in Area I; approved programs can fulfill some of the requirements for the major. Interested students should consult the director of undergraduate studies and the Center for International Experience (www.yale.edu/yalecollege/international).

Students majoring in Biology must take all courses in the major for a letter grade. College seminars do not count toward the requirements of the major. The Biology major should not be taken as one of two majors with Molecular Biophysics and Biochemistry.

Prerequisites The basic science courses required of all Biology majors are MCDB 120a, E&EB 122b, and either MCDB 121La or E&EB 123Lb; CHEM 112a, 113b, or 114a, 115b, or 118a taken with their appropriate laboratories as well as one term of organic chemistry with laboratory (CHEM 124a, 125b, with 126La, 127Lb satisfies both chemistry requirements); two terms of PHYS 170a, 171b or higher; and one term of MATH 115a or b or above, but not MATH 190a. The second term of organic chemistry lecture, CHEM 221a or b or 227a, may be used as an elective in the major. Note that the prerequisites fulfill most of the usual premedical science requirements.

Placement Students who have scored 710 or higher on the SAT subject matter Biology M test, or who have scored 5 on the Advanced Placement test in biology, may be exempt from taking MCDB 120a and its associated laboratory. Students scoring 5 on the Advanced Placement biology test may also be exempt from E&EB 122b and its associated laboratory, but students are not permitted to place out of E&EB 122b and 123Lb using the SAT subject matter test M or E. Students with equivalent scores on one of the corresponding chemistry tests, or who have taken an International Baccalaureate higher-level examination in an

appropriate subject, may also be exempt from taking MCDB 120a, but should first discuss their preparation in biology with the director of undergraduate studies in MCDB.

Acceleration credit awarded in chemistry, mathematics, and physics, or completion of advanced courses in those departments, is accepted instead of the relevant prerequisites for the Biology major. Students who already have mathematics preparation equivalent to MATH 115a or b or higher are encouraged to take additional mathematics, such as MATH 120a or b, 222a or b, or 225a or b.

Placement in chemistry courses is arranged by the Chemistry department. Because the required chemistry courses are prerequisite to a number of biology courses, students are strongly urged to take general and organic chemistry in the freshman and sophomore years. Students who place out of general chemistry should take organic chemistry during their freshman year. Finishing the prerequisites early allows for a more adventurous program in later years.

Requirements of the major Beyond the prerequisites, the B.A. degree requires seven lecture courses or seminars, two laboratories, and the senior requirement (E&EB 470a or b, MCDB 470a or b, E&EB 475a or b, MCDB 475a or b, or the senior essay); the B.S. degree requires seven lecture courses or seminars, two laboratories, and the senior requirement (two terms of E&EB 475a and b or MCDB 475a and b or 485a and 486b). The B.S. degree with an intensive major requires, in addition to the prerequisites, seven lecture courses or seminars, two laboratories, and the senior requirement (E&EB 495a, 496b or MCDB 495a, 496b).

Core requirements for Area I, ecology and evolutionary biology Area I majors are required to take MCDB 202a, STAT 101a or the equivalent, E&EB 220a, and 225b.

Electives for Area I, ecology and evolutionary biology In addition to the four core courses, students must take three electives, one of which must be a course in organismal diversity chosen from E&EB 246b, 250a, 255b, 264a, 272b, or MCDB 290b. Students who wish to take electives from other departments should obtain the approval of the director of undergraduate studies in EEB.

Laboratory requirement Two laboratories beyond the prerequisites are required for the major.

Core requirements for Area II, molecular, cellular, and developmental biology Biology majors in Area II are required to take MCDB 202a, 300a or its equivalent, and either 205b or 210b. (MCDB 210b is not a core course for the biotechnology track.) Equivalents for MCDB 300a are defined as either (a) both MB&B 300a and 301b or (b) MB&B 300a only, if the student took MCDB 120a or 200b prior to MB&B 300a or has the permission of the director of undergraduate studies in MCDB. For this purpose, placing out of MCDB 120a is not the equivalent of having taken MCDB 120a.

Electives for Area II, molecular, cellular, and developmental biology In addition to the prerequisites and core requirements, the standard degree program requires four electives, including three from MCDB (numbered 150 or above), EEB (numbered 140 or above), or MB&B (numbered 200 or above), and one upper-level MCDB elective numbered 350 or higher.

Two laboratories at the 200 level or higher are also required for the standard program, one of which can be selected from courses in EEB or MB&B.

The neurobiology track requires MCDB 320a, one MCDB course numbered 350 or above, and two courses chosen from BENG 410a, CPSC 475b, MCDB 240b, 310a, 315b, 410b, 415b, 425a, 430a, 440b, 460b, PSYC 270b, 376a, and either STAT 101a or PSYC 200b. Other courses may be substituted with the approval of the student's track adviser. (Students should note that PSYC 110a or b is a prerequisite for many psychology courses but does not substitute as an elective in the neurobiology track.) Two laboratories chosen from MCDB courses are also required as electives. Students interested in the neurobiology track should consult an adviser for the track. Advisers whose names are listed followed by "[F]" may be consulted during the fall term.

Neurobiology track advisers: P. Forscher, 222 KBT (432-6344)
H. Keshishian, 640A KBT (432-3478)
E. Stein, 232 KBT (432-8402)
D. Wells, 338A KBT (432-3481)
R. Wyman [F], 610A KBT (432-3475)
W. Zhong [Sp], 616 KBT (432-9233)

The biotechnology track requires MCDB 370b and three courses chosen from any MCDB course numbered 150 or above, MB&B 420a, 421b, 443b, BENG 351a, 352b, 410a, 435b, 457b, 464b, CENG 210a, 411a, 412b, CPSC 437b, 445a, 470a, or 475b. Two laboratories are required: either two from MCDB (including at least one from MCDB 341La or Lb to MCDB 345Lb) or BENG 355La, 356Lb or CENG 412b. Students interested in the biotechnology track should consult an adviser for the track. Advisers whose names are listed followed by "[F]" may be consulted during the fall term.

Biotechnology track advisers: R. Breaker [F], 506 KBT (432-9389)
X. W. Deng, 352B OML (432-8908)
K. Nelson, 710A KBT (432-5013)
J. Wolenski, 330 KBT (432-6912)

Many of the courses in other departments listed immediately above have prerequisites; such prerequisites can be substituted for an upper-level elective with permission of the MCDB director of undergraduate studies.

For all tracks in Area II If both MCDB 205b and 210b are taken, one counts as a core course and the other as an elective. If both MB&B 300a and 301b are taken, one counts as a core course (in place of MCDB 300a) and one as an elective. Two laboratory courses from MCDB 342La, 343La, 344Lb, and 345Lb can be used together as one elective credit. If used as an elective, these laboratories cannot also fulfill the laboratory requirement. 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 director of undergraduate studies. College seminars cannot be substituted for electives.

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 requirements of each track and degree is available in the office of the director of undergraduate studies (122D OML for Area I, 754 KBT for Area II). All students must fill out a checklist of requirements and go over it with the undergraduate registrar, Karen Broderick (Area I) or Crystal Adamchek (Area II), by the spring term of the junior year. For the B.A. degree the requirement can be met in any one of three ways: by submitting a senior essay of fifteen to twenty pages evaluating current research in a field of biology; by successful completion of one term of tutorial work (E&EB 470a or b or MCDB 470a or b); or by successful completion of one term of individual research (E&EB 475a or b or MCDB 475a or b).

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 appropriate director of undergraduate studies 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 director of undergraduate studies by the last day of classes. Students electing this option should obtain an approval form from the office of the director of undergraduate studies.

B.S. degree The requirements for the B.S. degree are the same as for the B.A. degree except for the senior requirement, which differs in its greater emphasis on individual research. The senior requirement is two consecutive terms of E&EB 475a or b or MCDB 475a or b, at least one of which must be taken during the senior year, or MCDB 485a, 486b. Students are expected to spend ten hours per week conducting individual research. Ordinarily, both terms of E&EB 475a or b or MCDB 475a or b are taken during the senior year, but it is possible for a student to begin work toward the senior requirement in the spring of the junior year, continue it over the summer, and complete it during the final year, an arrangement that may be particularly useful for students doing fieldwork. Yale College does not grant academic credit for summer research unless the student is enrolled in an independent research course in Yale Summer Session.

B.S. degree, intensive major Requirements for the B.S. degree with an intensive major are the same as those for the B.A. degree except that students fulfill the senior requirement by taking E&EB 495a, 496b or MCDB 495a, 496b, Intensive Research, which earns four course credits. Seniors in the intensive major are expected to spend twenty hours per week conducting individual research.

It should be noted that the research courses E&EB 475a or b and 495a, 496b and MCDB 475a or b, 485a, 486b, and 495a, 496b exist primarily to fulfill the senior requirement. Some students may wish to take E&EB 475a or b or MCDB 475a or b earlier in their course of study. This contributes to the thirty-six course credits required for graduation, but does not substitute for any of the other requirements of the major including the senior requirement. Students may take up to three credits in E&EB 475a or b and MCDB 475a or b (MCDB 485a, 486b counts as two terms of MCDB 475a or b in this calculation) during their undergraduate career.

Laboratory preparation for research Students concentrating in Area II or with an interest in molecular evolution and who are planning to undertake research are advised to take one or more of the following laboratories first: MCDB 341La or Lb, 342La, 343La, 344Lb, or 345Lb.

Combined 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. Completion in fewer than eight terms is not allowed. The requirements are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree. In addition to the three or four core requirements (depending on track) specified for the standard major, the three or four electives must be graduate-level courses designated "G." One of these is a graduate seminar selected with the approval of the director of undergraduate studies. Students must earn a grade of A or A– in two graduate-level courses and a grade of B– or higher in the rest.
2. Six credits outside the major must be taken in the last two years, and at least two undergraduate courses in the last two terms.
3. In addition to the courses specified above, students must complete two graduate research courses for six course credits: (a) MCDB 585b or E&EB 585b, a two-credit course typically taken in the second term of the junior year. At the start of the course, each student forms a committee comprised of the adviser and two faculty members that meets to discuss the research project. Two of the members of this committee must be members of either the MCDB or EEB faculty, as appropriate to the thesis topic. 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/E&EB 595, a four-credit, yearlong course that is similar to MCDB 495a, 496b and E&EB 495a, 496b 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. Students must apply in writing to the appropriate director of undergraduate studies and obtain departmental approval no later than the beginning of the second term of their junior year. Applications must be submitted by November 1 in the preceding term. Students must have the approval of both the director of undergraduate studies and the director of graduate studies to receive graduate credit for the graduate courses they select.
2. Students must have two-thirds A or A– grades in all of their courses and two-thirds A or A– grades in Biology courses, including prerequisites, in order to be admitted to the program.

Advising Freshmen considering a major in Biology are invited to consult with one of the two directors of undergraduate studies and/or a faculty member in EEB or MCDB who is a fellow of their residential college. Once an area of concentration is chosen, students should find a faculty adviser in the appropriate department. For assistance in identifying a suitable adviser, students should contact the undergraduate registrar, Karen Broderick (Area I) or Crystal Adamchek (Area II). Students in the neurobiology or biotechnology track should consult an adviser for their track (listed above). Students in EEB should consult one of the advisers assigned to their class. The course schedules of all Biology majors (including sophomores intending to major in Biology) must be signed by a faculty member in one of the two participating departments; the signature of the director of undergraduate studies is not required. Students whose regular adviser is on leave can consult the director of undergraduate studies to arrange for an alternate.

Area I, ecology and evolutionary biology

- Class of 2011:* Jeffrey Powell, 170 ESC (432-3887)
Stephen Stearns [Sp], 560 OML (432-8452)
- Class of 2012:* Günter Wagner, 327A OML (432-9998)
David Post, 426B OML (432-3005)
- Class of 2013:* Jeffrey Townsend, 226B OML (432-4646)
Paul Turner, 301A OML (432-5918)
- Class of 2014:* Leo Buss, 326B OML (432-3869)

Area II, molecular, cellular, and developmental biology Any member of the MCDB department can serve as a faculty adviser to majors. College faculty advisers available to freshmen:

- | | |
|--|---|
| BK, J. Wolenski | MC, X. W. Deng, H. Keshishian,
K. Nelson, T. Pollard, F. Slack |
| BR, I. Dawson | PC, J. Carlson, C. Crews |
| CC, M. Mooseker, R. Wyman | SY, C. Jacobs-Wagner, S. Roeder |
| DC, P. Forscher, V. Irish, L. N. Ornston [F],
W. Zhong [Sp] | SM, S. Dellaporta [Sp], D. Kankel,
J. Rosenbaum |
| TD, S. Holley | ES, E. Stein, D. Wells |
| JE, T. Nelson [F], R. Breaker | TC, S. Altman |

REQUIREMENTS OF THE MAJOR

Prerequisites MCDB 120a, E&EB 122b; either MCDB 121La or E&EB 123Lb; CHEM 112a, 113b, or 114a, 115b, or 118a, with labs, and 1 term of organic chem with lab (CHEM 124a, 125b with 126La, 127Lb satisfies both reqs); PHYS 170a, 171b, or above; MATH 115a or b or higher (except MATH 190a); all courses taken for letter grades

Number of courses *B.A.* — 7 courses and 2 labs beyond prereqs taken for letter grades, totaling 8 or 9 course credits, incl senior req; *B.S.* — 7 courses and 2 labs taken for letter grades, totaling 10 course credits, incl senior req; *B.S., intensive major* — 7 courses and 2 labs taken for letter grades, totaling 12 course credits, incl senior req

Specific courses required *Area I: Ecology and evolutionary biology*—STAT 101a or equivalent, E&EB 220a, 225b, MCDB 202a; *Area II: Molecular, cellular, and developmental biology—Standard track*—MCDB 202a, 300a, and either 205b or 210b; *Neurobiology track*—MCDB 202a, 300a, 320a, and either 205b or 210b; *Biotechnology track*—MCDB 202a, 205b, 300a, and 370b

Distribution of courses *Area I: Ecology and evolutionary biology*—3 electives, 1 in organismal diversity; *Area II: Molecular, cellular, and developmental biology—Standard track*—3 electives from EEB numbered 140 or above, MCDB numbered 150 or above, or MB&B numbered 200 or above, and 1 addtl MCDB course numbered 350 or above; *Neurobiology and biotechnology tracks*—3 electives as specified

Substitution permitted *Area II*—1 course relevant to biology in another dept, with DUS permission, except for college sems; higher-level courses for lower-level courses, with approval of adviser or DUS

Senior requirement *B.A.*—MCDB 470a or b, or E&EB 470a or b, or MCDB 475a or b, or E&EB 475a or b, taken in senior year, or senior essay; *B.S.*—2 terms of MCDB 475a or b or E&EB 475a or b, at least 1 in senior year, or MCDB 485a, 486b; *B.S., intensive major*—MCDB 495a, 496b or E&EB 495a, 496b

Because the length of laboratory sessions depends on the particular experiment, the ending times of laboratory courses vary widely. Students should allow several hours for each laboratory.

INTRODUCTORY COURSES WITHOUT PREREQUISITES

*MCDB 060a and 061b, Topics in Reproductive Biology Harvey Kliman

M 2:30–4 SC Fr sem ½ Course cr per term Cr/year only (37)

An introduction to reproductive biology, focused on selected topics in reproductive system development; physiology and endocrinology; sexuality and gender differences; and assisted reproductive technologies. Exploration of primary literature in model system and human reproductive biology. Enrollment limited to freshmen with advanced preparation in biology equivalent to a score of 5 on the Advanced Placement test in Biology. May be applied as an elective toward the Biology major. Students must apply in person by attending the first class meeting.

STAT 101a^G, Introduction to Statistics: Life Sciences Jonathan Reuning-Scherer, Günter Wagner

For description see under Statistics.

MCDB 105a or b/MB&B 105a or b, An Issues Approach to Biology Dieter Söll and staff

MWF 11:35–12:25 SC (0)

Biological concepts taught in context of current societal issues, such as stem cell research and genetically modified organisms. Emphasis on biological literacy to enable students to evaluate scientific arguments.

*MCDB 106a/HLTH 155a, Biology of Malaria, Lyme, and Other Vector-Borne Diseases Alexia Belperron

MW 1–2:15 SC (0)

Introduction to the biology of pathogen transmission from one organism to another by insects; special focus on malaria and Lyme disease. Modes of transmission and establishment of infection; immune responses and the associated challenges to prevention and treatment and the development of vaccines. Intended for non-science majors. Prerequisite: high school biology.

***MCDB 107a, Human Biology** Mitchell Kundel, William Segraves

TTH 2:30–3:45 SC (27)

An introduction to the fundamentals of human anatomy and physiology. Enrollment limited to freshmen and sophomores.

***MCDB 109b, Immunology and Microorganisms** Paula Kavathas

MW 2:30–3:45 SC (RP, O)

Introduction to the human immune system, followed by study of microorganisms such as influenza, HIV, human papilloma virus, *Chlamydia trachomatis*, and commensal bacteria. Discussion of the biology of each organism and interaction with the host immune system, reinforcing principles of immune function. Enrollment limited to freshmen and sophomores.

MCDB 120a, Principles of Molecular, Cellular, and Developmental Biology

John Carlson and staff

MWF 11:35–12:25 SC (34)

Introduction to biochemistry, genetics, cell biology, and development. Emphasis on the cell as the basic unit of life; its composition, functions, replication, and differentiation. Suitable as the first step in any biological sciences major, and also for any student wishing to understand the fundamentals of biology at the molecular and cellular level. This course is a prerequisite to MCDB courses numbered 202 or higher.

MCDB 121La, Laboratory for Principles of Molecular, Cellular, and Developmental Biology Maria Moreno

HTBA SC ½ Course cr (O)

A survey of the experimental techniques used in molecular, cellular, and developmental biology with an emphasis on the utility of model organisms. Exercises in basic molecular biology techniques, protein chemistry, genetic analysis, cell fractionation, microbiology, microscopy and imaging, embryogenesis, and plant and animal development. Concurrently with or after MCDB 120a.

E&EB 122b, Principles of Evolution, Ecology, and Behavior Stephen Stearns

MWF 11:35–12:25 WR, SC (34)

Principles of evolution, ecology, and behavior explained and illustrated by recent advances that have changed the field. Emphasis on major events in the history and key transitions in the organization of life. Ecological processes from organisms through populations and communities to the biosphere. Foraging, mating, and selfish and cooperative behavior placed in evolutionary and ecological context. Recommended preparation: MCDB 120a or equivalent.

E&EB 123La or Lb, Laboratory for Principles of Evolution, Ecology, and Behavior

Marta Martínez Wells and staff

HTBA For sections see www.yale.edu/oci SC ½ Course cr (O)

Experimental approaches to organismal and population biology, including study of the diversity of life. Concurrently with or after E&EB 122b.

E&EB 125b/G&G 125b, History of Life Derek Briggs, Leo Hickey

For description see under Geology & Geophysics.

***MCDB 135b, How the Brain Works** David Wells, Mitchell Kundel

MW 2:30–3:45 SC (0)

For non-science majors. The biology of the brain: gross anatomy of the brain and the cellular components that make up nervous tissue. Neurodegenerative diseases such as Alzheimer's, Parkinson's, and ALS; sensory processing such as vision and pain; psychoactive drugs and their use in treating brain disorders and in recreation. Enrollment limited to freshmen and sophomores.

MCDB 150b^G/HIST 400b, Global Problems of Population Growth Robert Wyman, Fabian Drixler

MW 2:30–3:45, 1 HTBA (37)

The worldwide population explosion in its human, environmental, and economic dimensions. Sociobiological bases of reproductive behavior. Population history and the cause of demographic change. Interactions of population growth with economic development and environmental alteration. Political, religious, and ethical issues surrounding fertility; human rights and the status of women.

E&EB 160a, Diversity of Life Staff

MWF 11:35–12:25 SC (34)

A survey of the diversity of organisms on Earth with a focus on their evolutionary history, biology, and adaptations to their environment.

INTERMEDIATE EEB COURSES

E&EB 220a^G/EVST 223a, General Ecology David Post

MWF 10:30–11:20 SC (33)

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 112a or b or equivalent.

E&EB 225b^G, Evolutionary Biology Antonia Monteiro, Jeffrey Townsend

TTH 11:35–12:50 SC (24)

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. Recommended preparation: E&EB 122b.

E&EB 226Lb^G, Laboratory for Evolutionary Biology Gisella Caccone

W 1:30–4:30 SC ½ Course cr (0)

The companion laboratory to E&EB 225b. Patterns and processes of evolution, including collection and interpretation of molecular and morphological data in a phylogenetic

context. Focus on methods of analysis of species-level and population-level variation in natural populations. Concurrently with or after E&EB 225b or with permission of instructor.

E&EB 228b^G, Ecology and Evolution of Infectious Diseases Paul Turner

TTH 10:30–11:20, 1 HTBA SC (o)

Overview of the ecology and evolution of pathogens (bacteria, viruses, protozoa) and their impact on host populations. Topics include theoretical concepts, ecological and evolutionary dynamics, molecular biology, and epidemiology of ancient and emerging diseases. Prerequisite: E&EB 122b or permission of instructor.

***E&EB 235a, Evolution and Medicine** Stephen Stearns

MWF 11:35–12:25 SC (34)

Survey of evolutionary insights that make important differences in medical research and clinical practice, including evolutionary mechanisms and the medical issues they affect. Individual genetic variation in susceptibility; evolutionary conflicts and tradeoffs in reproductive medicine; the evolution of antibiotic resistance and virulence in pathogens; emerging diseases; the evolution of aging; cancer as an evolutionary process. After MCDB 120a or E&EB 122b, or with permission of instructor.

E&EB 246b, Plant Diversity and Evolution Staff

MW 1–2:15 SC (o)

Introduction to the evolutionary relationships of plant lineages. The complexity, diversity, and characteristics of the major plant groups, including the green algae, mosses, ferns, conifers, and flowering plants, within a phylogenetic context. To be taken concurrently with E&EB 247Lb. Prerequisite: a general understanding of introductory biology and evolution.

E&EB 247Lb, Laboratory for Plant Diversity and Evolution Staff

T 1–4 SC ½ Course cr (o)

Local flora field research; hands-on experience with the plant groups examined in the accompanying lectures. To be taken concurrently with E&EB 246b.

E&EB 250a^G, Biology of Terrestrial Arthropods Marta Martínez Wells

TTH 11:35–12:50 SC (24)

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). After E&EB 122b.

E&EB 251La^G, Laboratory for Biology of Terrestrial Arthropods Marta Martínez Wells

W 1:30–4:30 SC ½ Course cr (o)

Comparative anatomy, dissections, identification, and classification of terrestrial arthropods; specimen collection; field trips. Concurrently with or after E&EB 250a.

E&EB 255b^G, Invertebrates I Leo Buss

MW 11:35–12:50 SC (34)

A systematic treatment of the invertebrate phyla, with emphasis on anatomy, functional organization, and evolutionary history. After E&EB 122b or G&G 125b or with permission of instructor.

E&EB 256Lb^G, Laboratory for Invertebrates I Leo Buss

W 1:30–4:30 SC ½ Course cr (o)

Study of the anatomy of representative living invertebrates accompanied by examination of museum specimens of living and fossil invertebrates. Concurrently with E&EB 255b.

E&EB 264a^G, Ichthyology Thomas Near

MWF 1:30–2:20 SC (36)

A survey of fish diversity, including jawless vertebrates, chimaeras and sharks, lungfishes, and ray-finned fishes. Topics include the evolutionary origin of vertebrates, the fossil record of fishes, evolutionary diversification of major extant fish lineages, biogeography, ecology, and reproductive strategies of fishes.

E&EB 265La^G, Laboratory for Ichthyology Thomas Near

T 1:30–4:30 SC ½ Course cr (26)

Laboratory and field studies of fish diversity, form, function, behavior, and classification. The course primarily involves study of museum specimens and of living and fossil fishes. Concurrently with E&EB 264a.

E&EB 272b^G, Ornithology Richard Prum

MWF 9:25–10:15 SC (32)

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.

***E&EB 273Lb^G, Laboratory for Ornithology** Richard Prum

T 1:30–4:30 SC ½ Course cr (o)

Laboratory and field studies of avian morphology, diversity, phylogeny, classification, identification, and behavior.

***E&EB 275a^G/EVST 400a, Biological Oceanography** Mary Beth Decker

For description see under Environmental Studies.

ADVANCED EEB COURSES***E&EB 310b^G, Evolutionary Genetics** Jeffrey Powell

TH 2:30–4:30 (o)

Introduction to population genetics and phylogenetics. Theoretical fundamentals and empirical data, with an emphasis on molecular aspects. After MCDB 200b, STAT 101a, E&EB 225b, or with permission of instructor.

***E&EB 390a^G, Evolution of Development** Antonia Monteiro

TTH 9–10:15 SC (o)

An introduction to the ways that developmental mechanisms change through time to give rise to organismal diversity. Topics include how mutations influence the processes of gene regulation, tissue growth, and cell and organ differentiation.

***E&EB 460b^G, Studies in Evolutionary Medicine I** Stephen Stearns and staff

TTH 4–5:15 SC (o)

Principles of evolutionary biology applied to issues in medical research and practice, such as lactose and alcohol tolerance; the “hygiene hypothesis”; genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; the

evolution of aging; the ecology and evolution of disease; and the emergence of new diseases. Students develop proposals for research to be conducted during the summer. Admission by competitive application; forms are available on the EEB Web site.

***E&EB 461a^c, Studies in Evolutionary Medicine II** Paul Turner

TTH 4–5:15 SC (o)

Continuation of E&EB 460b. Prerequisite: E&EB 460b or with permission of instructor.

EEB RESEARCH AND TUTORIALS

***E&EB 470a or b, Tutorial** Marta Martínez Wells

HTBA (o)

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. The proposal must be submitted by Wednesday, September 8, for the fall term and Wednesday, January 19, for the spring term. The final paper is due in the hands of the director of undergraduate studies by Friday, December 10, for the fall term and Monday, April 25, for the spring term. 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 will count as an elective for the major. Normally, faculty sponsors must be members of the EEB department. One term of this course fulfills the senior requirement for the B.A. degree if taken in the senior year.

***E&EB 475a or b, Research** Marta Martínez Wells

HTBA (o)

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 Classes server, 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 Wednesday, September 8, for the fall term and Wednesday, January 19, for the spring term. The final research paper is due in the hands of the director of undergraduate studies by Friday, December 10, for the fall term and Monday, April 25, for the spring term. Fulfills the senior requirement for the B.A. degree if taken in the senior year.

***E&EB 495a and 496b, Intensive Senior Research** Marta Martínez Wells

HTBA 2 Course cr per term Cr/year only (o)

Two terms of intensive original research during the senior year under the sponsorship of a faculty member. Similar to other research courses except that a more substantial portion of the student's time should be spent on the research project (an average of twenty hours per

week). A research proposal approved by the sponsoring faculty member must be submitted to the director of undergraduate studies by September 8, using the form available from the office of undergraduate studies or from the Classes server. Interim oral reports and a final written research paper are required. The final paper is due Monday, April 25. Fulfills the senior requirement and leads to the B.S. degree with an intensive major.

MCDB COURSES

MCDB 120a or 200b is a prerequisite for courses numbered 202 and above.

MCDB 200b, Molecular Biology Stephen Dellaporta and staff

MWF 11:35–12:50 SC (34)

A study of the central dogma and fundamental principles of molecular biology, including a detailed discussion of model organisms and experimental methodologies in biological research. Topics include chemistry of biological macromolecules, DNA and RNA structure and function, chromosome and genome organization, transcriptional and translational regulation, microRNAs, protein structure and function, genomics, and bioinformatics. Designed to provide an accelerated venue for MCDB majors entering the department's core curriculum. Prerequisite: score of 5 on the Advanced Placement test in Biology or permission of instructor.

MCDB 201Lb, Molecular Biology Laboratory Maria Moreno

HTBA For sections see www.yale.edu/oci WR, SC ½ Course cr (RP, o)

Basic molecular biology training in a project-based laboratory setting. Experiments analyze gene function through techniques of PCR, plasmid and cDNA cloning, DNA sequence analysis, and protein expression and purification. Instruction in experimental design, data analysis, and interpretation. For freshmen and sophomores. Concurrently with or after MCDB 200b. Special registration procedures apply. Interested students must contact the instructor and attend an organizational meeting during the first week of classes.

MCDB 202a, Genetics Shirleen Roeder and staff

TTH 11:35–12:50 SC (o)

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.

MCDB 203La, Laboratory for Genetics Iain Dawson and staff

HTBA For sections see www.yale.edu/oci SC ½ Course cr (o)

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, mutagenesis and mutant analysis, recombination and gene mapping, isolation and manipulation of DNA, and DNA sequence analysis. Concurrently with or after MCDB 202a.

MCDB 205b, Cell Biology Thomas Pollard and staff

TTH 9–10:15 SC (22)

A comprehensive introductory course in cell biology. Emphasis on the general principles that explain the molecular mechanisms of cellular function.

MCDB 210b, Developmental Biology Vivian Irish and staff

MW 9–10:15 SC (0)

Cellular differentiation and its genetic and molecular control; fertilization, cleavage, and morphogenesis of plants and animals; polarity and positional information; organogenesis and development of specialized tissues; evolution and development.

***MCDB 230b/MB&B 230b, Rain Forest Expedition and Laboratory** Scott Strobel and staff

For description see under Molecular Biophysics & Biochemistry.

MCDB 240b, Biology of Reproduction Hugh Taylor, Mary Klein

MWF 10:30–11:20 SC (33)

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. Prerequisite: MCDB 120a, score of 5 on the Advanced Placement test in Biology, or score of 710 or above on the SAT Biology M test.

MCDB 241Lb, Laboratory for Biology of Reproduction and Development Mary Klein

TTH 1:30–5 SC ½ Course cr (26)

Laboratory investigation of reproductive and developmental processes. Emphasis on mammalian reproduction and embryonic development in classic vertebrate and invertebrate systems. Topics include gametogenesis, ovulation, hormonal control of reproduction, and investigation of embryogenesis in the frog and the fruit fly, *Drosophila*. Enrollment limited. Concurrently with or after MCDB 240b or 210b. Not open to freshmen. Special registration procedures apply; students must consult the instructor prior to the first week of classes.

MCDB 290b, Microbiology Christine Jacobs-Wagner, Carol Bascom-Slack

TTH 1–2:15 SC (26)

Cell structure of microorganisms, bacterial genetics, microbial evolution and diversity, microbial development, microbial interaction, chemotaxis and motility, gene regulation, microbial genomics, host defense systems, infectious diseases, viruses, and biological weapons. After CHEM 220a or b, 221a or b, and one term of biochemistry, or with permission of instructor.

MCDB 291Lb, Laboratory for Microbiology Iain Dawson

TTH 2:30–5:30 SC ½ Course cr (0)

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 290b.

MCDB 300a^G/MB&B 200a, Biochemistry L. Nicholas Ornston and staff

MWF 9:25–10:15 SC (32)

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. After one term of organic chemistry.

MCDB 301La or Lb/MB&B 251La or Lb, Laboratory for Biochemistry

William Konigsberg, Aruna Pawashe

For description see under Molecular Biophysics & Biochemistry.

MCDB 310a^G/BENG 350a^G, Physiological Systems Mark Saltzman, Emile Boulpaep, and staff

For description see under Biomedical Engineering.

MCDB 315b, Biological Mechanisms of Reaction to Injury Michael Kashgarian, Joseph Madri, and staff

TTH 11:35–12:50 SC (RP, 24)

Human biology and disease as a manifestation of reaction to injury. Organ structure and function, cell injury, circulatory and inflammatory responses, disordered physiology, and neoplasia. Enrollment limited; preference to junior and senior majors in MCDB or MB&B. Prerequisite: MCDB 205b, 300a, or 310a.

MCDB 320a^G, Neurobiology Haig Keshishian, Paul Forscher

MWF 11:35–12:25 SC (34)

The excitability of the nerve cell membrane as a starting point for the study of molecular, cellular, and intercellular mechanisms underlying the generation and control of behavior. After a year of chemistry; a course in physics is strongly recommended.

MCDB 321La^G, Laboratory for Neurobiology Haig Keshishian, Robert Wyman

TW 1:30–4:30 SC ½ Course cr (50)

Optional laboratory. Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy. Concurrently with or after MCDB 320a.

***MCDB 341La or Lb, Laboratory in Electron Microscopy** Barry Piekos

HTBA For sections see www.yale.edu/oci SC ½ Course cr (RP, 50)

Techniques in light and electron microscopy. Enrollment limited; preference given to Biology and MB&B majors; students must devote two to three additional laboratory hours per week. Students should contact the instructor prior to the first week of classes. After or concurrently with MCDB 205b.

***MCDB 342La, Laboratory in Nucleic Acids I** Kenneth Nelson

TTH 1:30–4:30 SC ½ Course cr (0)

A project from a research laboratory within the MCDB department, using many of the technologies from molecular and cell biology. Laboratories meet twice a week for the first half of the term. With or after MCDB 202a, 205b, or 300a. Enrollment limited. Special registration procedures apply. Students must consult the instructor prior to the first week of classes.

***MCDB 343La, Laboratory in Nucleic Acids II** Kenneth Nelson

TTH 1:30–4:30 SC ½ Course cr (0)

Continuation of MCDB 342La to more advanced methods and techniques in molecular and cell biology, including projects such as making and screening cDNA libraries or microarray screening and analysis. Laboratories meet twice a week for the second half of the term. Prerequisite: MCDB 342La or permission of instructor. Enrollment limited. Special registration procedures apply; students must consult the instructor prior to the first week of classes.

***MCDB 344Lb, Experimental Techniques in Cellular Biology** Joseph Wolenski

MW 1:30–6:30 SC ½ Course cr (36)

A problems-based approach to questions in cell and molecular biology, with emphasis on experimental strategies and techniques. Topics include SDS-PAGE, immunoblots, column chromatography, mammalian cell culture, cell fractionation, phase contrast microscopy, confocal microscopy, drug studies, bacterial cultures, and methods of transfection and transformation. Prepares for MCDB 475a or b or 485a, 486b or 495a, 496b. Enrollment limited to 18. Meets during January and February. Prerequisite: MCDB 205b. Special registration procedures apply; students must contact the instructor 10 to 12 months in advance.

***MCDB 345Lb, Experimental Strategies in Cellular Biology** Joseph Wolenski

MW 1:30–6:30 SC ½ Course cr (36)

Continuation of MCDB 344Lb, with increased emphasis on experimental design and interpretation of data. Research projects involving protein purification are semi-independent. Focus on developing an independent research project in modern biomedical research. Students participate in journal discussions, formal seminars, and presentations of data to peers. Prepares for MCDB 475a or b or 485a, 486b or 495a, 496b. Enrollment limited. Meets during March and April. Prerequisite: MCDB 344Lb. Special preregistration procedures apply; students must contact the instructor by October of the fall term for spring registration.

MCDB 361b^G/AMTH 465b, Systems Modeling in Biology Thierry Emonet and staff

TTH 2:30–3:45 QR, SC (0)

Introduction to the techniques of integrating mathematics, physics, and engineering into the analysis of complex living systems. Use of these techniques to address questions about the design principles of biological systems. Discussion of experiments and corresponding mathematical models. Students build their own models using MATLAB.

MCDB 370b^G, Biotechnology Xing-Wang Deng and staff

MW 11:35–12:50 SC (34)

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 200b or 202a or 300a.

***MCDB 387b, The Eukaryotic Cell Cycle** Iain Dawson

HTBA For sections see www.yale.edu/oci SC (0)

The regulation and coordination of the eukaryotic cell cycle examined by means of a detailed critique of primary literature. Particular attention to the processes of development, differentiation, and oncogenic disease. Enrollment limited, with preference to juniors and seniors. Prerequisite or corequisite: MCDB 202a or 205b. Electronic permission key required. Students must contact the instructor prior to the first week of classes.

[MCDB 410b^G, Molecular Basis of Development]

MCDB 415b^G, Cellular and Molecular Physiology Emile Boulpaep, Frederick Sigworth

MWF 9:25–10:15 SC (32)

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 205b, 310a, 320a, or permission of instructor.

MCDB 425a^G/MB&B 425a^G, Basic Concepts of Genetic Analysis Tian Xu and staff

For description see under Molecular Biophysics & Biochemistry.

MCDB 430a^G, Biology of the Immune System Akiko Iwasaki and staff

MWF 9:25–10:15 SC (32)

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, HIV/AIDS. After MCDB 300a.

***MCDB 440b^G, Brain Development and Plasticity** Weimin Zhong, Elke Stein

MW 2:30–3:45 SC (37)

Recent advances in scientific understanding of brain development and plasticity, including neuronal determination, axon guidance, synaptogenesis, and developmental plasticity. Prerequisite: MCDB 320a or permission of instructor.

MCDB 441b/EVST 441b/F&ES 441b/G&G 440b^G, Methods in Geomicrobiology

Ruth Blake

For description see under Geology & Geophysics.

MCDB 452b^G/MB&B 452b^G, Bioinformatics: Practical Application of Simulation and Data Mining Mark Gerstein

For description see under Molecular Biophysics & Biochemistry.

***MCDB 460b^G, Cell Biology of the Neuron** Elke Stein

TTH 4–5:15 SC (o)

A comprehensive course in neuronal cell biology. Principles of cell biology reviewed in the context of the developing nervous system. Discussion topics include membrane trafficking, receptor mechanisms, neurotrophin signaling, neuronal cytoskeleton, axon guidance, and synapse formation and maintenance. Prerequisite: a course in cell biology.

***MCDB 470a or b, Tutorial** Douglas Kankel

HTBA (o)

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. This is intended to be a supplementary course and, therefore, to have weekly or biweekly discussion meetings between the student and the sponsoring faculty member. To register, the student must prepare a form, available in the office of the director of undergraduate studies, and a written plan of study with bibliography, approved by the adviser. The form and proposal must be uploaded to the Classes server or submitted to the course instructor in 754 KBT by Friday, September 10, for the fall term and Tuesday, January 18, for the spring term. The final paper is due in the hands of the sponsoring faculty member, with a copy to the course instructor, by the beginning of reading period. 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 will count as an elective for the major. One term of this course fulfills the senior requirement if taken in the

senior year. Additional sections offered in Beijing, China, under the supervision of Xing-Wang Deng. See under Peking University–Yale University Joint Undergraduate Program.

***MCDB 475a or b, Research** Xing-Wang Deng and staff

HTBA (o)

Research projects under faculty supervision, ordinarily taken to fulfill the senior requirement. This course may be taken before the senior year, but it cannot substitute for other requirements. Students are expected to spend approximately ten hours per week in the laboratory, and to make presentations to students and advisers at monthly section meetings. Written assignments include a short research proposal summary at the beginning of the term, approved by the Yale faculty sponsor and the instructor in charge of the course. A final research report is required at the end of the term. Seniors taking this course to fulfill the senior requirement must give an oral presentation of their research at the end of the term. 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 485a, 486b. Students should line up a research laboratory during the term preceding the research. Guidelines for the course should be obtained from the office of the director of undergraduate studies or downloaded from the Classes server. Written proposals are due Friday, September 10, for the fall term and Tuesday, January 18, for the spring term. One term of this course fulfills the senior requirement if taken in the senior year. Additional sections offered in Beijing, China, under the supervision of Xing-Wang Deng. See under Peking University–Yale University Joint Undergraduate Program.

***MCDB 485a and 486b, Research in Biology** Mark Mooseker

HTBA Cr/year only (o)

Individual two-term laboratory research projects under the supervision of a faculty member. Students are expected to spend ten to twelve hours per week in the laboratory, and to make presentations to students and advisers at monthly discussion groups. 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 should be obtained from the office of the director of undergraduate studies or downloaded from the Classes server. Written proposals are due Friday, September 10, 2010. Fulfills the senior requirement if taken in the senior year. Additional sections offered in Beijing, China, under the supervision of Xing-Wang Deng. See under Peking University–Yale University Joint Undergraduate Program.

***MCDB 495a and 496b, Intensive Research in Biology** Mark Mooseker

HTBA 2 Course cr per term Cr/year only (o)

Qualified students may undertake directed research in some field of biology during the senior year. Before registering for this course, the student must be accepted for a research project 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 are covered in detail in an information sheet that students should obtain from the office of the director of undergraduate studies early in the final term of the junior year. A written proposal must be submitted by Friday, September 10, 2010. Fulfills the senior requirement if taken in the senior year.

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 online bulletin of the Graduate School and many are posted at <http://bbs.yale.edu>. Additional information is available from the directors of undergraduate and graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

Biomedical Engineering

Director of undergraduate studies: James Duncan, N309 D TAC, 785-2427, 313 MEC, 432-9917, james.duncan@yale.edu

FACULTY OF THE DEPARTMENT OF BIOMEDICAL ENGINEERING

Professors Richard Carson, R. Todd Constable, James Duncan (*Electrical Engineering*), Laura Niklason, Douglas Rothman, Mark Saltzman (*Chemical Engineering*), Frederick Sigworth, Steven Zucker (*Computer Science*)

Associate Professors Robin de Graaf, Tarek Fahmy, Fahmeed Hyder, Themis Kyriakides, Evan Morris, Xenophon Papademetris, Lawrence Staib (*Electrical Engineering*), Hemant Tagare (*Electrical Engineering*)

Assistant Professors Rong Fan, Anjelica Gonzalez, Michael Levene, Kathryn Miller-Jensen, Smita Sampath, Erik Shapiro

Lecturer Jeremy Blum

Engineering methods and strategies are used to address important biomedical problems ranging from studies of physiological function using images to the development of artificial organs and new biomaterials. The major in Biomedical Engineering is designed to provide students with an understanding of the common methodologies that underlie many of these problems as well as the ability to develop quantitative approaches to understanding one of three biomedical engineering fields in more detail.

The flexible course structure of the major permits students to understand and bridge basic concepts in the life sciences and at least one of the traditional engineering disciplines offered at Yale, while also gaining a comprehensive understanding of biomedical engineering as a field of study.

Requirements of the major The B.S. degree program in Biomedical Engineering offers three tracks: the bioimaging track, the biomechanics track, and the molecular engineering track.

During the freshman year, students study basic mathematics, chemistry, and biology. By the end of the sophomore year, they have taken physics, ENAS 194a or b, and BENG 350a, Physiological Systems. In the junior year, students obtain a comprehensive grounding in the field through taking BENG 351a and 352b, Biomedical Engineering I and II, and BENG 355La and 356Lb, Biomedical Engineering Laboratory, as well as an elective in one of the three areas of concentration in order to prepare for more advanced work. During the remainder of the junior and senior years, students acquire depth in one of the three areas of concentration. A senior seminar and a senior project permit students to gain practical, detailed information about their chosen area of concentration.

The following courses are prerequisite to the major for students in all tracks: MCDB 120a; CHEM 112a, 114a, or 118a; ENAS 194a or b; MATH 112a or b, 115a or b; MATH 120a or b or ENAS 151a or b; PHYS 180a, 181b, 205La or Lb, and 206La or Lb (or 165La and 166Lb, with permission of the director of undergraduate studies).

Students must complete ten term courses, totaling at least nine course credits, beyond the prerequisites, including at least three required courses in the chosen track, both terms of the Biomedical Engineering Laboratory (BENG 355La, 356Lb), and the two-term senior requirement.

All students in the major are required to take the following three term courses and one yearlong laboratory sequence: BENG 350a, 351a, 352b, and 355La, 356Lb. Students in the *bioimaging track* must also take three courses chosen from EENG 310b, BENG 410a, 421b, 436b, 445a, 449b, or 475b. Students in the *biomechanics track* must also take three courses chosen from MENG 185b, 280a, 361a, BENG 410a, 434a, or 457b. Students in the *molecular engineering track* must also take three courses chosen from BENG 410a, 434a, 435b, 464b, MENG 361a, or MB&B 300a. Any relevant course may be substituted with the permission of the director of undergraduate studies. By the end of senior year, two courses in the life sciences must have been included among the prerequisite and required courses for the major.

Senior requirement In their senior year, all students must complete a one-term senior project in their final term of enrollment (BENG 471a or 472b) and the senior seminar (BENG 480a).

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

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 courses in any one of the tracks after consultation with the director of undergraduate studies.

REQUIREMENTS OF THE MAJOR

Prerequisites MCDB 120a; CHEM 112a, 114a, or 118a; ENAS 194a or b; MATH 112a or b, 115a or b; MATH 120a or b or ENAS 151a or b; PHYS 180a, 181b, and 205La or Lb, 206La or Lb (or 165La, 166Lb with DUS permission)

Number of courses 10 term courses, totaling at least 9 course credits, beyond prereqs (incl senior req)

Distribution of courses 2 courses in life sciences among prereq and req courses

Specific courses required *All tracks*—BENG 350a, 351a, 352b, 355La, 356Lb; *Bioimaging track*—3 from EENG 310b, BENG 410a, 421b, 436b, 445a, 449b, or 475b; *Biomechanics track*—3 from MENG 185b, 280a, 361a, BENG 410a, 434a, or 457b; *Molecular engineering track*—3 from BENG 410a, 434a, 435b, 464b, MENG 361a, or MB&B 300a

Substitution permitted Relevant course with DUS permission

Senior requirement Senior project in final term (BENG 471a or 472b) and senior sem (BENG 480a)

[BENG 100b, Frontiers of Biomedical Engineering]

BENG 350a^c/MCDB 310a^c, Physiological Systems Mark Saltzman, Emile Boulpaep, and staff

MWF 9:25–10:15 SC (32)

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 113b or 115b, or PHYS 180a and 181b; MCDB 120a.

BENG 351a/CENG 351a, Biomedical Engineering I: Quantitative Physiology

Tarek Fahmy

TTH 11:35–12:50 QR, SC (24)

Together with the companion course BENG 352b, a yearlong presentation of the fundamentals of biomedical engineering. Demonstration of the use of engineering analysis and synthesis in problems in the life sciences and medicine; focus on modeling of molecular physiological processes and design of artificial organs. Lectures are coordinated with BENG 350a to illustrate how engineering analysis can be used to understand physiological processes. Additional topics include pharmacokinetics, heat and mass transfer in physiological systems, hemodialysis, drug delivery, and tissue engineering. Concurrently with BENG 350a. Prerequisites: MCDB 120a, CHEM 112a, 114a, or 118a; PHYS 180a, 181b; MATH 115a or b; ENAS 194a or b.

BENG 352b/EENG 352b, Biomedical Engineering II

James Duncan, Fahmeed Hyder

TTH 11:35–12:50 QR, SC (24)

In conjunction with BENG 351a, a comprehensive introduction to the field of biomedical engineering. Topics include biosignals, medical imaging, mathematical modeling of biosystems, and biomechanics. Prerequisites: PHYS 180a and 181b, MATH 115a or b, and ENAS 194a or b.

BENG 355La and 356Lb, Biomedical Engineering Laboratory

Lawrence Staib, Michael Levene

HTBA SC ½ Course cr per term (0)

Introduction to laboratory techniques and tools used for physiological measurement in biomedical engineering. Topics include bioelectric measurement, bioimaging technologies, signal processing, and dialysis. Enrollment limited.

BENG 405b^c/EVST 415b, Biotechnology and the Developing World Jeremy Blum

TTH 9–10:15 (0)

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. Prerequisites: MCDB 120a.

***BENG 410a, Physical and Chemical Basis of Bioimaging and Biosensing**

Douglas Rothman, Frederick Sigworth

TTH 1–2:15 QR, SC (26)

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 351a and 352b or permission of instructor.

BENG 411b^c, Biomedical Microtechnology and Nanotechnology Rong Fan

TTH 10:30–11:20, 1 HTBA (0)

Principles and applications of micro- and nanotechnologies for biomedicine. Approaches to fabricating micro- and nanostructures. Fluid mechanics, electrokinetics, and molecular transport in microfluidic systems. Integrated biosensors and microTAS for laboratory medicine and point-of-care uses. High-content technologies, including DNA, protein microarrays, and cell-based assays for differential diagnosis and disease stratification. Emerging nanobiotechnology for systems medicine. Prerequisites: CHEM 112a, 114a, or 118a, and ENAS 194a or b.

***BENG 421b^c, Fundamentals of Medical Imaging** R. Todd Constable

MW 11:35–12:50 QR, SC (34)

The physics of image formation, with special emphasis on techniques with medical applications. Emphasis on concepts common to different types of imaging, along with understanding how information is limited by physical phenomena. Topics include mathematical concepts of image analysis; formation of images by ionizing radiation; ultrasound; NMR and other energy forms; and methods of evaluating image quality. Prerequisites: ENAS 194a or b, and PHYS 180a, 181b, or 200a, 201b, or permission of instructor.

BENG 434a, Biomaterials Anjelica Gonzalez

TTH 9–10:15 SC (22)

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 113b or 115b; organic chemistry recommended.

BENG 435b^c, Biomaterial-Tissue Interactions Themis Kyriakides

MW 2:30–3:45 SC (37)

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 112a, 114a, or 118a, and MCDB 120a, or equivalents.

[BENG 436b^c, Biophotonics and Optical Microscopy]**BENG 445a^c/EENG 445a^c, Biomedical Image Processing and Analysis**

James Duncan, Lawrence Staib

MW 4–5:15 (37)

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: EENG 310b or permission of instructors. Recommended preparation: familiarity with probability theory.

BENG 449b^c, Biomedical Data Analysis Richard Carson

MWF 9:25–10:15 QR (32)

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 120a or b or ENAS 151a or b. After or concurrently with ENAS 194a or b.

BENG 457b^c/MENG 457b, Biomechanics Staff

TTH 2:30–3:45 QR, SC (RP, 27)

An introduction to the application of mechanical engineering principles to biological materials and systems. Topics include ligament, tendon, bone, muscle; joints, gait analysis; exercise physiology. The basic concepts are directed toward an understanding of the science of orthopedic surgery and sports medicine. Prerequisites: MENG 280a and 383a or permission of instructor.

BENG 464b, Tissue Engineering Laura Niklason

HTBA SC 1½ Course cr (o)

Introduction to the major aspects of tissue engineering, including materials selection, scaffold fabrication, cell sources, cell seeding, bioreactor design, drug delivery, and tissue characterization. Class sessions include lectures and hands-on laboratory work. Prerequisite: CHEM 112a, 114a, or 118a. Recommended preparation: organic chemistry.

***BENG 471a and 472b, Special Projects** James Duncan

HTBA (o)

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 is usually taken during the spring term of the senior year but with permission of the director of undergraduate studies can be taken any time during a student's career, and may be taken more than once. Permission of both the instructor and the director of undergraduate studies is required.

BENG 475b^c/CPSC 475b^c, Computational Vision and Biological Perception

Steven Zucker

For description see under Computer Science.

***BENG 480a^c, Seminar in Biomedical Engineering** Xenophon Papademetris

HTBA (o)

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.

***BENG 485b^c, Fundamentals of Neuroimaging** Fahmeed Hyder, Douglas Rothman

TH 3:30–5:30 SC (o)

The neuroenergetic and neurochemical basis of several dominant neuroimaging methods, including fMRI. Topics include technical aspects of different methods, interpretation of results, and controversies or challenges regarding the application of fMRI and related methods in medicine.

Biophysics

(*See under Molecular Biophysics and Biochemistry.*)

British Studies

(COURSES AT THE PAUL MELLON CENTRE IN LONDON)

During the spring term, the Yale-in-London program at the Paul Mellon Centre for Studies in British Art, located in central London, offers four courses in British studies covering British history, history of art or architecture, literature, and drama. Courses taught at the Paul Mellon Centre must be taken for a letter grade. Further information and application forms are available at http://ycba.yale.edu/education/edu_yil.html. Inquiries may also be directed to yaleinlondon@yale.edu. The application deadline for spring term 2011 is Friday, October 8, 2010. Students will be notified of acceptance within one month of the application deadline. Inquiries about the summer program, described in chapter I, should be directed to the same address. Applications for summer 2011 are due Friday, January 14, 2011.

***BRST 177b, British Art and Landscape** Martin Postle

HTBA HU (o)

The role of visual art in articulating cultural, literary, political, and environmental approaches to the landscape of the British Isles in the period from 1660 to 1860. Artists include Jan Siberechts, George Lambert, Thomas Gainsborough, Richard Wilson, J. M. W. Turner, and John Constable.

***BRST 178b, Portraiture in Literature and the Visual Arts** Jill Campbell

HTBA HU (o)

Forms of portraiture in literary works and the visual arts from the Renaissance to the twentieth century. What a period's conventions of portraiture suggest about the meaning of personal identity; techniques used by the portraitist to indicate the individuality of a subject; how interests in the individuality of historical persons are balanced with elements of typical or generic identity; new forms in the eighteenth century that reflect an emerging interest in suppositional or fictional persons; the use of different materials and media.

***BRST 179b, Literature and the Sense of Place** Jill Campbell

HTBA HU (o)

The employment of setting in works of literature; literary references to actual features of the natural and man-made world, with particular attention to London. Fictional works that set imaginary events and people in places that can be remembered, seen, traveled to, or inhabited. The effects of references to well-known places on readers and would-be writers who live in other places, such as colonies or former colonies of England or France.

***BRST 322b, Politics and Society in Great Britain, 1688–1832** Staff

HTBA HU (o)

Political and cultural aspects of the “long eighteenth century.” Oligarchical structures; the rule of property; the American and French revolutions; problems presented by Ireland and India; marriage, divorce, and notions of gender; crime; religious movements; the advance of consumerism; and the “culture of politeness.”

Chemical Engineering

Director of undergraduate studies: Paul Van Tassel, 304 ML, 432-7983,
paul.vantassel@yale.edu

FACULTY OF THE DEPARTMENT OF CHEMICAL ENGINEERING

Professors Eric Altman, †Gaboury Benoit, †Stephen Edberg, Menachem Elimelech, Abbas Firoozabadi (*Adjunct*), †Thomas Graedel, Gary Haller, †Edward Kaplan, Michael Loewenberg, Robert McGraw (*Adjunct*), Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, †James Saiers, †Mark Saltzman, †Udo Schwarz, T. Kyle Vanderlick, Paul Van Tassel, †Kurt Zilm

Associate Professors †Michelle Bell, Yehia Khalil (*Adjunct*), William Mitch, Jordan Peccia

Assistant Professors †Eric Dufresne, †Tarek Fahmy, Chinedum Osuji, André Taylor, Corey Wilson, †Julie Zimmerman

Lecturer James Wallis

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

Energy, the environment, and health care represent some of the greatest 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 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; practice engineering toward the benefit of humankind.

Students considering a chemical engineering major are encouraged to take two terms of chemistry and mathematics during the freshman year, and to contact the director of undergraduate studies.

Requirements of the major Two degree programs are offered: a B.S. in Chemical Engineering accredited by the Engineering Accreditation Commission of ABET, Inc., and a B.S. in Engineering Sciences (Chemical).

Prerequisites Students in both degree programs take the following prerequisite courses: MATH 112a or b, 115a or b, and ENAS 151a or b or equivalent; PHYS 180a, 181b; CHEM 114a, 115b, and 116La, or CHEM 118a; ENAS 130b. Students with advanced high school preparation may reduce the number of prerequisites.

B.S. degree program in Chemical Engineering The curriculum for the ABET-accredited B.S. degree in Chemical Engineering includes the following required courses beyond the prerequisites:

1. Mathematics: ENAS 194a or b or equivalent
2. Chemistry: CHEM 220a or b or 225b; 221a or b or 227a; 332a, 333b, and 330La
3. Engineering science: MENG 361a and three term courses chosen from engineering electives
4. Chemical engineering: CENG 210a, 300a, 301b, 315b, 411a, 412b, 480a

Senior requirement In their senior year students must pass CENG 416b, Chemical Engineering Process Design.

B.S. degree program in Engineering Sciences (Chemical) The B.S. degree in Engineering Sciences (Chemical) requires ten term courses beyond the prerequisites, chosen in consultation with the director of undergraduate studies. The standard program includes the following courses:

1. Mathematics: ENAS 194a or b or equivalent
2. Chemistry: CHEM 220a or b or 225b, and 221a or b or 227a; or 332a, 333b
3. Engineering science: MENG 361a
4. Chemical engineering: CENG 210a, 300a, 301b, 315b, 411a

Senior requirement In their senior year students must complete a senior research project in CENG 490a or b.

REQUIREMENTS OF THE MAJOR

CHEMICAL ENGINEERING, B.S.

Prerequisites MATH 112a or b, 115a or b, ENAS 151a or b or equivalent; CHEM 114a, 115b, and 116La, or CHEM 118a; PHYS 180a, 181b; ENAS 130b

Number of courses 18 term courses beyond prereqs (incl senior req)

Specific courses required ENAS 194a or b or equivalent; CHEM 220a or b or 225b; 221a or b or 227a; 332a, 333b, and 330La; MENG 361a; CENG 210a, 300a, 301b, 315b, 411a, 412b, 480a

Distribution of courses 3 addtl electives in engineering

Senior requirement CENG 416b

ENGINEERING SCIENCES (CHEMICAL), B.S.

Prerequisites MATH 112a or b, 115a or b, ENAS 151a or b or equivalent; CHEM 114a, 115b, and 116La, or CHEM 118a; PHYS 180a, 181b; ENAS 130b

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

Specific courses required ENAS 194a or b or equivalent; CHEM 220a or b or 225b, and 221a or b or 227a, or 332a, 333b; MENG 361a; CENG 210a, 300a, 301b, 315b, 411a

Senior requirement CENG 490a or b

CENG 120a/ENAS 120a/ENVE 120a, Introduction to Environmental Engineering

William Mitch

For description see under Environmental Engineering.

CENG 210a/ENVE 210a, Principles of Chemical Engineering and Process Modeling

André Taylor

MW 1–2:15 QR, SC (RP, 36)

Analysis of the transport and reactions of chemical species as applied to problems in chemical, biochemical, and environmental systems. Emphasis on the interpretation of laboratory experiments, mathematical modeling, and dimensional analysis. Lectures include classroom demonstrations. Prerequisite: MATH 120a or b or permission of instructor.

CENG 300a, Chemical Engineering Thermodynamics Paul Van Tassel

MW 11:35–12:50 QR, SC (RP, 34)

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 120a or b or ENAS 151a or b or permission of instructor.

CENG 301b, Chemical Kinetics and Chemical Reactors Lisa Pfefferle

MW 11:35–12:50 QR, SC (RP, 34)

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 194a or b or permission of instructor.

CENG 315b/ENVE 315b, Transport Phenomena Michael Loewenberg

MW 1–2:15 QR, SC (RP, 36)

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 194a or b or permission of instructor.

CENG 351a/BENG 351a, Biomedical Engineering I: Quantitative Physiology

Tarek Fahmy

For description see under Biomedical Engineering.

CENG 373a/ENVE 373a, Air Pollution Control Yehia Khalil

For description see under Environmental Engineering.

***CENG 377a/ENVE 377a, Water Quality Control** Gideon Oron

For description see under Environmental Engineering.

CENG 410a⁶, Biomolecular Engineering Corey Wilson

TTH 1–2:15, 1 HTBA (RP, 26)

A survey of the principles and scope of biomolecular engineering. Discussion of concepts at the interface of applied mathematics, biology, biophysical chemistry, and chemical engineering that are used to develop novel molecular tools, materials, and approaches based on biological building blocks and machinery. Modeling the physicochemical properties that confer function in biological systems; low- and high-resolution protein engineering; the design of synthetic interactomes.

CENG 411a, Separation and Purification Processes Daniel Rosner

TTH 1–2:15 QR, SC (RP, 26)

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 300a or 315b or permission of instructor.

CENG 412b, Chemical Engineering Laboratory Paul Van Tassel

W 12–4 SC (o)

An introduction to basic experimental methods in chemical engineering science, including interpretation, analysis, and modeling of experimental results. Students conduct experiments in fluid mechanics, heat transfer, absorption, kinetics, and thin film synthesis.

CENG 416b/ENVE 416b, Chemical Engineering Process Design Yehia Khalil

TTH 7–8:15 p.m. QR, SC (RP, o)

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. Prerequisites: CENG 301b and 411a.

CENG 471a or b, Independent Research Paul Van Tassel

HTBA (o)

Faculty-supervised individual student research and design projects. Emphasis on the integration of mathematics with basic and engineering sciences in the solution of a theoretical, experimental, and/or design problem. May be taken more than once for credit.

CENG 480a, Chemical Engineering Process Control Eric Altman

TTH 9–10:15 QR, SC (RP, 22)

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 194a or b or permission of instructor.

***CENG 490a or b, Senior Research Project** Paul Van Tassel

HTBA (o)

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.

COURSE IN ANOTHER DEPARTMENT THAT COUNTS TOWARD THE MAJOR

The following course counts equally with Chemical Engineering courses toward the requirements of the major.

MENG 361a, Mechanical Engineering II: Fluid Mechanics Mitchell Smooke

Chemistry

Director of undergraduate studies: Kurt Zilm, 249 SCL, 432-3956, kurt.zilm@yale.edu

FACULTY OF THE DEPARTMENT OF CHEMISTRY

Professors †Sidney Altman, Victor Batista, Gary Brudvig, Robert Crabtree, †Craig Crews, R. James Cross, Jr., Jonathan Ellman, John Faller, †Gary Haller, †Francesco Iachello, Mark Johnson, William Jorgensen, J. Patrick Loria, J. Michael McBride, Scott Miller, Peter Moore, †Lynne Regan, †James Rothman, Martin Saunders, Alanna Schepartz, Charles Schmuttenmaer, †Dieter Söll, †Thomas Steitz, †Scott Strobel, John Tully, Patrick Vaccaro, Frederick Ziegler (*Emeritus*), Kurt Zilm

Associate Professor Ann Valentine

Assistant Professors Richard Baxter, Nilay Hazari, Seth Herzon, David Spiegel, Elsa Yan

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

†A joint appointment with primary affiliation in another department.

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 Three one-term courses with no prerequisites are offered for non-science majors: CHEM 101a, Chemistry in the Modern World, CHEM 102a, Introduction to Green Chemistry, and CHEM 103b, Chemistry, Energy, and the Environment. They do not satisfy medical school requirements or the general chemistry requirement for any science major.

Introductory courses and placement The majority of students begin with a general chemistry sequence: either CHEM 112a and 113b, Chemistry with Problem Solving; CHEM 114a and 115b, Comprehensive General Chemistry; or CHEM 118a, Quantitative Foundations of General Chemistry. All of these courses fulfill the prerequisite for general chemistry in the Chemistry major. A typical student in CHEM 112a may have taken a year of high school chemistry, but has not been exposed to the problem-solving approach used in many university-level science courses. Students in CHEM 114a may have taken one or possibly two years of chemistry in high school and have had some exposure to quantitative problem-solving scientific methods. A little more than half of the students in CHEM 114a last took chemistry as sophomores in high school. Students in CHEM 118a have done well in an advanced placement chemistry course or shown other evidence of high achievement in science and mathematics. For instance, students with a Chemistry Advanced Placement test score of 5 are placed into CHEM 118a.

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. CHEM 124a and 125b, Freshman Organic Chemistry, is designed expressly for freshmen. Other courses in organic chemistry, CHEM 220a or b and 221a or b, are also available to qualified freshmen. Students with a strong background in physics and calculus may be eligible for the physical chemistry courses CHEM 332a and 333b.

Placement procedures The Chemistry department reviews the admission records of all freshmen prior to the beginning of the fall term. Using test scores and information supplied by students in preregistration, the department determines the appropriate general chemistry course for every entering freshman, either CHEM 112a, 114a, or 118a. Students will be able to view their initial placement in late August by following links provided at <http://chem.yale.edu/undergrad>. Placement updates will be posted on the same site during registration week in the fall term.

Freshmen wishing to take CHEM 124a, 220a, or 332a, or those wishing to take a higher-level course than their initially assigned placement, are required to take a placement examination on the first day of registration week in the fall term. Students who feel they have been placed incorrectly at too high a level may discuss changing their placement with a chemistry placement adviser and do not need to take the examination. Students uncertain about their placement are encouraged to sit for the examination, as it provides the best measure of a student's readiness to enter the wide variety of courses offered to freshmen.

Students with placement questions, or those wishing to change their course preference indicated during preregistration, should attend the department's orientation meeting prior to the placement examination. Additional sessions with placement advisers are scheduled throughout the first week of the fall term in 1 SCL at times listed in the *Calendar for the Opening Days of College*. Students wishing to change their placement should consult an adviser as soon as possible.

Students are advised to review general chemistry before taking the placement examination. Use of an electronic calculator is permitted. Times and places for the examination are published in the *Calendar for the Opening Days of College*. After the examination, final placements are posted at <http://chem.yale.edu/undergrad>. For further information about placement and the examination, consult the *Calendar for the Opening Days of College*, the Freshman Web site (yalecollege.yale.edu/content/chemistry-1), and <http://chem.yale.edu/undergrad>.

Permission keys Enrollment in all introductory chemistry courses requires an electronic permission key. Keys are automatically issued by the department for entering freshmen and are displayed as green key-shaped icons next to the appropriate courses on the online registration page. Students are blocked from enrolling in any chemistry course for which they do not possess a permission key. Students experiencing problems with permission keys should inquire in person at the department office, 1 SCL.

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 at www.yale.edu/courseinfo. Due to the nature of laboratory exercises, it is impractical to preview laboratory courses during the course selection period.

Placement information for upperclassmen Upperclassmen wishing to take CHEM 114a, 115b, or 118a must first confirm their placement and obtain permission keys by inquiring at the department office, 1 SCL. Because CHEM 112a and 113b are restricted to freshmen, upperclassmen are placed into either CHEM 114a or 118a. Upperclassmen wishing to enroll in CHEM 220a or b may do so, as long as they have satisfied the general chemistry prerequisite.

Information 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 CHEM 112a and 113b, or 114a and 115b, or CHEM 328a or 332a followed by 333b. Students taking CHEM 118a often complete this requirement by taking either CHEM 252b and 251Lb or a course in biochemistry with laboratory. Students should consult with Undergraduate Career Services for the most up-to-date premedical course advice.

Major degree programs Four degree programs are offered: a B.S., an intensive major leading to a B.S., a B.A., and a combined B.S./M.S. The B.S. degree is pursued by the greatest number of majors. It 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 can also satisfy the requirements for a certified degree in chemistry as set forth by the American Chemical Society. The B.A. 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 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.

Degree requirements common to all Chemistry degree programs One year of general chemistry and laboratory, or the equivalent in advanced placement, is a prerequisite to all four degree programs. In addition, all degrees require a year of organic chemistry (CHEM 124a or 220a or b or 225b, and 125b or 221a or b or 227a) and laboratory (CHEM 126La or 222La or Lb, and 127Lb or 223La or Lb), a year of physical chemistry (CHEM 332a or 328a and 333b, except for the B.A., which does not require 333b) and one term of laboratory (CHEM 330La), and a term course in inorganic chemistry (CHEM 252b or higher). No chemistry courses taken Credit/D/Fail may be counted toward the major (including substitutions for advanced courses).

Prerequisites outside the Chemistry department Each degree program requires a course in physical chemistry. Single-variable calculus and college-level physics are required for the physical chemistry courses. Students are also encouraged to complete a course in multivariable calculus and a physics course that uses calculus.

B.S. degree In addition to the prerequisites and common degree requirements, the B.S. requires completion of an additional half-credit chemistry laboratory elective 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 chemistry. One term of CHEM 490a or b involving original research may be applied toward the advanced-course requirement.

B.S. degree, intensive major The requirements for the B.S. degree with an intensive major are the same as those for the regular B.S., except that the laboratory elective requirement is increased to one full course credit, and five, rather than four, advanced chemistry courses are required. The five advanced courses must include two terms of the independent research course CHEM 490a or b.

B.A. degree The B.A. degree requires completion of the prerequisites, the common degree requirements, and three course credits of advanced chemistry lecture or laboratory courses, one of which may be CHEM 490a or b. At least one of the advanced courses must be a lecture course in chemistry. CHEM 333b can be counted toward this requirement, although not as the sole advanced chemistry lecture course offered.

Combined B.S./M.S. degree program in Chemistry 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 by the first day of classes in the sixth term of enrollment. Acceptance into the program requires two-thirds A or A– grades within the major and one-half A or A– grades overall after five terms. Two terms of CHEM 490a or b must be taken in the fifth and sixth terms with grades of A or A– earned to continue in the program. Subsequent grades are irrelevant as long as normal progress is maintained. The B.S./M.S. degree program requires completion of the intensive major requirements, a physics course at the level of 200 or higher, and eight graduate courses in chemistry (four of which count toward the B.S.). Four terms of research are required, including two terms of research taken in CHEM 990.

Advanced courses For the purposes of degree requirements, all chemistry courses numbered 400 or higher count as advanced lecture or laboratory courses, as do CHEM 224La or Lb, 226La or Lb, 251Lb, 331Lb, MB&B 300a, 301b, and 360Lb.

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 director of undergraduate studies. Students without advanced placement who complete CHEM 116La and 117Lb may count one-half course credit of physics laboratory toward the laboratory requirement, with approval of the director of undergraduate studies. CHEM 490a or b may not in any circumstances be substituted for any of the laboratory requirements. The graduate courses CHEM 562, 564, and 565 may not be counted toward any requirement of the major.

Senior requirement Senior B.S. candidates and intensive majors prepare a written report and give an oral presentation on their independent project in CHEM 490b. Research papers are expected to be fifteen to twenty-five pages in length (double-spaced, twelve-point font, exclusive of figures and bibliography). Students pursuing the B.A. typically do not pursue independent research, but instead write a senior essay under the guidance of a faculty member as arranged by the instructor of CHEM 490b. The senior essay option may also be elected by B.S. students. The requirements of the senior essay are the same as those for research papers. Students electing the senior essay must secure a faculty sponsor by the middle of the fall term of senior year.

Sequence of courses Majors are encouraged to begin their programs in the freshman 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:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CHEM 118a, 119La, math prereq	CHEM 220a, 221b, 252b, 222La, 223Lb, physics prereq	CHEM 332a, 333b, 330La, 251Lb, 1 elective	CHEM 490b, 2 electives

Approval of major programs of study All Chemistry majors in the sophomore, junior, and senior years must have their programs approved by the director of undergraduate studies. A program tailored to each major's goals is created and recorded on a Chemistry Course of Study form kept in the student's file in the department office. Majors who have

a current course of study form on file may have their schedules signed by the director of undergraduate studies or any of the advisers to the major: J. Michael McBride, Patrick Vaccaro, or Victor Batista.

Special restrictions on lecture courses Completion of the first term of any yearlong chemistry lecture sequence (CHEM 112a and 113b, 114a and 115b, 124a and 125b, 220a or b and 221a or b, 225b and 227a, and 332a and 333b) with a passing grade is a prerequisite for registration in the subsequent term.

Students receive credit for only one chemistry sequence of any given type. For example, a student who has completed CHEM 112a and 113b may not subsequently enroll in CHEM 118a; a student who has completed CHEM 124a and 125b may not subsequently enroll in CHEM 220a or b. Similarly, students may not enroll in a course that is a prerequisite to a course they have already taken. Thus, 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 (except CHEM 124a and 125b, for which CHEM 126La and 127Lb are corequisites), although the department does not recommend it. However, the appropriate lecture course is a prerequisite or corequisite for each laboratory course. A student who is not enrolled in the second term of a yearlong lecture course may not take the second term of the related laboratory course. This restriction can be waived only by the director of undergraduate studies.

Year or Term Abroad Participation in the Year or Term Abroad program is available for qualified majors at Sussex University (U.K.). Interested students should consult the Chemistry Year Abroad coordinator, Robert Crabtree. For general information about the Year or Term Abroad, see chapter II of this bulletin.

REQUIREMENTS OF THE MAJOR

Prerequisites CHEM 112a and 113b, or 114a and 115b, or 118a; CHEM 116La and 117Lb, or 119La; MATH 112a or b, 115a or b (MATH 120a or b or ENAS 151a or b suggested); PHYS 180a and 181b, or 200a and 201b (170a, 171b acceptable), or equivalents in advanced placement

Number of courses *B.A.*—10 term courses, totaling 9 course credits; *B.S.*—13 term courses, totaling 11½ course credits; *B.S., intensive major*—14 or 15 term courses, totaling 13 course credits

Specific courses required *All degrees*—organic chem (CHEM 124a, 125b, or 220a or b, 221a or b, or 225b, 227a); organic chem lab (CHEM 126La, 127Lb or 222La or Lb, 223La or Lb); physical chem I (CHEM 328a or 332a); inorganic chem (CHEM 252b, 450b, 452a, or 457a); physical chem lab I (CHEM 330La); *B.S.*—CHEM 333b; *B.S., intensive major*—CHEM 333b, two terms of CHEM 490a or b

Distribution of courses *B.A.*—3 course credits in advanced lectures or labs; *B.S.*—adtl lab for ½ course credit; 4 course credits for advanced lectures or labs; *B.S., intensive major*—adtl labs for 1 course credit; 5 course credits in advanced lectures or labs

Substitution permitted Up to 2 relevant advanced science courses in other depts for advanced chem courses with DUS permission

Senior requirement CHEM 490b or senior essay

COURSES FOR NONMAJORS WITHOUT PREREQUISITES

CHEM 101a, Chemistry in the Modern World N. Ganapathi

TTH 9–10:15 SC (22)

Basic concepts necessary to understand how chemistry affects life in the modern world. Laws, events, and other ways that chemistry shapes human lives. Intended for non–science majors; no prerequisites. Does not satisfy premedical chemistry requirements or requirements for the Chemistry major. Not open to students who have completed another chemistry course at Yale.

[CHEM 102a, Introduction to Green Chemistry]**CHEM 103b, Chemistry, Energy, and the Environment** John Tully

TTH 1–2:15 SC (26)

Introduction to principles that govern chemical processes in everyday life, with emphasis on the production and use of energy. Exploration of constraints imposed by the laws of thermodynamics and the underlying nature of chemical reactions, as well as associated direct and environmental costs. Intended for non–science majors with a basic high school background in chemistry and physics, as well as high school algebra. Does not satisfy premedical chemistry requirements or requirements for the Chemistry major. Not open to students who have completed another chemistry course at Yale.

INTRODUCTORY COURSES

Freshmen planning to take an introductory Chemistry course during their first term are required to preregister over the summer. Those planning to elect CHEM 124a or 332a must also register in person and take a placement examination as described in the text above and on the Freshman Web site (yalecollege.yale.edu/content/chemistry-1). Placement in other introductory Chemistry courses is made on the basis of test scores and other admissions data, as discussed in the text above. Time and place for the orientation meeting, registration, and placement examination are listed in the *Calendar for the Opening Days of College*. For further information on placement see the Freshman Web site.

All freshman candidates for CHEM 124a, 220a, 225b, or 332a are required to take the department's advanced chemistry placement examination.

***CHEM 112a, Chemistry with Problem Solving I** Jonathan Parr, Gary Brudvig

MWF 10:30–11:20 QR, SC (RP, 33)

A systematic introduction to chemistry. Topics include atomic/molecular structure, stoichiometry, thermochemistry, chemical periodicity/bonding, and reactions in aqueous solutions. For beginning students in chemistry or for those whose exposure to the subject has been moderate. Special emphasis on scientific problem-solving skills through an additional discussion section devoted to quantitative reasoning. Attendance at one discussion section and one problem-solving section required. Enrollment limited to freshmen, by placement only.

***CHEM 113b, Chemistry with Problem Solving II** Jonathan Parr

MWF 10:30–11:20 QR, SC (RP, 33)

Continuation of CHEM 112a. Phase-dependent properties of matter, solutions and their behavior, chemical equilibrium, chemical kinetics, and the chemistry of the elements.

Attendance at one discussion section and one problem-solving section required. After CHEM 112a. Enrollment limited to freshmen, by placement only.

***CHEM 114a, Comprehensive General Chemistry I** Ann Valentine

MWF 10:30–11:20 QR, SC (RP, 33)

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. For students with a good secondary school exposure to general chemistry. Attendance at a weekly discussion section required. Normally accompanied by CHEM 116La. Enrollment by placement only.

***CHEM 115b, Comprehensive General Chemistry II** Kurt Zilm

MWF 10:30–11:20 QR, SC (RP, 33)

Continuation of CHEM 114a. Kinetics, chemical equilibrium, acid-base chemistry, free energy and entropy, electrochemistry, nuclear chemistry, and descriptive chemistry of the elements. Attendance at a weekly discussion section required. After CHEM 114a. Normally accompanied by CHEM 117Lb. Enrollment by placement only.

CHEM 116La, General Chemistry Laboratory I N. Ganapathi

HTBA SC $\frac{1}{2}$ Course cr (RP, 0)

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 112a or 114a. May not be taken after a higher-numbered laboratory course.

CHEM 117Lb, General Chemistry Laboratory II N. Ganapathi

HTBA SC $\frac{1}{2}$ Course cr (RP, 0)

Continuation of CHEM 116La. Introduction to rate and equilibrium measurements, acid-base chemistry, synthesis of inorganic compounds, and qualitative/quantitative analysis. After CHEM 116La. To accompany or follow CHEM 113b or 115b. May not be taken after a higher-numbered laboratory course.

***CHEM 118a, Quantitative Foundations of General Chemistry** Mark Johnson

MWF 10:30–11:20 QR, SC (33)

An advanced course emphasizing conceptual aspects and physical principles in general chemistry. Fulfills the general chemistry prerequisite for organic chemistry. Enrollment by placement only.

CHEM 119La, Laboratory for Comprehensive General Chemistry Jonathan Parr

HTBA SC $\frac{1}{2}$ Course cr (0)

Introductory laboratory for students with advanced standing. Emphasis on the fundamental quantitative and physical principles of general chemistry together with quantitative and data analysis. Accompanies CHEM 118a, 328a, or 332a.

***CHEM 124a, Freshman Organic Chemistry I** J. Michael McBride

MWF 10:30–11:20 SC (RP, 33)

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. Must be taken concurrently with CHEM 126La.

CHEM 125b, Freshman Organic Chemistry II J. Michael McBride

MWF 10:30–11:20 SC (RP, 33)

Continuation of CHEM 124a. Survey of simple and complex reaction mechanisms, spectroscopy, organic synthesis, and the molecules of nature. After CHEM 124a. Must be taken concurrently with CHEM 127Lb.

CHEM 126La, Laboratory for Freshman Organic Chemistry I Christine DiMeglio

HTBA SC ½ Course cr (o)

The first half of a two-term laboratory sequence designed to introduce the basic synthetic and analytic techniques of organic chemistry. Must be taken concurrently with CHEM 124a.

CHEM 127Lb, Laboratory for Freshman Organic Chemistry II Christine DiMeglio

HTBA SC ½ Course cr (o)

The second half of a two-term laboratory sequence in organic chemistry. One-, two-, and three-step syntheses of organic target molecules. After CHEM 126La. Must be taken concurrently with CHEM 125b.

INTERMEDIATE COURSES**CHEM 220a or b, Organic Chemistry** Frederick Ziegler, William Jorgensen

MWF 9:25–10:15 SC (RP, 32)

An introductory course covering the fundamental principles of organic chemistry. The laboratory for this course is CHEM 222La or Lb. Discussion section at 12:30 is offered in fall term only. 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 221a or b.

CHEM 221a or b, The Organic Chemistry of Life Processes Martin Saunders,

Alanna Schepartz

MWF 9:25–10:15 SC (RP, 32)

The principles of organic reactivity and how they form the basis for biological processes. The laboratory for this course is CHEM 223La or Lb. After CHEM 220a or b. Students who have earned a grade lower than C in general chemistry are cautioned that they may not be sufficiently prepared for this course.

CHEM 222La or Lb, Laboratory for Organic Chemistry I Christine DiMeglio

HTBA SC ½ Course cr (o)

First term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. After or concurrently with CHEM 220a or b or 225b. Prerequisite: CHEM 117Lb or equivalent.

CHEM 223La or Lb, Laboratory for Organic Chemistry II Christine DiMeglio

HTBA SC ½ Course cr (o)

Second term of an introductory laboratory sequence covering basic synthetic and analytic techniques in organic chemistry. After or concurrently with CHEM 221a or b or 227a. Prerequisite: CHEM 222La or Lb.

[CHEM 224La or Lb, Advanced Chemistry Laboratory]

[CHEM 225b, Comprehensive Organic Chemistry I]

CHEM 226La or Lb, Intensive Advanced Chemistry Laboratory Christine DiMeglio,
Jonathan Parr

HTBA WR, SC (RP, o)

An intensive course in advanced organic 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 127Lb or 223La or Lb. For enrollment procedures, contact the instructors.

[CHEM 227a, Comprehensive Organic Chemistry II]

CHEM 251Lb, Inorganic Chemistry Laboratory Jonathan Parr

HTBA SC ½ Course cr (o)

Introductory laboratory course covering synthetic and physical characterization techniques in inorganic chemistry. After CHEM 119La or 126La or 222La or Lb; concurrently with or after CHEM 252b.

CHEM 252b, Introductory Inorganic Chemistry Robert Crabtree

MWF 10:30–11:20 SC (RP, 33)

The “vigor and diversity” of modern inorganic chemistry are presented; an introduction to the fundamental concepts of solid-state chemistry, coordination chemistry, and organo-metallic chemistry. After CHEM 113b, 115b, or 118a. After or concurrently with CHEM 220a or b or by permission of instructor. May not be taken after CHEM 450b, 452a, or 457a.

CHEM 328a, Physical Chemistry with Applications in the Biological Sciences

Richard Baxter

TTH 9–10:15 QR, SC (RP, 22)

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 332a is preferred for Chemistry majors. Prerequisites: introductory physics, college-level general chemistry, and single-variable calculus required; MATH 120a or b or ENAS 151a or b suggested; or permission of instructor. May not be taken after CHEM 332a.

CHEM 330La, Laboratory for Physical Chemistry I Patrick Vaccaro, N. Ganapathi

HTBA SC (RP, 50)

Introduction to the tools and techniques of modern physical chemistry. Analog/digital electronics, measurement of thermodynamic properties, optical laser spectroscopy, and nuclear magnetic resonance. After or concurrently with CHEM 328a or 332a. Meets on Wednesday, Thursday, and Friday from 1:30 to 2:20 for the first week of the term.

CHEM 331Lb, Laboratory for Physical Chemistry II R. James Cross, Jr., N. Ganapathi

HTBA SC (RP, 50)

Continuation of CHEM 330La. Application of physical methods to chemical analysis by spectroscopic and spectrometric techniques. After or concurrently with CHEM 333b. After CHEM 330La. Meets on Thursday and Friday from 1:30 to 2:20 for the first week of the term.

***CHEM 332a, Physical Chemistry with Applications in the Physical Sciences I**

Charles Schmuttenmaer

MWF 9:25–10:15 QR, SC (RP, 32)

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 required; MATH 120a or b or ENAS 151a or b suggested; or permission of instructor. May not be taken after CHEM 328a.

***CHEM 333b, Physical Chemistry with Applications in the Physical Sciences II**

Patrick Vaccaro

MWF 9:25–10:15 QR, SC (RP, 32)

Continuation of CHEM 332a, including topics drawn from quantum mechanics, atomic/molecular structure, spectroscopy, and statistical thermodynamics. Prerequisites: CHEM 328a or 332a required; familiarity with differential equations recommended; or permission of instructor.

ADVANCED COURSES***CHEM 418a^G, Advanced Organic Chemistry I** William Jorgensen

MW 11:35–12:50 SC (RP, 34)

Concise overview of structure, properties, thermodynamics, kinetics, reactions, and intermolecular interactions for organic molecular systems. Prerequisites: CHEM 125b, 221a or b, or 227a, CHEM 328a or 332a, and CHEM 333b.

***CHEM 419b^G, Advanced Organic Chemistry II** Scott Miller

MW 11:35–12:50 SC (RP, 34)

Continuation of CHEM 418a, with an emphasis on stereochemical aspects of chemical reactions of interest to synthetic settings as well as in biomolecules. Prerequisite: CHEM 418a.

CHEM 421b^G, Chemical Biology Alanna Schepartz

TTH 9–10:15 SC (RP, 22)

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: CHEM 125b, 221a or b, or 227a, and MCDB 120a or equivalent.

CHEM 423a^G, Synthetic Methods in Organic Chemistry Seth Herzon

MWF 10:30–11:20 SC (RP, 33)

A discussion of modern methods. Functional group manipulation, synthesis and functionalization of stereodefined double bonds, carbonyl addition chemistry, and synthetic designs. Normally taken only by students with a special interest in organic synthesis; for others, CHEM 418a is more appropriate. Prerequisite: CHEM 125b, 221a or b, or 227a, or permission of instructor.

[CHEM 425b^G, Spectroscopic Methods of Structure Determination]**[CHEM 426b^G, Computational Chemistry and Biochemistry]**

CHEM 430b^G, Statistical Mechanics and Thermodynamics Victor Batista

MWF 9:25–10:15 QR, SC (RP, 32)

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 328a or 332a, and CHEM 333b, or permission of instructor.

CHEM 440a^G, Molecules and Radiation I Kurt Zilm

MWF 8:20–9:10 QR, SC (RP, 31)

An integrated treatment of quantum mechanics and modern spectroscopy. Basic wave and matrix mechanics, perturbation theory, angular momentum, group theory, time-dependent quantum mechanics, selection rules, coherent evolution in two-level systems, lineshapes, and NMR spectroscopy. Prerequisite: CHEM 333b or permission of instructor.

CHEM 442b^G, Molecules and Radiation II Charles Schmuttenmaer

MW 11:35–12:50 QR, SC (RP, 34)

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

[CHEM 449b^G, Biophysical Chemistry]**CHEM 450b^G, Advanced Inorganic Chemistry** Nilay Hazari

TTH 9–10:15 SC (RP, 22)

Elementary group theory, molecular orbitals, states arising from molecular orbitals containing several electrons, ligand field theory, and electronic structure of metal complexes. Introduction to physical methods used in the determination of molecular structure and the bonding of polyatomic molecules. May be taken independently of CHEM 452a. Prerequisites: CHEM 328a or 332a and CHEM 333b; CHEM 457a or equivalent and an introduction to quantum mechanics strongly recommended.

CHEM 452a^G, Organometallic Chemistry Nilay Hazari

TTH 9–10:15 SC (RP, 22)

A survey of the organometallic chemistry of the transition elements and of homogeneous catalysis. May be taken independently of CHEM 450b. Prerequisites: CHEM 125b, 221a or b, or 227a, and CHEM 252b.

CHEM 457a^G, Modern Coordination Chemistry John Faller

TTH 11:35–12:50 SC (RP, 24)

The principles of modern inorganic chemistry. Main group and transition element chemistry: reactions, bonding, structure, and spectra. Prerequisites: CHEM 125b, 221a or b, or 227a.

CHEM 470a^G, Introductory Quantum Chemistry Victor Batista

TTH 9–10:15 QR, SC (RP, 22)

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

***CHEM 490a or b, Independent Research in Chemistry** Jonathan Parr

HTBA (RP, O)

After consulting with the director of undergraduate studies no later than midterm of the preceding term, students choose to work on individual laboratory or theoretical research problems under the direction of a faculty member in Chemistry or a closely related field. Students can familiarize themselves with ongoing research in the department by reviewing the departmental Web site (www.chem.yale.edu) and by attending an evening seminar series presented during the first weeks of the fall term. Specific dates and times of the evening seminars may be obtained in the department office, 1 SCL. Independent work may also encompass research in chemical education. Occasional required seminars address laboratory safety, literature searching, research methods, and scientific ethics. Students present their research results in a formal seminar series late in the spring term. At least ten hours of research weekly. May be taken multiple times for credit. Enrollment limited to junior and senior Chemistry majors except with permission of the course instructor.

To enroll, the student must complete a CHEM 490a or b registration form (available in the department office, 1 SCL), have it signed by both the intended faculty adviser and the course instructor, and submit it to the department office for approval by the director of undergraduate studies prior to the date on which the student's schedule is due. All students taking CHEM 490a or b must also consult with the director of undergraduate studies for approval of their projects by midterm of the term preceding enrollment in CHEM 490a or b.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in chemistry that may be of particular interest to undergraduates are listed in the online bulletin of the Graduate School. Information about them is available in the office of the director of undergraduate studies. Enrollment requires permission of both the director of graduate studies and the instructor.

Child Study Center

The Child Study Center is a department of the School of Medicine that works to further understanding of the problems of children and families. Among the disciplines involved in this work are child psychiatry, pediatrics, genetics, neurobiology, epidemiology, psychology, nursing, social work, and social policy. The mission of the Center is to understand child development, social, behavioral, and emotional adjustment, and psychiatric disorders, and to help children and families in need of care.

***CHLD 125a/PSYC 125a/TPRP 125a, Child Development** Nancy Close

W 1:30–3:20, 3 HTBA WR, SO (O)

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. For the Classes of 2011 and 2012, meets requirements for Teacher Preparation's early childhood certification.

***CHLD 126b/TPRP 191b, Clinical Child Development and Assessment of Young Children** Nancy Close

For description see under Teacher Preparation & Education Studies.

***CHLD 127a/PSYC 127a/TPRP 127a, Early Childhood Methods** Carla Horwitz

M 2:30–4:20, 3 HTBA WR, SO (RP, 0)

Development of curricula for preschool children—infants, toddlers, three-, four-, and five-year-olds—in light of current research and child development theory. For the Classes of 2011 and 2012, meets requirements for Teacher Preparation's early childhood certification.

***CHLD 128b/PSYC 128b/TPRP 128b, Language, Literacy, and Play** Nancy Close, Carla Horwitz

W 9:25–11:15 WR, SO (RP, 0)

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. For the Classes of 2011 and 2012, meets requirements for Teacher Preparation's early childhood certification.

***CHLD 350a or b/PSYC 350a or b, Autism and Related Disorders** Ami Klin, Fred Volkmar

T 3:30–5:20 SO (RP, 0)

Topics in the etiology, diagnosis, treatment, and natural history of childhood autism and other severe disorders of early onset. Retardation, behavioral disorders, and childhood psychosis. Supervised experience. Prerequisite: an introductory psychology course.

Chinese

(See under East Asian Languages and Literatures and under Peking University–Yale University Joint Undergraduate Program.)

Chinese Studies

(See under East Asian Studies and under Peking University–Yale University Joint Undergraduate Program.)

Classics

Director of undergraduate studies: Kirk Freudenburg, 408 PHELPS, 432-3491, kirk.freudenburg@yale.edu

FACULTY OF THE DEPARTMENT OF CLASSICS

Professors Egbert Bakker, Victor Bers, Susanne Bobzien, Kirk Freudenburg, Verity Harte, Donald Kagan, Diana Kleiner, Christina Kraus (*Chair*), Joseph Manning, John Matthews, William Metcalf (*Adjunct*)

Associate Professor Emily Greenwood

Assistant Professors John Fisher, Milette Gaifman, Pauline LeVen, Irene Peirano, Barbara Sattler

Lecturers Nathan Elkins, Veronika Grimm, Susan Matheson, John Oksanish, Joseph Solodow

The Department of Classics offers a major in Classics, 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.

THE MAJOR IN CLASSICS

The major in Classics is primarily a liberal arts major. It provides an excellent general education in a comprehensive humanistic discipline; it can also give the background necessary for those 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 powers of critical analysis, appreciation of literary values, and understanding of the ancient cultural traditions that constitute the foundation of Western civilization. Courses in other literatures, in 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 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. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

The standard major A standard major in both literatures requires no fewer than ten term courses. These include six term courses in Greek and Latin at the level of 390 or above, surveys of the history of Greek and Latin literature in translation (CLCV 254a and 255b), and two additional courses in related areas of history and art. The language courses must include GREK 390a or LATN 390b and five term courses at the level of 400 or above. One of the additional courses in a related field must be a term course in ancient history, and the other must be a term course in ancient history, 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 term courses in that literature at the level of 390 or above, surveys of the history of Greek and Latin literature in translation (CLCV 254a and 255b), a term course in ancient history related to the chosen literature, and an additional term course in ancient history, classical art and archaeology, or classical civilization. The language courses must include GREK 390a or LATN 390b and at least five term courses at the level of 400 or above. Students are encouraged to do some work in the second language and may substitute two terms at the intermediate level (131a and 141b) in the second language for two 400-level courses in the major literature.

Senior requirement At the end of the senior year the student majoring in both literatures takes a comprehensive examination in the history of Greek and Latin literature and in translation of both languages; the student majoring in one literature takes a senior departmental examination in the history of the literature of the major and in translation of that 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 devote two terms in the senior year to writing an essay (CLSS 490a and 491b) under the regular guidance of a faculty adviser. A brief prospectus of the essay must be submitted preferably at the end of the junior year and in no case later than October 15 of the senior year. The candidate must submit two copies of the senior essay to the director of undergraduate studies no later than April 1 of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 10 term courses

Specific courses required GREK 390a or LATN 390b; CLCV 254a and 255b

Distribution of courses *Two literatures*—6 courses in both langs at level 390 or above, with at least 5 at 400 level or above; 1 course in ancient hist; 1 addtl course in ancient hist, classical art and archaeology, or classical civ; *One literature*—6 courses in lit at level 390 or above, with at least 5 at 400 level or above; 1 course in ancient hist related to lit of major; 1 addtl course in ancient hist, classical art and archaeology, or classical civ

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

Senior requirement Senior dept exam in hist and translation of Greek and Latin lit (*two lits*) or major lit (*one lit*)

Intensive major Senior essay (CLSS 490a, 491b) in addition to above

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 members of contemporary society. Ancient texts are studied primarily in translation, though under the guidance of instructors who know ancient literature in the original languages.

Candidates for the major complete at least twelve term courses (including the senior seminar) 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 two survey courses, CLCV 254a and 255b. It is strongly

recommended that candidates elect one course each in the general areas of ancient epic, drama, philosophy, and Roman civilization. Candidates for the major are encouraged to take related courses in other departments. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Senior requirement Students devote both terms of the senior year to a significant project of original research, usually an essay, under the guidance of a faculty adviser (CLCV 450a, 451b). A brief prospectus of the project must be submitted to the director of undergraduate studies preferably at the end of the junior year and in no case later than October 15 of the senior year. The completed project must be submitted to the department no later than April 1 of the senior year. If the student has written an essay, two copies are required.

Programs for all majors must be approved by the director of undergraduate studies.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl two-term senior sem)

Specific courses required CLCV 254a, 255b

Distribution of courses 2 courses in ancient hist and/or classical art and archaeology;
2 courses in Greek or Latin (or both) numbered 131 or higher

Senior requirement Senior project (CLCV 450a, 451b)

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, surveys of the history of Greek and Latin literature in translation (CLCV 254a and 255b), and one term course in ancient Greek history. The language courses should include GREK 390a. 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 130a, 140b) 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. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Senior requirement At the end of the senior year the student takes a comprehensive examination in the history of Greek 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, students in the intensive major devote two terms in the senior year to writing an essay (CLSS 490a and 491b) under the regular guidance of a faculty member. A brief prospectus of the essay must be submitted preferably at the end of the junior year and in no case later than October 15 of the senior year. The candidate must submit two copies of the senior essay to the director of undergraduate studies no later than April 1 of the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 10 term courses

Specific courses required GREK 390a, CLCV 254a, 255b

Distribution of courses 4 term courses in ancient Greek numbered 390 or higher; 1 term course in ancient Greek hist; 2 term courses in modern Greek numbered 130 or higher; 1 term course in postclassical Greek hist or culture

Senior requirement Senior dept exam

Intensive major Senior essay (CLSS 490a, 491b) in addition to above

PLACEMENT POLICY

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 practicable.

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 141b or LATN 141b after a 400-level course in the fall, or to be admitted to a 400-level course after completion of GREK 131a or LATN 131a. Freshmen are encouraged to take advantage of the initial course selection period before course schedules are due to find the most appropriate course.

GREEK

GREK 110a, Beginning Greek: The Elements of Greek Grammar Staff

MTWTHF 9:25–10:15 L1 1½ Course cr (RP, 32)

Introduction to ancient Greek. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for GREK 120b. No prior knowledge of Greek assumed.

GREK 120b, Beginning Greek: Review of Grammar and Selected Readings Staff

MTWTHF 9:25–10:15 L2 1½ Course cr (RP, 32)

Continuation of GREK 110a. Emphasis on consolidating grammar and on readings from Greek authors. The sequence GREK 110a, 120b prepares for 131a or 141b. Prerequisite: GREK 110a or equivalent.

GREK 131a, Greek Prose: An Introduction Staff

MWF 10:30–11:20 L3 (33)

Close reading of selections from classical Greek prose with review of grammar. Counts as L4 if taken after GREK 141b or equivalent.

GREK 141b, Homer: An Introduction Egbert Bakker

MWF 11:35–12:25 L3 (34)

A first approach to reading Homeric poetry in Greek. Selected books of the *Iliad* or the *Odyssey*. Counts as L4 if taken after GREK 131a or equivalent.

GREK 390a^c, Greek Syntax and Stylistics Victor Bers

TTH 9–10:15 L5, HU (22)

A review of accidence and syntax, elementary composition, and analysis of Greek prose styles of the fifth and fourth centuries B.C., including a comparison of “prosaic” and “poetic” syntax. Prerequisite: previous familiarity with some Greek prose beyond the elementary level, or permission of instructor.

***GREK 403a^c, Comparative Greek Grammar** John Fisher

MW 1–2:15 L5, HU (36)

A historical and comparative study of the Greek language. Emphasis on the earliest records of Greek, the development of Greek grammar and vocabulary from Proto-Indo-European, and a comparison of this development with the grammar and vocabulary of Latin, English, and other Indo-European languages, including Sanskrit. Prerequisite: advanced knowledge of Greek language and literature.

GREK 410b^c/PHIL 215b, Plato's Republic Verity Harte

TTH 11:35–12:50 L5, HU (0)

Reading and discussion of the Greek text of Plato's *Republic*, Book Ten. Topics include Plato's notorious criticism of art, his discussion of the true nature of soul, and the myth of Er, which portrays the afterlife of the soul.

***GREK 431a^c/PHIL 400a^c, Plato's Sophist** Verity Harte, Barbara Sattler

For description see under Philosophy.

GREK 443b^c, Homer's Iliad Egbert Bakker

MW 4–5:15 L5, HU (37)

Reading of selected books of the *Iliad*, with attention to Homeric language and style, the Homeric view of heroes and gods, and the reception of Homer in antiquity.

***GREK 449a, Plato's Protagoras** John Oksanish

TTH 11:35–12:50 L5, HU (24)

Close reading of Plato's *Protagoras*, focusing on translation and interpretation of the text in relation to other Platonic dialogues. Attention to the work's intellectual, cultural, and historical contexts. A bridge course between L4 and other L5 courses.

***GREK 451a^G, Herodotus** Joseph Manning

TTH 1–2:15 L5, HU (26)

Introduction to selected works of Herodotus in Greek, with attention to grammar, dialect, and structure. Discussion of the author's historical methods and of other issues in secondary scholarship.

GREK 471b^G, Plutarch's *Lives Emily Greenwood

TH 1:30–3:20 L5, HU (26)

Close reading of selections from the *Parallel Lives*, including the lives of Pericles, Alcibiades, and Nicias. Plutarch's reception and mediation of Greco-Roman historical traditions; the nature and design of the *Lives*; ways in which genres such as biography, history, and historical fiction influenced and were influenced by Plutarch's work.

***GREK 494a or b, Independent Tutorial in Greek Language and Literature**

Kirk Freudenburg

HTBA (o)

For students with advanced Greek language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work should result in a term paper or examination. A limited number of these classes may be offered toward the major.

LATIN**LATN 110a, Beginning Latin: The Elements of Latin Grammar** Caroline Stark

and staff

5 HTBA L1 1½ Course cr (RP, 61)

Introduction to Latin. Emphasis on morphology and syntax within a structured program of readings and exercises. Prepares for LATN 120b. No prior knowledge of Latin assumed. Preregistration, which is required, is on Tuesday, August 31, at the Academic Fair in WLH from 2 to 4 p.m.

LATN 120b, Beginning Latin: Review of Grammar and Selected Readings

John Fisher and staff

5 HTBA L2 1½ Course cr (RP, 61)

Continuation of LATN 110a. Emphasis on consolidating grammar and on readings from Latin authors. The sequence LATN 110a, 120b prepares for 131a or 141b. Prerequisite: LATN 110a or equivalent.

LATN 131a, Latin Prose: An Introduction Irene Peirano and staff

3 HTBA L3 (61)

Close reading of a major work of classical prose; review of grammar as needed. Counts as L4 if taken after LATN 141b or equivalent.

LATN 141b, Latin Poetry: An Introduction Christina Kraus

MWF 1:30–2:20 L3 (61)

The course is devoted to Vergil. Counts as L4 if taken after LATN 131a or equivalent.

LATN 390b^G, Latin Syntax and Stylistics Joseph Solodow

MW 9–10:15 L5, HU (32)

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.

LATN 433a^C, Sallust Irene Peirano

MW 2:30–3:45 L5, HU (37)

An introduction to the works, style, and thought of Sallust. Close reading and discussion of Sallust's two main works, the *Bellum Catilinae* and *Bellum Jugurthinum*, with attention to language and style. Topics include historiography as a genre, intertextuality, the Sallustian persona and style, ethnography, and characterization.

LATN 437a^C, Roman Comedy John Fisher

MW 4–5:15 L5, HU (37)

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.

***LATN 440a, Roman Friendship** Joseph Solodow

MW 11:35–12:50 L5, HU (34)

Readings from works by Catullus (selected poems), Cicero (*De Amicitia*), Horace (*Epistles I*), and Pliny the Younger (selected letters). Focus on the concept of friendship and its importance in Roman society. A bridge course between L4 and other L5 courses.

***LATN 462b^C, The Histories of Tacitus** William Metcalf

TTH 1–2:15 L5, HU (26)

Close reading of the *Histories* of Tacitus and related selections from his other works. Attention to syntax and style. Focus on the influence of the author's background and experience on his narrative.

LATN 475b^C, Horace: Satires and Epistles Kirk Freudenburg

TTH 11:35–12:50 L5, HU (24)

Readings in Horace's hexameter works, the *Satires* and *Epistles*.

***LATN 494a or b, Independent Tutorial in Latin Language and Literature**

Kirk Freudenburg

HTBA (o)

For students with advanced Latin language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work should result in a term paper or examination. A limited number of these classes may be offered toward the major.

CLASSICS

***CLSS 490a and 491b, Senior Essay for the Intensive Major in Classics**

Kirk Freudenburg

HTBA (o)

Qualified students may write a 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.

CLASSICAL CIVILIZATION

★CLCV 018b, Poetry and Prehistory John Fisher

TTH 1–2:15 HU Fr sem Tr (26)

Survey of the earliest texts written in languages of the Indo-European family. Discussion of modern scholarship that uses common themes in these texts to reconstruct the myth and poetry of the Indo-Europeans. Readings in translation include the *Iguvine Tables* from Umbrian, the *Rig Veda* from Sanskrit, histories of Livy from Latin, the *Elder Edda* from Old Norse, and mythical texts from Old Irish and Hittite. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

CLCV 125a/PHIL 125a, Introduction: Ancient Philosophy Susanne Bobzien

For description see under Philosophy.

★CLCV 134b/HIST 217Jb/HSBM 414b, A History of Ancient Greek Medicine

Veronika Grimm

MW 11:35–12:50 HU (34)

An introduction to Greek medicine from the fifth century B.C. to the second century A.D., with attention to central concepts, methods, and theories. The relation of scientific theories to clinical practice, to magic, to temple medicine, and to Greek philosophy.

CLCV 160b/ARCG 243b/HSAR 243b, Greek Art and Architecture Milette Gaifman

For description see under History of Art.

CLCV 170a/ARCG 170a/HSAR 250a, Roman Art: Empire, Identity, and Society

Diana Kleiner

For description see under History of Art.

CLCV 175b/ARCG 252b/HSAR 252b, Roman Architecture Diana Kleiner

For description see under History of Art.

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

Joseph Manning

TTH 11:35–12:50; disc. 1 HTBA HU (24)

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.”

CLCV 205a/HIST 205a, Introduction to Ancient Greek History Donald Kagan

TTH 1–2:15; disc. 1 HTBA HU (26)

An introductory course in Greek history tracing the development of Greek civilization as manifested in political, intellectual, and creative achievements from the Bronze Age to the end of the classical period. Students read original sources in translation as well as the works of modern scholars.

CLCV 206a/HIST 217a, Introduction to Roman History: The Republic

William Metcalf

MW 2:30–3:45; disc. 1 HTBA HU (37)

The development of Rome from a small village in the archaic period to the head of an empire by the death of Caesar in 44 B.C. Readings from primary sources with emphasis

on how the ancients perceived and wrote history, as well as engagement with epigraphic and archaeological material.

***CLCV 218b/THST 218b, Drama and Demos** Timothy Robinson

TTH 1–2:15 WR, HU Tr (26)

The major plays of Aeschylus, Sophocles, Euripides, and Aristophanes read in translation with attention to their theatricality and to their articulation of contemporary attitudes toward politics, psychology, and the consolidation and disintegration of the Athenian *polis* during the fifth century B.C. Prerequisite: a course on ancient Greece (history or literature) or in theater studies.

***CLCV 223b/HUMS 298b/LITR 164b, Love and Desire in the Classical Tradition**

Emily Greenwood, Caroline Stark

TTH 11:35–12:50 HU (24)

The cultural history of love and desire in ancient Greece and Rome. The reception of Greco-Roman concepts of love in Western philosophy, art, literature, and music from the Renaissance to the present. The language, ethics, and politics of love in Greco-Roman civilization; constructions of the desiring subject and desired object in the West.

***CLCV 230b/ARCG 424b/HSAR 424b, eClavdia: Women in Ancient Rome**

Diana Kleiner

For description see under History of Art.

CLCV 254a/LITR 158a, Introduction to Greek Literature Victor Bers

TTH 1–2:15, 1 HTBA HU Tr (26)

Survey of the literature of ancient Greece from the Archaic period to the Second Sophistic. Readings and discussion in English.

CLCV 255b/LITR 159b, Introduction to Latin Literature Kirk Freudenburg

TTH 2:30–3:45, 1 HTBA HU Tr (27)

Survey of the literature of ancient Rome from the Republic to the sixth century C.E. Readings and discussion in English.

***CLCV 264b/HUMS 290b/LITR 163b, Literary Interpretation in Greece and Rome**

Irene Peirano

MW 1–2:15 HU Tr (36)

Introduction to modes of literary criticism in antiquity. The extent to which ancient theorists anticipate or bypass modern critical concerns. Readings in translation include works by Plato, Aristotle, Cicero, and Virgil; selections from modern theoretical works by Riffaterre, Foucault, Barthes, and others.

***CLCV 282a, Sport and Spectacle in Greece and Rome** Nathan Elkins

TTH 11:35–12:50 WR, HU (24)

An exploration of the development and function of Greek and Roman sport and spectacle and their venues.

CLCV 292b/HUMS 314b/LITR 162b, Ancient Greece and Rome in Historical Fiction

Emily Greenwood

TTH 4–5:15 HU (27)

Classics of modern historical fiction set in ancient Greece and Rome, from Robert Graves's *I, Claudius* (1934) to Robert Harris's *Imperium* (2006). Greek and Roman works on which

these novels are based. Historical fiction in relation to the genres of history, fiction, and biography. Students write their own short passages of historical fiction.

***CLCV 312b/HUMS 442b/NELC 315b, Translating the Hero** Kathryn Slanski
For description see under Humanities.

***CLCV 406a/HIST 200Ja, Athenian Imperial Democracy** Donald Kagan
T 2:30–4:20 HU (27)

A history of Greece in the years between the Persian invasion and the Peloponnesian War, with emphasis on Athens. Prerequisite: CLCV 205a or equivalent.

***CLCV 414a^G/HIST 213Ja, Religions of the Roman Empire** Veronika Grimm
MW 11:35–12:50 HU (0)

A survey of the religions of Rome and its empire from the Republic to the time of Constantine. Readings from ancient texts, in translation, and secondary sources.

***CLCV 418b/PHIL 401b^G, Theories of Emotion in Greco-Roman Antiquity**
Verity Harte
For description see under Philosophy.

***CLCV 423b/HIST 209Jb, The Origins of Byzantium** John Matthews
MW 2:30–3:45 HU (0)

The transition from the Roman to the Byzantine empire. Study of literary, documentary, and material evidence, with attention to social, cultural, and political issues.

***CLCV 450a and 451b, Senior Project for the Major in Classical Civilization**
Kirk Freudenburg

HTBA (0)

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, each student explores in depth a subject of personal interest in literature, archaeology, art, philosophy, or history.

***CLCV 494a or b, Independent Tutorial in Classical Civilization** Kirk Freudenburg
HTBA (0)

For students who wish to pursue a specialized subject in classical civilization not otherwise covered in courses. Students are expected to provide a detailed reading list and a clear outline of their project early in the term. The work should result in a term paper or examination. A limited number of these classes may be offered toward the major. Readings in translation.

OTHER COURSES RELEVANT TO THE MAJOR

HSAR 239b^G/ARCG 239b/HUMS 252b/NELC 104b, Art of the Ancient Near East and Aegean Karen Foster
For description see under History of Art.

***HUMS 226a, Classical to Romantic Epic** Jane Levin

***HUMS 299a, Rhetoric and Political Order** Norma Thompson

NELC 121a/HUMS 441a, The Hero in the Ancient Near East Kathryn Slanski
For description see under Near Eastern Languages & Civilizations.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Various graduate seminars are open to juniors and seniors with the qualifications expected of graduate students, i.e., proficiency in the pertinent ancient and modern languages. Descriptions of the courses are available from the director of undergraduate studies. Permission is required of the instructor, the director of undergraduate studies, and the director of graduate studies.

Cognitive Science

Director of undergraduate studies: Brian Scholl, 304 SSS, 432-4629,
brian.scholl@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM IN COGNITIVE SCIENCE

Professors Woo-kyoung Ahn (*Psychology*), Stephen Anderson (*Linguistics*), Amy Arnsten (*School of Medicine*), John Bargh (*Psychology*), Paul Bloom (*Psychology*), Marvin Chun (*Psychology*), Michael Della Rocca (*Philosophy*), Ravi Dhar (*School of Management*), Julie Dorsey (*Computer Science*), Carol Fowler (*Adjunct*) (*Psychology*), Robert Frank (*Linguistics*), David Gelernter (*Computer Science*), Tamar Gendler (*Philosophy*), Donald Green (*Political Science*), Laurence Horn (*Linguistics*), Marcia Johnson (*Psychology*), Dan Kahan (*Law School*), Frank Keil (*Psychology, Linguistics*), Lawrence Marks (*Psychology*), Gregory McCarthy (*Psychology*), Drew McDermott (*Computer Science*), Nathan Novemsky (*School of Management*), Kenneth Pugh (*School of Medicine*), Holly Rushmeier (*Computer Science*), Brian Scholl (*Psychology*), Sun-Joo Shin (*Philosophy*), Zoltán Szabó (*Philosophy*), Fred Volkmar (*School of Medicine*), Xiao-Jing Wang (*School of Medicine*), David Watts (*Anthropology*), Bruce Wexler (*School of Medicine*), Karen Wynn (*Psychology*), Raffaella Zanuttini (*Linguistics*), Steven Zucker (*Computer Science*)

Associate Professors Hal Blumenfeld (*School of Medicine*), Keith Chen (*School of Management*), Jeremy Gray (*Psychology*), Ami Klin (*School of Medicine*), Daeyeol Lee (*School of Medicine*), Kevin Pelphrey (*School of Medicine*), Maria Piñango (*Linguistics*), Ian Quinn (*Music*), Laurie Santos (*Psychology*), Brian Scassellati (*Computer Science*), Teresa Treat (*Psychology*)

Assistant Professors Erica Dawson (*School of Management*), Gaja Jarosz (*Linguistics*), Joshua Knobe (*Philosophy*), James Mazer (*School of Medicine*), John Morrell (*Mechanical Engineering*), Jill North (*Philosophy*), Kristina Olson (*Psychology*), Eve Poudrier (*Music*), Joseph Simmons (*School of Management*)

Lecturer Mark Phelan (*Philosophy*)

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, 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.

Introductory courses An introductory survey course, CGSC 110a, is normally taken by the end of the fall term of the sophomore year and prior to admission to the major. An introductory survey course in psychology, linguistics, computer science, neuroscience, or philosophy should also be taken by the end of the fall term of the sophomore year.

Requirements of the major Fifteen course credits are required for the major, including the two introductory courses and the senior colloquium and project. The remaining twelve term courses are chosen from an approved list that includes courses in psychology, linguistics, computer science, neuroscience, and philosophy bearing on the study of the mind and its relation to the brain. Beyond these core areas, the program also draws on relevant courses in anthropology, art, biology, economics, and music. Majors take four courses in one core field, three in another, two in a third, and one in a fourth, with the remaining two courses selected (with the approval of the director of undergraduate studies) from courses relevant to the student's program in Cognitive Science. The particular selection of courses must be approved by the director of undergraduate studies in order to assure overall coherence and breadth. Courses taken Credit/D/Fail may not be counted toward the requirements of the major, except with permission of the director of undergraduate studies.

Specific programs will vary considerably depending on the student's choice of areas of concentration, as well as the offerings of participating departments from year to year. Themes that have structured course work in the major in recent years include irrationality, visual neuroscience, the self and moral cognition, language, cognition and the arts, and connecting the brain and behavior.

Senior requirement In the senior year, majors take the senior colloquium and project, CGSC 490a and 491b. In the fall term students begin researching and writing a senior essay under the guidance of an appropriate faculty member in an area of cognitive science. In the spring term students complete the senior essay. Throughout the senior year, students meet regularly with one another and with the faculty in the context of this course to discuss current work in cognitive science and their own developing research projects.

Application to the major Students must apply to enter the major at the end of the fall term of the sophomore year. Applications must be made in writing to the director of undergraduate studies no later than Friday, December 10, in 109 K. Applications must include both an official or unofficial transcript of work at Yale that lists fall-term 2010 courses and a brief statement of purpose, which serves to indicate academic interests and expected focus within the areas of the Cognitive Science major. Application forms and answers to

frequently asked questions are available on line at www.yale.edu/cogsci. Applicants will be notified of decisions concerning admission to the major in January 2011.

REQUIREMENTS OF THE MAJOR

Prerequisites CGSC 110a or equivalent; 1 intro survey course in related discipline, as specified

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

Distribution of courses 4 term courses from one core field, 3 from another, 2 from a third, and 1 from a fourth; 2 addtl term courses from relevant area

Senior requirement CGSC 490a, 491b

INTRODUCTORY COURSES

CGSC 110a/PSYC 130a, Introduction to Cognitive Science Staff

MW 1–2:15 SO (o)

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.

[CGSC 201a/PSYC 120a, Brain and Thought: An Introduction to the Human Brain]

CGSC 273a/PHIL 273a, Mind and Thought Mark Phelan

For description see under Philosophy.

CGSC 281b/PHIL 181b, Philosophy and the Science of Human Nature Tamar Gendler

For description see under Philosophy.

ADVANCED COURSES

CGSC 304b/PSYC 304b, The Mental Lives of Babies and Animals Karen Wynn

For description see under Psychology.

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

For description see under Psychology.

[CGSC 320b/LING 140b^c, Computational Models in Cognitive Science]

[CGSC 343a/MUSI 343a, Music Cognition]

***CGSC 390b, Junior Seminar in Cognitive Science** Mark Phelan

T 3:30–5:30 (o)

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 407b/PSYC 407b, Cognitive Science of Causality** Frank Keil

For description see under Psychology.

***CGSC 423b/PSYC 423b^c, Cognitive Science of Good and Evil** Paul Bloom

For description see under Psychology.

***CGSC 425b/PSYC 425b^G, Social Perception** Brian Scholl

For description see under Psychology.

***CGSC 471a and 472b, Directed Research in Cognitive Science** Brian Scholl

HTBA (o)

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. May be elected for one or two terms.

***CGSC 473a and 474b, Directed Reading in Cognitive Science** Brian Scholl

HTBA (o)

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. May be elected for one or two terms.

***CGSC 490a and 491b, Senior Colloquium and Project** Tamar Gendler

HTBA ½ Course cr per term Cr/year only (o)

A research colloquium leading to the selection of a topic for, and the completion of, the senior essay. Students attend regular colloquium presentations by outside scholars. By the end of the fall term students choose an essay topic. During the spring term presentations become more narrowly focused on students' senior projects.

COURSES IN OTHER DEPARTMENTS RELEVANT TO COGNITIVE SCIENCE

ANTH 182b, Primate Ecology and Social Behavior David Watts**ANTH 270a, Evolution and Human Behavior** David Watts***CHLD 350a or b/PSYC 350a or b, Autism and Related Disorders** Ami Klin,
Fred Volkmar

For description see under Child Study Center.

CPSC 201a or b, Introduction to Computer Science Dana Angluin [F],
Holly Rushmeier [Sp]**CPSC 202a, Mathematical Tools for Computer Science** Joan Feigenbaum**CPSC 463b^G, Machine Learning** Dana Angluin**CPSC 470a^G, Artificial Intelligence** Brian Scassellati**CPSC 473b^G, Intelligent Robotics** Brian Scassellati

CPSC 475b^G/BENG 475b^G, Computational Vision and Biological Perception

Steven Zucker

For description see under Computer Science.

E&EB 122b, Principles of Evolution, Ecology, and Behavior Stephen Stearns

For description see under Biology.

ECON 159a, Game Theory Benjamin Polak

ECON 351a, Mathematical Economics: Game Theory Johannes Horner

***HUMS 475b/PHIL 452b, Evolution of Beauty** Jonathan Gilmore, Richard Prum

For description see under Humanities.

LING 117a^G/PSYC 137a, Language and Mind Maria Piñango

For description see under Linguistics.

LING 120a^G/PSYC 318a, General Phonetics Jelena Krivokapić

For description see under Linguistics.

LING 130a^G/PSYC 322a, Evolution of Language Stephen Anderson

For description see under Linguistics.

LING 132a^G, Introduction to Phonological Analysis Darya Kavitskaya

LING 135b^G, Phonological Theory Gaja Jarosz

***LING 141a^G/PSYC 327a, Language and Computation** Gaja Jarosz

For description see under Linguistics.

LING 153a^G, Syntax I Raffaella Zanuttini

LING 169a^G, Meaning Laurence Horn

***LING 180b^G, Morphology** Darya Kavitskaya

LING 212b^G, Linguistic Change Ashwini Deo

LING 226b^G, Formal Foundations of Linguistic Theories II Robert Frank

***LING 230b^G, Techniques in Neurolinguistics** Einar Mæhl

LING 231b^G/PSYC 331b, Neurolinguistics Maria Piñango

For description see under Linguistics.

***LING 251b^G, Learnability and Development** Gaja Jarosz

LING 254b^G, Syntax II Robert Frank

***LING 260a^G/PSYC 360a, Topics in Syntax: The Mental Lexicon** Maria Piñango

For description see under Linguistics.

***LING 263b^G, Semantics** Ashwini Deo

***LING 270a^G/PHIL 431a^G, Topics in Semantics: Modality** Tamina Stephenson

For description see under Linguistics.

***MCDB 135b, How the Brain Works** David Wells, Mitchell Kundel

For description see under Biology.

MCDB 320a^G, Neurobiology Haig Keshishian, Paul Forscher

For description see under Biology.

MCDB 321La^G, Laboratory for Neurobiology Haig Keshishian, Robert Wyman

For description see under Biology.

***MCDB 440b^G, Brain Development and Plasticity** Weimin Zhong, Elke Stein

For description see under Biology.

PHIL 115a, First-Order Logic Sun-Joo Shin

PHIL 267a^G, Mathematical Logic Sun-Joo Shin

PHIL 271a/LING 271a, Philosophy of Language Zoltán Szabó, Justin Khoo

For description see under Philosophy.

PSYC 140a, Developmental Psychology Frank Keil

PSYC 160b, Human Neuroscience Jeremy Gray

PSYC 170a, Fundamentals of Neuroscience Thomas Brown

PSYC 230Lb, Research Methods in Human Neuroscience Gregory McCarthy

***PSYC 240a, Research Methods in Conditioning and Learning** Allan Wagner

***PSYC 270b, Research Methods in Behavioral Neuroscience** Staff

***PSYC 306a, Nature, Nurture, and Human Behavior** Julia Kim-Cohen

PSYC 376a, Basics of Learning and Memory Thomas Brown

College Seminars in the Residential Colleges

Residential college seminars for the fall and spring terms are described on the Web at www.yale.edu/collegeseminar. The online listings contain course titles, descriptions, and prerequisites. Course syllabi are available on line at classesv2.yale.edu.

Students apply to college seminars before classes begin through the online tool at www.yale.edu/collegeseminar. In any given term, students may apply to a maximum of three college seminars; choices are not ranked by order of preference. Students may enroll in no more than two college seminars per term and may enroll in no more than four total during their time at Yale.

Comparative Literature

The Comparative Literature department offers undergraduate courses under the rubric "The Literature Major," and a graduate degree in Comparative Literature. For a listing of Yale College courses, see under The Literature Major.

Computer Science

Director of undergraduate studies: Stanley Eisenstat, 208 AKW, 432-1246, stanley.eisenstat@yale.edu

FACULTY OF THE DEPARTMENT OF COMPUTER SCIENCE

Professors Dana Angluin, James Aspnes, Julie Dorsey, Stanley Eisenstat, Joan Feigenbaum, Michael Fischer, David Gelernter, Paul Hudak, Drew McDermott, Vladimir Rokhlin, Holly Rushmeier, Martin Schultz, Zhong Shao, Avi Silberschatz (*Chair*), Daniel Spielman, Steven Zucker

Associate Professors Brian Scassellati, Yang Richard Yang

Assistant Professors Daniel Abadi, Bryan Ford

Lecturers Brad Rosen, Elizabeth Stark

The Department of Computer Science offers both B.S. and B.A. degree programs, as well as combined majors with the Departments of Electrical Engineering (see Electrical Engineering and Computer Science), Mathematics (see Computer Science and Mathematics), and Psychology (see 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 201a or b, Introduction to Computer Science, 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 joint 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 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. With the exception of CPSC 201a or b, none assumes previous knowledge of computers.

1. CPSC 079b examines the methods used to define shapes, materials, and lighting in computer-generated images. Students use a modeling/rendering system to create an animated video with rich visual effects. Proficiency in high school-level mathematics is assumed.
2. CPSC 112a or b teaches students majoring in any subject area how to program a computer and solve problems using the language Java or C#. Students with previous programming experience should consider taking CPSC 201a or b instead.

- 3. CPSC 150a explores how some of the key ideas in computer science have affected philosophy of mind, cognitivism, connectionism, and related areas. This humanities-style course has significant readings and a paper, and satisfies the writing distributional requirement.
- 4. CPSC 151b studies the history of the graphical user interface in an attempt to guess its future. This course also satisfies the writing distributional requirement.
- 5. CPSC 183a 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.
- 6. CPSC 201a or b 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 201a or b without taking CPSC 112a or b. (These courses meet at the same time so that students are easily able to change levels if necessary.)
- 7. CPSC 202a 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 core courses: CPSC 201a or b; CPSC 202a or MATH 244a; CPSC 223b, 323a, 365b, and 490a or b. The B.S. degree program requires six additional intermediate or advanced courses in Computer Science, for a total of twelve; the B.A. degree program, four, for a total of ten. CPSC 480a or b and 490a or b may not be counted toward these electives. All courses in the major must be taken for a letter grade.

Students majoring in Computer Science are advised to complete CPSC 201a or b and 223b by the end of the sophomore year.

For students who already know how to program, typical B.S. programs starting in the freshman and sophomore years are:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 201a	CPSC 202a CPSC 323a	Two electives	CPSC 490a
CPSC 223b	CPSC 365b One elective	Two electives	One elective

and

<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 201a CPSC 202a	CPSC 323a One elective	CPSC 490a Two electives
CPSC 223b	CPSC 365b One elective	Two electives

For typical B.A. programs, two of the electives would be omitted.

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 director of undergraduate studies, be counted toward the requirements.

Students considering graduate study in computer science are advised to take CPSC 421a and 422b, 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 440b 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 202a. 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 222a or b, 225a or b, or 230a, 231b, and MATH 112a or b, 115a or b, or 120a or b.

Senior requirement In the senior year students must take CPSC 490a or b, 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 director of undergraduate studies, students may enroll in 490a or b more than once or before their senior year.

Schedule approval All Computer Science majors in the sophomore, junior, and senior years should have their programs approved by the director of undergraduate studies.

Combined B.S./M.S. degree program in Computer Science 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. The requirements are as follows:

1. Candidates must satisfy the Yale College requirements for the B.S. degree in Computer Science.
2. In fulfilling these requirements, students must complete eight graduate courses from the approved list, up to two of which may, with the permission of the director of undergraduate studies 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 690a or b, 691a or b, or 692a or b.

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 201a or b; CPSC 202a or MATH 244a; CPSC 223b, 323a, 365b

Distribution of courses *B.S.* — 6 addtl intermediate or advanced Comp Sci courses;

B.A. — four addtl intermediate or advanced Comp Sci courses

Substitution permitted Advanced courses in other depts, with DUS permission

Senior requirement Senior project (CPSC 490a or b)

INTRODUCTORY COURSES

[CPSC 079b, Digital Photorealism]

CPSC 112a or b, Introduction to Programming Drew McDermott [F],
Yang Richard Yang [Sp]

MWF 10:30–11:20 [F]; MWF 11:35–12:25 [SP] QR (50)

Development on the computer of programming skills, problem-solving methods, and selected applications. No previous experience with computers necessary.

CPSC 150a/HUMS 407a, Computer Science and the Modern Intellectual Agenda

David Gelernter

MW 11:35–12:50 WR, HU (34)

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.

CPSC 151b/HUMS 408b, The Graphical User Interface David Gelernter

MW 11:35–12:50 WR (0)

The role of graphical user interfaces (GUIs) on standard platforms such as desktop PCs, laptops, and small-screen devices. Discussion of how and why GUIs developed as they did, why they have evolved so little since the desktop computers of the 1970s, and how changing hardware and user requirements might reshape them in the future. Enrollment limited to 25.

CPSC 183a, Introduction to Law and Technology Brad Rosen, Elizabeth Stark

MW 4–5:15 SO (0)

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.

***CPSC 184b, Intellectual Property in the Digital Age** Elizabeth Stark

W 3:30–5:30 SO (0)

The future of knowledge in cyberspace explored through discussion of copyright, patent, and trademark law in the context of new technologies. Topics include fair use, remixing, P2P, free software, the public domain, digital rights management, software patents, biotechnology, and online communities and collaboration. Prerequisite: CPSC <180a or b> or 183a. May not be taken after CPSC <182b>.

***CPSC 185b, Control, Privacy, and Technology** Brad Rosen

F 3:30–5:20 WR, SO (0)

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. Prerequisite: CPSC <180a or b> or 183a.

CPSC 201a or b, Introduction to Computer Science Dana Angluin [F],
Holly Rushmeier [Sp]

MWF 10:30–11:20 [F]; MWF 11:35–12:25 [SP] QR (50)

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 112a or b or equivalent.

CPSC 202a, Mathematical Tools for Computer Science Joan Feigenbaum

TTH 1–2:15 QR (26)

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.

CPSC 223b, Data Structures and Programming Techniques Stanley Eisenstat

TTH 1–2:15 QR (RP, 26)

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 201a or b or equivalent.

***CPSC 290a or b, Directed Research** Stanley Eisenstat

HTBA (0)

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. May be taken more than once for credit.

MATH 244a/AMTH 244a, Discrete Mathematics Matthew Hirn

For description see under Mathematics.

INTERMEDIATE COURSES

CPSC 323a, Introduction to Systems Programming and Computer Organization

Stanley Eisenstat

MW 1–2:15 QR (RP, 0)

Machine architecture and computer organization, systems programming in a high-level language, assembly language, issues in operating systems, software engineering, prototyping in nonprogramming languages. After CPSC 223b.

CPSC 365b, Design and Analysis of Algorithms Daniel Spielman

TTH 2:30–3:45 QR (27)

Paradigms for problem solving: divide and conquer, recursion, greedy algorithms, dynamic programming, randomized and probabilistic algorithms. Techniques for analyzing the efficiency of algorithms and designing efficient algorithms and data structures. Algorithms for graph theoretic problems, network flows, and numerical linear algebra. Provides algorithmic background essential to further study of computer science. After CPSC 202a and 223b.

EENG 348a, Digital Systems Roman Kuc

ADVANCED COURSES

CPSC 421a^G, Compilers and Interpreters Zhong Shao

MW 1–2:15 QR (36)

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 323a.

CPSC 422b^G, Operating Systems Bryan Ford

MW 1–2:15 QR (36)

The design and implementation of operating systems. Topics include synchronization, deadlock, process management, storage management, file systems, security, protection, and networking. After CPSC 323a.

[CPSC 424b^G, Parallel Programming Techniques]

[CPSC 425b^G, Theory of Distributed Systems]

CPSC 427a^G, Object-Oriented Programming Michael Fischer

TTH 1–2:15 QR (0)

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++. After CPSC 223b.

CPSC 428b^G, Language-Based Security Zhong Shao

TTH 2:30–3:45 QR (0)

Basic design and implementation of language-based approaches for increasing the security and reliability of systems software. Topics include proof-carrying code, certifying compilation, typed assembly languages, runtime checking and monitoring, high-confidence embedded systems and drivers, and language support for verification of safety and liveness properties. After CPSC 202a, 323a, and MATH 222a or b, or equivalents.

[CPSC 430a^G, Formal Semantics]

CPSC 431a^G, Computer Music: Algorithmic and Heuristic Composition Paul Hudak

MW 2:30–3:45 QR (0)

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 202a and 223b.

[CPSC 432a^G, Computer Music: Sound Representation and Synthesis]

[CPSC 433b^G, Computer Networks]

CPSC 434b^G, Mobile Computing and Wireless Networking Yang Richard Yang

MW 2:30–3:45 QR (37)

Introduction to the principles of mobile computing and its enabling technologies. Topics include wireless systems; information management; location-independent and location-dependent computing models; disconnected and weakly-connected operation models;

human-computer interactions; mobile applications and services; security; power management; and sensor networks. After CPSC 202a and 323a.

[CPSC 435b^G, Internet-Scale Applications]

***CPSC 436a^G/EENG 460a^G, Networked Embedded Systems and Sensor Networks**

Andreas Savvides

For description see under Electrical Engineering.

CPSC 437b^G, Introduction to Databases Avi Silberschatz

TTH 1–2:15 QR (0)

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 202a and 223b.

[CPSC 438b^G, Database System Implementation and Architectures]

CPSC 440b^G, Numerical Computation Vladimir Rokhlin

TTH 2:30–3:45 QR (27)

Algorithms for numerical problems in the physical, biological, and social sciences: solution of linear and nonlinear systems of equations, interpolation and approximation of functions, numerical differentiation and integration, optimization. After CPSC 112a or b or an equivalent introductory programming course; MATH 120a or b; and MATH 222a or b or 225a or b or CPSC 202a.

CPSC 445a^G, Introduction to Data Mining Vladimir Rokhlin

MW 1–2:15 QR (0)

A study of algorithms and systems that allow computers to find patterns and regularities in databases, to perform prediction and forecasting, and to improve their performance generally through interaction with data. After CPSC 202a, 223b, and MATH 222a or b, or equivalents.

CPSC 462a^G/AMTH 462a^G, Graphs and Networks Daniel Spielman

For description see under Applied Mathematics.

CPSC 463b^G, Machine Learning Dana Angluin

MW 2:30–3:45 QR (0)

Paradigms and algorithms for learning classification rules and more complex behaviors from examples and other kinds of data. Topics may include version spaces, decision trees, artificial neural networks, Bayesian networks, instance-based learning, genetic algorithms, reinforcement learning, inductive logic programming, the MDL principle, the PAC model, VC dimension, sample bounds, boosting, support vector machines, queries, grammatical inference, and transductive and inductive inference. After CPSC 202a and 223b, or with permission of instructor. CPSC 365b is recommended.

[CPSC 467b^G, Cryptography and Computer Security]

CPSC 468a^G, Computational Complexity Joan Feigenbaum

TTH 1–2:15 QR (0)

Introduction to the theory of computational complexity. Basic complexity classes, including polynomial time, nondeterministic polynomial time, probabilistic polynomial time,

polynomial space, logarithmic space, and nondeterministic logarithmic space. The roles of reductions, completeness, randomness, and interaction in the formal study of computation. After CPSC 365b or with permission of instructor.

CPSC 469b^C, Randomized Algorithms James Aspnes

TTH 1–2:15 QR (26)

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 365b; a solid background in probability is desirable.

CPSC 470a^C, Artificial Intelligence Brian Scassellati

MWF 10:30–11:20 QR (33)

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 201a or b and 202a.

CPSC 473b^C, Intelligent Robotics Brian Scassellati

MWF 10:30–11:20 QR (o)

Introduction to the construction of intelligent, autonomous systems. Sensory-motor coordination and task-based perception. Implementation techniques for behavior selection and arbitration, including behavior-based design, evolutionary design, dynamical systems, and hybrid deliberative-reactive systems. Situated learning and adaptive behavior. After CPSC 202a; after or concurrently with CPSC 223b.

CPSC 475b^C/BENG 475b^C, Computational Vision and Biological Perception

Steven Zucker

MW 1–2:15 QR, SC (RP, 36)

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. After MATH 120a or b and CPSC 112a or b, or with permission of instructor.

[CPSC 478b^C, Computer Graphics]

CPSC 479a^C, Advanced Topics in Computer Graphics Julie Dorsey

TTH 2:30–3:45 QR (o)

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 202a and 223b.

***CPSC 480a or b, Directed Reading** Stanley Eisenstat

HTBA (o)

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 490a or b, Special Projects** Stanley Eisenstat

HTBA (o)

Individual research. Requires a faculty supervisor and the permission of the director of undergraduate studies. The student must submit a written report about the results of the project. May be taken more than once for credit.

MB&B 452b^c/MCDB 452b^c, Bioinformatics: Practical Application of Simulation and Data Mining Mark Gerstein

For description see under Molecular Biophysics & Biochemistry.

Computer Science and Electrical Engineering

(See under Electrical Engineering and Computer Science.)

Computer Science and Mathematics

Directors of undergraduate studies: Stanley Eisenstat (Computer Science), 208 AKW, 432-1246, stanley.eisenstat@yale.edu; Roger Howe (Mathematics), 220B LOM, 432-4686, roger.howe@yale.edu

Computer Science and Mathematics is an interdepartmental major for students who are interested in computational mathematics, the use of computers in mathematics, mathematical aspects of algorithm design and analysis, and theoretical foundations of computing.

The major requires fourteen term courses as well as a senior project. Six of the fourteen courses must be in computer science: CPSC 201a or b, 223b, 323a, and 365b; one from CPSC 440b, 462a, 468a, or 469b; and one additional advanced term course other than CPSC 480a or b or 490a or b. The remaining eight courses must be in mathematics: MATH 120a or b, either 222a or b or 225a or b, 244a, and five additional advanced term courses other than MATH 470a or b ("advanced courses" are those that have as a prerequisite MATH 120a or b, 222a or b, or 225a or b). MATH 230a, 231b may replace MATH 120a or b and 222a or b or 225a or b.

The senior requirement is a project or an essay on a topic acceptable to both departments. An oral report on the mathematical aspects of the project must be presented to the Mathematics faculty.

The entire program of each student majoring in Computer Science and Mathematics must be approved by the director of undergraduate studies in each department. Courses taken Credit/D/Fail may not be counted toward the major.

REQUIREMENTS OF THE MAJOR

Prerequisites None

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

Specific courses required CPSC 201a or b, 223b, 323a, 365b; one from CPSC 440b, 462a, 468a, or 469b; MATH 120a or b, either 222a or b or 225a or b, 244a

Distribution of courses 5 addtl advanced courses in math (may not be MATH 470a or b); 1 addtl advanced course in comp sci (may not be CPSC 480a or b or 490a or b)

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

Senior requirement Senior project or senior essay on topic acceptable to Comp Sci and Math depts; oral report to Math dept on mathematical aspects of project

Computer Science and Psychology

Directors of undergraduate studies: Stanley Eisenstat (Computer Science), 208 AKW, 432-1246, stanley.eisenstat@yale.edu; Woo-kyoung Ahn (Psychology), 319 SSS, 432-9626, psychdus@yale.edu

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, neural modes of computation, and biological perception.

The prerequisite for the major is PSYC 110a or b. Beyond the prerequisite, the major requires fourteen term courses as well as a senior project.

Eight of the fourteen courses must be in computer science: CPSC 201a or b, 202a, 223b, 323a, 365b, and three advanced computer science courses in artificial intelligence or neural computing. MATH 244a may substitute for CPSC 202a. CPSC 480a or b and 490a or b may not be counted as one of these courses.

The remaining six courses must be in psychology, including PSYC 200b, at least one from PSYC 210–299, at least two courses from the social science point of view, indicated as List A under Psychology, and at least one course in cognitive psychology or cognitive science listed in Psychology (e.g., PSYC 120a or 130a). PSYC 490a, 491b, 492a, and 493b may not be counted as one of these courses.

A second course in cognitive psychology or cognitive science may substitute for one of the courses in artificial intelligence or neural computing. An additional course in psychology and an examination arranged with the instructor of PSYC 200b may substitute for PSYC 200b.

Senior requirement Students must take CPSC 490a or b or PSYC 492a or 493b, and the project must be approved by the director of undergraduate studies in each department.

The entire program of each student majoring in Computer Science and Psychology must be approved by the director of undergraduate studies in each department. No course in Computer Science taken Credit/D/Fail may be counted toward the major; a maximum of one course in Psychology taken Credit/D/Fail may be counted toward the major.

REQUIREMENTS OF THE MAJOR

Prerequisite PSYC 110a or b

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

Specific courses required CPSC 201a or b, 202a, 223b, 323a, 365b; PSYC 200b

Distribution of courses 8 courses in Comp Sci, with 3 advanced AI or neural computing courses; 6 courses in Psych, with at least 1 from PSYC 210–299, at least 2 from List A under Psych, and at least 1 in cognitive psych or cognitive science listed in Psych

Substitution permitted For CPSC 202a, MATH 244a; for 1 course in AI or neural computing, 1 addtl course in cognitive psych or cognitive science; for PSYC 200b, 1 addtl course in Psych and exam arranged with instructor

Senior requirement CPSC 490a or b or PSYC 492a or 493b with project approved by DUS in each dept

Computing and the Arts

Director of undergraduate studies: Stanley Eisenstat (Computer Science), 208 AKW, 432-1246, stanley.eisenstat@yale.edu

Computing and the Arts is an interdepartmental major designed for students who wish to integrate work in computing with work in one of the arts disciplines: 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; lessons that can be learned from trying to create a robotic conductor or performer.

For students with an artistic perspective, computing methods offer a systematic approach to achieving their vision. A foundation in computer science allows artists to understand existing computing tools more comprehensively and to use them more effectively. Furthermore, it gives them insight into what fundamentally can and cannot be done with computers, so they can anticipate the future development of new tools for computing in their field.

Prerequisites The prerequisite for all students in the major is CPSC 112a or b, which should be taken during the freshman year. Additional prerequisites for the Art track are ART 111a or b and 114a or b. There are no additional prerequisites for the History of Art track. An additional prerequisite for the Music track is MUSI 210a or b, as determined by the music theory placement test. (Students who do not place into or out of MUSI 210a or b may need to take a lower-level course first.) Additional prerequisites for the Theater Studies track are THST 110a and 111b. There is no required favorable review of studio work for admission to the major in any track.

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 201a or b, 202a, and 223b. Students are advised to complete CPSC 202a and 223b by the end of the sophomore year. MATH 244a may be substituted for CPSC 202a.

The six remaining courses are selected from one of the arts disciplines. Students choose a track in art, history of art, music, or theater studies. All requirements for a single track must be satisfied, as specified below.

The Art track requires the following courses in addition to the Computer Science courses listed above: (1) three 100-level courses beyond ART 111a or b and 114a or b, such as ART 132a or b, 138a or b, and <145a or b>; (2) two courses in Art at the 200 or 300 level; (3) one course in Art at the 400 level; (4) two courses selected from CPSC 475b, 478b, and 479a; (5) one additional intermediate or advanced Computer Science course (excluding CPSC 490a or b).

The History of Art track requires the following courses in addition to the Computer Science courses listed above: (1) one introductory History of Art course: HSAR 112a, 115b, or 116b; (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 401a or b; (5) one 400-level seminar in History of Art; (6) two courses selected from CPSC 437b, 475b, 478b or 479a, one of which must be CPSC 478b or 479a; (7) one additional intermediate or advanced computer science course (excluding CPSC 490a or b).

The Music track requires the following courses in addition to the Computer Science courses listed above: (1) MUSI 325a; (2) five term courses chosen from MUSI 312a, 313b, 343a, 395b, 412a, 413b, 450a, 466b, 471a, 472b, and <485b>; (3) CPSC 431a; (4) CPSC 432a; (5) one additional intermediate or advanced Computer Science course (excluding CPSC 490a or b).

The Theater Studies track requires the following courses in addition to the Computer Science courses listed above: (1) THST 210a; (2) three courses in dramatic literature or theater history; (3) two upper-level Theater Studies production seminars in design, directing, or playwriting; (4) CPSC 431a or 432a; (5) CPSC 478b or 479a; (6) one additional intermediate or advanced computer science course (excluding CPSC 490a or b).

Senior requirement The senior project requires two terms: one term of CPAR 491a or b, and one term of ART 495a or b, HSAR 499a or b, MUSI 490a or 491b, or THST 491a or b, depending on the track chosen. The project must be approved by the director of undergraduate studies and be acceptable to both departments. Students must submit a written report, including an electronic abstract and Web page(s).

The entire program of each student majoring in Computing and the Arts must be approved by the director of undergraduate studies. Courses taken Credit/D/Fail may not be counted toward the major.

REQUIREMENTS OF THE MAJOR

Prerequisites *All tracks*—CPSC 112a or b; *Art track*—ART 111a or b, 114a or b; *Music track*—MUSI 210a or b; *Theater Studies track*—THST 110a, 111b

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

Specific courses required *All tracks*—CPSC 201a or b, 202a, 223b; *Art track*—2 from CPSC 475b, 478b, 479a; *History of Art track*—2 from CPSC 437b, 475b, 478b, 479a, including 1 of CPSC 478b, 479a; HSAR 112a, 115b, or 116b; HSAR 401a or b; *Music track*—CPSC 431a, 432a; MUSI 325a; *Theater Studies track*—CPSC 431a or 432a; CPSC 478b or 479a; THST 210a

Distribution of courses *All tracks*—6 courses in Comp Sci, incl 1 addtl intermediate or advanced course beyond specific reqs (excluding CPSC 490a or b); *Art track*—3 courses in Art at 100-level (excluding prereqs), 2 at 200 or 300 level, and 1 at 400 level (in addition to senior req); *History of Art track*—2 courses in different areas of History of Art at 200, 300, or 400 level; one 400-level sem in History of Art; 1 studio art course; *Music track*—5 term courses from MUSI 312a, 313b, 343a, 395b, 412a, 413b, 450a, 466b, 471a, 472b, <485b>; *Theater Studies track*—3 courses in dramatic lit or theater history; 2 production sems, as specified

Substitution permitted MATH 244a for CPSC 202a

Senior requirement *All tracks*—Two-term senior project approved by DUS; *Art track*—Senior project completed in CPAR 491a or b and ART 495a or b; *History of Art track*—Senior project completed in CPAR 491a or b and HSAR 499a or b; *Music track*—Senior project completed in CPAR 491a or b and MUSI 490a or 491b; *Theater Studies track*—Senior project completed in CPAR 491a or b and THST 491a or b

***CPAR 291a or b, Special Projects** Stanley Eisenstat

HTBA (o)

Individual research project in computing and the arts. Requires a faculty supervisor and permission of the director of undergraduate studies. May be taken more than once for credit.

***CPAR 491a or b, Senior Project in Computing and the Arts** Stanley Eisenstat

HTBA (o)

Individual research project for majors in Computing and the Arts. Requires two faculty supervisors, one from Computer Science and one from the department in the chosen track. Requires permission of the director of undergraduate studies. The student must present both a verbal and a written report describing the results of the project. May be taken more than once for credit.

Czech

(See under Slavic Languages and Literatures.)

DeVane Lecture Course

The DeVane Lecture Course is a series of lectures open to the general public that can also be taken by Yale undergraduates for course credit. The next set of DeVane Lectures is scheduled to be offered during the 2011–2012 academic year.

Directed Studies

Director of undergraduate studies: Jane Levin, 53 Wall St., 432-1314, jane.levin@yale.edu; chair of Humanities: R. Howard Bloch, 53 Wall St., 432-1313, howard.bloch@yale.edu

Directed Studies, a selective program for freshmen, is an interdisciplinary study of Western civilization. One hundred twenty-five students are accepted each year.

Each course meets weekly for one lecture and two seminars; seminars have eighteen students and one faculty member. The regular lectures and seminars are complemented by a series of colloquia. Distinguished members of the faculty are invited to speak on major issues arising from the work in the program, on related disciplines not included in the program, and on the relationship between Western civilization and the non-Western world. Colloquium topics in recent years have included the use of the humanities, the Christian reception of Aristotle, and ancient art and property rights. Directed Studies fulfills the following distributional requirements: two course credits in the humanities and arts, two course credits in the social sciences, and two course credits in writing. The program serves as a strong foundation for all majors in Yale College, including those in the sciences.

***DRST 001a and 002b, Directed Studies: Literature** Jane Levin, Egbert Bakker, Mark Bauer, Angela Capodivacca, Kirk Freudenburg, Bella Grigoryan, Peter Hawkins, Virginia Jewiss, David Kastan, Claude Rawson, John Rogers, Christopher Semk, Ruth Yeazell

Lect. M 11:35–12:25; disc. HTBA WR, HU (63)

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.

***DRST 003a and 004b, Directed Studies: Philosophy** Stephen Darwall, Jay Elliott, Jonathan Gilmore, Paul Grimstad, John Hare, Verity Harte, David Possen, Barbara Sattler, Ludger Viefhues, Kenneth Winkler

Lect. W 11:35–12:25; disc. HTBA WR, HU (24)

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.

***DRST 005a and 006b, Directed Studies: Historical and Political Thought** Emily Greenwood, Gwenda-lin Grewal, Charles Hill, Demetra Kasimis, Anthony Kronman, Helene Landemore, Karuna Mantena, Matthew McCarty, Kathryn Slanski, Steven Smith, Norma Thompson

Lect. F 11:35–12:25; disc. HTBA SO (34)

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.

Drama

(See under *Theater Studies*.)

East Asian Languages and Literatures

Director of undergraduate studies: Paize Keulemans, 311 HGS, 432-2027, paize.keulemans@yale.edu; language director: Seungja Choi, Rm. 101, 432-434 Temple St., 432-2866, seungja.choi@yale.edu

FACULTY OF THE DEPARTMENT OF EAST ASIAN LANGUAGES AND LITERATURES

Professors Kang-i Sun Chang, Edward Kamens (*Chair*), Tina Lu, Haun Saussy, John Treat

Associate Professor Aaron Gerow

Assistant Professors Paize Keulemans, Chloe Starr, Jing Tsu

Senior Lecturer Koichi Shinohara

Senior Lectors Seungja Choi, Koichi Hiroe, Zhengguo Kang, Angela Lee-Smith, Ninghui Liang, Yoshiko Maruyama, Ling Mu, Michiaki Murata, Hiroyo Nishimura, Masahiko Seto, Mari Stever, Wei Su, Peisong Xu, William Zhou

Lectors Hsiu-hsien Chan, Min Chen, Rongzhen Li, Fan Liu, Yukie Mammoto, Jianhua Shen, Haiwen Wang, Yu-lin Wang-Saussy

The Department of East Asian Languages and Literatures offers majors in Chinese and Japanese. These are liberal arts majors intended to give the student a general knowledge of Chinese or Japanese literature and the techniques of literary analysis, and advanced oral and written skills in one of these languages. The department also offers language courses in Korean and courses in East Asian humanities. Courses in Indonesian and Vietnamese are listed under Southeast Asia Studies in this bulletin.

Because the study of an East Asian language presents special challenges, all students interested in these languages are encouraged to begin their studies as early as possible in their careers at Yale. Students must begin language study no later than the sophomore year in order to complete the requirements of either major in the department. Students considering a major in East Asian Languages and Literatures should consult the director of undergraduate studies. The Richard U. Light Fellowship, administered by the Office of Fellowship Programs, provides opportunities for qualified Yale students to study East Asian languages in East Asia. Numerous other fellowships are also available. Language requirements may be met in part by taking accelerated language courses elsewhere, but students wishing to receive credit for language study completed at another university must take a placement examination to determine their level of proficiency. It is a departmental policy that Yale College students may not audit language courses.

Course numbering Courses with numbers up to 099 are freshman seminars on East Asian literature, film, and humanities. Language courses are numbered from 100 to 199. Courses with numbers from 200 to 399 address literature, film, and the humanities: introductory courses in premodern periods are numbered from 200 to 249; introductory courses in the modern period are numbered from 250 to 299; more advanced courses in premodern periods are numbered from 300 to 349; and more advanced courses in the modern period are numbered from 350 to 399.

Placement examination Students who are enrolling in the department's language classes 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 year. The times and places of the examinations are listed on the departmental Web site (www.yale.edu/eall/undergrad) in late August. The Chinese and Japanese examinations have online components accessed through the same site. Students of Japanese, Chinese, and Korean returning from programs abroad must take a placement examination unless the coursework was completed at an institution preapproved by the Light Fellowship program with a grade B or higher. For questions, consult with the director of undergraduate studies.

THE MAJOR IN CHINESE

The major in Chinese is designed to give the student a broad understanding of the chief forms and themes of Chinese literature through reading in the original language. By the

senior year, the student majoring in Chinese can acquire advanced skills in speaking and reading Chinese and in interpreting Chinese literature.

Prerequisite to the major is CHNS 140b or the equivalent. The major consists of at least eleven other courses, which fall into the following seven categories: (1) Chinese literature in translation: two term courses at the 200 or 300 level, of which one must be in premodern literature; (2) third-year Chinese: CHNS 150a and 151b or equivalents; (3) two terms of literary Chinese: CHNS 170a and 171b or equivalents; (4) one general literature course, such as ENGL 129a, 130b, LITR 120a, or 300b, or a course on Japanese literature at the 200 level; (5) one course conducted in English that gives an overview of Chinese culture, such as HIST 306b; (6) Chinese literature in the original language: two term courses that involve the study of literary texts (premodern or modern vernacular) to be chosen from the fourth-year Chinese language courses in which literary texts are used (such as CHNS 160a or 161b), CHNS 190b, or other courses at the discretion of the director of undergraduate studies; (7) the senior essay. A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major with permission of the director of undergraduate studies.

In order to acquaint themselves with the breadth of the field, students majoring in Chinese should take one or more courses in Chinese literature in translation as early as possible in their careers at Yale. Graduate courses in Chinese may count toward the major; enrollment in them requires permission of the instructor and of the director of graduate studies.

Senior requirement Students prepare a senior essay in CHNS 491a or b or in CHNS 492a, 493b.

REQUIREMENTS OF THE MAJOR

Prerequisite CHNS 140b or equivalent

Number of courses 11 term courses beyond prereq (incl one-term senior essay) or 12 term courses (incl two-term senior essay)

Specific courses required CHNS 150a, 151b and 170a, 171b or equivalents

Distribution of courses 2 courses in Chinese lit in translation, incl 1 in premodern lit; 1 general lit course; 1 overview of Chinese culture in English; 2 courses in Chinese lit in Chinese

Senior requirement Senior essay (CHNS 491a or b, or 492a and 493b)

THE MAJOR IN JAPANESE

The Japanese major immerses the student in the breadth and depth of the Japanese literary tradition, premodern through modern. By the senior year, the student majoring in Japanese can acquire advanced skills in speaking and reading Japanese and in interpreting Japanese literature.

Prerequisite to the major is JAPN 140b or the equivalent. The major consists of at least eleven other courses, which fall into the following seven categories: (1) Japanese literature in translation or Japanese film: three term courses at the 200 or 300 level, of which one must be in premodern literature and one in modern literature; (2) advanced modern

Japanese: JAPN 150a and 151b or equivalents; (3) literary Japanese: JAPN 170a; (4) one general literature or film course, such as ENGL 129a, 130b, LITR 120a, 300b, FILM 150a, or a course on Chinese literature at the 200 level; (5) one course in English that gives an overview of Japanese culture, such as ANTH 254a; (6) Japanese literature in the original language: two term courses that involve the study of literary or other types of texts, pre-modern or modern, such as JAPN 156a, 157b, 171b, or other courses as approved by the director of undergraduate studies; (7) the senior essay. A maximum of one course taken Credit/D/Fail may be counted toward the requirements of the major with permission of the director of undergraduate studies.

In order to acquaint themselves with the breadth of the field, students majoring in Japanese should take one or more courses in Japanese literature in translation as early as possible in their careers at Yale. Graduate courses in Japanese may count toward the major; enrollment in them requires permission of the instructor and of the director of graduate studies.

Senior requirement Students prepare a senior essay in JAPN 491a or b or in JAPN 492a, 493b.

REQUIREMENTS OF THE MAJOR

Prerequisite JAPN 140b or equivalent

Number of courses 11 term courses beyond prereq (incl one-term senior essay) or 12 term courses (incl two-term senior essay)

Specific courses required JAPN 150a, 151b or equivalent; JAPN 170a

Distribution of courses 3 courses in Japanese lit in translation or Japanese film, incl 1 in premodern lit and 1 in modern lit; 1 general lit or film course; 1 overview of Japanese culture in English; 2 courses in Japanese lit in Japanese

Senior requirement Senior essay (JAPN 491a or b, or 492a and 493b)

CHINESE

***CHNS 110a, Elementary Modern Chinese I** William Zhou and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, o)

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. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program. Credit only on completion of CHNS 120b.

***CHNS 112a, Elementary Modern Chinese for Advanced Learners I** Ninghui Liang and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, o)

First level of the advanced learner sequence, intended for students with some aural proficiency but 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. Credit only on completion of CHNS 122b.

***CHNS 120b, Elementary Modern Chinese II** William Zhou and staff5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 0)

Continuation of CHNS 110a. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 122a or b, Elementary Modern Chinese for Advanced Learners II**

Ninghui Liang and staff

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 0)

Continuation of CHNS 112a.

CHNS 125b, Intensive Elementary Modern Chinese Ningping Yu

HTBA L1–L2 2 Course cr (50)

An intensive immersion course that covers the material of CHNS 110a and 120b in one term. Emphasis on spoken language and drills, pronunciation, grammatical analysis, conversation practice, and introduction to reading and writing Chinese characters. Intended for students with no background in Chinese. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 130a, Intermediate Modern Chinese I** Ling Mu and staff5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (RP, 61)

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. Prerequisite: CHNS 120b or equivalent. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 132a, Intermediate Modern Chinese for Advanced Learners I** Peisong Xu and staff

5 HTBA L3 1½ Course cr (RP, 61)

The second level of the advanced learner sequence. Intended for students with intermediate to advanced oral proficiency and high 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 122a or b or equivalent.

***CHNS 140b, Intermediate Modern Chinese II** Ling Mu and staff5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 61)

Continuation of CHNS 130a. To be followed by CHNS 150a. Prerequisite: CHNS 130a or equivalent. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 142b, Intermediate Modern Chinese for Advanced Learners II** Peisong Xu and staff5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 61)

Continuation of CHNS 132a. Admits to CHNS 152a. Prerequisite: CHNS 132a or equivalent.

***CHNS 150a, Advanced Modern Chinese I** Rongzhen Li, Haiwen Wang, and staff5 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (61)

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 140b. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 151b, Advanced Modern Chinese II** Rongzhen Li and staff5 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (61)

Continuation of CHNS 150a. Prerequisite: CHNS 150a or equivalent. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 152a, Advanced Modern Chinese I for Advanced Learners** Zhengguo Kang3 HTBA For sections see www.yale.edu/oci L5 (61)

Third level of the advanced learner sequence in Chinese. Intended for students with advanced speaking and listening skills (able to conduct conversations fluently) and with high intermediate 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. Prerequisite: CHNS 142b or equivalent.

***CHNS 153b, Advanced Modern Chinese II for Advanced Learners** Zhengguo Kang3 HTBA For sections see www.yale.edu/oci L5 (61)

Continuation of CHNS 152a. Prerequisite: CHNS 152a or equivalent.

***CHNS 154a, Advanced Modern Chinese III** Jianhua Shen3 HTBA For sections see www.yale.edu/oci L5 (61)

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. Prerequisite: CHNS 151b or equivalent.

***CHNS 155b, Advanced Modern Chinese IV** Jianhua Shen3 HTBA For sections see www.yale.edu/oci L5 (61)

Continuation of CHNS 154a. Prerequisite: CHNS 154a or equivalent.

***CHNS 156a, Chinese through Film** Zhengguo Kang

MWF 11:35–12:25 L5 (0)

A survey of Chinese films of the past twenty years, optimized for language teaching. Texts include plot summaries, critical essays, and some scripts. Discussions, screenings, presentations, and writing workshops consolidate the four language skills. Prerequisite: CHNS 151b or equivalent.

***CHNS 158a, Readings in Contemporary Chinese Texts I** Wei Su3 HTBA For sections see www.yale.edu/oci L5 (RP, 61)

Selected readings in Chinese fiction of the past twenty years. Lectures, discussions, and written work in Chinese aim at integrated mastery of the modern language. Prerequisite: CHNS 151b or equivalent.

***CHNS 159b, Readings in Contemporary Chinese Texts II** Wei Su3 HTBA For sections see www.yale.edu/oci L5 (RP, 61)

Continuation of CHNS 158a. Selected readings in Chinese essays and articles of the past twenty years. Prerequisite: CHNS 151b or equivalent.

***CHNS 160a, Readings in Modern Chinese Texts I** Wei Su

MWF 10:30–11:20 L5 (33)

An advanced language course designed to continue the development of students' overall language skills through reading and discussion of modern short stories. After CHNS 151b or equivalent.

***CHNS 161b, Readings in Modern Chinese Texts II** Wei Su

MWF 10:30–11:20 L5 (33)

Continuation of CHNS 160a. Readings in modern Chinese essays and articles. After CHNS 151b or equivalent.

CHNS 165b, Chinese Composition Zhengguo Kang

MWF 11:35–12:25 L5 (0)

A writing course for advanced students with solid oral and reading proficiency. A systematic writing program, from simple assignments such as descriptions, narratives, and expositions to more sophisticated critical essays. Prerequisite: a course conducted in Chinese numbered 154a or higher.

CHNS 170a^c, Introduction to Literary Chinese I Paize Keulemans

TTH 11:35–12:50 L5 (RP, 24)

Reading and interpretation of texts in various styles of literary Chinese (*wenyan*), with attention to basic problems of syntax and literary style. After CHNS 142b, 151b, or equivalent.

CHNS 171b^c, Introduction to Literary Chinese II Paize Keulemans

TTH 11:35–12:50 L5 (RP, 24)

Continuation of CHNS 170a. After CHNS 142b, 151b, 170a, or equivalent.

***CHNS 190b^c, Advanced Readings in Modern Chinese Literature** Jing Tsu

W 3:30–5:20 L5, HU (37)

A rigorous introduction to literary criticism and analysis using texts in the original language. Focus on the contemporary period, drawing from fiction written in Chinese in different parts of the world, from mainland China to Taiwan and from Malaysia to Hong Kong. Texts in both simplified and traditional characters. After CHNS 153b or 159b or equivalent.

CHNS 200a^c/LITR 172a^c, Man and Nature in Chinese Literature Kang-i Sun Chang

TTH 1–2:15 HU Tr (0)

Concepts of man and nature in traditional Chinese literature, with special attention to aesthetic and cultural meanings. Topics include Taoism, Buddhism, and lyricism; body

and sexuality; contemplation and self-cultivation; travel in literature; landscape and the art of description; images of Utopian communities as compared to the Western notion of Utopia; ideas of self-identity; and dream, pilgrimage, and allegory. No knowledge of Chinese required.

CHNS 201b⁶/WGSS 405b, Women and Literature in Traditional China

Kang-i Sun Chang

TTH 1–2:15 HU Tr (o)

Major women writers in traditional China, as well as representations of women in works by male authors. Topics include the dichotomy of *yin* and *yang*, women and the fox spirits, the power of women's writing, women in exile, Taoist nuns, widow poets, courtesans and the literati culture, women's poetry clubs, women's script (*nushu*), the cross-dressing ladies, footbinding and representations of the female body, food and sexuality, notions of *qing* (love), aesthetics of illness, women and revolution, and the function of memory in women's literature. No knowledge of Chinese required.

CHNS 204a or b, Introduction to Chinese Civilization Tina Lu

HTBA HU (50)

Survey of one of the world's oldest continuous civilizations from the Neolithic to 1919, touching on religion, art, philosophy, and other forms of cultural production. Focus on the history and literature of premodern China over the course of the imperial period. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 205b, Intertextuality** Tina Lu

HTBA HU Tr (o)

An introduction to approaches to literature through close reading and analysis. Questions include how to read works from different literary traditions, how works written at different times in different languages inform one other, and how canons and literary histories are created. All readings in English translation. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 225a, The Dream of the Red Chamber** Tina Lu

HTBA HU Tr (o)

The monumental novel *Hongloumeng* (Story of the Stone or Dream of the Red Chamber) occupies an unusual place in sinological scholarship: at once the fantastic story of a boy who seems to be a reincarnated rock, and also perhaps our best source for understanding real life in eighteenth-century China. Reading of the entire novel in translation, exploring it both as historical document and as work of imagination. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***CHNS 265a/AMST 326a/ER&M 300a/FILM 435a/LITR 258a, Chinese Diaspora and the Americas in Fiction and Film** Jing Tsu

W 3:30–5:20; screenings T 7–9 p.m. HU Tr (o)

Comparative survey of modern fiction and film portraying Chinese diaspora in North and South America. Topics include labor, migration, displacement, ethnicity, gender, linguistic hybridity, world Chinatowns, and popular culture. Readings in translation.

***CHNS 302b⁶, Readings in Classical Chinese Prose** Kang-i Sun Chang

W 1:30–3:20 HU (o)

Readings in classical Chinese prose with commentaries and notes in modern Chinese. Exploration of a variety of themes and styles. Conducted in English and in Chinese.

***CHNS 303a^c, Readings in Classical Chinese Poetry** Kang-i Sun Chang

W 1:30–3:20 HU (o)

Fundamentals of classical Chinese poetry and poetics. Primary readings in Chinese; conducted in English and in Chinese.

***CHNS 470a and 471b, Independent Tutorial** Paize Keulemans

HTBA (o)

For students with advanced Chinese 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.

***CHNS 491a or b, Senior Essay** Paize Keulemans

HTBA (o)

Preparation of a one-term senior essay under faculty supervision.

***CHNS 492a and 493b, Yearlong Senior Essay** Paize Keulemans

HTBA (o)

Preparation of a two-term senior essay under faculty supervision.

JAPANESE

***JAPN 002b/HUMS 082b, Genji's World: Japan's Culture, c. 1000** Edward Kamens

TTH 2:30–3:45 WR, HU Fr sem Tr (o)

The culture and society of ancient Japan at a watershed moment. Two literary classics from this milieu, *The Pillow Book* of Sei Shonagon and *The Tale of Genji*, along with poetry, diaries, historical chronicles, and studies of art, architecture, religion, and social customs. No knowledge of Japanese required. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***JAPN 110a, Elementary Japanese I** Hiroyo Nishimura and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

An introductory course in spoken Japanese. Drills in pronunciation and conversation; lectures on grammar; and an introduction to reading and writing, including *hiragana*, *katakana*, and *kanji*. Credit only on completion of JAPN 120b.

***JAPN 120b, Elementary Japanese II** Hiroyo Nishimura and staff

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of JAPN 110a. Prerequisite: JAPN 110a.

***JAPN 130a, Intermediate Japanese I** Masahiko Seto and staff

5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (RP, 61)

Continued development in both written and spoken Japanese, with reinforcement of grammatical structures using texts, films, and animation. Materials expose students to aspects of Japanese culture. Internet software is used to develop skills in listening and reading. Prerequisite: JAPN 120b or equivalent.

***JAPN 140b, Intermediate Japanese II** Masahiko Seto and staff3 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 61)

Continuation of JAPN 130a. Prerequisite: JAPN 130a or equivalent.

***JAPN 150a, Advanced Japanese I** Mari Stever and staff3 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (RP, 61)

Continued development of proficiency in aural and reading comprehension, as well as speaking and writing skills. Reading and discussion of short stories, essays, and journal articles. Viewing and discussion of Japanese anime, television shows, and films. Writing practice includes a diary, letters, essays, and criticism. After JAPN 140b or equivalent.

***JAPN 151b, Advanced Japanese II** Mari Stever and staff3 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (RP, 61)

Continuation of JAPN 150a. After JAPN 150a or equivalent.

***JAPN 156a, Advanced Japanese III** Michiaki Murata and staff3 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (o)

Close reading of modern Japanese writings in current affairs, social science, cultural history, and modern literature. Students develop their speaking, listening, and writing skills through discussion and written exercises. Drama and films are included. After JAPN 151b or equivalent.

***JAPN 157b, Advanced Japanese IV** Michiaki Murata and staff3 HTBA For sections see www.yale.edu/oci L5 1½ Course cr (o)

Continuation of JAPN 156a. After JAPN 156a or equivalent.

***JAPN 159b^c, Literature and the Humanities** John Treat

TTH 11:35–12:50 L5 (o)

Canonical Japanese short stories and essays read in line-by-line translation. Use of reference works and the Internet to research structures and vocabulary. Designed to help students at the fourth-year level of modern Japanese prepare for either graduate-level courses in Japanese literature or independent study of written Japanese. After JAPN 151b or equivalent.

***JAPN 162a, Advanced Japanese V** Koichi Hiroe

TTH 9–10:15 L5 (o)

Further development of skills used in academic settings, including public speaking, formal presentations, and expository writing based on research. Materials include lectures, scholarly papers, criticism, fiction, and films. After JAPN 157b or equivalent; recommended to be taken after or concurrently with JAPN 170a.

***JAPN 163b, Advanced Japanese VI** Koichi Hiroe

TTH 9–10:15 L5 (o)

Continuation of JAPN 162a. After JAPN 162a or equivalent; recommended to be taken after JAPN 170a.

JAPN 170a^c, Introduction to Literary Japanese Edward Kamens

MWF 9:25–10:15 L5 (o)

Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. After JAPN 151b or equivalent.

***JAPN 171b^G, Readings in Literary Japanese** Edward Kamens

MW 9–10:15 L5 (RP, o)

Close analytical reading of a selection of texts from the Nara through the Tokugawa periods: prose, poetry, and various genres. Introduction to *kanbun*. After JAPN 170a or equivalent.

***JAPN 251b^G/LITR 251b, Japanese Literature after 1970** John Treat

TTH 2:30–3:45 HU Tr (o)

Study of Japanese literature published between 1970 and the present. Writers may include Murakami Ryu, Maruya Saiichi, Shimada Masahiko, Nakagami Kenji, Yoshimoto Banana, Yamada Eimi, Murakami Haruki, and Medoruma Shun. Enrollment limited to 20. No knowledge of Japanese required.

***JAPN 270a^G/FILM 446a/LITR 384a, Japanese Cinema before 1960** Aaron Gerow

TTH 11:35–12:50 HU Tr (o)

The history of Japanese cinema to 1960, including the social, cultural, and industrial backgrounds to its development. Periods covered include the silent era, the coming of sound and the wartime period, the occupation era, the golden age of the 1950s, and the new modernism of the late 1950s. No knowledge of Japanese required.

***JAPN 272a, Japanese Popular Culture** Aaron Gerow

MW 4–5:15; screenings T 7–9 p.m. HU (o)

Contemporary Japanese popular culture and its historical antecedents, with particular focus on film, anime, manga, literature, television, and music.

***JAPN 470a and 471b, Independent Tutorial** Paize Keulemans

HTBA (o)

For students with advanced Japanese 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.

***JAPN 491a or b, Senior Essay** Paize Keulemans

HTBA (o)

Preparation of a one-term senior essay under faculty supervision.

***JAPN 492a and 493b, Yearlong Senior Essay** Paize Keulemans

HTBA (o)

Preparation of a two-term senior essay under faculty supervision.

KOREAN***KREN 110a, Elementary Korean I** Angela Lee-Smith

MTWTHF 9:25–10:15 L1 1½ Course cr (RP, 32)

A beginning course in modern Korean. Pronunciation, lectures on grammar, conversation practice, and introduction to the writing system (*Hankul*). Credit only on completion of KREN 120b.

***KREN 120b, Elementary Korean II** Angela Lee-Smith

MTWTHF 9:25–10:15 L2 1½ Course cr (RP, 32)

Continuation of KREN 110a. After KREN 110a or equivalent.

***KREN 130a, Intermediate Korean I** Angela Lee-Smith

MTWTHF 11:35–12:25 L3 1½ Course cr (RP, 34)

Continued development of skills in modern Korean, spoken and written, leading to proficiency at the intermediate level. After KREN 120b or equivalent.

***KREN 132a, Intermediate Korean for Advanced Learners I** Angela Lee-Smith

MTWTHF 10:30–11:20 L3 1½ Course cr (RP, 33)

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.***KREN 140b, Intermediate Korean II** Angela Lee-Smith

MTWTHF 11:35–12:25 L4 1½ Course cr (RP, 34)

Continuation of KREN 130a. After KREN 130a or equivalent.

***KREN 142b, Intermediate Korean for Advanced Learners II** Angela Lee-Smith

MTWTHF 10:30–11:20 L4 1½ Course cr (RP, 33)

Continuation of KREN 132a. After KREN 132a or equivalent.

***KREN 150a, Advanced Korean I** Seungja Choi

MWF 11:35–12:50 L5 1½ Course cr (34)

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. Conducted in Korean. After KREN 140b or equivalent.

***KREN 151b, Advanced Korean II** Seungja Choi

MWF 11:35–12:50 L5 1½ Course cr (34)

Continuation of KREN 150a. After KREN 150a or equivalent.

***KREN 154b, Advanced Korean III** Seungja Choi

W 2:30–4:20 L5 (37)

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 151b or equivalent.

***KREN 470a and 471b, Independent Tutorial** Paize Keulemans

HTBA (o)

For students with advanced Korean language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work must be supervised by an adviser and must terminate in a term paper or its equivalent. Permission to enroll requires submission of a detailed project proposal by the end of the first week of classes and its approval by the director of undergraduate studies.

East Asian Studies

Director of undergraduate studies: Jun Saito, 124 Prospect St., 432-1841,
jun.saito@yale.edu, <http://research.yale.edu/eastasianstudies>

FACULTY ASSOCIATED WITH THE PROGRAM OF EAST ASIAN STUDIES

Professors Daniel Botsman (*History*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Deborah Davis (*Sociology*), Koichi Hamada (*Economics*), Valerie Hansen (*History*), Edward Kamens (*East Asian Languages & Literatures*), William Kelly (*Anthropology*), Tina Lu (*East Asian Languages & Literatures*), Peter Perdue (*History*), Frances Rosenbluth (*Political Science*), Haun Saussy (*Chair*) (*Comparative Literature, East Asian Languages & Literatures*), Helen Siu (*Anthropology*), William Summers (*History of Science, History of Medicine*), John Treat (*East Asian Languages & Literatures*), Anne Underhill (*Anthropology*), Mimi Yiengpruksawan (*History of Art*)

Associate Professors Aaron Gerow (*East Asian Languages & Literatures, Film Studies*), Pierre Landry (*Political Science*), Lillian Tseng (*History of Art*)

Assistant Professors Seok-ju Cho (*Political Science*), Fabian Drixler (*History*), William Honeychurch (*Anthropology*), Paize Keulemans (*East Asian Languages & Literatures*), Karen Nakamura (*Anthropology*), Andrew Quintman (*Religious Studies*), Jun Saito (*Political Science*), Chloe Starr (*Divinity School*), Jing Tsu (*East Asian Languages & Literatures*), Jessica Weiss (*Political Science*)

Senior Lecturers Annping Chin (*History*), Koichi Shinohara (*Religious Studies, East Asian Languages & Literatures*)

Lecturers Francesca Di Marco, Youn-mi Kim, Alyssa Park

Senior Lectors Seungja Choi, Koichi Hiroe, Zhengguo Kang, Angela Lee-Smith, Ninghui Liang, Yoshiko Maruyama, Ling Mu, Michiaki Murata, Hiroyo Nishimura, Masahiko Seto, Mari Stever, Wei Su, Peisong Xu, William Zhou

Lectors Hsiu-hsien Chan, Min Chen, Rongzhen Li, Fan Liu, Yukie Mammoto, Jianhua Shen, Haiwen Wang, Yu-lin Wang-Saussy

In the East Asian Studies major, students concentrate on a country or an area within East Asia and organize 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 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.

The prerequisite to the major is completion of study at the L2 level of an East Asian language taught at Yale. Beyond this 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 (a senior seminar culminating in a senior thesis, a one-term senior essay, or a two-term directed research project). These courses are normally taken at Yale during the academic year, but with prior approval of the director of undergraduate studies the requirement may be fulfilled through successful course work undertaken elsewhere.

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

Senior requirement All students must satisfy a senior requirement undertaken during the senior year. This requirement can be met in one of three ways. Students may take one seminar in 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 480a or b or a one-credit, two-term senior research project in EAST 491a, 492b culminating in an essay.

Upon entering the major, students are expected to draw up an intellectually coherent sequence of courses in consultation with the director of undergraduate studies. They must consult with the director of undergraduate studies 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 East Asian Studies Council Web site at <http://research.yale.edu/eastasianstudies>. Students are also encouraged to visit the IplanYale Web site, <http://iplanyale.yale.edu>, for help in planning the major.

REQUIREMENTS OF THE MAJOR

Prerequisite L2 level of an East Asian language taught at Yale

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 on East Asia outside country or area of concentration

Senior requirement 1 senior-year sem culminating in a senior thesis, or one-term senior essay in EAST 480a or b, or one-credit, two-term senior research project in EAST 491a, 492b

EAST 186a/SOCY 136a, Contemporary Chinese Society Deborah Davis

For description see under Sociology.

EAST 275b/HSAR 356b/HUMS 424b/LITR 318b, Asian Humanities: Text and Object

Haun Saussy, Mimi Yiengpruksawan

TTH 2:30–3:20, 1 HTBA HU (27)

An introduction to the cultures of China, Japan, India, and central Asia through close examination of significant texts and objects. Designed as a sequel to Directed Studies, the course foregrounds multidisciplinary exploration and discussion.

EAST 320b/HIST 316b, History of China, 1550 to the Present Peter Perdue

For description see under History.

EAST 356b/INTS 355b/PLSC 433b, East Asian Capitalism Jun Saito

For description see under Political Science.

***EAST 357a/PLSC 390a^c, State and Society in Post-Mao China** Jessica Weiss

For description see under Political Science.

***EAST 408a/EP&E 308a/SOCY 395a, Wealth and Poverty in Modern China**

Deborah Davis

For description see under Sociology.

***EAST 410b/INTS 443b/SOCY 310b, Civic Life in Modern China I**

Deborah Davis

For description see under International Studies.

***EAST 479b/ECON 479b, Economic Development of Japan** Koichi Hamada

For description see under Economics.

***EAST 480a or b, One-Term Senior Essay** Jun Saito

HTBA (o)

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 492b, Senior Research Project** Jun Saito

HTBA ½ Course cr per term Cr/year only (o)

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.

ELECTIVES WITHIN THE MAJOR

ANTH 170b, Chinese Culture, Society, and History Helen Siu

ANTH 215b/ARCG 215b, Archaeology of China Anne Underhill

For description see under Anthropology.

***ANTH 234b/WGSS 234b, Disability and Culture** Karen Nakamura

For description see under Anthropology.

ANTH 254a, Japan: Culture, Society, Modernity Karen Nakamura

CHNS 170a^c, Introduction to Literary Chinese I Paize Keulemans

For description see under East Asian Languages & Literatures.

CHNS 171b^c, Introduction to Literary Chinese II Paize Keulemans

For description see under East Asian Languages & Literatures.

***CHNS 190b^c, Advanced Readings in Modern Chinese Literature** Jing Tsu

For description see under East Asian Languages & Literatures.

CHNS 200a^c/LITR 172a^c, Man and Nature in Chinese Literature Kang-i Sun Chang

For description see under East Asian Languages & Literatures.

CHNS 201b^c/WGSS 405b, Women and Literature in Traditional China

Kang-i Sun Chang

For description see under East Asian Languages & Literatures.

CHNS 204a or b, Introduction to Chinese Civilization Tina Lu

For description see under East Asian Languages & Literatures.

***CHNS 205b, Intertextuality** Tina Lu

For description see under East Asian Languages & Literatures.

***CHNS 225a, The Dream of the Red Chamber** Tina Lu

For description see under East Asian Languages & Literatures.

***CHNS 302b^c, Readings in Classical Chinese Prose** Kang-i Sun Chang

For description see under East Asian Languages & Literatures.

***CHNS 303a^c, Readings in Classical Chinese Poetry** Kang-i Sun Chang

For description see under East Asian Languages & Literatures.

HIST 303a, Japan's Modern Revolution Daniel Botsman

HIST 306b, Empires of East Asia Valerie Hansen, Fabian Drixler

HIST 314b/HUMS 426b, Early Sources in Chinese Intellectual Traditions

Annping Chin

For description see under History.

HIST 315a/HUMS 421a, History of Traditional China to 1600 Valerie Hansen

For description see under History.

***HIST 327Ja, Navigating Life in Nineteenth-Century Japan** Fabian Drixler

***HIST 379Jb/HSBM 447b^c, History of Chinese Science** William Summers

For description see under History.

HSAR 116b, Introduction to the History of Art: Arts of the Buddhist World

Mimi Yiengpruksawan

HSAR 350b, Chinese Art and the Modern World Lillian Tseng

HSAR 351a/ARCG 212a, Art and Archaeology in China Lillian Tseng

For description see under History of Art.

***HSAR 481b, Art and Architecture of the Forbidden City in China** Lillian Tseng

HUMS 418a/RLST 130a/SAST 367a, Traditional Literature of India, China, and Japan

Koichi Shinohara, Phyllis Granoff

For description see under Humanities.

***JAPN 002b/HUMS 082b, Genji's World: Japan's Culture, c. 1000** Edward Kamens

For description see under East Asian Languages & Literatures.

***JAPN 171b^G, Readings in Literary Japanese** Edward Kamens

For description see under East Asian Languages & Literatures.

***JAPN 251b^G/LITR 251b, Japanese Literature after 1970** John Treat

For description see under East Asian Languages & Literatures.

***JAPN 270a^G/FILM 446a/LITR 384a, Japanese Cinema before 1960** Aaron Gerow

For description see under East Asian Languages & Literatures.

***JAPN 272a, Japanese Popular Culture** Aaron Gerow

For description see under East Asian Languages & Literatures.

PLSC 162b^G, Japan and the World** Jun SaitoPLSC 379a^G, Japanese Politics and Political Economy** Jun Saito***PLSC 388a^G, Public Opinion in China** Pierre Landry**RLST 126a/SAST 262a, Tibetan Buddhism** Andrew Quintman

For description see under Religious Studies.

***RLST 180a/SAST 312a, Rituals of Buddhist Tantra** Andrew Quintman

For description see under Religious Studies.

***RLST 182b/SAST 459b, Buddhist Traditions of Mind and Meditation**

Andrew Quintman

For description see under Religious Studies.

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 director of undergraduate studies, and the director of graduate studies.

Ecology and Evolutionary Biology

Director of undergraduate studies: Leo Buss, 326B OML, 432-3837,
karen.broderick@yale.edu, www.eeb.yale.edu

Students interested in the area of ecology and evolutionary biology may find courses and major requirements listed under Biology, Area I. Students should consult an adviser from the appropriate list in that section.

The faculty roster for the Department of Ecology and Evolutionary Biology may be found under Biology. The department offers undergraduate courses in an area of concentration in the Biology major. See under Biology, Area I.

Economics

Director of undergraduate studies: Anthony Smith, Rm. 306, 28 Hillhouse Ave., 432-3583 or 432-3574, qazi.azam@yale.edu

FACULTY OF THE DEPARTMENT OF ECONOMICS

Professors Joseph Altonji, Donald Andrews, Lanier Benkard, Dirk Bergemann, Steven Berry, Truman Bewley, †Richard Brooks, Donald Brown, Xiaohong Chen, †Judith Chevalier, Eduardo Engel, Ray Fair, †Howard Forman, John Geanakoplos, †William Goetzmann, Mikhail Golosov, Timothy Guinnane, Philip Haile, Koichi Hamada, Johannes Horner, Gerald Jaynes, Dean Karlan, Yuichi Kitamura, Alvin Klevorick, Richard Levin, Giovanni Maggi, †Robert Mendelsohn, Giuseppe Moscarini, †Barry Nalebuff, William Nordhaus, Peter Phillips, Benjamin Polak, Miguel Ramirez (*Visiting*), †John Roemer, Mark Rosenzweig, Larry Samuelson, Herbert Scarf, Robert Shiller, †Jody Sindelar, Anthony Smith, T. N. Srinivasan, †Shyam Sunder, Aleh Tsyvinski, Christopher Udry, Edward Vytlačil, †Ernesto Zedillo

Associate Professors Dino Gerardi, †Sheila Olmstead, Ebonya Washington

Assistant Professors Costas Arkolakis, David Atkin, †Christopher Blattman, Bjoern Bruegemann, Eduardo Faingold, Amanda Kowalski, Fabian Lange, Melinda Miller (*Visiting*), Guillermo Ordoñez, Taisuke Otsu, Nancy Qian, Kareen Rozen, Melissa Tartari, Eric Weese

Lecturers Irasema Alonso, Sigrídur Benediktsdóttir, Michael Boozer, Kenneth Couch, Cheryl Doss, Tolga Koker, Sebastian Kranz, Douglas McKee, Nicholas Perna, Michael Schmertzler, Katerina Simons, Philip Slavin, David Swensen, Dean Takahashi

†Primary appointment in another department or school.

Economics concerns the wealth of nations, its origins in production and exchange, its allocation among competing uses, its distribution among individuals, and its accumulation or decline. Economics at Yale is regarded and taught as part of a liberal education, not as a preparation for any particular vocation. Nonetheless, economics provides an especially relevant background for a number of professions.

Requirements of the major Students majoring in Economics are required to take twelve term courses. Two of these may be introductory economics courses, one in microeconomics and one in macroeconomics. All majors must take the following courses: one term of intermediate microeconomics (chosen from ECON 121a or b or 125a); one term of intermediate macroeconomics (chosen from ECON 122a or b or 126b); one term of econometrics (chosen from ECON 131a or b or 132a or b or 136b); and one Yale mathematics course, usually selected from MATH 112a or b, 115a or b, 118a or b, or 120a or b. Students who place out of these mathematics courses must take a higher-level mathematics course at Yale and

should consult the director of undergraduate studies in Economics. All of these required courses should be completed prior to the senior year. Majors must also take two courses numbered ECON 400–491. At least one of these must be taken in the senior year, and at least one must be either a seminar or the senior essay.

Students may count toward the major one course related to economics but taught in another field, provided the course's prerequisites include at least two of the three courses required for the major in intermediate microeconomics, intermediate macroeconomics, and econometrics.

Students who take a term abroad or take summer courses not at Yale may petition the director of undergraduate studies 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 director of undergraduate studies before taking such courses. Courses taken outside Yale may not be counted toward the major requirements in intermediate microeconomics, intermediate macroeconomics, or econometrics.

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

Introductory courses These courses serve students considering a major in Economics as well as others who would like an introduction to the subject. Most students enroll in ECON 115a or b and 116a or b, lecture courses with a discussion section. ECON 115a or b is concerned with microeconomics and includes such topics as markets, prices, production, distribution, and the allocation of resources. ECON 116a or b covers such macroeconomic issues as unemployment, inflation, growth, and international economics; it has a microeconomics prerequisite.

ECON 110a and 111b are limited-enrollment alternatives to ECON 115a or b and 116a or b; they are open only to freshmen selected from those who preregister. ECON 108a or b also covers microeconomics, but with a greater emphasis on quantitative methods and examples. It is intended for, but not restricted to, freshmen with little or no experience with calculus. Enrollment is limited, and requires the permission of the director of undergraduate studies. The substance of ECON 108a or b, 110a, and 115a or b is similar, and ECON 111b and 116a or b are similar as well. A student may receive credit for only one course each in introductory micro- and macroeconomics.

The department recommends that students interested in majoring in Economics take introductory economics in the freshman year. In order to make the introductory courses available to all freshmen and to students majoring in other subjects, the introductory courses do not have a mathematics requirement.

Introductory courses: placement and exemptions Students with a score of 5 on the Advanced Placement tests for microeconomics and macroeconomics *and* a score of 5 on the Advanced Placement Calculus BC test may petition the director of undergraduate studies to place out of introductory microeconomics and enroll directly in intermediate microeconomics. It is recommended that students with a score of 5 on the Advanced Placement economics tests but without a 5 on the Calculus BC test take a Yale mathematics course such as MATH 115a or b or 120a or b, and then petition the director of undergraduate studies to

place out of introductory microeconomics and instead take intermediate microeconomics in the following term. Students with high scores on examinations equivalent to Advanced Placement, such as the GCE A-level or Higher Level International Baccalaureate, may also petition to be exempted from the introductory courses. For other placement and exemption questions, consult the Economics Web site, www.econ.yale.edu/undergrad/ugrad.htm.

Mathematics Students are advised to meet the mathematics requirement for the major during their freshman year. The department also recommends that majors either complete MATH 118a or b or complete two term courses including MATH 120a or b and either 222a or b or 225a or b. The latter two-term sequence is preferable for students who wish to take further mathematics courses or who plan to pursue a graduate degree in economics.

Econometrics Students are advised to take a two-term sequence of statistics and econometrics courses, especially if they are considering a senior essay. One option is to take ECON 131a or b followed by 132a or b. Students with a stronger mathematics background or who plan to pursue a graduate degree in economics are encouraged to take either ECON 135a or STAT 241a and 242b, followed by ECON 136b. Prospective majors are urged to start their econometrics sequence in the fall of sophomore year.

Intermediate microeconomics and macroeconomics Along with econometrics, intermediate microeconomics and macroeconomics form the core of the major. Two options are available in both micro- and macroeconomics. The standard intermediate courses are ECON 121a or b and 122a or b. Students with a stronger mathematics background are encouraged to take ECON 125a and 126b instead. The intermediate courses need not be taken in sequence: in particular, ECON 125a is not required for 126b.

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; and economic history. Some advanced field courses have 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.

Starred lecture courses These advanced courses, 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 120a or b. Advanced lecture courses may be applied toward the senior requirement.

Seminars Although there is diversity in approaches in the various seminars (courses 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 in the advanced courses.

There is preregistration for departmental seminars, and enrollment is limited. Applications are received in the Undergraduate Studies office, Room 101, 28 Hillhouse Avenue,

during the designated sign-up period in the preceding term. Students must take two of three core courses before enrolling in a seminar. Underclassmen and nonmajors may apply for places in Economics seminars, but priority is given to senior Economics majors (including those in Economics and Mathematics) who have not yet completed two seminars: all other students will be put on a wait list. Seminar enrollment lists (including the wait lists) will be posted outside Room 101, 28 Hillhouse Avenue, and on the Economics undergraduate Web page. The seminar requirement must be met by Yale Economics courses; seminars in other departments or taken elsewhere do not suffice. Residential college seminars do not count toward the major.

Senior requirement Majors are required to take two departmental courses numbered ECON 400–491. At least one of these courses must be taken in the senior year, and at least one must be either a seminar or the senior essay. ECON 491a (the senior essay) counts as one seminar. ECON 492b does not count toward the senior requirement. Students who took ECON <429a> prior to their senior year may not count it toward the senior requirement.

Senior essay Only those majors who submit a senior essay are eligible for Distinction in the Major. There are three types of senior essay: (1) students may write a one-term essay in an advanced departmental course (numbered 400–489) taken during the senior year; (2) 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 491a); or (3) students may write a two-term essay starting 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 491a and 492b). The department does not permit one-term senior essays in the spring term except those written in advanced departmental courses (ECON 400–489). Meetings to discuss the senior essay will be held at the beginning of the fall term; see below under “Distinction in the Major.”

Distinction in the Major To be considered for distinction, students must meet the appropriate grade standards (see chapter I) and submit a senior essay to the Economics department by the end of the next-to-last week of classes in the spring term. Students who fail to submit such a paper will not be considered for Distinction in the Major. Note that the paper 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. Grade computation for Distinction does not include the introductory economics courses, the required mathematics course, related-credit courses, or courses taken outside Yale. Meetings for seniors to discuss the senior essay will be held on Wednesday, September 1, at 4:30 p.m. and Thursday, September 2, at 1:30 p.m. in Room 106, 28 Hillhouse Avenue. Details regarding calculations for Distinction in the Major will be discussed in these meetings, and senior essay guidelines will be distributed. Senior essay prospectus forms are due Monday, October 4, 2010.

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

of undergraduate studies, and the director of graduate studies, be admitted to graduate courses and seminars.

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 and linear algebra. Students are urged to discuss their plans for graduate work with the director of undergraduate studies as early in their college careers as possible.

Combined B.A./M.A. program Students interested in the B.A./M.A. program in Economics may submit a preliminary application in the fall of their junior year to the directors of undergraduate and graduate studies. Admission to this program is limited to students who have achieved A grades in at least two-thirds of all of their undergraduate courses and have also achieved A grades in all courses relating to the major. Applicants must have taken MATH 120a or b and 222a or b or equivalent. If granted permission, applicants take two of the following three graduate courses: ECON 500a, 510a, and 550a. Only students who earn a grade of at least A– in each course will be considered for candidacy in the B.A./M.A. program. Applications are forwarded to a joint committee of Yale College and the Graduate School. This committee makes the final decision on admission of students to the program. It is not possible to enter the B.A./M.A. program except in the fall of the junior year. If admitted to the program, a student completes eight term courses of graduate work in the junior and senior years; these eight courses must be economics courses designed primarily for Ph.D. students (courses in the International and Development Economics program do not count toward this requirement). The eight graduate courses include the two required for candidacy in the program as well as two chosen from the six core courses in the graduate sequence of microeconomics, macroeconomics, and econometrics. In addition, the student must complete the two-term senior departmental essay by enrollment in ECON 491a and 492b. All students in the program must complete ECON 132a or b or 136b or a graduate course in econometrics. It is recommended that students complete the distributional requirements before the senior year. Appropriate graduate theory courses may be substituted for the core Economics courses 121a or b and 122a or b as well as the one-term econometrics course required of majors. The eight graduate courses must not be entirely concentrated in the final two terms, and students in the program must take at least six term courses outside the major during their last four terms at Yale and at least two undergraduate courses during their last two terms. Course schedules must be approved each term by both the director of undergraduate studies in Economics and the director of graduate studies in Economics. To receive the M.A. as well as the B.A. at the end of the senior year, the student must receive two terms of A in the graduate courses, an average of B in the remaining graduate courses, and a reader's grade of B+ or higher on the senior essay.

Students interested in this program should see the director of undergraduate studies before or during registration for the first term of the junior year.

Faculty representatives The Economics department has faculty representatives associated with each residential college. Students majoring in Economics should secure written approval of their course selection from one of their college representatives. Changes in their major program must be approved by a representative. Questions concerning the major or

programs of study should be directed to a college representative. For 2010–2011 the college representatives are as follows:

BK, D. Karlan, P. Haile	MC, A. Kowalski, G. Jaynes
BR, G. Ordoñez, F. Lange	PC, G. Moscarini, E. Engel
CC, A. Tsyvinski, L. Samuelson	SY, T. Bewley, B. Bruegemann
DC, R. Shiller, M. Golosov	SM, E. Faingold, A. Smith
TD, L. Benkard, K. Rozen	ES, J. Altonji, G. Maggi
JE, S. Berry, X. Chen	TC, T. Guinnane, N. Qian

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses

Distribution of courses 2 term courses of intro econ: 1 of microecon, 1 of macroecon; 1 from MATH 112a or b, 115a or b, 118a or b, 120a or b; 2 courses numbered ECON 400–491, at least 1 in senior year and either a sem or the senior essay

Specific courses required ECON 121a or b or 125a; 122a or b or 126b; 131a or b or 132a or b or 136b

Substitution permitted 1 related course in another dept, as specified

Senior requirement 1 course numbered ECON 400–491

INTRODUCTORY COURSES

***ECON 108a or b, Quantitative Foundations of Microeconomics** Tolga Koker [F], Katerina Simons [Sp]

TTH 2:30–3:45 [F]; MW 2:30–3:45 [SP]; disc. F 9:25–10:15 QR, SO (64)

Introductory microeconomics with a special emphasis on quantitative methods and examples. Intended for students with limited or no experience with calculus. Enrollment limited. Preregistration is required at www.econ.yale.edu/undergrad/ugrad.htm. Final enrollment list will be posted on the bulletin board at 28 Hillhouse Ave. May not be taken after ECON 110a, 115a or b, or <117a>.

***ECON 110a, An Introduction to Microeconomic Analysis** Tolga Koker, Katerina Simons, and staff

HTBA For sections see www.yale.edu/oci QR, SO (64)

Similar to ECON 115a or b, but taught as a lecture discussion with limited enrollment. Enrollment limited to freshmen. Preregistration is required at www.econ.yale.edu/undergrad/ugrad.htm. Final enrollment list will be posted on the bulletin board at 28 Hillhouse Ave. May not be taken after ECON 108a or b or 115a or b.

***ECON 111b, An Introduction to Macroeconomic Analysis** Sigríður Benediktsdóttir, Irasema Alonso, and staff

HTBA For sections see www.yale.edu/oci SO (64)

Similar to ECON 116a or b, but taught as a lecture discussion with limited enrollment. Enrollment limited to freshmen. Preregistration is required at www.econ.yale.edu/undergrad/ugrad.htm. Prerequisite: ECON 108a or b, 110a, or 115a or b. May not be taken after ECON 116a or b.

ECON 115a or b, Introductory Microeconomics Steven Berry [F], Dean Karlan [Sp]

MW 1–2:15 [F]; TTH 1–2:15 [SP] QR, SO (64)

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 108a or b, 110a, or <117a>.

ECON 116a or b, Introductory Macroeconomics Ray Fair [F], Anthony Smith [Sp]

TTH 1–2:15 [F]; MW 1–2:15 [SP] SO (64)

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 111b. Prerequisite: ECON 108a or b, 110a, or 115a or b.

INTERMEDIATE CORE COURSES**ECON 121a or b, Intermediate Microeconomics** Larry Samuelson [F],

Eduardo Faingold [Sp]

MW 9–10:15 [F]; MW 1–2:15 [SP] QR, SO Core (64)

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 125a.

ECON 122a or b, Intermediate Macroeconomics William Nordhaus [F],

Bjoern Bruegemann [Sp]

MW 11:35–12:50 [F]; MW 9–10:15 [SP] QR, SO Core (64)

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. Enrollment limited in ECON 122a. After two terms of introductory economics and completion of the mathematics requirement for the major or its equivalent. May not be taken after ECON 126b.

ECON 125a, Microeconomic Theory Kareen Rozen

MW 1–2:15 QR, SO Core (36)

Similar to ECON 121a or b 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 118a or b or 120a or b or equivalent. May not be taken after ECON 121a or b.

ECON 126b, Macroeconomic Theory Giuseppe Moscarini

MW 1–2:15 QR, SO Core (36)

Similar to ECON 122a or b 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 118a or b or 120a or b or equivalent. May not be taken after ECON 122a or b.

ECONOMETRICS CORE COURSES

ECON 131a or b, Econometrics and Data Analysis I Lanier Benkard [F],
Yuichi Kitamura [Sp]

TTH 11:35–12:50 QR, SO Core (24)

Basic probability theory and statistics, distribution theory, estimation and inference, bivariate regression, introduction to multivariate regression, introduction to statistical computing. After introductory microeconomics and MATH 112a or b or equivalent.

ECON 132a or b, Econometrics and Data Analysis II Fabian Lange [F],
Joseph Altonji [Sp]

TTH 11:35–12:50 QR, SO Core (24)

Continuation of ECON 131a or b, with a focus on multivariate regression. Topics include statistical inference, choice of functional form, heteroskedasticity, serial correlation, two-stage least squares, qualitative choice models, time series models, and forecasting. Emphasis on statistical computing and the mechanics of how to conduct and present empirical research. After two terms of introductory economics, completion of the mathematics requirement for the major, and ECON 131a or b or ECON 135a or a course in the STAT 101–106 series.

ECON 135a, Introduction to Probability and Statistics Xiaohong Chen

TTH 9–10:15 QR, SO (22)

Foundations of mathematical statistics: probability theory, distribution theory, parameter estimation, hypothesis testing, regression, and computer programming. Recommended for students considering graduate study in economics. After introductory microeconomics and either MATH 118a or b or MATH 120a or b and 222a or b or 225a or b.

ECON 136b, Econometrics Melissa Tartari

MW 9–10:15 QR, SO Core (32)

Continuation of ECON 135a 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. After ECON 135a or STAT 241a and 242b.

FIELD COURSES

ECON 159a, Game Theory Benjamin Polak

MW 11:35–12:50 QR, SO (34)

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.

ECON 170a, Health Economics and Public Policy Howard Forman

TTH 2:30–3:45 SO (27)

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. May not be taken after ECON 467a.

ECON 182b/HIST 135b, American Economic History Melinda Miller

TTH 1–2:15 SO (26)

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 two terms of introductory economics.

ECON 186a, European Economic History, 1700–1815 Timothy Guinnane

TTH 1–2:15 SO (26)

European economic growth and development from the late seventeenth century through the first stages of the British industrial revolution. The role of institutional development, trade and imperialism, agricultural improvements, and industrialization. Particular attention to comparisons between Britain and other parts of Europe. After ECON 115a or b or 121a or b, and ECON 116a or b or 122a or b.

[ECON 187a, European Economic History, 1815–1945]**[ECON 200b, Firms, Markets, and Competition]****[ECON 251a, Financial Theory]****ECON 252b, Financial Markets** Robert Shiller

MW 9–10:15 SO (32)

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.

[ECON 253b, Computational Finance]**[ECON 254b, Financial Econometrics]****[ECON 275b/PLSC 218b, Public Economics]****[ECON 276b, Law and Economics]****[ECON 277b, Law and Economics of Contracts II]****ECON 280b/AFAM 282b, Poverty under Postindustrial Capitalism** Gerald Jaynes

For description see under African American Studies.

ECON 300a/INTS 358a, International Trade Theory and Policy T. N. Srinivasan,
Ernesto Zedillo

MW 9–10:15 SO (32)

Theories of comparative advantage, factor abundance, and product differentiation as reasons for trade between countries. The relationship between trade and aggregate welfare;

historical and contemporary issues in globalization and trade policy. After intermediate microeconomics.

ECON 320a, Economic Policy in Latin America Eduardo Engel

WF 2:30–3:45 SO (37)

The economic, social, and political impact of reforms implemented in Latin America during the 1990s. Review of the inward-oriented development model pursued from the 1950s to the early 1980s; the debt crisis of the 1980s and the policy consensus that followed. Prerequisites: introductory microeconomics and introductory macroeconomics.

ECON 325b/INTS 352b, Economics of Developing Countries Nancy Qian

MW 11:35–12:50 SO (34)

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. After introductory microeconomics.

ECON 330a^c/EVST 340a, Economics of Natural Resources Robert Mendelsohn

MWF 10:30–11:20 QR, SO (33)

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.

[ECON 331b, The Economics of Energy and Climate Change]

ECON 350b, Mathematical Economics: General Equilibrium Theory Truman Bewley

TTH 1–2:15 QR, SO (26)

An introduction to general equilibrium theory and its extension to equilibria involving uncertainty and time. Discussion of the economic role of insurance and of intertemporal models, namely, the overlapping generations model and the optimal growth theory model. Recommended for students considering graduate study in economics. After MATH 118a or b or 120a or b, and intermediate microeconomics.

ECON 351a, Mathematical Economics: Game Theory Johannes Horner

MW 1–2:15 QR, SO (36)

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 118a or b, 120a or b, and intermediate microeconomics.

ADVANCED LECTURE COURSES

[ECON 401a, Labor Economics and Welfare Policies]

***ECON 403b, Trade and Development** David Atkin

TTH 2:30–3:45 SO (0)

Comparison of selected developing countries, where international trade has brought about rapid growth and large-scale reductions in poverty, with other countries, where global

trade has increased inequality and brought little growth. Both theoretical models and empirical evidence are used. Prerequisites: intermediate microeconomics and an econometrics or statistics course.

ECON 404b⁶, Population Economics Nancy Qian

TTH 10:30–11:20, 1 HTBA SO (o)

An overview of relationships between economic and population issues. Topics include causes and consequences of declining fertility rates; gender discrimination; disease; and the effects of famine and war, both currently in developing countries and historically in developed countries. Prerequisites: introductory statistics and intermediate microeconomics.

***ECON 405b, Health Economics and Public Policy** Amanda Kowalski

TTH 9–10:15 SO (22)

Economic principles and empirical methods applied to issues in health economics. Discussion of policies to address market failures in health care markets. Consumer behavior in medical markets, valuing medical improvements, and evaluating health insurance reform. Prerequisites: intermediate microeconomics and econometrics.

***ECON 406a, Macroeconomics of Financial Markets** Guillermo Ordoñez

MW 1–2:15 SO (o)

Financial markets and their potential both to spur economic development and growth and to generate and spread economic crises. Differences between financial and other market types. How policies can improve financial markets' advantages and reduce their detriments. Prerequisites: intermediate microeconomics and intermediate macroeconomics.

***ECON 407b, International Finance** Costas Arkolakis

TTH 9–10:15 SO (o)

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.

SEMINARS

Preregistration for junior and senior majors, held in Room 101, 28 Hillhouse Ave., is required during the designated sign-up period.

***ECON 450a, Investment Analysis** David Swensen, Dean Takahashi

M 1–3:20 SO (o)

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.

***ECON 451b, Global Financial Systems, Financial Crises, and Regulations**

Sigríður Benediktssdóttir

T 3:30–5:20 SO (o)

The global financial system, with emphasis on financial crisis. The role of central banks and regulatory agencies. Focus on the global financial crisis of 2007–2009 and the resulting

changes being proposed and implemented. Prerequisites: intermediate microeconomics and intermediate macroeconomics.

***ECON 453a, Antitrust Law and Economics** Sebastian Kranz

F 2:30–4:30 SO (o)

The character, logic, and economic effects of U.S. antitrust laws, drawing on legal and economic analyses. Major areas of antitrust law: price fixing and other horizontal restraints of trade, vertical restraints of trade, monopolization, and mergers. After intermediate microeconomics or equivalent. Preference to students who have completed ECON 200b.

***ECON 455a, Information Economy** Judith Chevalier

W 3:30–5:20 SO (o)

The economics of information, communication, and electronic commerce. Topics include the communications infrastructure – telephone, broadband, and wireless communications – and the regulation and adoption of these technologies; the basic economics of selected uses of the Internet; the organization of businesses as they are affected by new communications technologies; and intellectual property and antitrust issues in the information economy. Prerequisite: introductory microeconomics.

***ECON 456a, Private Equity Investing** Michael Schmertzler

M 1:30–3:20 SO (o)

A case-oriented study of principal issues and investment types found in substantial private equity portfolios. Topics include enterprise valuation, value creation, business economics, negotiation, and legal structure, based on primary source materials and original cases. Prerequisites: intermediate microeconomics or equivalent, and econometrics.

[ECON 457b, Financial History]

***ECON 461b, Economics, Addiction, and Public Policy** Jody Sindelar

2 HTBA SO (o)

Smoking, alcoholism, illicit drugs, and obesity studied from economic and policy perspectives. Focus on causes of and solutions to problems. After introductory microeconomics.

***ECON 462b, The Economics of Human Capital in Latin America** Douglas McKee

T 1:30–3:20 SO (o)

Economic issues related to a population's education, skills, and health; focus on contemporary Latin American societies. Determinants of health and education; evaluation of human capital development policies; the role of human capital in a variety of economic contexts, including the labor market, immigration, child investment, intrahousehold bargaining, inequality, and poverty. Prerequisites: intermediate microeconomics and econometrics.

***ECON 465a/EP&E 224a, Debating Globalization** Ernesto Zedillo

M 2:30–4:20 SO (RP, o)

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. After two terms of introductory economics. Preference to seniors majoring in Economics or EP&E.

***ECON 466a, Economics of Aging** Douglas McKee

W 1:30–3:20 SO (o)

Overview of the economics of aging and retirement. Saving for retirement, the decision to retire, design of social security systems, how families decide who cares for the elderly, and how older people decide to whom to leave their assets. Prerequisites: intermediate microeconomics and econometrics.

[ECON 467a/EP&E 229a, Issues in Health Economics]

***ECON 468b, Institutions and Incentives in Economic Development**

Mark Rosenzweig

W 1:30–3:20 SO (o)

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.

***ECON 470b/EP&E 413b, Topics in American Economic History** Melinda Miller

W 1:30–3:20 SO (o)

An empirical study of nineteenth- and early twentieth-century financial markets. Topics include institutions, banking, panics and crashes, the gold standard, capital market integration, deflation, and the Great Depression. Prerequisites: intermediate microeconomics or equivalent, and econometrics or a course in the STAT 101–106 series.

***ECON 473b/EP&E 227b/PLSC 343b, Equality** John Roemer

For description see under Ethics, Politics, & Economics.

***ECON 476a, Topics in International Economics** Miguel Ramirez

W 1:30–3:20 SO (o)

Recent developments in international economics. Trade policy and market structure; the economics of trading blocs such as the EEC and NAFTA; the economic consequences of continued U.S. external deficits; globalization and inequality; exchange rates, interest rates, and volatility; speculative capital flows and exchange rate policies; and financial crises and the prospects for the European Monetary Union. Prerequisites: intermediate microeconomics and macroeconomics or equivalents.

***ECON 479b/EAST 479b, Economic Development of Japan** Koichi Hamada

TH 1:30–3:20 SO (o)

Japan's economic development, with attention to the period of tremendous success in the 1960s and the recession of the 1990s. The nature of incentive mechanisms; institutions behind the history of modern and contemporary Japan. After introductory microeconomics and macroeconomics.

[ECON 480b, Topics in Macroeconomics]

***ECON 482b, Labor and Public Policy** Melissa Tartari

T 9:25–11:15 SO (22)

Study of how individuals choose whether to participate in the labor market, and of ways in which those decisions are influenced by factors such as market prices, public assistance programs, taxation, and health and disability insurance. Case studies include the negative income tax experiments of the 1970s, tax reform in the 1980s, welfare programs and

the earned income tax credit in the 1990s, and recent Medicaid expansion. Prerequisites: intermediate microeconomics and econometrics.

***ECON 484a, The United States Banking System** Nicholas Perna

T 1:30–3:20 SO (o)

The structure and functions of the U.S. banking system, with special attention to the role of the Federal Reserve, private sector banks, and related financial institutions in the overall economy. The role of monetary policy in promoting economic growth and stability; the U.S. banking system as compared with foreign systems; and future evolution of the U.S. banking system, including the role of electronic commerce. After intermediate macroeconomics or equivalent.

***ECON 485a, Booms, Recessions, and the Labor Market** Bjoern Bruegemann

TH 1:30–3:20 SO (o)

A study of cyclical fluctuations in the labor market, using the 2007 recession as a starting point. Why unemployment rises in recessions, what policy can do about it, and how individuals' careers are affected by seeking a new job in bad economic times. Prerequisites: intermediate macroeconomics, intermediate microeconomics, and econometrics.

***ECON 486a/EP&E 225a, Topics in Labor Economics** Kenneth Couch

F 9:25–11:15 SO (o)

Introduction to applied empirical research in labor economics. Emphasis on how research topics can be framed as economic questions and how data can be used to generate relevant empirical information. Topics include measurement of discrimination in the labor market, determinants of black-white differences in employment and earnings, the impact of minimum wages, and economic mobility. Prerequisite: intermediate economics. Enrollment limited to majors in Economics, Economics and Mathematics, and EP&E.

[ECON 488a, Experimental Economics]

***ECON 491a and 492b, The Senior Essay** Anthony Smith

HTBA (o)

Students deciding to write one-term senior essays by enrolling in ECON 491a, or two-term senior essays by enrolling in ECON 491a and 492b, must choose their topics and advisers by Monday, October 4, 2010. One-term senior essays are due at the end of the last week of classes in the fall term. In order to be considered for Distinction in the Major, students must submit three copies of their essay to the Economics department office by the end of the next-to-last week of classes in the spring term. This is also the due date for two-term senior essays. Advisers are chosen with the assistance of the director of undergraduate studies. 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. The first meeting is on Wednesday, September 1, from 4:30 to 5:20, or on Thursday, September 2, from 1:30 to 2:20, in Room 106, 28 Hillhouse Ave. Seniors planning to write a senior essay, including those who plan to write a spring-term essay, should attend this meeting. Details regarding calculation of Distinction will be discussed and senior essay guidelines will be distributed.

***ECON 498a and 499b, Directed Reading** Anthony Smith

HTBA (o)

Students desiring a directed reading course in special topics in economics not covered in other graduate or undergraduate courses may elect this course, usually 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. Does not meet the requirement for a departmental seminar.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in Economics are open to qualified undergraduates. Descriptions of courses are available in the Economics department office. Permission of the instructor and of the director of graduate studies is required.

Economics and Mathematics

Director of undergraduate studies (Economics): Anthony Smith, 28 Hillhouse Ave., 432-3583 or 432-3574, tony.smith@yale.edu or qazi.azam@yale.edu; director of undergraduate studies (Mathematics): Roger Howe, 220B LOM, 432-4686 or 432-7316, roger.howe@yale.edu or bernadette.alston-facey@yale.edu.

The Economics and Mathematics major is intended for students with a strong intellectual 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 120a or b; one term from ECON 110a or 115a or b; and ECON 111b or 116a or b. With permission of the directors of undergraduate studies, upper-level courses may be substituted for prerequisite courses.

Requirements of the major A total of twelve term courses is required beyond the introductory level in economics and in mathematics, with at least five in mathematics and at least seven in economics. These courses must include:

1. One intermediate microeconomics course chosen from ECON 125a or 121a or b, and one intermediate macroeconomics course chosen from ECON 126b or 122a or b
2. A year of mathematical economics, ECON 350b and 351a
3. Two term courses of econometrics, ECON 135a and 136b (with permission of the director of undergraduate studies in Economics, STAT 241a and 242b may be taken instead of ECON 135a)
4. A term course in linear algebra, MATH 222a or b or 225a or b (or 230a 231b, for two course credits)
5. An introductory term course in analysis, MATH 300b or 301a
6. Senior seminar in mathematics, MATH 480a or b

Because optimization is an important theme in mathematics and is particularly relevant for economics, OPRS 235a is recommended for students majoring in Economics and Mathematics and can be counted toward either the Mathematics or Economics course requirements. Students may take an advanced math course in lieu of MATH 120a or b.

To be considered for Distinction in the Major, students must meet specified grade standards (see chapter I) and submit a senior essay written in either an Economics department seminar or in ECON 491a or in 491a and 492b to the Economics department; for details see under Economics. (The paper must be written in a course taken in the senior year.) All courses beyond the introductory level in Mathematics and Economics are counted in the computation of grades for Distinction.

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

REQUIREMENTS OF THE MAJOR

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

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

Distribution of courses 5 courses in math and 7 in econ

Specific courses required ECON 121a or b or 125a; ECON 126b or 122a or b; ECON 350b and 351a; ECON 135a and 136b; MATH 222a or b or 225a or b (or 230a, 231b); MATH 300b or 301a

Substitution permitted STAT 241a and 242b for ECON 135a, with permission of DUS in Econ

Senior requirement Senior sem in math (MATH 480a or b); optional senior essay

Education

(See under Teacher Preparation and Education Studies.)

Egyptian

(See under Near Eastern Languages and Civilizations.)

Electrical Engineering

Director of undergraduate studies: Mark Reed, 523 BCT, 432-4306, mark.reed@yale.edu

FACULTY OF THE DEPARTMENT OF ELECTRICAL ENGINEERING

Professors James Duncan, Jung Han, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), J. Rimas Vaišnys

Associate Professors Eugenio Culurciello, Hür Köser, Richard Lethin (*Adjunct*), Yiorgos Makris, Andreas Savvides, Lawrence Staib, Hemant Tagare, Sekhar Tatikonda

Assistant Professors Minjoo Lee, Hongxing Tang

Lecturer Edmund Yeh

Electrical Engineering broadly encompasses disciplines such as microelectronics, photonics, computer engineering, signal processing, control systems, and communications, all of which enable and underpin a modern technological society. Three degree programs are offered that allow students to select the level of technical depth appropriate for individual goals. The B.A. in Engineering Sciences (Electrical) is suitable for a career outside technology, in which a student nevertheless benefits from an appreciation of electrical engineering perspectives. The B.S. in Engineering Sciences (Electrical) provides more technical exposure while retaining academic options outside the electrical engineering core area. The B.S. in Electrical Engineering, accredited by the Engineering Accreditation Commission of ABET, Inc., is appropriate for highly motivated students who are interested in learning the scientific fundamentals and the technologies and creative processes of contemporary electrical engineering. In a world deeply dependent on technology, recent ABET graduates have found their degree a particularly effective credential not only for further work in engineering, but also for careers in business, management consulting, investment banking, medicine, and intellectual property law.

Because the introductory courses are common to all three degree programs, the student does not usually need to make a final choice before the junior year. An interdepartmental program with Computer Science is also offered (see under Electrical Engineering and Computer Science), and students can pursue interdisciplinary studies in other areas of engineering and science.

Prerequisites All three degree programs require MATH 112a or b, 115a or b, ENAS 151a or b or MATH 120a or b or higher, ENAS 130b or CPSC 112a or b or higher, and PHYS 180a, 181b or higher (PHYS 170a, 171b is acceptable for the B.A. degree). Acceleration credits awarded on entrance can be used to satisfy the MATH 112a or b and 115a or b requirements. Students whose preparation exceeds the level of ENAS 151a or b or MATH 120a or b are asked to take a higher-level mathematics course instead, such as MATH 250a. Similarly, students whose preparation at entrance exceeds the level of PHYS 180a, 181b are asked to take higher-level physics courses instead, such as PHYS 200a, 201b. Students whose programming skills exceed the level of ENAS 130b or CPSC 112a or b are asked to take a more advanced programming course instead, such as CPSC 201a or b; consult with the director of undergraduate studies.

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 in topics in engineering. These courses include:

1. Mathematics and basic science (four term courses): ENAS 194a or b; MATH 222a or b or 225a or b; APHY 322b or equivalent; STAT 241a or equivalent.
2. Electrical engineering and related subjects (thirteen term courses): EENG 200a, 201b, 202a, 203b, 310b, 320a, 325b, 348a, 481a (the senior project); and four engineering electives, at least three of which should be at the 400 level. CPSC 365b and all 400-level Computer Science courses qualify as ABET electives.

Each student's program must be approved by the director of undergraduate studies.

For students who have taken the equivalent of one year of calculus in high school, a typical ABET-accredited B.S. program might include:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
EENG 200a	EENG 202a	EENG 320a	EENG 481a
ENAS 151a or MATH 120a	STAT 241a	EENG 348a	Two electives
PHYS 180a			
EENG 201b	CPSC 112b or ENAS 130b	APHY 322b	Two electives
MATH 222b	ENAS 203b	EENG 310b	
PHYS 181b	ENAS 194b	EENG 325b	

For students who start with MATH 112a or b, a typical ABET-accredited B.S. program might include:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 112a	EENG 200a	EENG 202a	EENG 481a
MATH 112a	ENAS 151a or MATH 120a	EENG 320a	STAT 241a
	PHYS 180a	EENG 348a	Two electives
EENG 201b	ENAS 194b	EENG 203b	APHY 322b
MATH 115b	MATH 222b	EENG 310b	Two electives
	PHYS 181b	EENG 325b	

Faster-paced and slower-paced variations are possible, depending on the student's level of preparation and commitment to the major; consult with the director of undergraduate studies.

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., economics or cognitive psychology). It requires thirteen technical term courses beyond the prerequisites, specifically: MATH 222a or b or 225a or b; ENAS 194a or b; EENG 200a, 201b, 202a, 203b; EENG 471a or, with permission of the director of undergraduate studies, 481a (the senior project); and six electives approved by the director of undergraduate studies, at least three of which must be at the 400 level.

For students who have taken the equivalent of one year of calculus in high school, a typical program for this degree might include:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
EENG 200a	CPSC 112a	Two electives	EENG 471a
ENAS 151a or MATH 120a	EENG 202a		One elective
PHYS 180a			
EENG 201b	EENG 203b	One elective	Two electives
MATH 222b	ENAS 194b		
PHYS 181b			

For students who start with MATH 112a or b, a typical program for this degree might include:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 112a	EENG 200a	EENG 202a	EENG 471a
MATH 112a	ENAS 151a or MATH 120a	One elective	Two electives
	PHYS 180a		
EENG 201b	ENAS 194b	EENG 203b	Two electives
MATH 115b	MATH 222b	One elective	
	PHYS 181b		

Faster-paced and slower-paced variations are possible, depending on the student's level of preparation and commitment to the major; consult with the director of undergraduate studies. The implied flexibility during the junior and senior years in the schedules above is often used to accommodate a second major, such as Economics, or to master a related technical area, such as recent developments in biology or environmental studies.

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 222a or b or 225a or b, or ENAS 194a or b; EENG 200a, 201b, 202a, and 471a (the senior requirement); and three approved electives.

Senior requirement A research or design project carried out in the fall term of the senior year is required in all three programs. The student must take EENG 471a or 481a, present a written report, and make an oral presentation during the fall term. The written report is due in the departmental office by the last day of reading period. Arrangements to undertake a project in fulfillment of the senior requirement must be made by the end of the reading period of the preceding term, when a registration form (available from the departmental office), signed by the intended faculty adviser and the director of undergraduate studies, must be submitted.

Approval of programs All Electrical Engineering and Engineering Sciences majors must have their programs approved by the director of undergraduate studies. Arrangements to take EENG 471a, 472b, or 481a must be made during the term preceding enrollment in the course. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

REQUIREMENTS OF THE MAJOR

ELECTRICAL ENGINEERING, B.S.

Prerequisites MATH 112a or b, 115a or b; ENAS 151a or b or MATH 120a or b or higher; ENAS 130b or CPSC 112a or b or higher; PHYS 180a, 181b or higher

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

Specific courses required ENAS 194a or b; MATH 222a or b or 225a or b; APHY 322b; STAT 241a; EENG 200a, 201b, 202a, 203b, 310b, 320a, 325b, 348a

Senior requirement One-term design project (EENG 481a)

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

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

Senior requirement *B.S.*—one-term research or design project (EENG 471a or, with permission of DUS, 481a); *B.A.*—one-term research or design project (EENG 471a)

EENG 200a, Introduction to Electronics Tso-Ping Ma

TTH 11:35–12:50; lab HTBA QR (24)

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 115a or b or equivalent.

EENG 201b, Introduction to Computer Engineering Andreas Savvides

MW 1–2:15; lab HTBA QR (0)

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.

EENG 202a, Communications, Computation, and Control Sekhar Tatikonda

MW 2:30–3:45; lab 1 HTBA QR (37)

Introduction to systems that sense, process, control, and communicate. Techniques that analyze system performance are applied to first- and second-order systems that operate on continuous-time waveforms and numerical data. Applications include robotics, digital image processing, and voice recognition systems. MATLAB programming and laboratory experiments illustrate concepts. Prerequisite: MATH 115a or b.

EENG 203b, Circuits and Systems Design Hongxing Tang, Mark Reed

HTBA QR (RP, 50)

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 200a and 202a.

***EENG 235a and 236b, Special Projects** Director of undergraduate studies

HTBA ½ Course cr per term (o)

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. Additional sections offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

EENG 310b, Signals and Systems Kumpati Narendra

TTH 2:30–3:45 QR (27)

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 115a or b. Recommended preparation: EENG 202a.

***EENG 320a, Introduction to Semiconductor Devices** Mark Reed

TTH 1–2:15; lab 3 HTBA QR, SC (26)

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 325b and 401b. Prerequisites: PHYS 180a and 181b or permission of instructor. Recommended preparation: EENG 200a.

EENG 325b, Electronic Circuits Hür Köser

MW 11:35–12:50; lab 3 HTBA QR (RP, 34)

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 200a.

EENG 348a, Digital Systems Roman Kuc

TTH 2:30–3:45; lab HTBA QR (27)

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 201b.

EENG 352b/BENG 352b, Biomedical Engineering II James Duncan, Fahmeed Hyder
For description see under Biomedical Engineering.

EENG 397b/ENAS 397b, Mathematical Methods in Engineering J. Rimas Vaišnys

TTH 11:35–12:50 QR (24)

Exploration of several areas of mathematics useful in engineering. Topics are drawn from complex analysis and differential equations: complex variables, Fourier series, Fourier transforms, Laplace transforms, Z transforms, boundary value problems, and linear partial differential equations. Application to physical problems. Prerequisites: MATH 222a or b, and ENAS 194a or b or MATH 246a or b, or equivalents.

EENG 401b^c/APHY 321b^c, Semiconductor Silicon Devices and Technology

Tso-Ping Ma

MW 9–10:15; lab 1 HTBA QR, SC (32)

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. Prerequisite: EENG 320a or equivalent or permission of instructor.

***EENG 402La^c/MENG 402La^c, Nano and Microsystem Technology** Hongxing Tang

TH 1:30–5:30 (o)

Cross-disciplinary laboratory experiments covering microfabrication, silicon micro-machining, MEMS device fabrication and characterization, scanned probe microscopy, electron microscopy, microfluidics, and lab-on-a-chip systems. Students fabricate MEMS, bio-MEMS, and microfluidic devices in a cleanroom environment. Prerequisite: EENG 320a or equivalent.

[EENG 406b^c, Photovoltaic Energy]**EENG 408a^c, Electronic Materials: Fundamentals and Applications** Jung Han

MW 11:35–12:50 QR, SC (34)

Survey and review of fundamental issues associated with modern microelectronic and optoelectronic materials. Topics include band theory, electronic transport, surface kinetics, diffusion, materials defects, elasticity in thin films, epitaxy, and Si integrated circuits. Prerequisite: EENG 320a or permission of instructor.

EENG 410a^c, Physics and Devices of Optical Communication Jung Han

MW 1–2:15 QR, SC (36)

A survey of the enabling components and devices that constitute modern optical communications systems. Focus on the physics and principles of each functional unit, its current technological status, important design issues relevant to the overall performance, and future directions. Prerequisites: EENG 320a and APHY 322b, or permission of instructor.

***EENG 425a^c, Introduction to VLSI System Design** Richard Lethin

TH 1:30–3:20 QR (26)

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.

EENG 428b^G/ENAS 428b^G, Sensors and Biosensors Eugenio Culurciello

HTBA QR (0)

Analysis of the design of integrated sensors, using modern fabrication technologies and recent circuit topologies. Creation of a framework for sensor design that attains performance as close as possible to the fundamental limits of transduction and processing. Particular attention to mapping algorithms and topologies into circuits that can match the physical level of the quantities to be sensed. Students develop sensory systems for biomedical application and for sensor networks.

EENG 436b, Systems and Control Kumpati Narendra

TTH 11:35–12:50 QR (24)

Design of feedback control systems with applications to engineering, biological, and economic systems. Topics include state-space representation, stability, controllability, and observability of discrete-time systems; system identification; optimal control of systems with multiple outputs. Prerequisites: ENAS 194a or b, MATH 222a or b or 225a or b, and EENG 310b or permission of instructor.

***EENG 437a/AMTH 437a, Optimization Techniques** A. Stephen Morse

For description see under Applied Mathematics.

***EENG 442a^G/AMTH 342a, Linear Systems** A. Stephen Morse

MW 1–2:15 QR (36)

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 222a or b or permission of instructor.

EENG 444a^G, Digital Communication Systems Edmund Yeh

TTH 1–2:15 QR (26)

Introduction to the fundamental theory underlying modern digital communication. Quantitative measures of information and data compression: the Huffman and Lempel-Ziv algorithms, scalar and vector quantization. Representations of signal waveforms: sampling, orthonormal expansions, waveforms as vectors in signal space. Transmission of signals through noisy channels; pulse amplitude and quadrature amplitude modulation, orthogonal signaling, signal design, noise processes, optimal detection, and error probability analysis. Applications to practical systems such as CD players, telephone modems, and wireless networks. Prerequisites: knowledge of signals and systems at the level of EENG 310b; knowledge of basic probability at the level of STAT 241a (may be taken concurrently).

EENG 445a^G/BENG 445a^G, Biomedical Image Processing and Analysis

James Duncan, Lawrence Staib

For description see under Biomedical Engineering.

[EENG 449b^G, Computers for Cognition]**EENG 454b^G/AMTH 364b^G/STAT 364b^G, Information Theory** Andrew Barron

For description see under Statistics.

***EENG 460a^c/CPSC 436a^c, Networked Embedded Systems and Sensor Networks**

Andreas Savvides

TTH 11:35–12:50 (24)

Introduction to the fundamental concepts of networked embedded systems and wireless sensor networks, presenting a cross-disciplinary approach to the design and implementation of smart wireless embedded systems. Topics include embedded systems programming concepts, low-power and power-aware design, radio technologies, communication protocols for ubiquitous computing systems, and mathematical foundations of sensor behavior. Laboratory work includes programming assignments on low-power wireless devices. Open to seniors in Electrical Engineering or Computer Science only. Prerequisite: CPSC 223b or equivalent programming experience in a high-level language.

***EENG 471a and 472b, Advanced Special Projects** Mark Reed

HTBA (0)

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. These courses may be taken at any appropriate time during the student's career and may be taken more than once. 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.

***EENG 481a, Advanced ABET Projects** Roman Kuc

MW 2:30–3:45 (RP, 0)

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 310b, 320a, 325b, and 348a.

Electrical Engineering and Computer Science

Directors of undergraduate studies: Mark Reed (Electrical Engineering), 523 BCT, 432-4306, mark.reed@yale.edu; Stanley Eisenstat (Computer Science), 208 AKW, 432-1246, stanley.eisenstat@yale.edu

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.

The prerequisites for the major are MATH 112a or b, 115a or b, and ENAS 151a or b or MATH 120a or b; CPSC 112a or b; and PHYS 180a and 181b, or 200a and 201b. Acceleration credits may be used to satisfy some of these requirements. However, since 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 in Electrical Engineering when planning their course schedules.

The major requires fifteen term courses beyond the prerequisites: CPSC 201a or b, 202a, 223b, 323a, and 365b; EENG 200a, 201b, 202a, and 203b; one from MATH 222a or b, 225a or b, or STAT 241a; four advanced electives, two in electrical engineering, two in computer science; and a senior project. MATH 244a may be substituted for CPSC 202a. Electives must be 300- or 400-level courses in the departments of Electrical Engineering and Computer Science, or must be approved by the director of undergraduate studies in each department. Double-titled courses may be counted either way to fulfill this requirement. CPSC 480a or b and 490a or b may not be used as electives. With permission of the director of undergraduate studies in each department, EENG 471a or 472b may be used as an electrical engineering elective.

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

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:

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
EENG 200a	CPSC 201a	CPSC 202a	Senior project
ENAS 151a	EENG 202a	CPSC 323a	One elective
PHYS 180a			
EENG 201b	CPSC 223b	CPSC 365b	Two electives
PHYS 181b	EENG 203b	One elective	
	MATH 222b		

Students with no programming experience should take CPSC 112a in the fall of their freshman year and either postpone EENG 200a until their sophomore year or take MATH 120b in the spring instead of ENAS 151a in the fall.

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

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 112a	CPSC 201a	CPSC 202a	Two electives
MATH 115a	EENG 200a	CPSC 323a	
PHYS 180a	EENG 202a	STAT 241a	
EENG 201b	CPSC 223b	CPSC 365b	Senior project
MATH 120b	EENG 203b	One elective	One elective
PHYS 181b			

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

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
CPSC 112a	CPSC 201a	CPSC 202a	Two electives
MATH 112a	EENG 200a	CPSC 323a	
PHYS 170a	ENAS 151a	EENG 202a	
EENG 201b	CPSC 223b	CPSC 365b	Senior project
MATH 115b	MATH 222b	EENG 203b	One elective
PHYS 171b		One elective	

Students who start with MATH 112a may satisfy the physics prerequisite by taking PHYS 170a and 171b in their freshman year, as shown in the table above. However, since 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.

Senior requirement The senior project must be completed in CPSC 490a or b or EENG 471a or 472b, depending upon the adviser's department, and must be approved by the director of undergraduate studies in each department.

Approval of programs The entire program of a student majoring in Electrical Engineering and Computer Science must be approved by the director of undergraduate studies in each department.

Accreditation Students interested in pursuing an ABET-accredited degree should consider the B.S. program in Electrical Engineering. See under Electrical Engineering.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 112a or b, 115a or b, and ENAS 151a or b or MATH 120a or b; CPSC 112a or b; PHYS 180a, 181b, or 200a, 201b (PHYS 170a, 171b is acceptable for students who need to take MATH 112a or b)

Number of courses 15 term courses beyond prereqs (incl senior project)

Specific courses required CPSC 201a or b, 202a, 223b, 323a, and 365b; EENG 200a, 201b, 202a, and 203b; one from MATH 222a or b or 225a or b or STAT 241a

Distribution of courses 4 addtl 300- or 400-level electives, 2 in electrical engineering, 2 in comp sci

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

Senior requirement Independent project (CPSC 490a or b or EENG 471a or 472b) approved by DUS in each dept

Engineering

Dean of the School of Engineering & Applied Science: T. Kyle Vanderlick, 222 DL, 432-4200, engineering@yale.edu

Engineering programs are offered in the departments of Applied Physics, Biomedical Engineering, Chemical Engineering, Electrical Engineering, and Mechanical Engineering, and under the interdepartmental major in Environmental Engineering; interdisciplinary courses bearing on these programs are listed under Engineering and Applied Science. These departments are administered by the dean of the School of Engineering & Applied Science, and all offer B.S. degrees in their subject areas.

Curricula in Yale's undergraduate engineering 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 a joint major and/or careers in fields requiring less comprehensive technical knowledge. Such non-ABET programs include the B.S. in Engineering Sciences (Chemical, Electrical, Environmental, or Mechanical), as well as the B.A. 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 science and technology have on society. A related major in Applied Mathematics is also available. For descriptions of all the programs mentioned above, see the entries in this bulletin in their respective alphabetical positions.

Engineering and Applied Science

Director of undergraduate studies: Roman Kuc, 233 DL, 432-0159, roman.kuc@yale.edu

Courses in Engineering and Applied Science fall into three categories: those intended primarily for students majoring in one of the several engineering disciplines; those designed for students majoring in subjects other than engineering and the natural sciences; and those designed to meet common interests of students majoring in engineering or the natural sciences.

In the first category, the departments of Applied Physics, Biomedical Engineering, Chemical Engineering, Electrical Engineering, Mechanical Engineering, and the program in Environmental Engineering offer courses intended primarily for majors in these fields. These courses are listed under the individual programs. Courses in these majors may also be relevant for students with appropriate backgrounds who are majoring in chemistry, physics, biology, geology and geophysics, mathematics, and computer science.

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 and the natural sciences, and topics common to students majoring in engineering or the natural sciences. Courses for non-science 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.

COURSES WITHOUT PREREQUISITES IN ENGINEERING

***ENAS 060b/APHY 060b/PHYS 060b, Energy Technology and Society** Paul Fleury
TTH 2:30–3:45 QR, SC Fr sem (27)

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. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ENAS 110a or b/APHY 110a or b, The Technological World** Victor Henrich
MW 2:30–3:45 [F]; TTH 11:35–12:50 [SP] QR, SC (50)

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. Enrollment limited to 80.

ENAS 120a/CENG 120a/ENVE 120a, Introduction to Environmental Engineering

William Mitch

For description see under Environmental Engineering.

***ENAS 323a, Creativity and New Product Development** Henry Bolanos

HTBA For sections see www.yale.edu/oci SO (o)

An overview of the stages of product development in a competitive marketplace, with simulation of the process in class. A hands-on approach to creativity and the development process.

ENAS 335a, Professional Ethics Mercedes Carreras

TTH 11:35–12:50 SO (24)

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.

ENAS 360b^C/ENVE 360b, Green Engineering and Sustainable Design

Matthew Eckelman

For description see under Environmental Engineering.

ENAS 371a/ENVE 371a, Introduction to Hydrology and Water Resources

James Wallis

For description see under Environmental Engineering.

ENAS 443a/ENVE 443a^C/F&ES 380a^C, Greening Business Operations

Thomas Graedel, Marian Chertow

For description see under Environmental Engineering.

APPLIED MATHEMATICS AND COMPUTATION COURSES

ENAS 130b, Introduction to Computing for Engineers and Scientists Marshall Long

MWF 1:30–2:20 QR (RP, 36)

An introduction to the use of the Fortran 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 a brief introduction to numerical simulations. Prerequisite: MATH 115a or b or equivalent.

ENAS 151a or b, Multivariable Calculus for Engineers Robert Grober [F],

Mitchell Smooke [Sp]

TTH 9–10:15 QR (RP, 22)

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 115a or b or equivalent.

ENAS 194a or b, Ordinary and Partial Differential Equations with Applications

Sohrab Ismail-Beigi [F], Charles Ahn [Sp]

TTH 9–10:15 QR (RP, 22)

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 151a or b or equivalent, and knowledge of matrix-based operations.

ENAS 391a, Dynamics of Evolving Systems J. Rimas Vaišnys

TTH 9–10:15 QR (RP, 22)

Use of a computer to investigate the behavior of increasingly complex natural systems; construction of quantitative theories about natural phenomena. Emphasis on systems of biological interest. After ENAS 194a or b or equivalent.

ENAS 397b/EENG 397b, Mathematical Methods in Engineering J. Rimas Vaišnys

For description see under Electrical Engineering.

ENAS 428b⁶/EENG 428b⁶, Sensors and Biosensors Eugenio Culurciello

For description see under Electrical Engineering.

ENAS 440a⁶/MENG 440a, Applied Numerical Methods I Beth Anne Bennett

TTH 11:35–12:50 QR (RP, 24)

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 addressed in a variety of contexts. Prerequisites: MATH 115a or b, and 222a or b or 225a or b, or equivalents; ENAS 130b or some knowledge of MATLAB, C++, or Fortran programming.

ENAS 441b⁶/MENG 441b, Applied Numerical Methods II Beth Anne Bennett

TTH 11:35–12:50 QR (RP, 24)

The derivation, analysis, and implementation of numerical methods for the solution of ordinary and partial differential equations, both linear and nonlinear. Assessment of computational cost and error estimation for each method. Additional topics such as stability analysis explored in selected contexts. Prerequisites: MATH 115a or b, and 222a or b or 225a or b, or equivalents; ENAS 130b or some knowledge of MATLAB, C++, or Fortran programming; ENAS 194a or b or equivalent.

ENAS 452a, MEMS Design Hür Köser

MW 10:30–11:20, 1 HTBA QR (33)

An introduction to the broad field of microelectromechanical systems (MEMS), using examples and design projects drawn from real-world MEMS applications. Topics include material properties, microfabrication technologies, structural behavior, sensing techniques, actuation schemes, fluid behavior, simple electronic circuits, and feedback systems.

Prerequisites: ENAS 194a or b or equivalent, and knowledge of MATLAB. Recommended preparation: EENG 325b and some familiarity with microfabrication. Open only to seniors majoring in engineering disciplines except with permission of instructor.

ENAS 496b⁶, Probability and Stochastic Processes Sekhar Tatikonda

MW 1–2:15 QR (RP, 36)

A study of stochastic processes and estimation, including fundamentals of detection and estimation. Vector space representation of random variables, Bayesian and Neyman-Pearson hypothesis testing, Bayesian and nonrandom parameter estimation, minimum-variance unbiased estimators, and the Cramer-Rao bound. Stochastic processes. Linear prediction and Kalman filtering. Poisson counting process and renewal processes, Markov chains, branching processes, birth-death processes, and semi-Markov processes. Applications from communications, networking, and stochastic control.

English Language and Literature

Director of undergraduate studies: Amy Hungerford; associate director of undergraduate studies: Catherine Nicholson; 107 LC, 432-2224, ruben.roman@yale.edu, www.yale.edu/english/undergraduate.html

FACULTY OF THE DEPARTMENT OF ENGLISH

Professors Elizabeth Alexander, Harold Bloom, Leslie Brisman, David Bromwich, Jill Campbell, Janice Carlisle, Michael Denning, Wai Chee Dimock, Anne Fadiman (*Adjunct*), Roberta Frank, Paul Fry, Louise Glück (*Adjunct*), Sara Suleri Goodyear, Langdon Hammer, Margaret Homans, Amy Hungerford, David Scott Kastan, Traugott Lawler (*Emeritus*), Pericles Lewis, Lawrence Manley, Donald Margulies (*Adjunct*), J. D. McClatchy (*Adjunct*), Alastair Minnis, Annabel Patterson (*Emeritus*), Lee Patterson, Linda Peterson, Caryl Phillips, David Quint, Claude Rawson, Joseph Roach, Marc Robinson, John Rogers, Robert Stepto, Katie Trumpener, Michael Warner, Ruth Yeazell

Associate Professors Ala Alryyes, Murray Biggs (*Adjunct*), Jessica Brantley, Stefanie Markovits, Caleb Smith

Assistant Professors GerShun Avilez, Susan Chambers, Ian Cornelius, Paul Grimstad, Wendy Lee, Justin Neuman, Catherine Nicholson, Shital Pravinchandra, Jessica Pressman, Anthony Reed, Sam See, Brian Walsh, R. John Williams

Senior Lecturers James Berger, John Crowley, Richard Maxwell, Fred Strebeigh, Cynthia Zarin

Lecturers Jill Abramson, Edward Barnaby, Emily Barton, Steven Brill, Richard Deming, Andrew Ehrgood, Joseph Gordon, Karin Gosselink, Alfred Guy, Penelope Laurans, John Loge, Raymond Malewitz, Mark Oppenheimer, Paula Resch, Aaron Ritzenberg, Barbara Rockenbach, Pamela Schirmeister, Kim Shirkhani, Margaret Spillane, Michele Stepto, Barbara Stuart, Leslie Woodard

Courses offered by the Department of English are designed to develop students' understanding of important works of English, American, and other literatures in English; to provide historical perspectives from which to read and analyze these works; and to deepen

students' insight into their own experience. Courses also aim to develop students' abilities to express their ideas orally and in writing.

Introductory courses Courses numbered from 114 to 149 are introductory. Students planning to elect an introductory course in English should refer to the departmental Web site, www.yale.edu/english/undergraduate.html, for information about preregistration.

Prerequisite 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 European and American literature. The prerequisite for the major is ENGL 125a, 126b. It is strongly recommended that prospective English majors take at least ENGL 125a or 126b by the end of the sophomore year. If a student takes both ENGL 125a and 126b, then any two terms of ENGL 115, 120, 127–130, or DRST 001a, 002b in the Directed Studies program, or THST 110a, 111b, or ENGL 114a in combination with 115b or 116b, may count toward the twelve remaining terms in the major. If ENGL 125a and 126b are not taken, two terms of ENGL 127–130 or DRST 001a, 002b may count as the prerequisite so long as the student also takes, as part of the major, four advanced courses that deal substantially and intensively with poets included in ENGL 125a and 126b. Two of these courses should substitute for two of the three units in ENGL 125a (Chaucer, Spenser, and a Renaissance lyric poet), and two should substitute for two of the four units in ENGL 126b (Milton, Pope, Wordsworth, and a major modern poet). Courses that deal with more than one poet are acceptable for this purpose. Such courses may also count toward the requirement of three term courses in English literature before 1800 and one term course in English literature before 1900.

Regardless of how the prerequisite is fulfilled, the total number of term courses toward the major may not be fewer than fourteen, of which no more than four may be introductory (below the level of 150).

Advanced courses Courses numbered 150 and above are open to upperclassmen after two terms of English or with permission of the instructor. Starred courses, limited in enrollment, are seminars intended primarily for junior and senior English majors. Sophomores and nonmajors may be admitted where openings are available. Students are strongly encouraged to consult the director of undergraduate studies, the departmental representative in their residential college, and their departmental adviser for advice about their course choices.

When choosing courses, students should bear in mind that the English department's lecture courses and seminars play different roles in the curriculum. Lecture courses cover major periods and genres of English and American literature. They serve as general surveys of their subjects, and are typically offered every year or every other year. Seminars, by contrast, offer more specialized or intensive treatment of their topics, or engage topics not addressed in the lecture courses (for example, topics that span periods and genres). While seminars are often offered more than once, students should not expect the same seminars to be offered from one year to the next. Sophomores and juniors are encouraged to enroll in lecture courses in order to gain broad perspectives in preparation for more specialized study.

The major 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 term courses in literature written in English before 1800, one term course in literature written in English before 1900, and one term course in American literature, all representing a variety of periods and figures. Courses satisfying this requirement are indicated by the phrase “Pre-1800,” “Pre-1900,” or “Amer” in the data line. Pre-1800 courses can, by definition, satisfy the pre-1900 requirement. Courses in American literature in the pre-1800 or pre-1900 periods can satisfy both one of the period requirements and the American requirement; (2) at least one seminar in both the junior and the senior years. The nature of senior seminars (400-level literature seminars) is discussed below.

Certain residential college seminars, with permission of the director of undergraduate studies, may be substituted for a departmental seminar; courses in creative writing may not. Courses taken Credit/D/Fail may be counted toward the major.

A student whose program meets these requirements may count toward the major two upper-level literature courses in other departments, whether in English translation or in another language; alternatively, the student may count one such literature course and, with the permission of an adviser, one other upper-level course in any subject that is relevant to the student’s major in English. Such courses may not be counted toward the pre-1800 or the pre-1900 requirement. Two courses in creative writing may be counted toward the major. A student may petition the director of undergraduate studies for permission to include a third writing course.

In exceptional cases, a student whose interests and aims are well defined may, in consultation with the director of undergraduate studies, 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 the Literature Major; Directed Studies; American Studies; African American Studies; Theater Studies; Women’s, Gender, and Sexuality Studies; and Teacher Preparation and Education Studies.

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.

Senior requirement Students must complete a two-course senior requirement consisting of one of the following combinations: (1) a senior seminar and a senior essay; (2) two departmental seminars, one of which must be a senior seminar; (3) a two-term senior essay, with permission of the director of undergraduate studies; (4) a senior seminar or senior essay followed by 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.

Senior seminar Senior seminars are open to interested juniors as well, but one must be taken in the senior year to fulfill the senior requirement. These courses, usually numbered 400–449, are listed in the section “Senior Seminars.” Seniors, with the permission of the

director of undergraduate studies and the instructor, may arrange to take a junior seminar for senior seminar credit. The final essay written for a senior seminar should provide an appropriate culmination to the student's work in the major and in Yale College. It should rest on substantial independent work and should be approximately twenty double-spaced pages in 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.

The 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. It should ordinarily be written on a topic in an area on which the student has focused in previous studies. See ENGL 490a or b for the procedure. Students fulfilling the senior requirement through a two-term senior essay or through a senior essay followed by the senior writing concentration project must take a seminar during their senior year, but it need not be a 400-level seminar.

Writing courses Besides introductory courses that concentrate on the writing of expository prose (ENGL 114a or b, 115a or b, 116b, 120a or b), the English department offers several creative writing courses (ENGL 140–141 and 450–469). These courses are open to all students on the basis of the instructor's judgment of their work. Instructions for the submission of writing samples for admission to creative writing seminars and workshops are available in 107 LC and on the English department Web site at www.yale.edu/english/undergraduate.html. Students may in some cases arrange a tutorial in writing (ENGL 470a or b), 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.

The writing concentration The writing concentration is a special course of study open to students in the English major with demonstrated interest and achievement in writing. Admission is competitive. Interested English majors normally apply for admission to the concentration during the second term of their junior year. Application can also be made during the first term of the senior year. Every student admitted to the concentration must complete at least eleven literature courses as well as the other requirements of the major. Students admitted to the writing concentration may count up to four 400-level courses in writing toward completion of the B.A. degree in English; the four courses must include at least two courses in one genre and at least one course in another genre. Residential college seminars are not acceptable for credit toward the writing concentration, except by permission of the director of undergraduate studies. As one of the four writing courses, each student must complete ENGL 489a or b, The Writing Concentration Senior Project, a tutorial in which students produce a single sustained piece of writing or a portfolio of shorter works. The writing concentration senior project may be offered in partial fulfillment of the senior requirement.

Seniors applying for the spring of 2011 must do so by November 19, 2010. Juniors applying to the writing concentration for the fall of 2011 must do so by noon on April 11, 2011. Students are admitted selectively on the overall strength of their performance in the major and on the quality of their writing samples.

Advising A student planning a program of study in English should consult as early as possible with the appropriate residential college departmental representative:

BK, J. Rogers	MC, L. Brisman
BR, L. Peterson [F]; R. Frank [Sp]	PC, S. Markovits
CC, to be announced	SY, M. Robinson
DC, A. Hungerford	SM, J. Brantley
TD, C. Nicholson	ES, P. Fry
JE, D. Bromwich [F]; A. Hungerford [Sp]	TC, J. Carlisle

Schedules for all majors must be discussed with, and approved by, a faculty adviser from the English department, the director of undergraduate studies, or the associate director of undergraduate studies. Only then may they be submitted to the residential college dean's office. During the sixth term, each student completes a statement outlining progress in the major, in consultation with the student's adviser.

Applications and prospectuses for ENGL 490a or b and writing samples for admission to writing courses are received in the office of the English major in 107 LC. Prospectuses and applications for senior essays should be submitted during the designated sign-up period in the term before enrollment is intended. Enrollment lists for seminars and lists of approved senior essays and individual writing projects are posted in 107 LC.

REQUIREMENTS OF THE MAJOR

Prerequisite ENGL 125a, 126b or, with 4 addtl courses in major English poets, two terms selected from DRST 001a, 002b, ENGL 127a or b, or ENGL 129a, 130b

Number of courses 14 term courses (incl prereq and senior req)

Distribution of courses 3 courses in lit in English before 1800, 1 course in lit in English before 1900, and 1 course in American lit, all representing a variety of figures and periods; 2 sems, 1 in junior, 1 in senior year; no more than 4 intro-level courses

Substitution permitted 2 upper-level lit courses in other depts or, with permission, 1 upper-level lit course and 1 addtl upper-level course in other depts may count toward the major; 2 creative writing courses (ENGL 140–141, 450–469) may count toward the major; college sem designated by DUS for sem

Senior requirement 1 senior sem (ENGL 400–449) and senior essay (ENGL 490a or b); or 2 sems in senior year, 1 of which is a senior sem; or, with DUS permission, two-term senior essay; or 1 senior sem or senior essay and writing concentration senior project (ENGL 489a or b)

INTRODUCTORY COURSES

Freshmen who wish to take a fall-term introductory course in English must register for a specific section during the electronic registration process on Tuesday, August 31. Details about electronic registration will be available on the English department Web site at www.yale.edu/english/undergraduate.html. Syllabi listing the different topics taught in ENGL 114a and 115a will be posted on this site approximately two weeks before the beginning of classes. For further information about the levels of introductory courses

and the guidelines for placement, see the Freshman Web site, yalecollege.yale.edu/content/english-language-and-literature-1. Students uncertain about which course to take or with questions about enrollment in introductory courses should consult with a faculty member during English Department Placement on August 31 from 9 to 11:30 a.m. in 102 LC. Those who miss the initial registration may petition to enter an introductory course or to change sections by completing and submitting a form in 107 LC after classes begin.

Upperclassmen should register for introductory courses during the same electronic registration period on August 31.

English for Freshmen

***ENGL 006a/AFAM 019a, Representing U.S. Slavery** Anthony Reed

MW 11:35–12:50 WR, HU Fr sem (o)

The strategies, limitations, and ethics of representing slavery in a range of texts from the eighteenth, nineteenth, and twentieth centuries. Shifting meanings of race, gender, freedom, and emancipation in these texts. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ENGL 007a/AFAM 026a, The Black Arts Movement** GerShun Avilez

TTH 1–2:15 WR, HU Fr sem (o)

The artistic output of the Black Arts Movement (1965–75), including poetry, drama, fiction, nonfiction, visual art, and film. Emphasis on the fraught relationship between aesthetics and politics as well as on the disputed concept of “Blackness.” Authors include Amiri Baraka, Alice Walker, John A. Williams, Paule Marshall, Sonia Sanchez, and Melvin Van Peebles. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ENGL 008a, Medieval Drama** Jessica Brantley

MW 2:30–3:45 WR, HU Fr sem, Pre-1800 (o)

An exploration of medieval dramatic traditions in the context of performative practices, including pageantry, song, spectacle, recitation, liturgy, and meditative reading. Texts include *The York Plays*, *Everyman*, *Mankind*, and *Mary Magdalene*. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ENGL 009b/HUMS 091b, The Sagas of Icelanders** Roberta Frank

MW 2:30–3:45 HU Fr sem, Pre-1800 (o)

Readings in translation of selected sagas from the medieval North. These prose narratives, masterpieces of world literature, tell of Icelandic poets, vikings, warriors, wise women, and farmers who settled that wind-swept volcanic island during the Viking Age (c. 800–1100). Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ENGL 114a or b, Writing Seminars I** Karen Gosselink [F], Janice Carlisle [Sp], and staff

HTBA For sections see www.yale.edu/oci WR (o)

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 vision, word games, science and education, experts and expertise, the good life, and dissent in American culture.

***ENGL 115a or b, Literature Seminars I** Aaron Ritzenberg and staffHTBA For sections see www.yale.edu/oci WR, HU (o)

Exploration of major themes in selected works of literature. Individual sections focus on topics such as war, justice, childhood, and the natural world. Emphasis on the development of writing skills and the analysis of fiction, poetry, drama, and nonfiction prose.

***ENGL 116b, Writing Seminars II** Andrew Ehrgood and staffHTBA For sections see www.yale.edu/oci WR (o)

Refinement of the tools of rhetorical analysis and argument through study of writing related to specific fields of endeavor or inquiry. Typical topics of individual sections are the environment, science, the arts, the law, food, politics, and medicine. Varied writing assignments, with frequent review and revision, culminate with the development of a longer research essay. Prerequisite: ENGL 114a or b or permission of instructor.

English for Freshmen and Sophomores

ENGL 120a or b, 125a, 127a or b, and 129a are open to freshmen whose SAT and English Advanced Placement test scores fall within the range specified for these courses (see the Freshman Web site, yalecollege.yale.edu/content/english-language-and-literature-1), and to upperclassmen, normally after one or two terms of English for Freshmen.

ENGL 120a or b, Reading and Writing the Modern Essay Erin Peterson and staffHTBA For sections see www.yale.edu/oci WR (o)

Close study of selected works of nonfiction prepares students to become critical readers and to apply professionals' strategies to their own writing. Readings from such authors as Joan Didion, Malcolm Gladwell, Maxine Hong Kingston, N. Scott Momaday, George Orwell, Brent Staples, Jonathan Swift, Henry David Thoreau, Tom Wolfe, and Alice Walker. Written assignments, involving frequent revision, include autobiography, portraiture, nature writing, cultural critique, and formal argument.

***ENGL 125a and 126b, Major English Poets** Jessica Brantley [F], Linda Peterson [Sp], and staffHTBA For sections see www.yale.edu/oci WR, HU (63)

A study of the diversity and the continuity of the English literary tradition through close reading of the work of its major poets. Emphasis on developing skills of interpretation and critical writing. In the fall term, Chaucer, Spenser, and a Renaissance lyric poet. In the spring term, Milton, Pope, Wordsworth, and a modern poet.

***ENGL 127a or b, Readings in American Literature** R. John Williams and staffHTBA For sections see www.yale.edu/oci WR, HU Amer (63)

Major works of the American literary tradition in a variety of poetic and narrative forms and in diverse historical contexts. Emphasis on analytical reading and critical writing. Authors may include Melville, Poe, Hawthorne, Bryant, Whitman, Dickinson, Thoreau, Emerson, Douglass, Stowe, Twain, Wharton, Cather, H. Crane, Stevens, Stein, L. Hughes, Paredes, Ellison, O'Connor, Ginsberg, Lowell, O'Hara, M. Robinson, C. McCarthy, Morrison, E. P. Jones, J. Díaz.

***ENGL 129a, Tragedy** Brian Walsh and staffHTBA For sections see www.yale.edu/oci WR, HU (63)

Tragedy, as a genre, 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 in classics of stage and page. 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 developing the craft of persuasive argument through writing.

***ENGL 130b, Epic** Stefanie Markovits and staff

HTBA For sections see www.yale.edu/oci WR, HU (63)

The epic tradition traced from its foundations in ancient Greece and Rome to the modern novel. The creation of cultural values and identities; issues of 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 developing the craft of persuasive argument through writing.

ADVANCED COURSES

The courses listed below 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.

***ENGL 169b, Chaucer and Desire** Ian Cornelius

TTH 2:30–3:45 WR, HU Pre-1800 (0)

A careful reading of Chaucer's major poems, focusing on questions of sex, love, and desire. Selected Canterbury Tales, *Troilus and Criseyde*, *The Book of the Duchess*, and *The Parliament of Fowls*.

***ENGL 185a, Medieval Literature at the Movies** Alastair Minnis

M 9:25–11:15 WR, HU Pre-1800 (0)

Medieval narrative traditions and their appropriation in modern film. *Beowulf* (read in modern translation), selected Canterbury Tales, Malory's *Morte d'Arthur* (read in Middle English), and Twain's *A Connecticut Yankee in King Arthur's Court*.

ENGL 200b, Shakespeare: Comedies and Romances Lawrence Manley

TTH 11:35–12:25, 1 HTBA HU Pre-1800 (24)

Love, sex, gender, society, and theater practice in Shakespeare's comic genres, from the early farces and romantic comedies to the problem plays and late romances. Optional WR section.

ENGL 201a, Shakespeare: Histories and Tragedies David Scott Kastan

TTH 2:30–3:20, 1 HTBA HU Pre-1800 (27)

A study of Shakespeare's histories and tragedies, focusing on attentive reading of the play texts and consideration of the theatrical, literary, intellectual, political, and social worlds in which the plays were written and performed.

***ENGL 210b/HUMS 296b, Reading and Writing in Renaissance England**

David Scott Kastan

TTH 11:35–12:50 WR, HU Pre-1800 (0)

Practices of writing and reading in early modern England, focusing on Shakespeare, Donne, and the Bible. Exploration of what poets, playwrights, and translators actually did when they sat down to write, how their texts were disseminated in manuscript and print, and how their writing was received and reshaped by publishers, printers, and readers.

ENGL 220a, Milton John Rogers

MW 11:35–12:50, 1 HTBA WR, HU Pre-1800 (34)

A study of Milton's poetry, with some attention to his literary sources, his contemporaries, his controversial prose, and his decisive influence on the course of English poetry.

***ENGL 232b, Temptation in the Wilderness** John Rogers

T 1:30–3:20 WR, HU (o)

A study of primarily English and American literary works founded on the Gospel accounts of Satan's temptation of Jesus in the wilderness. Readings in Marlowe, Spenser, Milton, Goethe, Dostoevsky, Melville, Twain, Nathanael West, Faulkner, and Cormac McCarthy. Pre-1800 or pre-1900 with permission of the instructor and the director of undergraduate studies.

***ENGL 235b, The Eighteenth-Century British Novel** Wendy Lee

MW 2:30–3:45 WR, HU (o)

The genesis of the modern novel in British fiction from the eighteenth century. The quirks of eighteenth-century fiction: its violent sense of humor, outrageous sexuality, unhinged narrative economy, and staple characters of orphans, maids, and castaways.

***ENGL 243b/HUMS 428b/LITR 207b/MGRK 214b/WGSS 215b, Modern Literature and the Eastern Mediterranean** Langdon Hammer, George Syrimis

For description see under Hellenic Studies.

***ENGL 248a/EVST 325a, Nature Writing in the English-Speaking World**

Linda Peterson

MW 1–2:15 WR, HU Pre-1900 (o)

Natural history and environmental writing in the English-speaking world from the late eighteenth century to the present. Readings include Gilbert White's *Natural History of Selborne*, Thoreau's *Walden*, and Darwin's *Voyage of the Beagle*, as well as recent work by writers from Canada, the United States, India, Australia, and South Africa.

ENGL 250a, Romantic Poetry Paul Fry

TTH 1:30–2:20, 1 HTBA HU Pre-1900 (26)

Major works of Wordsworth, Coleridge, Byron, P. B. Shelley, and Keats, as well as selections from the works of Blake and from Mary Shelley's *Frankenstein*.

ENGL 256b, New Media Theory Jessica Pressman

TTH 2:30–3:20, 1 HTBA HU (o)

Introduction to the ways that digital media and technoculture are transforming how we read, write, and think. Readings include texts in media theory, contributions to the development of computing, cultural critiques of networked culture, and creative works of digital literature and art.

***ENGL 259b, Jane Austen** Stefanie Markovits

TTH 1–2:15 WR, HU Pre-1900 (o)

Close study of Austen's novels, with special attention to the critique of social and literary convention.

***ENGL 264b, Victorian Crime** Janice Carlisle

W 2:30–4:20 WR, HU Pre-1900 (37)

Crimes of passion, greed, and desperation as they are represented in Victorian literature from Dickens to Conan Doyle and in the graphic arts from Cruikshank to Frith. Readings include fiction, journalism, poetry, and stage melodramas; art works range from narrative paintings in oil to popular wood engravings.

ENGL 265b, The Victorian Novel Ruth Yeazell

MW 11:35–12:25, 1 HTBA HU Pre-1900 (34)

A selection of nineteenth-century novels, with attention to cultural contexts. Authors chosen from the Brontës, Gaskell, Dickens, Collins, Eliot, Trollope, and Hardy.

ENGL 266a, Dickens Janice Carlisle

MW 11:35–12:25, 1 HTBA HU Pre-1900 (34)

Charles Dickens as storyteller, social critic, and literary artist. Fiction from Dickens's early career (selections from *Pickwick Papers* and *Oliver Twist*; *The Old Curiosity Shop*), his middle years (*Bleak House* and *Hard Times*), and the last decade of his life (*Great Expectations* and *The Mystery of Edwin Drood*). Optional WR section.

***ENGL 276a/HUMS 354a, Ways of Knowing in Nineteenth-Century American Literature** Pamela Schirmeister

TTH 2:30–3:45 WR, HU Amer, Pre-1900 (0)

An examination of the ways in which nineteenth-century literary texts embody and express contested philosophical, epistemological, and historical claims about the developing American nation. Readings in Brockden Brown, Poe, Emerson, Hawthorne, Melville, Thoreau, Henry James, and William James, with some attention to concurrent historical materials such as the Federalist Papers, the Journals of Lewis and Clark, and political speeches.

ENGL 283a, Poetry since 1950 Langdon Hammer

TTH 11:35–12:25, 1 HTBA WR, HU (24)

Major poets of the second half of the twentieth century, including Bishop, Lowell, Larkin, Plath, Ashbery, Merrill, Gunn, Hill, and Heaney.

ENGL 289a/AMST 246a, Hemingway, Fitzgerald, Faulkner Wai Chee Dimock

TTH 10:30–11:20, 1 HTBA HU Amer (23)

An in-depth study of the major novels and short stories. Exploration of the relation between linguistic usage and political and ethnic identities, with close attention to words and the speech communities revolving around them.

ENGL 291b/AMST 261b, The American Novel since 1945 Amy Hungerford

MW 1:30–2:20, 1 HTBA HU Amer (36)

American fiction; works by Richard Wright, Flannery O'Connor, Jack Kerouac, Vladimir Nabokov, Joan Didion, Philip Roth, Thomas Pynchon, John Barth, Maxine Hong Kingston, Louise Erdrich, Cormac McCarthy, Colson Whitehead, Deb Olin Unferth, and Junot Diaz. Optional WR section.

***ENGL 294a/AFAM 294a, African American Literature I: 1740–1900** Robert Stepto
For description see under African American Studies. Amer, Pre-1900

***ENGL 295b/AFAM 295b/AMST 295b, African American Literature II: 1900–1970**
Robert Stepto
For description see under African American Studies. Amer

ENGL 296b/AFAM 296b/AMST 296b/WGSS 292b, African American Literature III: 1970 to the Present Elizabeth Alexander
For description see under African American Studies.

***ENGL 299b/AMST 301b/FILM 311b, East Asia in U.S. Literature and Film**
R. John Williams

MW 2:30–3:45 WR, HU (o)

An introductory course on American images of Asia and Asian America in twentieth-century literature and cinema.

ENGL 300b/LITR 300b^G, Introduction to Theory of Literature Haun Saussy
For description see under Literature.

***ENGL 321a/HUMS 246a/LITR 357a, Visual Culture in Literature, Drama, and Film**
Edward Barnaby
For description see under Literature.

***ENGL 325b/AMST 257b, Modern Apocalyptic Narratives** James Berger
For description see under American Studies.

***ENGL 328a, Medicine and Ethics in Global Literature** Shital Pravinchandra

TTH 11:35–12:50 WR, HU (o)

Global literature and films that address medical and technological developments; changes in human relationships and the complex ethical questions that arise in the wake of such developments. Texts by J. M. Coetzee, Sherman Alexie, Kazuo Ishiguro, and Salman Rushdie.

***ENGL 332a/AFAM 302a, Music and Poetics in the African Diaspora** Anthony Reed

TTH 1–2:15 WR, HU (o)

Reading of canonical and recent poetry and criticism to discern the connections between music and poetics in the Anglophone literature of the African diaspora. Techniques and uses of music, sound, and sound engineering in black literary culture. Emphasis on jazz, blues, and poetry.

***ENGL 333a, Ovid's English Renaissance** Catherine Nicholson

TTH 1–2:15 WR, HU Pre-1800 (o)

Ovid as the locus of enthusiasm and anxiety about literary creation in the sixteenth and seventeenth centuries. Ways that writers such as Marlowe, Shakespeare, Marston, Jonson, and Milton negotiated the perils and profits of apprenticeship to this volatile classical poet.

***ENGL 342b/HUMS 288b/WGSS 408b, Queer Mythologies** Sam See

TTH 1–2:15 WR, HU (o)

The use of mythology and mythopoeia (myth-making) by twentieth-century British and American writers to develop queer literary and historical communities. Texts include classical, biblical, Yorùbá, and Aztec myths as background for readings in modernist and post-modernist literature. Authors include Sigmund Freud, Hilda Doolittle, Jeanette Winterson, Tony Kushner, and Tarell Alvin McCraney.

***ENGL 344b/EP&E 265b/ER&M 436b, Global Fictions and Social Systems**

Justin Neuman

W 1:30–3:20 WR, HU (o)

Literary fictions and social systems from 1827 to the present that take an idea of the global as their frame of reference. Themes include politics (empire to postcolony), economics (capitalism, communism, “three worlds theory”), and technology (trade, media, war, energy). Works by Goethe, Melville, Marx, Verne, Forster, Tagore, Ondaatje, Rushdie, Salih, Fukuyama, Friedman, and Ishiguro.

***ENGL 351b/HUMS 254b, Satire** Claude Rawson

MW 1–2:15 WR, HU Pre-1800 (o)

A study of satire from primitive origins (including ritual curses) to the twentieth century. Authors include Horace, Juvenal, Donne, Dryden, Rochester, Swift, Pope, Shelley, Byron, T. S. Eliot, and W. H. Auden.

***ENGL 353a/HUMS 295a/LITR 463a, Medieval Celtic Literature** David Gabriel

For description see under Literature.

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

For description see under American Studies.

***ENGL 358b, Literature for Young People** Michele Stepto

M 1:30–3:20 HU (RP, o)

An eclectic approach to stories and storytelling for and by children. Authors include Nathaniel Hawthorne, Louisa May Alcott, J. K. Rowling, Leo Lionni, Laurent de Brunhoff, Dr. Seuss, Maurice Sendak, and children themselves.

ENGL 360b/HUMS 243b/LITR 223b/THST 223b, The Foundations of Modern Drama

Murray Biggs

For description see under Theater Studies.

***ENGL 361b/THST 329b, Theater Now** Marc Robinson

For description see under Theater Studies.

***ENGL 362b/THST 288b, From Celebrity to Stardom** Joseph Roach

MW 2:30–3:45 WR, HU (o)

The development of the star system from 1660 to the present, with special emphasis on the literature and visual imagery of charismatic attraction in the long eighteenth century.

***ENGL 363b, American Literature in the Shadow of Wars** Wai Chee Dimock

TTH 11:35–12:50 WR, HU Amer (o)

Whitman's Civil War poetry, Hemingway's *For Whom the Bell Tolls*, John Hersey's *Hiroshima*, and other works that bear witness to violence and conflict, comment on the fragilities of survival and nonsurvival, and meditate on the relation between the living and the dead. Works include a variety of genres from the nineteenth century to the twenty-first.

***ENGL 370a/AFAM 345a, Law, Race, and Narrative** GerShun Avilez

For description see under African American Studies Amer

***ENGL 371b/AFAM 389b/WGSS 389b, Sexuality in African American Literature and Popular Culture** GerShun Avilez

For description see under African American Studies.

***ENGL 381a, Detective Fiction: Poe to the Present** Paul Grimstad

TTH 2:30–3:45 WR, HU Amer (o)

A reconstruction of the literary and historical contexts in which Edgar Allan Poe invented detective fiction. More recent examples of the genre, including tales (Doyle's *Sherlock Holmes* stories), novels (*The Maltese Falcon*, *The Talented Mr. Ripley*), films (*Le Cercle Rouge*, *Chinatown*), television programs (*Law and Order*), and books and films that combine detective fiction with science fiction (*Blade Runner* and *Gun, with Occasional Music*).

***ENGL 385b/WGSS 339b, Feminist Fictions** Margaret Homans

WF 11:35–12:50 WR, HU (o)

Historical survey of works of fiction that have shaped feminist and queer thought from the late eighteenth century to the present. Authors include Wollstonecraft, C. Brontë, H. Jacobs, C. P. Gilman, Chopin, Woolf, Hurston, Wittig, LeGuin, Morrison, Anzaldua, and Winterson.

***ENGL 386b/WGSS 360b, Queer Theory** Michael Warner

For description see under Women's, Gender, & Sexuality Studies.

***ENGL 391a, Digital Literature** Jessica Pressman

W 2:30–4:20 WR, HU (o)

Introduction to born-digital literature, works created and accessed on the computer. Genres include hypertext and animated poetry, generative and interactive fiction, locative narrative and virtual reality installations. Digital literature situated in relation to print textuality, experimental poetics, and traditional modes of literary study.

***ENGL 395a/LITR 154a, The Bible as Literature** Leslie Brisman

MW 2:30–3:45 WR, HU (RP, 37)

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. Pre-1800 with completion of supplementary assignments in the language of the King James Bible. If enrollment requires, an additional section will be added Wednesdays, 4–5:15.

SENIOR SEMINARS

The seminars below are for seniors fulfilling the senior requirement. They are open to interested juniors and seniors outside the major when space is available.

***ENGL 403b, Study of Medieval Manuscripts** Jessica Brantley

W 1:30–3:20 WR, HU Pre-1800 (o)

A history of the medieval book and its social uses, based on materials at Beinecke Library. Topics include the roles of authors, scribes, artists, and readers in constructing, writing, illuminating, and editing manuscripts.

***ENGL 405b/AFAM 406b^G/AMST 405b^G, Autobiography in America** Robert Stepto
For description see under American Studies. Amer

***ENGL 409a, Shakespeare's Poems** Lawrence Manley
MW 2:30–3:45 WR, HU Pre-1800 (o)

Intensive study of Shakespeare's major poems (*Venus and Adonis*, *The Rape of Lucrece*, and the sonnets) with some attention to predecessors and contemporaries (Petrarch, Wyatt, Surrey, Sidney, Spenser, and Marlowe) and to critical responses.

***ENGL 410b, Shakespeare and His Dramatic Contemporaries** Brian Walsh
TTH 2:30–3:45 WR, HU Pre-1800 (o)

Selected plays of Shakespeare studied in relation to works by his major contemporaries, including Marlowe, Dekker, Jonson, Middleton, Webster, and Ford. The cultural and professional matrix from which Shakespeare's canon of plays emerged; trends in scholarship on early modern drama. Class sessions at Beinecke Library.

***ENGL 411a, Edgar Allan Poe** Paul Grimstad
TTH 11:35–12:50 WR, HU (o)

Chronological study of the poetry and prose of Edgar Allan Poe. Aspects of the author's career, including his work as magazine editor and reviewer, his relation to slavery and abolition, and his posthumous influence on French literature.

***ENGL 416a, Contemporary British Fiction** Caryl Phillips
M 3:30–5:20 WR, HU (o)

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 Alan Hollinghurst, Kazuo Ishiguro, Colin McInnes, Samuel Selvon, Ruth Praver Jhabvala, and John Osborne.

***ENGL 417a, The Age of Johnson** David Bromwich
MW 1–2:15 HU Pre-1800 (o)

Nonfiction prose of the later eighteenth century, with emphasis on the essays of Hume, the speeches of Burke, and the *Lives of the English Poets* by Samuel Johnson.

***ENGL 418a^G, Spenser** Leslie Brisman
MW 11:35–12:50 WR, HU Pre-1800 (RP, o)

A reading of most of *The Faerie Queene*, together with a selection of the minor poems. Emphasis on Spenser's innovation in the face of appealing precursors and on the difficulties of fitting recalcitrant ethical problems into the limits of allegory.

***ENGL 422a/LITR 440a, James Joyce's Ulysses** Pericles Lewis
TTH 11:35–12:50 HU (RP, o)

Advanced study of James Joyce's *Ulysses* in relation to three precursor texts: Homer's *Odyssey*, Shakespeare's *Hamlet*, and Joyce's *Portrait of the Artist as a Young Man*. Joyce's experiments in form and representation; major themes of the novel; Joyce's literary and historical context; and critical approaches to *Ulysses*. No previous knowledge of Joyce's work assumed.

***ENGL 425a, Wallace Stevens** David Bromwich
W 9:25–11:15 HU Amer (o)

Survey and interpretation of Wallace Stevens's major poetry and selected prose, with some attention to other modern poets such as Eliot, Frost, and William Carlos Williams.

***ENGL 431a, The Brontës and Their Afterlives** Linda Peterson

T 9:25–11:15 WR, HU (o)

The novels of Charlotte, Emily, and Anne Brontë, with modern adaptations in film and fiction. Additional readings include Gaskell's *Life of Charlotte Brontë*, Sinclair's *Three Sisters*, and Rhys's *Wide Sargasso Sea*; films include *Jane Eyre*, *Wuthering Heights*, and "biographies" of the Brontë sisters.

***ENGL 438a and 439b/THST 473a and 474b, Directed Independent Study:**

Eugene O'Neill Murray Biggs

HTBA (o)

For description see under Theater Studies.

***ENGL 440b/THST 440b, Modern Irish Drama** Murray Biggs

For description see under Theater Studies.

***ENGL 443a^G/AFAM 408a^G/AMST 460a^G, African American Poets of the Modern Era**

Robert Stepto

For description see under African American Studies. Amer

***ENGL 446b, Virginia Woolf** Margaret Homans

T 1:30–3:20 WR, HU (o)

A study of the major novels and other writings by Virginia Woolf, with additional readings in twentieth-century culture and politics and in Woolf biography and criticism. Focus on Woolf's responses and contributions to literary and political movements of her day and on the contemporary and recent reception of her work.

***ENGL 449a, T. S. Eliot: Tradition and Modernity** Claude Rawson

T 1:30–3:20 HU (o)

A study of Eliot as poet, critic, playwright, and man of letters.

COURSES IN WRITING

Introductory Courses

***ENGL 134b, Reading Fiction for Craft** Michael Cunningham

TH 1:30–3:20 HU (o)

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.

***ENGL 135b, Reading Poetry for Craft** Justin Sider

TTH 1–2:15 HU (o)

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.

***ENGL 140a or b, Introduction to Writing Fiction** Leslie Woodard [F],
John Crowley [Sp]

TU 3:30–5:20 [F]; W 1:30–3:20 [SP] (o)

An intensive introduction to the craft of fiction, designed for aspiring creative writers. Focus on the fundamentals of narrative technique and peer review. In the fall term, open to sophomores, juniors, and seniors; in the spring term, open to all students. Prerequisite: a previous course in English or in another literature.

***ENGL 141a, Introduction to Verse Writing** Louise Glück

T 1:30–3:20 (RP, o)

A seminar workshop for freshmen and sophomores who are beginning to write poetry. Interested students should have a solid grasp of nonfiction prose writing.

Advanced Courses

***ENGL 450b, Daily Themes** Langdon Hammer

TH 2:30–4:20 WR (o)

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 deadline: noon on Friday, December 10, 2010. Enrollment limited to sophomores, juniors, and seniors. Counts as a nonfiction course in the writing concentration.

***ENGL 453a/THST 320a, Playwriting** Donald Margulies

HTBA (o)

A seminar and workshop in writing for the stage. Readings emphasize contemporary plays, with some theory. Writing assignments include weekly exercises and the execution of a one-act play.

***ENGL 454a, Nonfiction Writing: Voice and Structure** Fred Strebeigh

TH 1:30–4 WR (RP, o)

A nonfiction workshop, confronting the challenges of journalism as an art. Emphasis on voice and structure. Study of texts that may suggest modes, voices, forms, and styles for nonfiction pieces. Frequent writing projects and revisions.

***ENGL 455b, Writing about Oneself** Anne Fadiman

TH 2:30–5 WR (o)

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, and personal essays. An older work, usually from the nineteenth or early twentieth century, is paired each week with a more recent one on the same theme.

***ENGL 458a or b, The Writing of Fiction** Emily Barton, John Crowley,
Michael Cunningham, Caryl Phillips

HTBA For sections see www.yale.edu/oci (o)

A workshop in the craft of writing fiction. May be repeated for credit.

***ENGL 460a or b, The Writing of Verse** Louise Glück and staff

M 3:30–5:20 [F]; M 1:30–3:20 [SP] (RP, o)

A seminar and workshop in the writing of verse. May be repeated for credit.

***ENGL 467a or b, Journalism** Steven Brill [F], Jill Abramson [Sp]

M 9:25–11:15 WR (o)

An intensive workshop in the art and changing role of journalism. Definitions of journalism; the role of journalism in a democracy and a free market; differences among information, news, vicarious news, and entertainment; knowing and telling a good story; the structure of newspaper articles, magazine features, television reports, and nonfiction books; interviewing; fairness; sourcing; the economics of journalism; and audience. Fulfills the core seminar requirement for Yale Journalism Scholars. No prerequisites.

***ENGL 468b/THST 327b, Advanced Playwriting Workshop** Donald Margulies

HTBA (RP, o)

A playwriting workshop for students who have taken courses in intermediate playwriting or screenwriting.

***ENGL 469a, Advanced Nonfiction Writing** Anne Fadiman

HTBA WR, HU (o)

A seminar and workshop with the theme “At Home in America.” Students consider the varied ways in which modern American literary journalists write about place, and address the theme themselves in both reportorial and first-person work. No prerequisites.

***ENGL 470a or b, Tutorial in Writing** Amy Hungerford

HTBA (o)

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. Prerequisites: two courses in writing.

SPECIAL PROJECTS***ENGL 471b, Special Projects for Juniors or Seniors** Amy Hungerford

HTBA (o)

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 by Thursday of the last week of classes in the term before the project is to be done. Application forms are available on the Web at www.yale.edu/english/undergraduate.html.

***ENGL 489a or b, The Writing Concentration Senior Project** Amy Hungerford

HTBA (o)

A term-long project in writing, under tutorial supervision, aimed at producing a single longer work (or a collection of related shorter works). An application and prospectus signed by the student's adviser must be submitted to the office of the director of undergraduate studies by Thursday of the last week of classes in the term before the project is to be done. 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). Application forms are available on the Web at www.yale.edu/english/undergraduate.html.

THE SENIOR ESSAY COURSE

***ENGL 490a or b, The Senior Essay** Amy Hungerford

HTBA (o)

An application and prospectus signed by the student's adviser must be submitted to the office of the director of undergraduate studies by Thursday of the last week of classes in the term before the project is to be done. Application forms are available on the Web at www.yale.edu/english/undergraduate.html. The senior 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.

Environment

At Yale, the environment is studied from a variety of perspectives. Majors are offered in Architecture, Biology, Chemical Engineering, Environmental Engineering, Environmental Studies, and Geology and Geophysics. Forestry & 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, History, History of Art, International Studies, Philosophy, Political Science, Sociology, and Study of the City. Some professional schools and programs offer relevant courses that may admit undergraduates, including Public Health, Forestry & Environmental Studies, the Law School, and the School of Management.

Environmental Engineering

Director of undergraduate studies: Jordan Peccia, 313C ML, 432-4385, jordan.peccia@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM IN ENVIRONMENTAL ENGINEERING

Professors Gaboury Benoit (*Forestry & Environmental Studies*), Ruth Blake (*Geology & Geophysics*), Stephen Edberg (*School of Medicine*), Menachem Elimelech (*Chemical Engineering*), Thomas Graedel (*Chemical Engineering, Forestry & Environmental Studies*), Edward Kaplan (*School of Management*), Lisa Pfefferle (*Chemical Engineering*), Joseph Pignatello (*Adjunct*) (*Chemical Engineering*), James Saiers (*Forestry & Environmental Studies*)

Associate Professors Michelle Bell (*Chemical Engineering, Forestry & Environmental Studies*), Yehia Khalil (*Adjunct*) (*Chemical Engineering*), William Mitch (*Chemical Engineering*), Jordan Peccia (*Chemical Engineering*)

Assistant Professor Julie Zimmerman (*Chemical Engineering, Forestry & Environmental Studies*)

Lecturers Matthew Eckelman (*Chemical Engineering*), James Wallis (*Chemical 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, preservation of sensitive wetlands, and the prevention of pollution through product and process design. Implementation of strategies for sustainable water and energy usage is also of critical importance.

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, economics, and management. Accordingly, the program allows students in the major to select an emphasis on technology, sustainability, public health, environmental economics and management, or chemical, biological, and geological systems.

The program prepares students for leadership positions in industry and government agencies or for further studies in engineering, science, business, law, and medicine.

Three degree programs are offered: the B.S. in Environmental Engineering, the B.S. in Engineering Sciences (Environmental), and the B.A. in Engineering Sciences (Environmental). The B.S. degree program in Environmental Engineering is for students who may be interested in a career as a practicing environmental engineer. The B.S. degree program in Engineering Sciences (Environmental) is for students who desire a strong background in environmental engineering and more flexibility for course work in other, sometimes indirectly related, fields. 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 The B.S. degree programs in Environmental Engineering and in Engineering Sciences (Environmental) both have the following prerequisites in mathematics and basic sciences: MATH 112a or b, 115a or b; MATH 120a or b or ENAS 151a or b; either CHEM 112a and 113b or 114a and 115b with 116La and 117Lb, or CHEM 118a and 119La by Advanced Placement test only, or one from CHEM 328a, 332a, or 333b with 330La or 331Lb by Advanced Placement test only; and PHYS 180a, 181b. The B.A. degree program in Engineering Sciences (Environmental) requires MATH 112a or b and 115a or b; CHEM 112a and 113b or 114a and 115b; and PHYS 170a, 171b.

B.S. degree program in Environmental Engineering This program requires at least eighteen term courses beyond the prerequisites, including the senior requirement (seventeen courses are required if CHEM 118a, 328a, 332a, or 333b is used to satisfy the chemistry prerequisite).

1. Required courses: CHEM 102a; CENG 300a or MENG 211a or one from CHEM 328a, 332a, or 333b (not required after CHEM 118a); ENAS 194a or b; ENVE 120a, 210a, 360b, 371a, 373a, and 377a; ENVE 448a or 315b; EVST 344b; MCDB 290b; MENG 361a
2. At least four electives within one of the following tracks must be chosen in consultation with the director of undergraduate studies:
 - Environmental engineering technology: ENAS 130b, ENVE 441a, 445a, or any statistics course
 - Green engineering and sustainability: ECON 330a, MENG 280a, or other courses approved by the director of undergraduate studies.
 - Public health: courses approved by the director of undergraduate studies that are listed in the bulletin of the School of Public Health

B.S. degree program in Engineering Sciences (Environmental) This program offers four specialization tracks: the environmental engineering technology track for students desiring an environmental technology emphasis; the environmental engineering science track for students desiring an environmental and earth science emphasis; the environmental chemical and biological science track for students desiring a chemical, biological, and public health emphasis; and the environmental resource management track for students desiring an emphasis on environmental policy and management. At least fifteen term courses are required beyond the prerequisites, including the senior requirement.

1. Required courses: CHEM 102a; ENAS 194a or b; ENVE 120a, 360b, 371a, 373a, and 377a; ENVE 448a or 315b; EVST 344b; MCDB 290b
2. At least four electives must be chosen in consultation with the director of undergraduate studies within one of the four specialization tracks according to the following guidelines: For the environmental engineering technology track, two electives must be technical and one must be selected from each of the following categories: earth sciences, biological sciences, and sustainable engineering.

For the environmental engineering science track, one elective must be selected from each of the following categories: earth sciences, biological sciences, and sustainable engineering.

For the environmental chemical and biological science track, two electives must be chemical and one must be selected from each of the following categories: biological sciences, public health or toxicology, and earth sciences.

For the environmental resource management track, one elective must be selected from each of the following categories: economics, management, and sustainable engineering.

B.A. degree program in Engineering Sciences (Environmental) This program includes the following required courses or their equivalents, totaling nine term courses beyond prerequisites, including the senior requirement:

1. Environmental engineering: ENVE 120a, 371a
2. Six electives must be chosen in consultation with the director of undergraduate studies. One of these electives must be selected from the following: CENG 300a, CHEM 328a, 332a, MENG 361a, ENVE 315b, 360b, 373a, 377a, 441a, 445a, 448a, or EVST 344b

Senior requirement Students in all three programs must pass ENVE 490a or b in their senior year.

REQUIREMENTS OF THE MAJOR**ENVIRONMENTAL ENGINEERING, B.S.**

Prerequisites MATH 112a or b, 115a or b; MATH 120a or b or ENAS 151a or b; either CHEM 112a, 113b or 114a, 115b with 116La, 117Lb, or CHEM 118a and 119La by AP test only, or 1 from CHEM 328a, 332a, or 333b with 330La or 331Lb by AP test only; PHYS 180a, 181b

Number of courses At least 18 term courses beyond prereqs, incl senior req (17 if CHEM 118a, 328a, 332a, or 333b is used for chem prereq)

Specific courses required CHEM 102a; CENG 300a or MENG 211a or 1 from CHEM 328a, 332a, or 333b (not required after CHEM 118a); ENAS 194a or b; ENVE 120a, 210a, 360b, 371a, 373a, 377a; ENVE 448a or 315b; EVST 344b; MCDB 290b; MENG 361a

Distribution of courses 4 electives as specified

Senior requirement ENVE 490a or b

ENGINEERING SCIENCES (ENVIRONMENTAL), B.S.

Prerequisites MATH 112a or b, 115a or b; MATH 120a or b or ENAS 151a or b; either CHEM 112a, 113b or 114a, 115b with 116La, 117Lb, or CHEM 118a and 119La by AP test only, or 1 from CHEM 328a, 332a, or 333b with 330La or 331Lb by AP test only; PHYS 180a, 181b

Number of courses At least 15 term courses beyond prereqs (incl senior req)

Specific courses required CHEM 102a; ENAS 194a or b; ENVE 120a, 360b, 371a, 373a, 377a; ENVE 448a or 315b; EVST 344b; MCDB 290b

Distribution of courses 4 electives as specified

Senior requirement ENVE 490a or b

ENGINEERING SCIENCES (ENVIRONMENTAL), B.A.

Prerequisites MATH 112a or b, 115a or b; either CHEM 112a, 113b or 114a, 115b; PHYS 170a, 171b

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

Specific courses required ENVE 120a, 371a

Distribution of courses 6 electives approved by DUS

Senior requirement ENVE 490a or b

ENVE 120a/CENG 120a/ENAS 120a, Introduction to Environmental Engineering

William Mitch

TTH 1–2:15 QR, SC (26)

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 radioactive wastes, and green technology.

ENVE 210a/CENG 210a, Principles of Chemical Engineering and Process Modeling

André Taylor

For description see under Chemical Engineering.

ENVE 315b/CENG 315b, Transport Phenomena Michael Loewenberg

For description see under Chemical Engineering.

ENVE 330b, Water for the World Julie Zimmerman

MW 2:30–3:45 (0)

Complex issues associated with water, global trends, and sustainability. Current water needs for human consumption, industry, agriculture, recreation, and ecosystem services; global warming, population growth, and the industrialization of developing nations. Fundamentals of water chemistry, water and wastewater treatment and distribution systems, and innovations for future designs. Prerequisite: ENVE 120a.

ENVE 360b/ENAS 360b^c, Green Engineering and Sustainable Design

Matthew Eckelman

MW 11:35–12:50 (34)

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 112a and 113b or 114a and 115b or permission of instructor.

ENVE 371a/ENAS 371a, Introduction to Hydrology and Water Resources

James Wallis

TTH 11:35–12:50 QR, SC (RP, 24)

Constraints on permanent human settlements caused by limited availability of reliable water sources. Environmental problems that arise when the quality of naturally occurring water is deficient, or when its quantity is excessive (floods) or insufficient (droughts). The designing of modifications to supplement the natural hydrologic cycle at a specific location.

ENVE 373a/CENG 373a, Air Pollution Control Yehia Khalil

TTH 4–5:15 QR, SC (RP, 27)

Kinetics, thermodynamics, and transport of chemical reactions of common air pollutants including suspended particulate matter. The role of surface chemistry and transport phenomena in air pollution. Pollutant dispersion modeling. Technology available to prevent or control air pollutants. Prerequisite: ENVE 210a or permission of instructor.

***ENVE 377a/CENG 377a, Water Quality Control** Gideon Oron

TTH 2:30–3:45 SC (RP, 27)

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 120a or permission of instructor.

ENVE 416b/CENG 416b, Chemical Engineering Process Design Yehia Khalil

For description see under Chemical Engineering.

ENVE 441a^c, Biological Processes in Environmental Engineering Jordan Peccia

MW 1–2:15 SC (36)

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 112a, 113b, or 114a, 115b, or 118a; MCDB 290b or equivalent; or with permission of instructor.

ENVE 443a^c/ENAS 443a/F&ES 380a^c, Greening Business Operations

Thomas Graedel, Marian Chertow

MW 1–2:15 (36)

Engineering, environmental, and financial perspectives applied to selected industries. Methods from operations management, industrial ecology, green chemistry and engineering, and accounting and finance are used to investigate sustainability approaches and the relationship between environmental and economic considerations. Tools include discounted cash-flow analysis, life-cycle assessment, and environmental cost accounting. Field trips to companies.

[ENVE 445a/ENAS 445a^c, Environmental Risk Assessment]

ENVE 448a^c, Environmental Transport Processes Joseph Pignatello

TTH 4–5:15 QR, SC (27)

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 120a or permission of instructor.

★ENVE 490a or b, Senior Project Jordan Peccia

HTBA (o)

Individual research and design projects supervised by a faculty member in Environmental Engineering, or in a related field with permission of the director of undergraduate studies.

Environmental Studies

Director of undergraduate studies: to be announced, studies.environment@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF ENVIRONMENTAL STUDIES

Professors Paul Anastas (*Forestry & Environmental Studies*), Gaboury Benoit (*Forestry & Environmental Studies*), Graeme Berlyn (*Forestry & Environmental Studies*), Derek Briggs (*Geology & Geophysics*), Kelly Brownell (*Psychology, School of Medicine*), Gary Brudvig (*Chemistry*), Benjamin Cashore (*Forestry & Environmental Studies*), Michael Donoghue (*Ecology & Evolutionary Biology, Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies, Anthropology*), Menachem Elimelech (*Chemical Engineering, Environmental Engineering*), John Mack Faragher (*History*), Durland Fish (*School of Medicine*), Thomas Graedel (*Forestry & Environmental Studies*), Leo Hickey (*Geology & Geophysics*), Daniel Kevles (*History, History of Science*), Benedict Kiernan (*History*), Robert Mendelsohn (*Forestry & Environmental Studies, Economics*), Mark Pagani (*Geology & Geophysics*), Jeffrey Park (*Geology & Geophysics*), Peter Perdue (*History*), Linda Peterson (*English*), Jeffrey Powell (*Ecology & Evolutionary Biology*),

Professors (cont.)

Nicholas Robinson (*Forestry & Environmental Studies*) (Visiting), Susan Rose-Ackerman (*Law School, Political Science*), James Saiers (*Forestry & Environmental Studies*), Oswald Schmitz (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), James Scott (*Political Science, Anthropology*), Kalyanakrishnan Sivaramakrishnan (*Anthropology, Forestry & Environmental Studies*), David Skelly (*Forestry & Environmental Studies, Ecology & Evolutionary Biology*), Brian Skinner (*Geology & Geophysics*), Ronald Smith (*Geology & Geophysics*), Stephen Stearns (*Ecology & Evolutionary Biology*), Charles Tomlin (*Forestry & Environmental Studies*) (Visiting), Karl Turekian (*Geology & Geophysics*), John Wargo (*Forestry & Environmental Studies, Political Science*), Harvey Weiss (*Near Eastern Languages & Civilizations, Anthropology*), Robert Wyman (*Molecular, Cellular, & Developmental Biology*)

Associate Professors Michelle Addington (*School of Architecture, Forestry & Environmental Studies*), William Mitch (*Chemical Engineering, Environmental Engineering*), Sheila Olmstead (*Forestry & Environmental Studies*), David Post (*Ecology & Evolutionary Biology*), Peter Raymond (*Forestry & Environmental Studies*), Karen Seto (*Forestry & Environmental Studies*)

Assistant Professors Hagit Affek (*Geology & Geophysics*), Mark Bradford (*Forestry & Environmental Studies*), Alex Felson (*Forestry & Environmental Studies*), Karen Hébert (*Forestry & Environmental Studies, Anthropology*), Alan Mikhail (*History*), Paul Sabin (*History*), Melinda Smith (*Ecology & Evolutionary Biology*), Zhengrong Wang (*Geology & Geophysics*), Julie Zimmerman (*Chemical Engineering*)

Lecturers Shimon Anisfeld (*Forestry & Environmental Studies*), Carol Carpenter (*Forestry & Environmental Studies*), Mary Beth Decker (*Forestry & Environmental Studies*), Amity Doolittle (*Forestry & Environmental Studies*), Gordon Geballe (*Forestry & Environmental Studies*), Julie Newman (*Forestry & Environmental Studies*), Catherine Skinner (*Geology & Geophysics*), Carl Zimmer

Environmental Studies provides an interdisciplinary approach to understanding and responding to environmental problems. From the natural sciences, students learn experimental techniques and methods of analysis needed to make accurate observations, to document change, to distinguish those changes resulting from human activity, and to understand what comprises healthy landscapes and functioning ecosystems. Students look to the humanities and social sciences for explanations of the ways people behave and for analyses of our institutions and their social, political, and economic activities. The Environmental Studies major prepares students for graduate study in a range of disciplines including law, medicine, and public health, and for careers in business, environmental management and conservation, teaching, and writing.

Prerequisites Required for the major are: CHEM 112a, 113b, or 114a, 115b, or 118a; MCDB 120a or E&EB 122b; CHEM 116La and 117Lb, or 119La, or MCDB 121La, or E&EB 123Lb; MATH 112a or b or above (except MATH 190a) or PHYS 170a or above. Students are advised to take chemistry and biology during the freshman year before enrolling in the core courses in natural sciences. Students should finish the prerequisites before the end of the sophomore

year. Where relevant, students may employ acceleration credit to fulfill the prerequisites. Students entering Yale with advanced placement in both biology and chemistry must complete one term of introductory laboratory science. Students with advanced placement in only one of these subjects must take the remaining science prerequisite and its associated laboratory. Students should take a course in statistical methods of data analysis and probability (STAT 101–106 or 230b) prior to undertaking research in the natural and social sciences.

Requirements of the major In addition to the prerequisites, twelve and one-half or thirteen and one-half course credits are required for the major, including four core courses, one core laboratory, a concentration of six courses, a junior seminar, and a one- or two-term senior project and colloquium (EVST 496a or b). All courses in the major must be taken for a letter grade.

Core courses Students are required to take at least two core courses from Group A (humanities and social sciences), and two from Group B (environmental sciences) with the associated lab. Completing one course in each group is recommended before the end of the sophomore year.

Group A, humanities and social sciences: EVST 120a, 226b, 255b, 340a, 345a

Group B, environmental sciences: EVST 201a, 202La, 223a

Application to the Environmental Studies major Students must apply to enter the major during the spring term of their sophomore year. Application must be made in writing to the director of undergraduate studies no later than Tuesday, March 1, 2011, in the program office, Room Go4 KRN. Applications must include the following information: name, address, phone number, e-mail address, a transcript of work at Yale, and a brief statement of purpose indicating academic interests and a proposed area of individualized concentration. For more information about the application process, visit www.yale.edu/evst. Students considering a major in Environmental Studies should consult the director of undergraduate studies as early as possible in the freshman year.

Area of concentration Prior to the end of the sophomore year, students plan an area of concentration. They should consult with their adviser and the director of undergraduate studies in developing a coherent interdisciplinary program of six courses for their third and fourth years. Students may select up to four electives at the intermediate and upper level from the same department and at least two additional electives from relevant disciplines outside the immediate area of concentration. Students also may use core courses to fulfill the requirement for interdisciplinary electives during the third and fourth years. Students interested in history as an area of concentration should plan to include at least one of the history department's junior seminars dealing with environmental history in their program. These seminars provide instruction in analyzing sources, interpreting evidence, and the art of historical writing.

Study in the area of concentration prepares students to select and undertake a research project in the senior year. Possible areas of concentration include environmental issues in technologically advanced societies; the environment and the developing world; problems of continuing growth of human population; pollution, environmental medicine, and public

health; sustainable environmental management; the impact of globalization and multinational corporations on development and natural resources; conservation of biodiversity; energy supplies for the future; ecological restoration of urban landscapes; remediation of polluted sites and restoration of degraded landscapes; assessment of the extent of environmental change; ethical and religious beliefs of different cultures regarding the natural world.

Junior seminar In the junior year, all majors enroll in a junior seminar approved by the director of undergraduate studies. Students also consult with their advisers on the design of a senior research project and submit a preliminary plan for approval.

Summer environmental internship During the summer between the junior and senior years, many students gain practical experience in the field through research or internships in an area pertinent to their senior research project. Internships may be arranged with nonprofit organizations, government agencies, or corporations. Although the summer program is optional, many students take advantage of this opportunity with some financial support from the program.

Senior requirement Seniors must complete an independent research project, taken as EVST 496a or b. Students may undertake a one- or two-term senior project.

REQUIREMENTS OF THE MAJOR

Prerequisites CHEM 112a, 113b, or 114a, 115b, or 118a; MCDB 120a or E&EB 122b; CHEM 116La and 117Lb, or 119La, or MCDB 121La, or E&EB 123Lb; MATH 112a or b or above (except MATH 190a) or PHYS 170a or above

Number of courses 12½ or 13½ course credits beyond prereqs, incl one- or two-credit senior project

Distribution of courses 2 core courses from Group A, 2 from Group B with the associated lab, 6 courses in area of concentration, 1 junior sem

Senior requirement One- or two-term research project and colloq (EVST 496a or b)

INTRODUCTORY COURSE

ENVE 120a/CENG 120a/ENAS 120a, Introduction to Environmental Engineering

William Mitch

For description see under Environmental Engineering.

CORE COURSES

Group A

[EVST 120a/HIST 120a, Introduction to Environmental History]

EVST 226b/ARCG 226b, Global Environmental History Harvey Weiss

TTH 11:35–12:50 SO (24)

The dynamic relationship between environmental and social forces from the Pleistocene to the present. Pleistocene extinctions; transition from hunting and gathering to agriculture; origins of cities, states, and civilization in Mesopotamia and Egypt; adaptations and

collapses of early Old and New World civilizations in the face of environmental disasters; the destruction and reconstruction of the New World by the Old.

EVST 255b/F&ES 255b/PLSC 215b, Environmental Politics and Law John Wargo

TTH 10:30–11:20, 1 HTBA SO (23)

Exploration of the politics, policy, and law associated with attempts to manage environmental quality and natural resources. Themes of democracy, liberty, power, property, equality, causation, and risk. Case histories include air quality, water quality and quantity, pesticides and toxic substances, land use, agriculture and food, parks and protected areas, and energy.

EVST 340a/ECON 330a^c, Economics of Natural Resources Robert Mendelsohn

For description see under Economics.

***EVST 345b/ANTH 382b/F&ES 384b, Environmental Anthropology** Carol Carpenter

T 9:25–11:15 SO (0)

History of the anthropological study of the environment: nature-culture dichotomy, ecology and social organization, methodological debates, politics of the environment, and knowing the environment.

Group B

EVST 201a/G&G 140a, Atmosphere, Ocean, and Environmental Change

Ronald Smith

MWF 9:25–10:15 QR, SC (32)

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. Must be taken concurrently with EVST 202La.

***EVST 202La/G&G 141La, Laboratory for Atmosphere, Ocean, and Environmental Change** Ronald Smith

3 HTBA SC ½ Course cr (0)

Laboratory and field exercises to accompany EVST 201a. Must be taken concurrently with EVST 201a.

EVST 223a/E&EB 220a^c, General Ecology David Post

For description see under Biology.

INTERMEDIATE AND ADVANCED COURSES

The following courses have been approved for developing areas of concentration. Other courses may be suitable for designing an area of concentration with permission of the director of undergraduate studies.

Humanities

***EVST 315b/HIST 420Jb, War and the Environment** Bruno Cabanes, Gene Tempest

For description see under History.

***EVST 325a/ENGL 248a, Nature Writing in the English-Speaking World**

Linda Peterson

For description see under English Language & Literature.

***EVST 386a/HIST 386Ja, Environmental History of the Middle East** Alan Mikhail

For description see under History.

***AMST 258b, Wilderness in the North American Imagination** Staff

***AMST 381a/ARCH 351a, Poets' Landscapes** Dolores Hayden

For description see under American Studies.

ARCH 163b, Environment, Energy, Building Deborah Addington

***ARCH 344a, Urban Life and Landscape** Elihu Rubin

Social Sciences

***EVST 170b, Sustainability and Institutions: Innovation and Transformation**

Julie Newman

W 2:30–4:30 SO (0)

Sustainable development as it relates to institutional change, decision-making processes, and systems thinking. The origins, theory, and grounding principles of sustainable development. The application of those principles, using Yale University as a case study.

EVST 245a/F&ES 245a/PLSC 146a, International Environmental Policy and Governance Benjamin Cashore

HTBA SO (50)

The development of international environmental policy and the functioning of global environmental governance. Critical evaluation of theoretical claims in the literature and the reasoning of policy makers. Introduction of analytical and theoretical tools used to assess environmental problems. Case studies emphasize climate, forestry, and fisheries.

EVST 250b/ANTH 245b, Nature and Globalization Karen Hébert

For description see under Anthropology.

***EVST 355b/PLSC 200b^c, Political Economy of Environmental Policy**

Susan Rose-Ackerman

For description see under Political Science.

***EVST 424a/PLSC 420a, Rivers: Nature and Politics** James Scott

For description see under Political Science.

[EVST 440b/F&ES 440b^c, Environmental Hydrology]

***EVST 473b/ANTH 473b^c/ARCG 473b^c/NELC 188b^c, Civilizations and Collapse**

Harvey Weiss

For description see under Anthropology.

***PLSC 245a, Urban Politics and Policy** Cynthia Horan

STCY 176b, Introduction to the Study of the City Alexander Garvin

Natural Sciences

EVST 125b/G&G 120b, Earth's Changing Climate John Wettlaufer, Mark Pagani
For description see under Geology & Geophysics.

EVST 260a^G/F&ES 260a^G, Structure, Function, and Development of Vascular Plants
Graeme Berlyn

TTH 4–5:15 SC (27)

Morphogenesis and adaptation of trees from seed formation and germination to maturity. Physiological and developmental processes associated with structural changes in response to environment are discussed from both a phylogenetic and an adaptive point of view. After MCDB 120a.

***EVST 261a/F&ES 261a/G&G 261a^G, Minerals and Human Health** Brian Skinner, Ruth Blake

For description see under Geology & Geophysics.

EVST 265b/G&G 255b, Environmental Geomicrobiology Ruth Blake

For description see under Geology & Geophysics.

***EVST 275b/F&ES 275b^G, Ecosystems Patterns and Processes** Peter Raymond, Mark Bradford

TTH 9–10:15 SC (RP, 22)

Introduction to the ecosystem concept. Topics include the structure and functioning of ecological systems, the response of systems to changing environmental conditions, and preservation and management issues. Discussion of both terrestrial and marine/aquatic systems. Undergraduate enrollment limited to 15.

[EVST 276Lb/F&ES 276Lb^G, Laboratory for Ecosystems Patterns and Processes]

***EVST 305b, Topics in Environmental Science** Jeffrey Park

TTH 1–2:15 SC (0)

The natural world explored from the perspectives of the atmosphere, biosphere, hydrosphere, and geosphere. Applications to current environmental issues such as pollution, global warming, biodiversity change, disease, and sustainable energy production. Prerequisites: college-level biology, college-level chemistry or mathematics, and EVST 201a, or with permission of instructor.

EVST 307b/F&ES 307b^G, Organic Pollutants in the Environment Shimon Anisfeld

TTH 11:35–12:50 (24)

An overview of pollution problems posed by organic chemicals, including petroleum, pesticides, PCBs, dioxins, chlorinated solvents, and emerging contaminants. Processes governing the environmental fate of organic pollutants, e.g., evaporation, sorption, bioconcentration, and biodegradation. Technologies for prevention and remediation of organic pollution. No background in organic chemistry required.

***EVST 344b/F&ES 344b^G, Aquatic Chemistry** Gaboury Benoit

TTH 1–2:15 SC (26)

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.

[EVST 365a/E&EB 365a/F&ES 365a^G, Landscape Ecology]

[EVST 370a/E&EB 370a^G/F&ES 370a^G, Aquatic Ecology]

***EVST 400a/E&EB 275a^G, Biological Oceanography** Mary Beth Decker

TTH 11:35–12:50 SC (24)

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.

EVST 441b/F&ES 441b/G&G 440b^G/MCDB 441b, Methods in Geomicrobiology

Ruth Blake

For description see under Geology & Geophysics.

Environmental Engineering

EVST 415b/BENG 405b^G, Biotechnology and the Developing World Jeremy Blum

For description see under Biomedical Engineering.

ENVE 330b, Water for the World Julie Zimmerman

ENVE 371a/ENAS 371a, Introduction to Hydrology and Water Resources

James Wallis

For description see under Environmental Engineering.

ENVE 373a/CENG 373a, Air Pollution Control Yehia Khalil

For description see under Environmental Engineering.

***ENVE 377a/CENG 377a, Water Quality Control** Gideon Oron

For description see under Environmental Engineering.

ENVE 443a^G/ENAS 443a/F&ES 380a^G, Greening Business Operations

Thomas Graedel, Marian Chertow

For description see under Environmental Engineering.

JUNIOR SEMINARS

***EVST 200b/G&G 200b, Earth System Science** Jeffrey Park

For description see under Geology & Geophysics.

***EVST 215a, Scientific and Environmental Writing** Carl Zimmer

T 9:25–11:15 WR (RP, 0)

An intensive workshop in writing about science and the environment for a broad audience. Translating complex subjects into elegant prose, conducting interviews, handling

controversies, researching articles, and finding one's voice. Readings include exemplary works ranging from newspaper articles to book excerpts.

***EVST 285a/F&ES 285a, Political Ecology: Nature, Culture, and Power**

Amity Doolittle

T 1:30–3:20 SO (o)

Study of the relationship between society and the environment. Global processes of environmental conservation, development, and conflicts over natural resource use; political-economic contexts of environmental change; ways in which understandings of nature are discursively bound up with notions of culture and identity.

***EVST 290a/F&ES 290a, Geographic Information Systems** Charles Tomlin

TH 9:25–11:15 (o)

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 367b/F&ES 367b, Water Resources and Environmental Change** James Saiers

TTH 1–2:15 SC (26)

The effects of variations in the hydrologic cycle on the global distribution of freshwater. The role of environmental change in regulating freshwater supply and quality. The influences of agriculture, industry, mining, urbanization, climate change, and energy-production alternatives on freshwater resources in the United States and abroad.

***EVST 398a, Energy, Climate, Law, and Policy** John Wargo

M 1:30–3:20 SO (o)

Overview of the legal norms governing patterns of energy use and associated adverse effects on climate stability, environmental quality, and human health. Focus on U.S. law and policy, with some consideration of relevant international treaties. Special attention to building efficiency and to land-use regulation and urban growth, particularly coastal prospecting and development.

SENIOR SEMINAR

***EVST 496a or b, Senior Research Project and Colloquium** John Wargo

HTBA (o)

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 may choose to do either a one- or a two-term senior project.

Epidemiology and Public Health

(See under Public Health.)

Ethics, Politics, and Economics

Director of undergraduate studies: Ellen Lust, 31 Hillhouse Ave., 432-7178, ellen.lust-okar@yale.edu [F]; Bryan Garsten, 31 Hillhouse Ave., 432-7178, bryan.garsten@yale.edu [Sp]

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

Professors Jeffrey Alexander (*Sociology*), Seyla Benhabib (*Political Science, Philosophy*), David Cameron (*Political Science*), Ron Eyerman (*Sociology*), Bryan Garsten (*Political Science*), Tamar Gendler (*Philosophy*), Alan Gerber (*Political Science*), Philip Gorski (*Sociology*), Donald Green (*Political Science*), Shelly Kagan (*Philosophy*), Stathis Kalyvas (*Political Science*), Joseph LaPalombara (*Political Science*), Thomas Pogge (*Philosophy*), Benjamin Polak (*Economics*), Douglas Rae (*Political Science*), John Roemer (*Political Science*), Susan Rose-Ackerman (*Political Science, Law School*), Bruce Russett (*Political Science*), Nicholas Sambanis (*Director*) (*Political Science*), James Scott (*Political Science*), Ian Shapiro (*Political Science*), Steven Smith (*Political Science*), Peter Swenson (*Political Science*), Elisabeth Wood (*Political Science*)

Associate Professors Pierre Landry (*Political Science*), Ellen Lust (*Political Science*), Matthew Smith (*Philosophy*)

Assistant Professors Seok-ju Cho (*Political Science*), Alexandre Debs (*Political Science*), Justin Fox (*Political Science*), Karuna Mantena (*Political Science*), Vivek Sharma (*Political Science*), Peter Stamatov (*Sociology*), Ana De La O Torres (*Political Science*)

Senior Lecturer Boris Kapustin (*Ethics, Politics, & Economics, Global Affairs*)

Lecturers Thomas Donahue (*Political Science*), Howard Forman (*School of Medicine*), Alexander Kirshner (*Political Science*), Stephen Latham (*Political Science*), Jonathan Schell (*Global Affairs*), Prakash Sethi (*Ethics, Politics, & Economics*), James Sleeper (*Political Science*)

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.

Requirements of the major Fourteen term courses are required for the major, including five introductory courses and one intermediate microeconomics course. For students in

the Class of 2011, the major also requires four core courses. For students in the Class of 2012 and subsequent classes, the major also requires three core courses and one advanced seminar. In addition, all majors must complete four courses that comprise an individual area of concentration. The concentration is developed in consultation with the director of undergraduate studies and should culminate in a senior essay written in the area defined by the concentration.

Introductory courses Introductory courses provide a basic familiarity with contemporary economic analysis and survey central issues in ethics and political philosophy. Such a background is necessary to understand theories that combine different approaches to the three areas of inquiry and to assess policies with complex social, economic, and moral implications.

The five introductory courses include two in economics (microeconomics and macroeconomics), one in political philosophy, one in ethics, and one in statistics. An intermediate course in microeconomics is also required.

Core courses A group of core courses comprises the center of the major in Ethics, Politics, and Economics. The first core course, required for all majors, is EP&E 215a or b, Classics of Ethics, Politics, and Economics. Students in the Class of 2011 must complete three additional core courses, each selected from a different one of the following four groups: rationality and social choice, political systems, advanced topics in ethics and the human sciences, and social theory and cultural analysis. Three of the four core courses must be taken before the senior year. Students in the Class of 2012 and subsequent classes must complete two additional core courses, each selected from a different one of the following three groups: rationality and social choice, political systems, and social theory and cultural analysis. The three core courses must be taken before the senior year. Core courses are listed by group on the program's Web site at www.yale.edu/epe/undergrad/requirements.html.

Advanced seminars Students in the Class of 2012 and subsequent classes must complete one advanced seminar. The course is selected from an approved group of seminars that focus on how core modes of reasoning drawn from the major's three areas of inquiry can be applied to a particular area or problem. For information about which courses fulfill the advanced seminar requirement, see the program's Web site at www.yale.edu/epe/undergrad/requirements.html.

Area of concentration Each student defines an area of concentration in consultation with the director of undergraduate studies. 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 will treat 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 at least four courses appropriate to the theme, including the seminar or independent study course in which the senior essay is written (see "Senior essay" below).

For many students the concentration may expand to include five or more courses. In designing the area of concentration, students are encouraged to include seminars from departments related to their interests. The director of undergraduate studies 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; civil society and its normative implications.

Senior essay 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 director of undergraduate studies. If no appropriate seminar is offered in which the essay might be written, the student may instead enroll in EP&E 491a or b with approval of the director of undergraduate studies and a faculty member who will supervise the essay. Students who wish to undertake a more substantial yearlong essay may enroll in EP&E 492a, 493b.

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.

Senior essays written in the fall term are due December 6, 2010. Senior essays written in the spring term and yearlong essays are due April 11, 2011. One-term essays are normally expected to be forty to fifty pages in length; yearlong essays are normally expected to be eighty to one hundred pages in length.

Credit/D/Fail option Students admitted to the major may take any 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.

Application to the Ethics, Politics, and Economics major Students must apply to enter the major at the end of the fall term of their sophomore year. Application must be made in writing to the director of undergraduate studies no later than Monday, December 6, 2010, in the program registrar's office, 31 Hillhouse Avenue. Applications must include the following information: name, address, phone number, student identification number, e-mail address, a transcript of work at Yale that indicates fall-term 2010 courses, and a brief application essay. If possible, applicants should include a copy of a paper written for a course related to the subject matter of Ethics, Politics, and Economics. More information regarding the application process will be posted at www.yale.edu/epe. A list of accepted applicants will be posted on the same site by December 31, 2010.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 14 (incl senior req)

Specific course required EP&E 215a or b

Distribution of courses 1 intro course each in microeconomics, macroeconomics, political phil, ethics, and stat; 1 intermediate microeconomics course; 4 courses, incl course for senior req, in area of concentration defined by student in consultation with DUS; *Class of 2011*—3 addtl core courses, as specified; *Class of 2012 and subsequent classes*—2 addtl core courses, as specified; 1 advanced sem, as specified

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

EP&E 203a/PLSC 452a/STAT 102a^G, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer, Alan Gerber

For description see under Statistics.

EP&E 209a/PLSC 453a/STAT 103a^G, Introduction to Statistics: Social Sciences

Jonathan Reuning-Scherer

For description see under Statistics.

***EP&E 215a or b, Classics of Ethics, Politics, and Economics** Thomas Donahue,
Boris Kapustin

HTBA For sections see www.yale.edu/oci HU, SO Core (o)

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.

***EP&E 220a/PLSC 327a, Collective Choice and Political Morality** Thomas Donahue
W 3:30–5:20 SO Core (o)

Social choice theory and its implications for political morality. Challenges involved in creating a collective choice procedure, given diverse individual preferences. Philosophical foundations of social choice theory, including its assumptions about the nature of liberty. The feasibility of democracy and the existence of a public interest.

***EP&E 221a, Health Care Challenges in the Twenty-First Century** Howard Forman
W 1:30–3:20 SO Core (o)

Ethical, policy, and political challenges inherent in the current health care system of the United States. Lessons that can be learned from health care systems in other developed and emerging markets.

***EP&E 223b, Formal Modeling and Institutional Design** Justin Fox
M 3:30–5:20 SO Core (o)

Introduction to game theory and social choice theory, the primary tools used in the formal modeling of politics. How these tools have been applied to understand the interactions between policymakers and voters, executives and legislatures, bureaucrats and courts, and

interest groups and government officials. Focus on ways to design institutions that promote citizen welfare.

***EP&E 224a/ECON 465a, Debating Globalization** Ernesto Zedillo

For description see under Economics. Core

***EP&E 225a/ECON 486a, Topics in Labor Economics** Kenneth Couch

For description see under Economics. Core

***EP&E 226a, Fundamentals of Game Theory** Alexandre Debs

TTH 2:30–3:45 SO Core (27)

Introduction to fundamental tools and solution concepts in game theory, with applications to economics and political science.

***EP&E 227b/ECON 473b/PLSC 343b, Equality** John Roemer

T 1:30–3:20 SO Core (0)

Egalitarian theories of justice and their critics. Readings in philosophy are paired with analytic methods from economics. Topics include Rawlsian justice, utilitarianism, the veil of ignorance, Dworkin's resource egalitarianism, Roemer's equality of opportunity, Marxian exploitation, and Nozickian procedural justice. Some discussion of American economic inequality, Nordic social democracy, and the politics of inequality. Recommended preparation: intermediate microeconomics.

***EP&E 240a/INTS 333a^c/PLSC 428a, Comparative Welfare Policy in Developing Countries** Jeremy Seekings

For description see under International Studies. Core

***EP&E 241a/PLSC 185a^c, Secession and Political Boundaries** Nicholas Sambanis

For description see under Political Science. Core

***EP&E 242a/PLSC 372a, Politics and Markets** Peter Swenson

W 2:30–4:20 SO Core (0)

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, including the developmental and 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.

***EP&E 243b/PLSC 423b, Political Economy of Poverty Alleviation**

Ana De La O Torres

For description see under Political Science. Core

***EP&E 244a/PLSC 398a^c, Property Rights, Politics, and the Economy**

Ato Kwamena Onoma

For description see under Political Science. Core

***EP&E 245a/PLSC 152a, Global Firms and National Governments**

Joseph LaPalombara

For description see under Political Science. Core

***EP&E 246b/AFST 420b/LAST 406b/PLSC 430b, The Politics of Development Assistance** David Simon

For description see under Political Science. Core

***EP&E 247b/PLSC 208b^c, The American Welfare State in Comparative Perspective** Jacob Hacker

For description see under Political Science. Core

***EP&E 248b/PLSC 256b, American Political Institutions** Michael Fotos

For description see under Political Science.

***EP&E 249b/PLSC 147b, The United Nations and Collective Security** Jean Krasnow 1:30–3:20 SO Core (o)

The role of the United Nations in global politics. Analysis of the workings of the UN Security Council, the General Assembly, the International Court of Justice, and other UN agencies, funds, and programs. Topics include the International Criminal Court, cases of UN peacekeeping, and the imposition of sanctions.

***EP&E 250b/INTS 357b/PLSC 354b^c, The European Union** David Cameron

For description see under Political Science. Core

***EP&E 251a/PLSC 368a, Global Politics** Stathis Kalyvas

For description see under Political Science. Core

***EP&E 260b/PLSC 463b, Political Violence and Its Participants** Elisabeth Wood

For description see under Political Science. Core

***EP&E 265b/ENGL 344b/ER&M 436b, Global Fictions and Social Systems**

Justin Neuman

For description see under English Language & Literature. Core

***EP&E 266b/SOCY 309b^c, Religious Nationalism** Philip Gorski

For description see under Sociology. Core

***EP&E 267a/SOCY 216a/WGSS 314a, Social Movements** Ron Eyerman

For description see under Sociology. Core

***EP&E 269a/ER&M 362a/INTS 384a/SOCY 363a, Genocide and Ethnic Conflict**

Jasmina Beširević-Regan

For description see under Sociology. Core

EP&E 285a/ARCH 385a/HIST 152a/PLSC 279a/SOCY 149a, New Haven and the American City Alan Plattus, Elihu Rubin

For description see under Political Science. Core

***EP&E 303a/SOCY 330a^c, Civil Society and Democracy** Jeffrey Alexander

For description see under Sociology. Core

***EP&E 308a/EAST 408a/SOCY 395a, Wealth and Poverty in Modern China**

Deborah Davis

For description see under Sociology. Core

***EP&E 310b/PLSC 227b, Refugee Law and Policy** Alexandra Dufresne

TH 3:30–5:20 SO Core (o)

Controversies and challenges in U.S. and international refugee law and policy, with a focus on asylum law and practice in the United States. Emphasis on legal reasoning and analysis through close reading of statutes, regulations, and case law. Final project is a legal brief on behalf of a client.

***EP&E 312b/INTS 269b/PLSC 297b, Moral Choices in Politics** Boris Kapustin

For description see under International Studies. Core

***EP&E 317a/INTS 360a/PLSC 141a, Ethics of Humanitarian Intervention**

Annalisa Zinn

For description see under Political Science. Core

***EP&E 321b/PLSC 401b, Promoting Democracy in Developing Countries** Harry Blair

For description see under Political Science. Core

***EP&E 324a/PLSC 244a, Journalism, Liberalism, Democracy** James Sleeper

For description see under Political Science. Core

***EP&E 334b/PHIL 455b^G, Normative Ethics** Shelly Kagan

M 1:30–3:20 HU Core (o)

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). Enrollment limited to 20. If there is sufficient interest, a second section will be offered.

***EP&E 337a/SOCY 306a, Empires and Imperialism** Peter Stamatov, Samuel Nelson

For description see under Sociology. Core

EP&E 343b/PLSC 257b, Bioethics and Law Stephen Latham

For description see under Political Science. Core

***EP&E 353a/INTS 363a/PLSC 305a, Critique of Political Violence** Boris Kapustin

For description see under International Studies. Core

***EP&E 362b/INTS 335b/PLSC 151b^G, International Dimensions of Democratization**

Nikolay Marinov

For description see under Political Science. Core

***EP&E 365a/AFST 360a/INTS 347a/PLSC 417a, The Political Economy of AIDS in Africa** Nicoli Nattrass and staff

For description see under International Studies. Core

***EP&E 367a/PLSC 248a, The Political Economy of Health Care** Peter Swenson

For description see under Political Science. Core

***EP&E 369a, Ethics and American Business** Prakash Sethi

M 1:30–3:20 SO Core (o)

Ethical norms and values as they are incorporated in business decisions in the United States. Corporate culture and reward systems that influence ethical concerns; corporate responses to societal pressures to protect individuals and groups; emerging trends in corporate social responsibility, shareholder activism, and civil society organizations; changes in core concepts of economic efficiency and profitability.

***EP&E 381a, Ethics in the Age of Globalization and Multinational Corporations**

Prakash Sethi

M 3:30–5:20 SO Core (o)

Multinational corporations and their impact—both positive and negative—on national cultures, ethical norms, business practices, and political governance structures in the host countries. Attempts by corporations, civil society organizations, and national, multilateral, and international political entities to ameliorate the negative side effects of globalization while supporting efforts toward continued economic growth.

***EP&E 382b/PLSC 337b, Democracy and the Politics of Opposition**

Alexander Kirshner

T 1:30–3:20 SO Core (o)

Theoretical and historical introduction to democratic theory, with a focus on the relationship between democracy and opposition. Readings include works by Rousseau, Burke, Madison, Schumpeter, Adam Michnik, and Martin Luther King, Jr.

***EP&E 383a/PLSC 338a, Democracy and Constitutionalism** Alexander Kirshner

T 1:30–3:20 SO Core (o)

Introduction to constitutional and democratic theory. Study of the ways in which democracy and constitutionalism function together, as well as the circumstances in which they can undermine one another. Readings include works by Aristotle, Madison, Hamilton, Habermas, Dahl, and Kelsen.

***EP&E 389a/PLSC 234a^G, The Politics, Law, and Economics of Affirmative Action**

Ian Shapiro, Michael Graetz

For description see under Political Science. Core

***EP&E 392b/PLSC 333b^G, Topics in Democratic Theory** Ian Shapiro

For description see under Political Science. Core

***EP&E 413b/ECON 470b, Topics in American Economic History** Melinda Miller

For description see under Economics. Core

***EP&E 440b, Nonviolence and Political Power in the Twentieth Century**

Jonathan Schell

M 3:30–5:20 SO Core (o)

A study of nonviolent movements in the twentieth century. Topics include Gandhi in India, Solidarity in Poland, the fall of the Soviet Union, and the democracy movements of the late twentieth century. Consideration of democratic government, nuclear deterrence, and changes in the character of war and political power itself. Readings from case histories and from the works of such authors as Hobbes, Clausewitz, Mao Zedong, Hannah Arendt, Max Weber, and Václav Havel.

EP&E 442b/HIST 133b/INTS 345b, Strategic, Political, and Moral Dilemmas of the Nuclear Age Jonathan Schell

For description see under International Studies. Core

INDIVIDUAL RESEARCH AND SENIOR ESSAY COURSES***EP&E 491a or b, The Senior Essay** Staff

HTBA (o)

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 493b, The Yearlong Senior Essay** Staff

HTBA Cr/year only (o)

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.

GRADUATE AND PROFESSIONAL SCHOOL COURSES OF INTEREST TO UNDERGRADUATES

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 & 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 "Courses in the Yale Graduate and Professional Schools" in chapter II, section K.)

Ethnicity, Race, and Migration

Director of undergraduate studies: Patricia Pessar, 301A LUCE, 432-9344, patricia.pessar@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF ETHNICITY, RACE, AND MIGRATION

Professors Rolena Adorno (*Spanish & Portuguese*), Ned Blackhawk (*History, American Studies*), Alicia Schmidt Camacho (*American Studies*), Hazel Carby (*African American Studies, American Studies*), Michael Denning (*American Studies, English*),

Kathryn Dudley (*American Studies, Anthropology*), John Mack Faragher (*History, American Studies*), Donald Green (*Political Science*), Dolores Hayden (*Architecture, American Studies*), Jonathan Holloway (*History, African American Studies*), Margaret Homans (*English, Women's, Gender, & Sexuality Studies*), Paula Hyman (*History, Religious Studies*), Matthew Jacobson (*American Studies, African American Studies, History*), Gilbert Joseph (*History*), Kenneth Kidd (*School of Medicine*), Benedict Kiernan (*History*), Jennifer Klein (*History*), Marianne LaFrance (*Psychology, Women's, Gender, & Sexuality Studies*), Mary Lui (*American Studies, History*), Enrique Mayer (*Anthropology*), Patricia Pessar (*Adjunct*) (*American Studies, Anthropology*), Stephen Pitti (*History, American Studies*), Jeremy Seekings (*Global Affairs*) (*Visiting*), Helen Siu (*Anthropology*), John Szwed (*Emeritus*) (*African American Studies*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

Assistant Professors Jafari Allen (*Anthropology, African American Studies*), Khalilah Brown-Dean (*Political Science, African American Studies*), Terri Francis (*Film Studies, African American Studies*), Zareena Grewal (*American Studies*), Naomi Pabst (*African American Studies*), Birgit Brander Rasmussen (*American Studies*), Jing Tsu (*East Asian Languages & Literatures*)

Senior Lecturer Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*)

Lecturers Jasmina Beširević-Regan (*Sociology*), Lourdes Gutiérrez Nájera (*Ethnicity, Race, & Migration, American Studies*), Rani Neutill (*Ethnicity, Race, & Migration, American Studies*)

The program in Ethnicity, Race, and Migration enables students to combine a disciplinary requirement of a first major with 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 ethnicity, nationality, and race; grounding in both the history of migration and its contemporary manifestations; and knowledge of the cultures, structures, and peoples formed by these migrations.

Second major Ethnicity, Race, and Migration can be taken only as a second major. Students combine Ethnicity, Race, and Migration with a major that coordinates with research into ethnicity and migration. They should consult the director of undergraduate studies early in their academic careers about other departments that meet this criterion. Departments or programs that already have concentrations of courses dealing with ethnic issues—African American Studies, African Studies, American Studies, Anthropology, English, History, Literature, Political Science, Sociology, and Women's, Gender, and Sexuality Studies—are particularly appropriate, but a student may choose any traditional discipline that provides the tools for a rigorous senior project in Ethnicity, Race, and Migration. Course selections and choices of linked majors must be approved by the appropriate directors of undergraduate studies.

In working out programs for their two majors, students should note that, in accordance with the academic regulations concerning two majors (see “Two Majors” in chapter II, section K), each major must be completed independently, with no more than two term courses overlapping. This overlap must not be in 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.

Permission to complete two majors must be secured from the Committee on Honors and Academic Standing; forms are available from the residential college deans. Assistance in completing the form is available from the director of undergraduate studies in Ethnicity, Race, and Migration.

Requirements of the major In addition to fulfilling the requirements of the other major, a student must complete twelve term courses in Ethnicity, Race, and Migration, including the senior seminar and the senior essay or project. There are no prerequisites.

Introductory course ER&M 200a offers an introduction to the issues and disciplines involved in the study of ethnicity, race, and migration. Students interested in the major should take this course early in their studies, preferably during the sophomore year.

Area of concentration In consultation with the director of undergraduate studies, each student defines an area of concentration consisting of six term courses including the one-term senior essay or project. Advanced work in the foreign language related to a student's area of concentration is advised.

Distributional requirements In order to acquire a comparative sense of ethnicity, race, and migration, students are expected to take at least two courses in each of two distinct geographic areas. To gain familiarity with global movements of people within and across national borders, majors must take at least one course that examines historical or contemporary migrations. Students must also demonstrate evidence of interdisciplinary work related to ethnicity, race, and migration in at least two departments or academic fields.

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. Majors are encouraged to pursue academic research and other experiences abroad.

Senior requirement Students must take the senior colloquium (ER&M 491a) on theoretical and methodological issues and complete a one-term senior essay or project (ER&M 492b).

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific course required ER&M 200a

Distribution of courses 6 term courses in area of concentration (1 term of senior req may count); at least 2 term courses in each of 2 distinct geographic areas; at least 1 term course on historical or contemporary migrations; at least 2 term courses demonstrating interdisciplinary engagement with ethnicity, race, and migration

Senior requirement Senior sem (ER&M 491a) and senior essay or project (ER&M 492b)

INTRODUCTORY COURSE

ER&M 200a, Introduction to Ethnicity, Race, and Migration

Alicia Schmidt Camacho

MW 11:35–12:50, 1 HTBA HU, SO (o)

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.

ELECTIVES WITHIN THE MAJOR

ER&M 187a/AMST 133a/HIST 107a, Introduction to American Indian History

Alyssa Mt. Pleasant

For description see under History.

ER&M 190b/AMST 192b, Work and Daily Life in Global Capitalism

Michael Denning

For description see under American Studies.

ER&M 210b/AMST 211b, Race and Gender in American Literature

Birgit Rasmussen

For description see under American Studies.

***ER&M 232b/AMST 262b, Comparative Ethnic Studies** Birgit Rasmussen

For description see under American Studies.

***ER&M 234a/AFAM 421a/PLSC 263a, Race and Ethnicity in American Politics**

Khalilah Brown-Dean

For description see under Political Science.

ER&M 247b/AMST 221b/HIST 117b, The Peoples of Early America Ned Blackhawk

For description see under History.

ER&M 250b/AFST 180b⁶, Nigeria and Its Diaspora Oluseye Adesola

For description see under African Studies.

ER&M 282a/AMST 272a/HIST 183a, Asian American History, 1800 to the Present

Mary Lui

For description see under American Studies.

***ER&M 284a/AMST 277a, Introduction to Chicano and Latino Literatures**

Birgit Rasmussen

For description see under American Studies.

ER&M 286a/AMST 213a/HIST 128a, Mexicans, Mexican Americans, and the U.S.-Mexico Borderlands since 1848 Stephen Pitti

For description see under History.

***ER&M 298a/ANTH 298a/WGSS 298a, The Anthropology of Oratory and Rhetoric**

Bernard Bate

For description see under Anthropology.

***ER&M 300a/AMST 326a/CHNS 265a/FILM 435a/LITR 258a, Chinese Diaspora and the Americas in Fiction and Film** Jing Tsu

For description see under East Asian Languages & Literatures.

***ER&M 312a/AMST 315a, Colonial Visions and Contemporary Revisions**

Birgit Rasmussen

For description see under American Studies.

***ER&M 322b/AMST 325b/HIST 155Jb, Indian-Colonial Relations in Comparative Perspective** Alyssa Mt. Pleasant

For description see under American Studies.

***ER&M 328b/SAST 458b/WGSS 328b, Popular Culture and Postcolonial India**

Geetanjali Singh Chanda

For description see under Women's, Gender, & Sexuality Studies.

ER&M 340a/ANTH 207a, Peoples and Cultures of Latin America Enrique Mayer

For description see under Anthropology.

***ER&M 342a/HIST 372Ja, Revolutionary Change in Twentieth-Century Latin America** Gilbert Joseph

For description see under History.

***ER&M 362a/EP&E 269a/INTS 384a/SOCY 363a, Genocide and Ethnic Conflict**

Jasmina Beširević-Regan

For description see under Sociology.

***ER&M 363b/AMST 391b, Ethnicity, Race, and Material Culture** Kariann Yokota

For description see under American Studies.

***ER&M 381a/AMST 305a, U.S.-Mexico Borderlands** Lourdes Gutiérrez Nájera

M 2:30–4:20 SO (o)

The historical, political, and cultural construction of the U.S.-Mexico borderlands. Concrete analysis of the region, with attention to topics such as conflict and organizing efforts at the border. Exploration of more abstract ideas, including the border as strategy for cultural representation and the forging of new identities.

***ER&M 391b/AMST 395b, Radical California** Stephen Pitti

For description see under American Studies.

***ER&M 398a/AFST 398a/INTS 398a, Race and Class in Comparative Perspective**

Jeremy Seekings

For description see under International Studies.

***ER&M 411a/AMST 437a^C, Recording Vernacular Musics** Michael Denning

For description see under American Studies.

***ER&M 415a/AMST 467a, Investigating the Present** Alicia Schmidt Camacho

T 1:30–3:20 HU (o)

An interdisciplinary approach to the processes of social documentation, as practiced in the fields of cultural and ethnic studies. The challenges of representing ongoing social processes with authority and integrity; writing as a social act; methods for developing a contemporary

archive. Readings from the works of authors whose narratives cross the boundary between scholarship and literature.

***ER&M 435a/AMST 422a/HIST 151Ja, Writing Tribal Histories** Ned Blackhawk
For description see under History.

***ER&M 436b/ENGL 344b/EP&E 265b, Global Fictions and Social Systems**
Justin Neuman
For description see under English Language & Literature.

***ER&M 450a/AMST 419a/HIST 152Ja, Land, Homelands, and American Indian Histories** Alyssa Mt. Pleasant
For description see under American Studies.

AFAM 162b/AMST 162b/HIST 187b, African American History: From Emancipation to the Present Jonathan Holloway
For description see under African American Studies.

***AFAM 279a/AMST 273a/WGSS 342a, Black Women's Literature** Naomi Pabst
For description see under African American Studies.

***AFAM 292b/AMST 292b, Interracial Literature** Naomi Pabst
For description see under African American Studies.

AMST 191b/HIST 106b, The Formation of Modern American Culture, 1920 to the Present Matthew Jacobson
For description see under American Studies.

ANTH 120a, Language, Culture, and Identity J. Joseph Errington

***EP&E 310b/PLSC 227b, Refugee Law and Policy** Alexandra Dufresne
For description see under Ethics, Politics, & Economics.

HIST 345b^G/JDST 265b^G/RLST 202b^G, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus
For description see under History.

INTS 361b/PLSC 188b, International Human Rights Staff
For description see under International Studies.

***INTS 387a/PLSC 407a, The Politics of Nationalism and Ethnicity** Matthew Kocher
For description see under International Studies.

MCDB 150b^G/HIST 400b, Global Problems of Population Growth Robert Wyman, Fabian Drixler
For description see under Biology.

***MGRK 213a/FILM 421a/HUMS 414a/INTS 380a/WGSS 261a, Cinema of Migration** George Syrimis
For description see under Hellenic Studies.

***PLSC 264b, Big City Politics in America: New York, Los Angeles, Chicago** Cynthia Horan

***PLSC 310b^G, Borders** Paulina Ochoa Espejo

***PLSC 419a, Forced Migration** Ato Kwamena Onoma

***PLSC 447a/AFST 447a, The Rwandan Genocide in Comparative Context**

David Simon

For description see under Political Science.

***RLST 192a^G/HIST 165Ja^G/JDST 297a^G, Religion, Ethnicity, and Identity in American Jewish History** Paula Hyman

For description see under Religious Studies.

***SOCY 311a^G, Gender, Race, and Genetic Testing** Rene Almeling

***SOCY 314a, Inequality in America** Vida Maralani

WGSS 115b/AMST 115b/ANTH 115b, Gender in a Transnational World

Inderpal Grewal

For description see under Women's, Gender, & Sexuality Studies.

INDIVIDUAL RESEARCH AND SENIOR ESSAY COURSES

***ER&M 471a and 472b, Individual Reading and Research for Juniors and Seniors**

Patricia Pessar

HTBA (o)

For students who wish to cover material not otherwise offered by the program. The course may be used for research or for directed reading. In either case a term paper or its equivalent is required. Students meet regularly with a faculty adviser. To apply for admission, students submit a prospectus signed by the faculty adviser to the director of undergraduate studies.

***ER&M 491a, The Senior Colloquium: Theoretical and Methodological Issues**

Patricia Pessar

W 3:30–5:20 (o)

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** Patricia Pessar

W 3:30–5:20 (o)

Independent research on a one-term senior essay or project.

Film Studies

Director of undergraduate studies: Aaron Gerow, Rm. 316, 53 Wall St., 432-7082,
aaron.gerow@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF FILM STUDIES

Professors *Dudley Andrew (*Co-chair*) (*Comparative Literature, Film Studies*), Ora Avni (*French*), Hazel Carby (*African American Studies, American Studies*), Francesco Casetti (*Humanities, Film Studies*), *Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Michael Denning (*American Studies, English*), Thomas Elsaesser (*Film Studies*) (*Visiting*), *John Mack Faragher (*History*), Benjamin Harshav (*Comparative Literature*),

*David Joselit (*History of Art*), Stathis Kalyvas (*Political Science*), *Thomas Kavanagh (*French*), John MacKay (*Film Studies, Slavic Languages & Literatures*), *Millicent Marcus (*Italian*), Donald Margulies (*Adjunct*) (*English, Theater Studies*), Giuseppe Mazzotta (*Italian*), Christopher L. Miller (*African American Studies, French*), *Charles Musser (Co-chair) (*American Studies, Film Studies*), Alexander Nemerov (*History of Art*), *Brigitte Peucker (*German, Film Studies*), Joseph Roach (*English, Theater Studies*), *Michael Roemer (*Adjunct*) (*Art, American Studies*), John Szwed (*Emeritus*) (*African American Studies*), *Katie Trumpener (*Comparative Literature, English*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

Associate Professors *Murray Biggs (*Adjunct*) (*Theater Studies, English*), Moira Fradinger (*Comparative Literature*), *Terri Francis (*African American Studies, Film Studies*), *Aaron Gerow (*East Asian Languages & Literatures, Film Studies*)

Assistant Professors J. D. Connor (*History of Art*), Zareena Grewal (*Ethnicity, Race, & Migration*), Karen Nakamura (*Anthropology*)

Senior Lecturers *John Crowley (*English*), *Ron Gregg (*Film Studies*), *Richard Maxwell (*Comparative Literature, English*)

Lecturers James Charney (*School of Medicine*), *Michael Kerbel (*American Studies*), *Marc Lapadula (*Film Studies*)

Critics *Jonathan Andrews (*Art, Film Studies*), *Sandra Luckow (*Art*)

Senior Lecturer II Risa Sodi (*Italian*)

Senior Lectors Seungja Choi (*East Asian Languages & Literatures*), Karen von Kunes (*Slavic Languages & Literatures*)

*Member of the Film Studies Committee.

Film Studies is an interdisciplinary major that focuses on the history, theory, and criticism of film. Courses examine cinema's role as a unique modern art form and the contributions of moving image media as cultural practices of enduring social significance. Film Studies offers students latitude in defining their course of study within the framework established by the Film Studies Committee. With this freedom comes the responsibility of carefully planning a coherent and well-focused program. Because of the special demands of Film Studies and the diversity of its offerings, potential majors are encouraged to consult with the director of undergraduate studies early in their academic careers.

The major in Film Studies consists of fourteen term courses, including the prerequisite. A maximum of one course taken on a Credit/D/Fail basis may count toward the major with permission of the director of undergraduate studies.

Prerequisite Students normally take FILM 150a, Introduction to Film Studies, in their freshman or sophomore year. It is a prerequisite for many other courses in the major.

Required courses Students are required to take FILM 320a, Close Analysis of Film, preferably during their sophomore year. They must also take FILM 312a, Theory of Media, or FILM 333b, Early Film Theory and Modernity, preferably by the end of their junior year. Students are encouraged to take both. In addition, students must devote two term courses,

preferably upper-level courses, to the study of representative films from at least two different nations or cultures (for example, German expressionist cinema, Italian cinema, American comedy).

Students must take one term course on the creative process in film. Appropriate courses are listed under “Production Seminars,” but other courses in art, theater studies, or creative writing may be substituted with the permission of the director of undergraduate studies.

Area of concentration With the help of the director of undergraduate studies in Film Studies, each student defines an area of concentration comprising six courses. The six courses should form a coherent program in which the study of film is integrated with a particular discipline (history of art, literature, philosophy, the social sciences) or area of investigation (film theory, production, race and gender, photography, national or regional cultures and their cinemas). The focus of the concentration might also be a given historical or theoretical problem drawn from two areas, such as German expressionism in film and in art or narrative theory in film and in the novel. Students choosing a production-related concentration often start by completing ART 141a, 142b, and/or FILM 350a or b by the end of their sophomore year, and continue with ART 341a or b and/or FILM 395b by the end of their junior year, to prepare for FILM 455a, 456b, or 483a, 484b, or 487a, 488b in their senior year. They must take at least seven critical studies courses in the major. FILM 150a, 312a, 320a, 333b, and the two required courses on national cinemas may be counted among the seven. Critical studies courses are defined as those not listed under “Production Seminars.”

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. 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 491a, 492b). This option is intended for students with clearly defined topics that do not relate closely to a senior-level seminar. During the first two weeks of the first term of senior year, a petition for permission to do independent research should be submitted to the director of undergraduate studies in the form of a brief prospectus, approved by the proposed faculty adviser to the essay. 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 491a or 492b), 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 area of concentration. In researching and writing the essay, the student should consult regularly with the seminar instructor, supplying preliminary drafts as appropriate, and may consult with other faculty members as well.

Students who wish to complete a senior project as an alternative to an essay petition the Film Studies Committee for approval of their project at the end of the junior year. Alternative projects might include writing a screenplay in Advanced Screenwriting (FILM 487a, 488b) 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 Fiction Film Workshop (FILM 483a, 484b) or the Documentary Film Workshop (FILM 455a, 456b), and receive three credits for their projects (two credits for FILM 483a, 484b or 455a, 456b, and one for FILM 493a or 494b). Such a choice effectively commits students to one extra course in addition to the fourteen courses required for the major, because FILM 493a or 494b does not count toward the fourteen required courses when taken in conjunction with FILM 483a, 484b or 455a, 456b. Students may undertake a production project outside the workshops if (1) the Film 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 493a and 494b toward the fourteen courses required for the major.

Majors graduating in December must submit their senior essays or senior projects to the director of undergraduate studies by December 3; those graduating in May, by April 25. A second reader assigned by the director of undergraduate studies participates in evaluating the essay or project. In order to graduate from Yale College, a student majoring in Film Studies must achieve a passing grade on the senior essay or senior project.

Admission to senior-level seminars is at the instructor's discretion, but the Film 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 studies may wish to pursue the intensive major. Students in the intensive major complete a senior project in production and also write a senior essay on an unrelated topic. The intensive major in Film Studies is intended for students who are not pursuing two majors. Students must request approval from the Film Studies Committee at the end of their junior year by submitting a proposal that outlines their objectives and general area of study.

All majors Study of relevant foreign languages is urged for all Film 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.

Film Studies draws on the resources of many 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 for each student normally determines the relevance and acceptability of other courses.

REQUIREMENTS OF THE MAJOR

Prerequisite FILM 150a

Number of courses 14 term courses, incl prereq and senior req

Distribution of courses 6 courses in area of concentration; 2 courses in different national cinemas; 1 production course; if concentration is production-related, at least 7 critical studies courses

Specific courses required FILM 320a; FILM 312a or 333b

Senior requirement 2 terms of senior-level sems, or 2 terms of senior essay (FILM 491a, 492b), or 1 term of each; or 2 terms of senior project (FILM 455a, 456b, or 483a, 484b, or 487a, 488b)

Intensive major Both senior essay and senior project

REQUIRED COURSES

FILM 150a, Introduction to Film Studies Ron Gregg

TTH 1:30–2:20, 1 HTBA; screenings T 7–9 p.m. WR, HU (26)

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.

FILM 312a/LITR 354a, Theory of Media John MacKay, Francesco Casetti

MW 10:30–11:20, 1 HTBA; screenings W 7–9 p.m. HU (0)

Introduction to key issues in media studies. Relationships between commodity, artwork, and networks of exchange; media and public sphere; the analysis of radio and television; alternative or counter-hegemonic conceptions of media; and the viability of the concept “media” itself.

***FILM 320a/HSAR 490a, Close Analysis of Film** John MacKay

W 3:30–5:20; screenings TH 7–9 p.m. HU (0)

Exploration of ways in which traditional genres and alternative film forms establish or subvert convention and expectation in thematic and ideological concerns, narrative containment and excess, the representation of the body, the use of music and voice, and the construction of space in the cinema. Close analysis of expressive techniques of cinematic image and sound in a selection of Hollywood and European films. Prerequisite: FILM 150a.

FILM 333b/HUMS 375b/LITR 351b, Early Film Theory and Modernity

Francesco Casetti

MW 10:30–11:20, 1 HTBA HU (0)

Introduction to film theory from its beginnings to c. 1930, including its emphasis on the spectator’s experience. Ways in which early theory highlighted characteristics of modern life such as speed, economy, contingency, and excitation. The role of national identity in defining topics of theoretical research explored through comparison of American and European debates.

NATIONAL CINEMAS

FILM 260a^c/FREN 395a/LITR 381a, French New Wave Cinema Dudley Andrew, Michael Cramer

MW 11:35–12:25, 1 HTBA; screenings M 6:30–9 p.m. HU (0)

Films and writings of Truffaut, Godard, Rivette, Varda, and Rohmer. The influence of filmmakers such as Cocteau and Bresson and of writers such as Bazin, Robbe-Grillet, and Barthes. The politics of French culture in the shift from the Fourth to Fifth Republic; the impact of American film during the Cold War. Discussion section in French available.

***FILM 420a/AMST 341a/HSAR 413a, American Visual Culture, 1941–1945**

Alexander Nemerov

For description see under History of Art.

***FILM 427a/AMST 319a, American Documentary Films** Michael Roemer

For description see under American Studies.

***FILM 438b/AMST 416b, U.S. Cinema from 1960 to the Mid-1970s** Michael Kerbel

For description see under American Studies.

***FILM 446a/JAPN 270a^c/LITR 384a, Japanese Cinema before 1960** Aaron Gerow

For description see under East Asian Languages & Literatures.

***FILM 468a^c/GMAN 405a^c/GMST 405a/LITR 394a, Weimar Cinema**

Brigitte Peucker

T 3:30–5:20; screenings M 7–9 p.m. HU (o)

The German cinema, 1919–1930. Expressionist films and films of the New Objectivity. The pressures of technology and the other arts on cinema; issues of spectatorship, visual pleasure, and distraction. Readings by Simmel, Kracauer, Benjamin, and others. Films by Murnau, Lang, Lubitsch, Pabst, Brecht, von Sternberg, and others. Conducted in English, with readings in English.

FILM THEORY, AUTHORSHIP, AND SPECIAL TOPICS

***FILM 097b/HUMS 089b/ITAL 063b, Literature into Film** Millicent Marcus

For description see under Italian.

FILM 240b/LITR 143b, World Cinema Dudley Andrew

For description see under Literature.

***FILM 311b/AMST 301b/ENGL 299b, East Asia in U.S. Literature and Film**

R. John Williams

For description see under English Language & Literature.

FILM 407a/THST 357a, The Cinema of War Murray Biggs

MW 4:30–5:20, 1 HTBA HU (37)

A study of the effects of military actions on combatants, civilians, and those left behind. Emphasis on films from or about the two world wars, with samples from Vietnam, Iraq, and other theaters.

***FILM 411b/LITR 380b, The Films of Alfred Hitchcock** Brigitte Peucker

T 3:30–5:20 HU (o)

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.

***FILM 415b/AMST 393b^c, Digital Documentary and the Internet** Charles Musser,

Joshua Glick

T 1:30–3:20 HU (RP, o)

Exploration of the ways in which digital media technologies have transformed the documentary tradition during the last fifteen years. Changes in modes of production, distribution, exhibition, promotion, and spectatorship. Filmmakers' use of the Internet to promote and contextualize their work. Documentaries by established filmmakers, PBS, activist groups, and semiprofessional/amateur videomakers.

***FILM 421a/HUMS 414a/INTS 380a/MGRK 213a/WGSS 261a, Cinema of Migration**

George Syrimis

For description see under Hellenic Studies.

***FILM 429a/LITR 466a, War in Literature and Film** Katerina Clark

For description see under Literature.

***FILM 435a/AMST 326a/CHNS 265a/ER&M 300a/LITR 258a, Chinese Diaspora and the Americas in Fiction and Film** Jing Tsu

For description see under East Asian Languages & Literatures.

PRODUCTION SEMINARS

***FILM 350a or b, Screenwriting** Marc Lapadula

TH 3:30–5:20 (o)

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 150a. Not open to freshmen.

***FILM 395b, Intermediate Screenwriting** Marc Lapadula

W 7–8:50 p.m. (o)

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 350a or b. Priority to Film Studies majors.

***FILM 455a and 456b, Documentary Film Workshop** Charles Musser

W 12:30–3:20; screenings T 7–9 p.m. (RP, o)

A workshop designed primarily for Film Studies majors making documentaries as senior projects. Seniors in majors other than Film Studies admitted as space permits.

***FILM 483a and 484b/ART 442a and 443b, Advanced Fiction Film Workshop**

Jonathan Andrews

For description see under Art.

***FILM 487a and 488b, Advanced Screenwriting** Marc Lapadula

TH 1:30–3:20 (o)

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 Studies majors working on senior projects. Prerequisite: FILM 395b or permission of instructor.

***ART 141a and 142b, The Language of Film Workshop** Michael Roemer, Sandra

Luckow

***ART 341a or b, Intermediate Fiction Film Workshop** Michael Roemer [F], Jonathan Andrews [Sp], and staff

***ART 342b, Intermediate Documentary Film Workshop** Sandra Luckow

***ENGL 453a/THST 320a, Playwriting** Donald Margulies
For description see under English Language & Literature.

***MUSI 325a, Fundamentals of Music, Multimedia Art, and Technology**
Michael Klingbeil

THST 110a and 111b, Survey of Theater and Drama Joseph Roach

***THST 321a, Production Seminar: Playwriting** Deb Margolin

***THST 322b, Advanced Playwriting** Deb Margolin

***THST 324b, Playwright-Director Laboratory** Toni Dorfman

INDIVIDUAL RESEARCH AND SENIOR ESSAY COURSE OR PROJECT

***FILM 471a or b, Independent Directed Study** Staff
HTBA (o)

For students who wish to explore an aspect of film 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 491a and 492b, The Senior Essay** Terri Francis
HTBA (o)

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 494b, The Senior Project** Terri Francis
HTBA (o)

For students making a film or video, either fiction or nonfiction, as their senior project. Senior projects require the approval of the Film 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 455a, 456b or FILM 483a, 484b.

OTHER COURSES PERTINENT TO FILM

***ENGL 344b/EP&E 265b/ER&M 436b, Global Fictions and Social Systems**

Justin Neuman

For description see under English Language & Literature.

***ENGL 362b/THST 288b, From Celebrity to Stardom** Joseph Roach

For description see under English Language & Literature.

***FREN 412a/AFST 412a/LITR 265a/MMES 162a/WGSS 412a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev

For description see under French.

***HUMS 475b/PHIL 452b, Evolution of Beauty** Jonathan Gilmore, Richard Prum

For description see under Humanities.

LITR 120a, Introduction to Narrative David Quint and staff

***LITR 357a/ENGL 321a/HUMS 246a, Visual Culture in Literature, Drama, and Film**

Edward Barnaby

For description see under Literature.

***PHYS 101b, Movie Physics** Francis Robinson

PORT 246a/SPAN 245a, Latin American Film: Brazil, Mexico, and Argentina

Paulo Moreira

For description see under Portuguese.

***PORT 394a/LITR 294a/SPAN 385a, World Cities and Narratives** K. David Jackson

For description see under Portuguese.

***SPAN 223b, Spanish in Film: An Introduction to the New Latin American Cinema**

Margherita Tórtora

***WGSS 328b/ER&M 328b/SAST 458b, Popular Culture and Postcolonial India**

Geetanjali Singh Chanda

For description see under Women's, Gender, & Sexuality Studies.

Forestry & Environmental Studies

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

The School of Forestry & Environmental Studies is primarily a graduate and professional program designed to train leaders 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. degree from the School of Forestry & Environmental Studies in five years. For more information on the joint program,

see the School's Web site at <http://environment.yale.edu/prospective/masters-degrees>. Most graduate-level courses are open to qualified undergraduates. These courses are listed in the bulletin of the School of Forestry & Environmental Studies and most also appear in the online bulletin of the Graduate School of Arts and Sciences.

Information about the programs of the School of Forestry & Environmental Studies may be found on the Web at <http://environment.yale.edu>. Most lectures and symposia are open to undergraduates.

***F&ES 012a, Urban Ecology in New Haven** Gordon Geballe

TTH 9–10:15 Fr sem (o)

Methods from ecosystem ecology, landscape ecology, and industrial ecology applied to questions of how cities work and how they can be more sustainable. Guest speakers, community projects, and field trips in New Haven. Application of theory to New Haven and to cities around the world. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

F&ES 245a/EVST 245a/PLSC 146a, International Environmental Policy and Governance Benjamin Cashore

For description see under Environmental Studies.

F&ES 255b/EVST 255b/PLSC 215b, Environmental Politics and Law John Wargo

For description see under Environmental Studies.

F&ES 260a^c/EVST 260a^c, Structure, Function, and Development of Vascular Plants

Graeme Berlyn

For description see under Environmental Studies.

***F&ES 261a/EVST 261a/G&G 261a^c, Minerals and Human Health** Brian Skinner, Ruth Blake

For description see under Geology & Geophysics.

***F&ES 275b^c/EVST 275b, Ecosystems Patterns and Processes** Peter Raymond, Mark Bradford

For description see under Environmental Studies.

***F&ES 285a/EVST 285a, Political Ecology: Nature, Culture, and Power**

Amity Doolittle

For description see under Environmental Studies.

***F&ES 290a/EVST 290a, Geographic Information Systems** Charles Tomlin

For description see under Environmental Studies.

F&ES 307b^c/EVST 307b, Organic Pollutants in the Environment Shimon Anisfeld

For description see under Environmental Studies.

***F&ES 344b^c/EVST 344b, Aquatic Chemistry** Gaboury Benoit

For description see under Environmental Studies.

***F&ES 367b/EVST 367b, Water Resources and Environmental Change** James Saiers

For description see under Environmental Studies.

F&ES 380a^G/ENAS 443a/ENVE 443a^G, Greening Business Operations

Thomas Graedel, Marian Chertow

For description see under Environmental Engineering.

***F&ES 384b/ANTH 382b/EVST 345b, Environmental Anthropology** Carol Carpenter

For description see under Environmental Studies.

F&ES 441b/EVST 441b/G&G 440b^G/MCDB 441b, Methods in Geomicrobiology

Ruth Blake

For description see under Geology & Geophysics.

**COURSES IN THE SCHOOL OF FORESTRY &
ENVIRONMENTAL STUDIES**

For listings and detailed descriptions of professional school courses, consult the bulletin of the School of Forestry & Environmental Studies, or see <http://environment.yale.edu>.

French

Director of undergraduate studies: Edwin M. Duval, Rm. 316, 82–90 Wall St., 432–4902, edwin.duval@yale.edu [F]; Edwige Tamalet-Talbayev, Rm. 421, 82–90 Wall St., 432–4902, edwige.tamalet@yale.edu [Sp]

FACULTY OF THE DEPARTMENT OF FRENCH

Professors Ora Avni, R. Howard Bloch, Edwin M. Duval, Marie-Hélène Girard (*Visiting*), Alice Kaplan, Thomas Kavanagh (*Chair*), Christopher L. Miller, Maurice Samuels

Assistant Professors Christopher Semk, Edwige Tamalet-Talbayev, Yue Zhuo

Senior Lecturer Maryam Sanjabi

Lecturers Diane Charney, Alyson Waters

Senior Lectors Ruth Koizim, Soumia Koundi, Matuku Ngame, Lauren Pinzka, Françoise Schneider

Lectors Kathleen Burton, Karen Duval, Constance Sherak, Candace Skorupa, Katrien Wynant

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 greatest and richest literatures 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. For this reason the French major provides ideal preparation for careers not only in academics but also in a wide range of fields from law and diplomacy to journalism and the arts. Recent graduates have gone on to selective law schools and graduate programs in French and comparative literature. Others work in primary and secondary education, business, government, 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. Appropriate majors to combine with French might include, but are not limited to, African American Studies, African Studies, English, Film Studies, History, History of Art, Humanities, International Studies, 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 chapter II, section K, of this bulletin.) The department is also committed to working closely with students who wish to earn certification as a teacher of French through the Teacher Preparation and Education Studies program.

Study abroad Students are encouraged to spend a year or a term 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 Experience (www.yale.edu/yalecollege/international) and from Ruth Koizim, the study abroad adviser for the Department of French. The Kenneth Cornell Charitable Foundation provides some financial support for majors and prospective majors who undertake research projects related to their work in the major in France or a francophone country. Contact the director of undergraduate studies for details.

The major for the Classes of 2011 and 2012 Students in the Classes of 2011 and 2012 may fulfill the requirements of the French major as described below for the Class of 2013 and subsequent classes. Alternatively, they may fulfill the requirements of the major that were in place when they entered the major, as described in previous editions of this bulletin.

Prerequisites Candidates for the major should take two courses in the FREN 150–159 range, or a reasonable equivalent, during the freshman or sophomore year. Prospective majors are strongly encouraged to take at least one literature course numbered 170 or above before the end of the sophomore year.

The standard major for the Class of 2013 and subsequent classes The standard major consists of ten term courses numbered 160 or above, including a one-term senior essay (see below). At least four of these must be Group B courses numbered 200 or above. Students may count no more than three courses in the FREN 160–199 range and no more than two courses conducted in English (Group C or Group D) toward the major. With prior approval of the director of undergraduate studies, 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 director of undergraduate studies may grant exceptions to this limit for students who spend two academic terms in an approved study abroad program.) Relevant freshman seminars may count toward the major, with permission of the director of undergraduate studies.

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. Stipulations for courses in the 160–199 range, courses conducted in English, and courses taken outside the department are identical to those for the standard major.

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 491a or b 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 director of undergraduate studies by September 17 (fall-term essay) or November 12 (spring-term essay). A one-page prospectus and bibliography are due September 24 (fall term) or January 21 (spring term). A rough draft must be submitted to the adviser by October 22 (fall term) or March 25 (spring term). Two copies of the final essay are due in the department by November 12 (fall term) or April 18 (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 493a and 494b 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 director of undergraduate studies by September 17. A one-page prospectus and bibliography are due October 15. Students must submit an initial rough draft to their adviser by January 21 and a complete draft by March 25. Two copies of the final essay are due in the department by April 18.

All majors It is strongly recommended that all majors complete at least one term course in the FREN 170–179 sequence early in their studies. They are also 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 director of undergraduate studies no later than the fall term of the junior year. Schedules must be approved and signed by the director of undergraduate studies. Students planning to study abroad or to petition for completion of two majors should contact the director of undergraduate studies during the sophomore year. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

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 director of undergraduate studies in French by the fall term of the junior year. For further information about the Special Divisional Major see under that heading in this chapter.

Group A courses (FREN 110–159) This group consists of language courses that lead directly to courses counting toward the major. For further details, students should consult the Freshman Web site at yalecollege.yale.edu/content/french-o or see the director of undergraduate studies.

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. Courses in the FREN 170–179 range are gateway courses that introduce students to the study of French and francophone literatures, societies, and cultures. Courses in the FREN 180–199 range are advanced language courses. Courses numbered 200–449 are advanced seminars 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.

Group D courses Courses in this group are taught in other departments but may count toward the French major, with permission of the director of undergraduate studies.

Placement Proper placement is essential for productive language study. All students who have not yet taken French at Yale are expected to take the departmental placement test, with the exception of students who have no previous knowledge of French whatsoever and those whose placement has already been established by other means (see the Freshman Web site).

Please note that the departmental placement test is given only once a year, in the fall. Students who wish to begin taking French in the spring must take the test in the fall. The placement test will be given on Sunday, August 29, at 1:30 p.m. (last names A–M) and at 3 p.m. (last names N–Z) in 101 and 102 LC. Students unable to attend may take a makeup test on Monday, August 30, at 9 a.m. in 102 LC.

REQUIREMENTS OF THE MAJOR

Prerequisites 2 term courses numbered FREN 150–159 or equivalent

Number of courses *Standard major*—10 term courses numbered 160 or above; *Intensive major*—12 term courses numbered 160 or above

Distribution of courses *Standard major*—at least 4 term courses in Group B numbered 200 or above; no more than 3 term courses numbered FREN 160–199; no more than 2 term courses conducted in English; *Intensive major*—same, 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 491a or b); *Intensive major*—one-term (FREN 491a or b) or two-term (FREN 493a, 494b) senior essay in French or English

GROUP A COURSES

Preregistration, which is required for all fall-term courses numbered from 110 to 159, is held on Tuesday, August 31, from 2 to 4 p.m. See www.yale.edu/french for details. *Preregistration is not required for spring-term courses.*

FREN 110a, Elementary and Intermediate French I Matuku Ngame and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

Through extensive use of audio and video material, the course provides 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. Mandatory weekly tests given on Monday at 30-minute intervals from 5 to 8:30 p.m. To be followed by FREN 120b. Conducted entirely in French. Daily classroom and laboratory attendance is required. For students with no previous experience of French. Preregistration required. Credit only on completion of FREN 120b.

***FREN 120b, Elementary and Intermediate French II** Matuku Ngame and staff

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of FREN 110a. To be followed by FREN 130a or b. After FREN 110a.

FREN 121a, Intermediate French Matuku Ngame, Candace Skorupa

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

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 discussions 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. Preregistration required.

FREN 125a, Intensive Elementary French Constance Sherak and staff

Lect. MWF 9:25–10:15; practice MTWTHF 10:30–11:20; weekly test T 5–6 L1–L2
2 Course cr (RP, 61)

An accelerated course that covers in one term the material taught in FREN 110a and 120b. Practice in all language skills, with emphasis on communicative proficiency. Admits to FREN 145b. For students of superior linguistic ability. Conducted entirely in French. Preregistration required.

FREN 130a or b, Intermediate and Advanced French I Ruth Koizim, Soumia Koundi, and staff

5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (RP, 61)

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, plays, novels, and films. Admits to FREN 140a or b. Conducted entirely in French. After FREN 120b, 121a, or a satisfactory placement test score. Preregistration required for the fall term.

FREN 140a or b, Intermediate and Advanced French II Soumia Koundi, Ruth Koizim, and staff

5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 61)

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 150a or 151b. Conducted entirely in French. After FREN 130a or b or a satisfactory placement test score. Preregistration required for the fall term.

FREN 145b, Intensive Intermediate and Advanced French Constance Sherak and staff

Lect. MWF 9:25–10:15; practice MTWTHF 10:30–11:20; weekly test T 5–6 L3–L4
2 Course cr (RP, 61)

An accelerated course that covers in one term the material taught in FREN 130a or b and 140a or b. Emphasis on speaking, writing, and the conversion of grammatical knowledge into reading competence. Admits to FREN 150a or 151b. For students of superior linguistic ability. Conducted entirely in French. After FREN 120b or 125a.

FREN 150a, Advanced Language Practice I Françoise Schneider and staff

3 HTBA For sections see www.yale.edu/oci L5 (61)

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. After FREN 140a or b, 145b, or a satisfactory placement test score. May be taken after FREN 151b.

FREN 151b, Advanced Language Practice II Françoise Schneider and staff

3 HTBA For sections see www.yale.edu/oci L5 (61)

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. Emphasis on oral practice through debates and presentations on current events. After FREN 140a or b, 145b, or a satisfactory placement test score. May be taken independently of FREN 150a.

GROUP B COURSES

Group B courses are conducted entirely in French. Courses numbered from 160 to 199 are open to students who have passed two courses in the FREN 150–159 range or the equivalent, and to others with consent of the department. Courses numbered from 200 to 449 are open to students who have passed a course in the FREN 170–175 range, or with permission of the instructor. Students who have taken a course at the 200 level or higher may not ordinarily take a 100-level course for credit, with the exception of advanced language courses numbered 185 or higher. Students may take 200-, 300-, and 400-level courses in any order.

Courses in the 200–299 range are devoted to general fields; courses in the 300–449 range are devoted to specific topics.

FREN 160a or b, Advanced Culture and Conversation Françoise Schneider and staff
3 HTBA For sections see www.yale.edu/oci L5 (RP, o)

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. Prerequisite: FREN 150a and 151b, or a satisfactory placement test score, or permission of the course director. May not be taken for credit after courses numbered 170 or higher.

Gateway Courses

***FREN 170a or b, Introduction to the Study of Literature in French**

Lauren Pinzka and staff

HTBA For sections see www.yale.edu/oci L5, HU (61)

Introduction to close reading and analysis of literary texts written in French. Works by authors such as Marie de France, Molière, Balzac, Hugo, Baudelaire, Césaire, and Duras.

***FREN 172a or b, French and Francophone Cultural History** Lauren Pinzka [F], Maryam Sanjabi [Sp]

HTBA For sections see www.yale.edu/oci L5, HU (50)

An interdisciplinary introduction to French and francophone cultural history organized around a different theme or topic each term.

***FREN 174a, Contemporary French and Francophone Societies and Cultures**

Alice Kaplan

MF 11:35–12:50 L5, HU (o)

Introduction to contemporary French and francophone societies and cultures, with emphasis on political, social, and institutional issues. Organized around a particular theme or topic that varies from year to year.

Advanced Language Courses

***FREN 185a, Translation** Alyson Waters

W 3:30–5:20 L5, HU (o)

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 150a and 151b or with permission of instructor. Preference to juniors and seniors.

***FREN 186b, Intermediate Literary Translation** Alyson Waters

W 3:30–5:20 L5, HU (o)

A continuation of FREN 185a for students who wish to work on a longer project and to deepen their reading in translation theory. Prerequisite: FREN 185a.

***FREN 195a, Advanced Writing Workshop** Lauren Pinzka and staff

HTBA L5 (0)

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). After FREN 150a, 151b, or a satisfactory placement test score. Recommended for prospective majors.

*General Fields****FREN 212a, Medieval French Literature and Culture** R. Howard Bloch

TTH 9–10:15 L5, HU (0)

The principal literary genres of twelfth- and thirteenth-century France, including epic, romance, lai, lyric, theater, comic tale, and allegorical dream poem. Close reading of texts, with emphasis on their social and cultural contexts.

***FREN 221b, The French Enlightenment** Thomas Kavanagh

MW 11:35–12:50 L5, HU (0)

The French Enlightenment as a crucial transition from *ancien régime* absolutism to modernity. Topics include the heritage of absolutism, *libertinage* and the rococo, new relations between the public and private spheres, changing constructions of identity and gender, and the role of the *philosophes* in the coming of the Revolution. Authors include La Bruyère, Montesquieu, Prévost, Marivaux, Voltaire, Rousseau, Laclos, Beaumarchais, Mercier, Mirabeau, Olympe de Gouges, and Sade. Examination of paintings by Watteau, Chardin, Boucher, Fragonard, and Greuze, as well as cinematic representations of the period by Leconte, Frears, and Renoir.

*Special Topics****FREN 318a, Religion and Literature in the Renaissance** Edwin M. Duval

MW 1–2:15 L5, HU (36)

Literary expressions of sixteenth-century religious ferment from late medieval mysticism to the wars of religion. Popular songs and plays, satires, epics, and polemics by Renaissance writers such as Marguerite de Navarre, Marot, Rabelais, Ronsard, d'Aubigné, and Montaigne.

***FREN 325a, Courtiers, Conspirators, and Con Artists** Christopher Semk

MW 2:30–3:45 L5, HU (0)

The themes of lying and dissimulation in seventeenth-century French literature. Works of poetry (La Fontaine), plays (Corneille, Molière), and prose genres such as the letter (Pascal, Cyrano de Bergerac) and the maxim (La Rochefoucauld).

***FREN 381a, Paris, Capital of the Nineteenth Century** Maurice Samuels

TTH 2:30–3:45 L5, HU (27)

The myth of Paris as it took shape in nineteenth-century art and literature. Works by writers such as Hugo, Balzac, Baudelaire, and Rimbaud and by artists such as Delacroix, Gavarni, and Manet, as well as major impressionists such as Monet, Sisley, and Caillebotte. Other topics include nineteenth-century French history, Haussmann's urbanism, architecture, and the birth of photography.

FREN 386a, The German Occupation in Film and Fiction Ora Avni

TTH 1–2:15 L5, HU (26)

Ways in which representations of the German occupation of France have evolved over the past fifty years. Emphasis on the relationship between personal and collective memory; the writing and rewriting of history; public opinion; and the arts. Readings from the works of Henry Roussio, de Gaulle, Modiano, Céline, Drieu la Rochelle, Sartre, and Duras. Films include *Nuit et brouillard*, *Le Chagrin et la pitié*, *Au revoir les enfants*, *M. Klein*, *Lacombe Lucien*, and *Les Violons du bal*.

***FREN 414b/MMES 261b, The Algerian War of Independence and Its Literature**

Edwige Tamalet-Talbayev

TTH 1–2:15 L5, HU (RP, o)

Survey of literature about the Algerian war of independence written in both France and Algeria since 1954. The role of women in the insurgency; the construction of an Algerian national identity; the issue of political commitment for intellectuals; debates on terrorism and the use of torture. Some attention to film. Readings from the works of Camus, Dib, Kateb, Memmi, Stora, Blanchard, and Fanon.

SPECIAL TUTORIAL AND SENIOR COURSES***FREN 470a and 471b, Special Tutorial for Juniors and Seniors** Edwin M. Duval and staff

HTBA (o)

Special projects set up by the student in an area of individual interest with the help of a faculty adviser and the director of undergraduate studies. Intended to enable the student to cover material not offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term may be offered toward the major, but two terms may be offered toward the bachelor's degree. For additional information, consult the director of undergraduate studies.

***FREN 491a or b, The Senior Essay in the Standard Major** Staff

HTBA (o)

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 493a and 494b, The Senior Essay in the Intensive Major** Edwin M. Duval and staff

HTBA (o)

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. Credit only on completion of both terms. For additional information, consult the director of undergraduate studies.

GROUP C COURSES

Courses in this group are conducted in English; readings may be in French or English. Group C courses numbered above 100 are open to all students in Yale College.

***FREN 007b, Money and the Novel** Maurice Samuels

TTH 2:30–3:45 WR, HU Fr sem Tr (o)

The relationship between the invention of the modern novel and the rise of modern capitalism in France. Literature's role in making sense of economic turmoil; literature as a commodity. Authors include Balzac, Gide, Maupassant, Murger, and Zola. Readings and discussion in English. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***FREN 376b/AFAM 383b/AFST 476b, The Two Congos: Literature and Culture in the Heart of Africa** Christopher L. Miller

T 1:30–3:20 HU (o)

An interdisciplinary approach to two nations that share a name, a river, and elements of culture but that are divided by colonial heritage (one Belgian, one French). Focus on literature, with references to history, anthropology, art, politics, music, and sports. Views from outside the two countries (*Heart of Darkness*; *Tintin*; *The Poisonwood Bible*) and inside (E. Dongala, Sony Labou Tansi, H. Lopes, V. Y. Mudimbe, A. Mabanckou). The 1974 Ali-Foreman "Rumble in the Jungle" boxing match. Prerequisite: reading knowledge of French.

FREN 395a/FILM 260a^G/LITR 381a, French New Wave Cinema Dudley Andrew, Michael Cramer

For description see under Film Studies.

***FREN 412a/AFST 412a/LITR 265a/MMES 162a/WGSS 412a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev

TTH 9–10:15 HU Tr (RP, o)

Introduction to key concepts and thinkers in postcolonial theory from the Anglophone and Francophone traditions. Texts in relation to which postcolonial theory has been articulated. Readings from the works of Edward Said, Homi Bhabha, Gayatri Spivak, Frantz Fanon, Edouard Glissant, Salman Rushdie, Achille Mbembe, and others.

GROUP D COURSE

Group D courses are taught in other departments but may count toward the French major, with permission of the director of undergraduate studies.

HIST 276a, France since 1871 John Merriman**READING COURSE*****FREN 109a or b, French for Reading** Maryam SanjabiHTBA For sections see www.yale.edu/oci (o)

Fundamental grammar structures and basic vocabulary 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. Preregistration is *not* required. Conducted in English. Does not satisfy the language requirement.

Freshman Seminar Program

The Freshman Seminar program offers a diverse array of courses open only to freshmen and designed with freshmen 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 freshman 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. Application procedures and a complete list of courses may be found on line at yalecollege.yale.edu/content/freshman-seminar-program-o.

For a full description of each seminar, see the course listings of the originating department.

***AMST 002a, American Consumer Culture in the Twentieth Century**
Jean-Christophe Agnew

***AMST 004b, Narrations of Native America** Alyssa Mt. Pleasant

***AMST 006a, Violence and Justice in America** John Mack Faragher

***APHY 050a/PHYS 050a, Science of Modern Technology** Daniel Prober
For description see under Applied Physics.

***ARCH 001a, Architecture and Utopia** Peggy Deamer

***ART 001a, Studies in Visual Biography** Jessica Helfand

***ART 002b, Paper** Staff

***ASTR 030a, Search for Extraterrestrial Life** Hector Arce

***CLCV 018b, Poetry and Prehistory** John Fisher
For description see under Classics.

***ENAS 060b/APHY 060b/PHYS 060b, Energy Technology and Society** Paul Fleury
For description see under Engineering & Applied Science.

***ENGL 006a/AFAM 019a, Representing U.S. Slavery** Anthony Reed
For description see under English Language & Literature.

***ENGL 007a/AFAM 026a, The Black Arts Movement** GerShun Avilez
For description see under English Language & Literature.

***ENGL 008a, Medieval Drama** Jessica Brantley

***ENGL 009b/HUMS 091b, The Sagas of Icelanders** Roberta Frank
For description see under English Language & Literature.

***F&ES 012a, Urban Ecology in New Haven** Gordon Geballe

- *FREN 007b, **Money and the Novel** Maurice Samuels
- *HIST 001b/AFAM 095b/AMST 001b, **African American Freedom Movements in the Twentieth Century** Crystal Feimster
For description see under History.
- *HIST 003a, **Before 1492: Exploring the Americas** Valerie Hansen, Fabian Drixler
- *HIST 010a, **Postwar America at Home: 1945–1960** Cynthia Russett
- *HSAR 004a, **Visualized Communities** Margaret Olin
- *HUMS 075b/SPAN 070b, **The Cultures of Medieval Spain** María Rosa Menocal
For description see under Humanities.
- *HUMS 076a, **Epidemics in Global Perspective** William Summers
- *HUMS 092a/RLST 012a, **Divine Law in Historical Perspective** Christine Hayes
For description see under Humanities.
- *ITAL 063b/FILM 097b/HUMS 089b, **Literature into Film** Millicent Marcus
For description see under Italian.
- *JAPN 002b/HUMS 082b, **Genji's World: Japan's Culture, c. 1000** Edward Kamens
For description see under East Asian Languages & Literatures.
- *LING 008a, **Language Diversity and Endangerment** Stephen Anderson
- *MCDB 060a and 061b, **Topics in Reproductive Biology** Harvey Kliman
For description see under Biology.
- *MUSI 001b, **Exploring the Nature of Genius** Craig Wright
- *MUSI 002a, **The Role of the Performer in the Musical Experience**
Michael Friedmann
- *MUSI 008a, **Music Cultures of the World** Michael Veal
- *MUSI 023a, **Music and Melancholy** Seth Brodsky
- *MUSI 095b, **Creativity, Music, and Technology** Kathryn Alexander
- *NELC 001a/ARCG 001a, **Egypt and Northeast Africa: A Multidisciplinary Approach**
Colleen Manassa
For description see under Near Eastern Languages & Civilizations.
- *PHYS 095a, **Radiation and the Universe** Peter Parker
- *PORT 001b, **Latin American Short Fiction** Paulo Moreira
- *PORT 010a, **Portraits of Brazil** K. David Jackson
- *RUSS 023a, **Storytelling and the Russian Tradition** Bella Grigoryan
For description see under Slavic Languages & Literatures.
- *SCIE 030a and 031b, **Current Topics in Science** Charles Bailyn, Douglas Kankel

***SOCY 021b, Causes and Consequences of Mass Imprisonment**

Christopher Wildeman

***SOCY 035b/WGSS 035b, Reproductive and Genetic Technologies** Rene Almeling

For description see under Sociology.

SPAN 060b, Freshman Colloquium: Literary Studies in Spanish** Ernesto EstrellaWGSS 032b, History of Sexuality** Maria Trumpler

Gay and Lesbian Studies

Courses in lesbian, gay, bisexual, transgender, and queer studies are offered through the Women's, Gender, and Sexuality Studies program. See under that program for specific course listings.

Gender Studies

(See under *Women's, Gender, and Sexuality Studies*.)

Geology and Geophysics

Director of undergraduate studies: David Evans, 210 KGL, 432-3127,
dai.evans@yale.edu, www.yale.edu/geology

FACULTY OF THE DEPARTMENT OF GEOLOGY AND GEOPHYSICS

Professors Jay Ague, David Bercovici (*Chair*), Ruth Blake, Mark Brandon, Derek Briggs, Leo Buss, Michael Donoghue, David Evans, Jacques Gauthier, Thomas Graedel, Leo Hickey, Shun-ichiro Karato, Jun Korenaga, Mark Pagani, Jeffrey Park, Danny Rye, Brian Skinner, Ronald Smith, Karl Turekian, Elisabeth Vrba, John Wettlaufer

Associate Professor Alexey Fedorov

Assistant Professors Hagit Affek, William Boos, Kanani Lee, Maureen Long, Trude Storelvmo, Mary-Louise Timmermans, Zhengrong Wang

Lecturer Catherine Skinner

The Geology and Geophysics program prepares students for the application of scientific principles and methods to the understanding of Earth, 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, integrating the study of Earth's deep interior, tectonic plates, oceans, atmosphere, climate, land surface, natural resources, and biota. The emphasis of the curriculum is on employing basic principles from the core sciences (physics, chemistry, 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 B.S. tracks emphasize hands-on research experience in field-work, in laboratories, or in 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.

B.S. degree program Majors in the B.S. program choose from four tracks: the atmosphere, ocean, and climate track, the environmental geosciences track, the paleontology and geobiology track, and the solid Earth sciences track. The tracks are suggested pathways to professional careers and to major areas of interest and research in geology and geophysics. Students may change tracks during their course of study with guidance from the director of undergraduate studies.

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 college-level chemistry (CHEM 112a, 113b; 114a, 115b; or 118a), physics (PHYS 180a, 181b and PHYS 165La, 166Lb), computing (ENAS 130b or equivalent), and mathematics through differential equations (MATH 120a or b and ENAS 194a or b). The major requirements consist of ten and one-half course credits beyond the prerequisites, including either the senior essay or the senior thesis. Students take one 100-level course or freshman seminar as an introduction to Earth processes (G&G 100a, 110a, 120b, 125b); a higher-level course in G&G can be substituted with the permission of the director of undergraduate studies. Core courses totaling five and one-half credits introduce students to Earth's climate system (G&G 140a and 141La), meteorology (G&G 322a), physical oceanography (G&G 335a), fluid mechanics (MENG 361a), and statistics or linear algebra (STAT 230b or 238a or MATH 222a or b). Three electives are chosen from topics in the environment; processes that govern the atmosphere, ocean, and land surface; physics; and statistics. A list of suggested electives is available from the office of the director of undergraduate studies or on the Web at www.yale.edu/geology. At least one elective must be from G&G.
2. The environmental geosciences track provides a scientific understanding of the natural and anthropogenic processes that shape the Earth-atmosphere-biosphere system. It emphasizes comparative studies of past and current Earth processes to inform models of the environment's future. The prerequisites are broad and flexible and include college-level chemistry (CHEM 112a, 113b; 114a, 115b; or 118a) and mathematics through multivariate calculus (MATH 120a or b). Depending on their area of focus, students may choose a prerequisite in physics (PHYS 170a, 171b; 180a, 181b; or 200a, 201b), or they may choose cellular biology (MCDB 120a) and evolutionary biology (E&EB 122b or G&G 125b). The major requirements consist of eleven courses beyond the prerequisites, including either the senior essay or the senior thesis. Students take two courses in G&G numbered 090–160 as an introduction to the Earth system (G&G 100a, 110a, 120b; G&G 125b may be used if the physics prerequisites are selected). Four core courses are chosen from topics in resource use and sustainability (G&G 205a), the microbiology

of surface and near-surface environments (G&G 255b), geochemical principles (G&G 301a), environmental chemistry and pollution (G&G 457a), climate (G&G 322a), and satellite-based image analysis (G&G 362b). Four electives selected from Geology and Geophysics, Environmental Studies, Ecology and Evolutionary Biology, and related fields provide a broad approach to scientific study of the environment. A list of suggested electives is available from the office of the director of undergraduate studies or on the Web at www.yale.edu/geology. Electives may be chosen from the core courses, and at least two must be from G&G.

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 (MCDB 120a and E&EB 122b) and chemistry (CHEM 112a, 113b; 114a, 115b; or 118a), and mathematics through multivariate calculus (MATH 120a or b). The major requirements consist of eleven courses beyond the prerequisites, including either the senior essay or the senior thesis. Students take G&G 110a to gain geological and environmental context, and they are introduced to the fossil record and evolution in G&G 125b. Four core courses give majors a comprehensive background in sedimentary rocks and rock correlation (G&G 230a), the study of evolution (G&G 250a), microbiology in past and present environments (G&G 255b), and statistical data analysis as applied to the life sciences (STAT 101a). Four electives selected from Geology and Geophysics, Ecology and Evolutionary Biology, Molecular, Cellular, and Developmental Biology, and related fields offer students maximum flexibility in pursuing their specific interests. A list of suggested electives is available from the office of the director of undergraduate studies or on the Web at www.yale.edu/geology. At least one elective must be from G&G.
4. The solid Earth sciences 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 for natural disasters such as earthquakes and volcanic eruption). 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 college-level chemistry (CHEM 112a, 113b; 114a, 115b; or 118a) and physics (PHYS 170a, 171b; 180a, 181b; or 200a, 201b), and mathematics through multivariate calculus (MATH 120a or b). The major requirements consist of eleven courses beyond the prerequisites, including either the senior essay or the senior thesis. Students take two courses in G&G numbered 090–160 as an introduction to the Earth system (G&G 100a, 110a, 120b, 125b, 140a). The core of the track consists of four courses chosen from topics in mantle dynamics, earthquakes, and

volcanoes (G&G 201a), mountain building and global tectonics (G&G 212b), rocks and minerals (G&G 220a), sedimentary rocks and processes (G&G 230a), and geochemical principles (G&G 301a). Students also select four electives in geology, geochemistry, geophysics, or related topics. A list of suggested electives is available from the office of the director of undergraduate studies or on the Web at www.yale.edu/geology. Electives may be chosen from core courses, and at least two must be from G&G.

B.A. degree program The B.A. degree in Geology and Natural Resources requires fewer upper-level courses than the B.S. degree. It may be more appropriate for students who wish to major in two separate Yale programs, who study geoscience in preparation for a career in law, business, government, or environmental fields, or who decide to pursue a science major only after the freshman year. The prerequisites include mathematics (MATH 115a or b), biology (MCDB 120a or G&G 255b), and chemistry (CHEM 103b; 112a, 113b; 114a, 115b; or 118a). The major requirements consist of nine courses beyond the prerequisites. These nine include two courses in G&G numbered 090–160; courses in natural resources (G&G 205a) and geochemistry (G&G 301a); and five additional courses at the 200 level or higher in Geology and Geophysics or Environmental Engineering, including either the senior essay or the senior thesis. Course selections can be guided by any of the B.S. tracks described above.

Senior requirement Seniors in both degree programs must prepare either a senior essay based on one term of library, laboratory, or field research (G&G 492a or b) or, with the consent of the faculty, a two-term senior thesis (G&G 490a, 491b), 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 director of undergraduate studies for approval of the thesis proposal. The petition should be submitted by the end of the junior year. If the two-term senior thesis is elected, G&G 491b may count as an elective toward the major. A copy of each senior thesis or senior essay is deposited in the archives of the Geology and Geophysics Library.

Geology and Geophysics majors may not employ the Credit/D/Fail option for their prerequisites or for courses in the major. With permission of the director of undergraduate studies, acceleration credits awarded on entrance may be used to satisfy prerequisites, even if the student does not choose to accelerate. Higher-level courses may, with the permission of the director of undergraduate studies, be substituted for prerequisites and for specific required courses. Qualified seniors are encouraged to enroll in graduate courses, with the permission of the directors of graduate and undergraduate studies.

Practical experience In addition to prerequisites and required courses in Geology and Geophysics, candidates for the B.A. and B.S. degrees are strongly encouraged to gain practical experience in the Earth sciences. 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 Geology and Geophysics, by other academic institutions, or by certain government agencies and private industries. Consult the director of undergraduate studies for further information.

REQUIREMENTS OF THE MAJOR

Prerequisites *B.A.* — MATH 115a or b; MCDB 120a or G&G 255b; CHEM 103b, or 112a, 113b, or 114a, 115b, or 118a; *B.S.* — *All tracks* — CHEM 112a, 113b, or 114a, 115b, or 118a; MATH 120a or b; *Atmosphere, ocean, and climate track* — ENAS 130b or equivalent; ENAS 194a or b; PHYS 180a, 181b, 165La, 166Lb; *Environmental geosciences track* — physics (PHYS 170a, 171b, or 180a, 181b, or 200a, 201b) or biology (MCDB 120a and either E&EB 122b or G&G 125b); *Paleontology and geobiology track* — MCDB 120a; E&EB 122b; *Solid Earth sciences track* — PHYS 170a, 171b, or 180a, 181b, or 200a, 201b

Number of courses *B.A.* — 9 term courses beyond prereqs for letter grades (incl senior req); *B.S.* — *Atmosphere, ocean, and climate track* — 10½ course credits beyond prereqs for letter grades (incl senior req); *Environmental geosciences, paleontology and geobiology, and solid Earth sciences tracks* — 11 courses beyond prereqs for letter grades (incl senior req)

Distribution of courses *B.A.* — 2 courses in G&G numbered 090–160; 5 addtl courses at 200 level or higher in G&G or Environmental Engineering; *B.S.* — *Atmosphere, ocean, and climate track* — 1 freshman sem or 100-level course in G&G; 3 electives as specified; *Environmental geosciences and solid Earth sciences tracks* — 2 courses in G&G numbered 090–160; 4 electives as specified; *Paleontology and geobiology track* — 4 electives as specified

Specific courses required *B.A.* — G&G 205a, 301a; *B.S.* — *Atmosphere, ocean, and climate track* — G&G 140a, 141La, 322a, 335a; MENG 361a; STAT 230b or 238a or MATH 222a or b; *Environmental geosciences track* — 4 from G&G 205a, 255b, 301a, 322a, 362b, 457a; *Paleontology and geobiology track* — G&G 110a, 125b, 230a, 250a, 255b, STAT 101a; *Solid Earth sciences track* — 4 from G&G 201a, 212b, 220a, 230a, 301a

Substitution permitted *All programs* — with DUS permission, higher-level courses for prereqs or required courses

Senior requirement *All programs* — senior essay (G&G 492a or b) or, with permission of faculty, two-term senior thesis (G&G 490a, 491b)

[G&G 100a, Natural Disasters]

G&G 110a, Introductory Geoscience Danny Rye

MW 11:35–12:50; lab F 11:35–12:50 SC (34)

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.

G&G 120b/EVST 125b, Earth's Changing Climate John Wettlaufer, Mark Pagani

MWF 9:25–10:15 SC (32)

Investigation of the science of contemporary climate change or "global warming." Historical and contemporary methods used by scientists to draw conclusions concerning Earth's complex climate system and human influences on it, and to predict future climates. Risk assessment, response options.

G&G 125b/E&EB 125b, History of Life Derek Briggs, Leo Hickey

TTH 11:35–12:50 SC (24)

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.

G&G 140a/EVST 201a, Atmosphere, Ocean, and Environmental Change

Ronald Smith

For description see under Environmental Studies.

***G&G 141La/EVST 202La, Laboratory for Atmosphere, Ocean, and Environmental Change** Ronald Smith

For description see under Environmental Studies.

***G&G 200b/EVST 200b, Earth System Science** Jeffrey Park

MW 9–10:15 SC (0)

A survey of geoscience. Interaction of lithosphere, hydrosphere, atmosphere, and Earth's deep interior; natural controls on environment and climate in past, present, and future; rocks, minerals, glaciers, earthquakes, and volcanoes; natural hazards and natural resources.

[G&G 201a, Mantle Dynamics, Earthquakes, and Volcanoes]**G&G 205a, Natural Resources and Their Sustainability** David Evans, Jay Ague

TTH 9–10:15 SC (0)

The formation and distribution of renewable and nonrenewable energy, mineral, and water resources. Topics include the consequences of extraction and use; depletion and the availability of substitutes; and economic and geopolitical issues. Recommended preparation: introductory chemistry and geology.

[G&G 207b, The Science of Water]***G&G 212b, Global Tectonics** David Evans, Mark Brandon

MWF 10:30–11:20 SC (33)

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 or permission of instructor. Enrollment limited to 15.

G&G 220a, Petrology and Mineralogy Jay Ague

TTH 1–2:15 SC (26)

Comprehensive study of the structures, chemistry, and physical properties of minerals. Interpretation of mineral associations and textures in terms of processes acting in the formation of igneous and metamorphic rocks. Study of the interplay between plate tectonics and the genesis of igneous and metamorphic rocks. After one year of college-level chemistry; G&G 110a recommended.

***G&G 222b, Origin of Everything** David Bercovici

MW 11:35–12:50 SC (o)

Study of major scientific origin hypotheses, including the origin of the universe, galaxies, the solar system and planets, continents, oceans, atmospheres, magnetic fields, and mono- and multicellular life. Climatic and geographical perspectives on the origin of civilizations and human history.

G&G 230a/ARCG 230a, Stratigraphy Leo Hickey

TTH 9–10:15 SC (22)

The nature and classification of sedimentary rock bodies; principles in determining their ages by fossils and other means; interpretation of depositional environments; the historical record of the dynamic response of sediments to mountain building, to changes in sea level and climate, and to the evolution of Earth's biota. Laboratory sessions include one overnight weekend field trip and one Saturday field trip. Prerequisite: CHEM 113b or higher or permission of instructor.

***G&G 240a, Forensic Geoscience** Maureen Long, Hagit Affek

MW 9–10:15 SC (o)

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.

G&G 247b/MATH 247b, Partial Differential Equations John Wettlaufer and staff

For description see under Mathematics.

G&G 250a^c, Paleontology and Evolutionary Theory Elisabeth Vrba

TTH 11:35–12:50 SC (24)

Current concepts in evolutionary and systematic theory with particular reference to how they apply to the fossil record. Emphasis on use of paleontological data to study evolutionary processes. After G&G 125b or a 100-level course in biological sciences.

G&G 255b/EVST 265b, Environmental Geomicrobiology Ruth Blake

TTH 1–2:15 SC (26)

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.

***G&G 261a^c/EVST 261a/F&ES 261a, Minerals and Human Health** Brian Skinner, Ruth Blake

TTH 11:35–12:50 SC (o)

Study of the interrelationships between Earth materials and processes and personal and public health. The transposition from the environment of the chemical elements essential for life. After one year of college-level chemistry or with permission of instructor; G&G 110a recommended.

G&G 280a, Organic Geochemistry Mark Pagani

TTH 2:30–3:45 SC (27)

Introduction to organic geochemistry and its applications in environmental reconstruction. Basic concepts of molecular chemistry and biochemistry, compound-specific carbon and hydrogen isotope distributions, and ancient temperature and carbon dioxide reconstruction. Prerequisite: CHEM 114a or equivalent.

G&G 300b^G, Mineral Deposits Brian Skinner

3 HTBA SC (o)

Introduction to formation and distribution of mineral deposits. After G&G 220a.

[G&G 301a^G, Introduction to Geochemistry]**G&G 308b^G, The Global Carbon Cycle** Hagit Affek

MW 9–10:15 SC (o)

The isotopic composition of atmospheric gases. Focus on carbon dioxide and the use of its isotopes to balance the atmospheric carbon budget. Discussion of other gases associated with the global carbon cycle. Prerequisite: CHEM 113b, 115b, 118a, or permission of instructor.

G&G 310a^G, Isotope Geochemistry Danny Rye, Zhengrong Wang

MWF 9:25–10:15 QR, SC (RP, 32)

Fundamental principles of stable and radiogenic isotope geochemistry. Emphasis on applications to specific geologic problems, including petrogenesis, geochronology, geothermometry, surface processes, hydrology, and biogeochemistry. Prerequisites: CHEM 113b, MATH 120a or b, and PHYS 171b or equivalents, or with permission of instructor.

G&G 312b^G, Structure and Deformation of the Lithosphere Mark Brandon

MWF 11:35–12:25; lab HTBA QR, SC (34)

An overview of deformational processes affecting the continental and oceanic lithosphere. Topics include basic concepts of stress and strain, rheology of the crust and mantle, and typical structures formed in the crust and mantle. Weekly laboratories offer hands-on experiments. Three weekend field trips provide exposure to natural examples of geologic structures. After G&G 110a, or with permission of instructor.

G&G 313a^G, Invertebrate Paleontology: Evolving Form and Function Derek Briggs

MW 11:35–12:50 (o)

Exploration of the basic constraints and potentials that controlled adaptive radiation in the evolution of the invertebrate skeleton.

G&G 315b^G, Paleobotany Leo Hickey

TTH 9–10:15; lab HTBA SC (22)

The evolutionary history of plants through geological time, the origin and diversification of their major lineages and of plant communities, and the interaction of plants and their physical environment. Laboratory exercises involve the study of fossil and modern plants. Prerequisite: one course from E&EB 122b, 160a, 246b, G&G 125b, or 230a; or permission of instructor.

G&G 319a^G, Introduction to the Physics and Chemistry of Earth Materials

Shun-ichiro Karato

TTH 11:35–12:50 QR, SC (24)

Basic principles that control the physical and chemical properties of Earth materials. Equation of state, phase transformations, chemical reactions, elastic properties, diffusion, kinetics of reaction and mass/energy transport. After MATH 120a or b, PHYS 181b, and CHEM 113b.

G&G 322a^c, Physics of Weather and Climate Trude Storelvmo

MW 9–10:15 QR, SC (32)

The climatic system; survey of atmospheric behavior and climatic change; meteorological measurements and analysis; formulation of physical principles governing weather and climate with selected applications to small- and large-scale phenomena. After PHYS 181b and MATH 120a or b, or equivalents.

G&G 323b^c, Climate Dynamics Alexey Fedorov

MW 11:35–12:50 QR, SC (0)

An introduction to climate dynamics. Special emphasis on phenomena controlled by large-scale interactions between the ocean and atmosphere, from El Niño to decadal climate variability. Topics include conceptual models of climate, general circulation of the atmosphere, ocean wind-driven and thermohaline circulation, abrupt climate changes, climate models by means of GCMs, and climate predictability. After PHYS 181b, MATH 120a or b or equivalent, and one course in meteorology or physical oceanography; or with permission of instructor.

G&G 326a^c, Introduction to Earth and Planetary Physics David Bercovici

MWF 10:30–11:20 QR, SC (33)

An introduction to the structure and dynamics of Earth and other planets in the context of cosmic evolution. Review of basic physical principles and their applications to geophysics and planetary physics. Star formation and nucleosynthesis; planetary accretion and the birth of the solar system; heat flow, plate tectonics, and mantle dynamics; seismology and geodesy; core dynamics, geomagnetism, and planetary magnetism. Prerequisites: PHYS 181b and MATH 120a or b, or equivalents.

G&G 333a^c, Paleogeography David Evans

TTH 2:30–3:45, 1 HTBA QR, SC (0)

Quantitative methods for measuring horizontal motions on Earth's surface. Histories of continental motions and supercontinents during the past three billion years. True polar wander. Study of the foundations of paleomagnetism, including experience with field sampling and laboratory data acquisition. Prerequisites: G&G 110a, or a G&G course numbered 200 or higher; or permission of instructor.

G&G 335a^c, Physical Oceanography Alexey Fedorov

MW 11:35–12:50 QR, SC (0)

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 181b and MATH 120a or b, or equivalent; or with permission of instructor.

G&G 342a/PHYS 342a, Introduction to Earth and Environmental Physics

Steven Lamoreaux

For description see under Physics.

G&G 350b^G, Petrogenesis of Mountain Belts Jay Ague

TTH 1–2:15, 1 HTBA SC (RP, 26)

Examination of the fundamental principles governing the formation of metamorphic and igneous rocks during mountain building. Topics include processes of heat and mass transfer in orogenic belts, generation of igneous rocks in continental and subduction settings, ultrahigh pressure and ultrahigh temperature metamorphism, spatial and temporal patterns of petrologic processes throughout geologic time, and pressure-temperature-time paths of metamorphic and igneous rocks. Prerequisites: G&G 220a or equivalent, MATH 120a or b, and CHEM 115b or 118a; or with permission of instructor.

[G&G 362b^G/ARCG 362b/EVST 362b, Observing Earth from Space]**G&G 370b, Regional Perspectives on Global Geoscience** David Evans, Mark Brandon

TTH 2:30–3:45 SC (O)

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 110a, 200b, or 212b.

[G&G 402b^G, Paleoclimates]**G&G 421b^G, Geophysical Fluid Dynamics** Mary-Louise Timmermans

TTH 1–2:15 QR, SC (26)

Derivation of the equations of a geophysical fluid. Analysis of the most important dynamical phenomena common to all planetary atmospheres, oceans, and interiors, with emphasis on the roles of planetary rotation, gravitation, and thermal gradients. After or concurrently with MENG 361a or equivalent and one course in meteorology or oceanography, or with permission of instructor.

G&G 440b^G/EVST 441b/F&ES 441b/MCDB 441b, Methods in Geomicrobiology

Ruth Blake

T 1–2:15; lab TH 1–4 SC (26)

A laboratory-based course providing interdisciplinary practical training in geomicrobiological methods including microbial enrichment and cultivation techniques; light, epifluorescence, and electron microscopy; and molecular methods (DNA extraction, PCR, T-RFLP, FISH). Prerequisite: college-level chemistry.

G&G 450b^G, Deformation of Earth Materials Shun-ichiro Karato

TTH 9–10:15 QR, SC (22)

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. After MATH 120a or b, PHYS 181b, and CHEM 113b; or equivalents.

[G&G 456b^G, Introduction to Seismology]**[G&G 457a^G, Marine, Atmospheric, and Surficial Geochemistry]**

G&G 467a⁶/ARCG 467a, Geochemical Approaches to Archaeology Karl Turekian

MW 9–10:15 SC, SO (o)

The use of geochemical techniques to address archaeological problems including radioactive dating, source identification, and production of artifacts, all in the context of environmental constraints in human development.

[G&G 485b/ENAS 485b, Wind Energy]***G&G 487b, Individual Study in Geology and Geophysics** David Evans

HTBA ½ Course cr (o)

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.

***G&G 488a and 489b, Research in Geology and Geophysics** David Evans

HTBA (o)

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.

***G&G 490a and 491b, Research and Senior Thesis** David Evans

HTBA Cr/year only (o)

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.

***G&G 492a or b, The Senior Essay** David Evans

HTBA (o)

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.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Courses in the Graduate School are open to undergraduates with permission of the instructor and the director of graduate studies. Descriptions of graduate courses are available at the office of the director of undergraduate studies.

Germanic Languages and Literatures

Director of undergraduate studies: Paul North, 323 WLH, 432-6401, p.north@yale.edu

FACULTY OF THE DEPARTMENT OF GERMANIC LANGUAGES AND LITERATURES

Professors Rüdiger Campe (*Chair*), Cyrus Hamlin (*Emeritus*), Carol Jacobs, Rainer Nägele, Brigitte Peucker, Henry Sussman (*Visiting*)

Associate Professor Kirk Wetters

Assistant Professor Paul North

Lecturers Anthony Niesz, William Whobrey

Senior Lector II Marion Gehlker (*Language Coordinator*)

Senior Lector Howard Stern

The major in German is a liberal arts major whose aim is to provide competence in the German language and an understanding of German literature and culture in the context of European civilization. Although by no means restricted to prospective teachers or graduate students in German, the major provides background for professional work in these pursuits.

Prerequisite Students choosing the major should have completed GMAN 110a or b and 120a or b or have received equivalent credit through advanced placement or study abroad.

The major The major consists of eleven term courses, for a total of twelve course credits, including GMAN 130a or b, 140a or b, and 150a or b; one course from the German Modernities series, GMST 180–189; two introductory courses in German literature numbered GMAN 171–179 and conducted in German; and the senior essay. All courses in the major must be taken for a letter grade. The remaining courses to fulfill the major are chosen from Group B (conducted in German), up to two courses from Group C (conducted in English), one additional language course from Group A numbered 160 or above, and, with prior approval of the director of undergraduate studies, up to two term courses taken outside the department but bearing directly on the German cultural context.

Senior requirement for the standard major (one-term senior essay) Seniors in the standard German major enroll in GMAN 492a, a guided senior essay tutorial course. Students meet on a biweekly basis with the director of undergraduate studies 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. A preliminary statement indicating the general area to be dealt with and the choice of adviser should be submitted to the director of undergraduate studies by September 10; a three-page prospectus and bibliography are due by October 1. A rough draft must be submitted to the adviser by November 5. The completed essay, due on December 3, is graded jointly by the adviser and a designated faculty reader.

The intensive major (two-term senior essay) The intensive major is designed for students who wish to undertake a more extensive project of research and writing during their senior year. Requirements for the intensive major are the same as for the standard major, except that the intensive major requires twelve term courses (totaling thirteen course credits) beyond the prerequisite, of which two are devoted to the preparation of the senior essay (GMAN 492a and 493b). This essay, written under the direction of a faculty adviser, should be between sixty and seventy-five pages in length and should be presented no

later than April 22 of the senior year. The second term of essay preparation is undertaken independently, without tutorial support. The essay is graded jointly by the adviser and a designated faculty reader.

Group A courses Courses in Group A (GMAN 110–169) include elementary, intermediate, and advanced language courses. Only one advanced language course at the level of 160 and above may count toward the major.

Group B courses Courses in Group B (GMAN 171 and above) are advanced courses and count toward the major. Readings are in German, and the language of instruction is usually German.

Group C courses Courses in Group C are conducted in English with texts in translation. Only two term courses from this group may count toward the major.

Candidates for the major in German should consult the director of undergraduate studies.

Summer study and study abroad Students may take Intermediate German or German for Reading during the summer in New Haven and/or Berlin. For information, contact the director of undergraduate studies or the language coordinator. Students are urged to consider the Year or Term Abroad program, for which appropriate course credit toward the major is granted. Such study 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 all 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 chapter II of this bulletin.

German Studies In addition to the major in German literature, there is also a major in German Studies, an interdisciplinary study of the cultural, historical, and political life of the German-speaking peoples. See German Studies in the text below.

Placement The written part of the departmental placement examination will be administered on Sunday, August 29, from 2 to 3:15 p.m. in 207 WLH, followed by a five-minute oral interview between 3:15 and 4:45 p.m. A makeup examination will be administered on Tuesday, August 31, from 9 to 10:15 a.m. in 207 WLH. Students wishing to take the placement exam in January should sign up with the language coordinator by December 10, 2010. Students may also consult with the director of undergraduate studies or the language coordinator 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 110a or b or 125a.

REQUIREMENTS OF THE MAJOR

Prerequisite GMAN 110a or b and 120a or b, or equivalent

Number of courses 11 term courses, totaling 12 course credits, beyond prereq (incl senior essay) for letter grades

Specific courses required GMAN 130a or b, 140a or b, 150a or b; 2 from Group B courses numbered 171–179; 1 from GMST 180–189

Distribution of courses No more than 1 advanced lang course; no more than 2 Group C courses; with DUS approval, 2 term courses outside dept

Substitution permitted With DUS approval, courses taken on Year or Term Abroad for other courses in major

Senior requirement Senior essay tutorial (GMAN 492a)

Intensive major 12 term courses, totaling 13 course credits, beyond prereq for letter grades, incl two-term senior essay (GMAN 492a and 493b)

GROUP A COURSES

GMAN 110a or b, Elementary German I Marion Gehlker and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

A beginning course in spoken and written German that combines oral practice and cultural awareness with a solid foundation in grammar and vocabulary. Listening comprehension through online audio exercises and in-class video clips. Topics include family and school life, German-speaking countries, short literary readings by Hesse, Goethe, and Wondratschek, popular music, and the feature film *Lola rennt*. Tutors are available for extra help or for advanced practice. To be followed by GMAN 120a or b. Enrollment limited to 14 per section. Credit only on completion of GMAN 120a or b.

GMAN 120a or b, Elementary German II Marion Gehlker

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of GMAN 110a or b. Topics include German history, the environment, multi-cultural Germany, Austria, and Switzerland, popular music, a soap opera, and the feature film *Das schreckliche Mädchen*. Listening comprehension through online audio exercises and in-class video clips. Students read poems by Goethe and Jandl and short stories by Bichsel, Brecht, and Kafka. Tutors are available for extra help or for advanced practice. To be followed by GMAN 130a or b. Enrollment limited to 14 per section.

GMAN 125a, Intensive German I Howard Stern

MTWTHF 9:25–10:15; MTWTH 10:30–11:20 L1–L2 2 Course cr (RP, 0)

Intensive training in speaking, reading, writing, and comprehending the language. Focus on the mastery of formal grammar. For beginning students of superior linguistic ability.

GMAN 130a or b, Intermediate German I Marion Gehlker and staff

5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (RP, 0)

Builds on and expands knowledge acquired in GMAN 120a or b. A content-based class that helps students improve their oral and written linguistic skills and their cultural awareness through texts and audiovisual materials relating to German literature, culture, history, and politics. Topics include German universities, Berlin or Frankfurt, Germany before and after the Berlin Wall, and interpersonal relationships. Course materials include online listening comprehension exercises, poems and short stories by Kafka, Brecht, Kästner, Schneider, and Kaschnitz, popular and classical music, and feature films. Tutors are available for extra help or for advanced practice. After GMAN 120a or b or according to placement examination. To be followed by GMAN 140a or b. Enrollment limited to 14 per section.

GMAN 140a or b, Intermediate German II Marion Gehlker

5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 0)

Continuation of GMAN 130a or b. Topics include multicultural Germany, globalization, pacifism, and music and politics. Readings include fiction and nonfiction texts by Celan, Kaminer, and Einstein and a full-length novel. Tutors are available for extra help or for advanced practice. After GMAN 130a or b or according to placement examination. Normally followed by GMAN 150a or b or, with permission of the director of undergraduate studies, by GMAN 171a. Enrollment limited to 14 per section.

GMAN 145b, Intensive German II Howard Stern

MTWTHF 9:25–10:15; MTWTH 10:30–11:20 L3–L4 2 Course cr (RP, 0)

Continuation of GMAN 125a. Focus on speaking, writing, and the conversion of grammatical knowledge into reading competence for literary and scholarly purposes. Prerequisite: GMAN 125a.

GMAN 150a or b, Advanced German I Gabriela Stoicea [F], Anthony Niesz [Sp]

HTBA For sections see www.yale.edu/oci L5 (61)

An advanced language course intended to improve students' proficiency in aural and reading comprehension, as well as in speaking and writing. Discussion of literary texts by major German authors. Emphasis on vocabulary expansion with specialized grammatical review and a focus on stylistic development in students' writing. Recommended for students planning to use the language practically and as preparation for higher-level courses in both language and literature. After GMAN 140a or b or 145b. For entering students with a score of 5 on the German Advanced Placement test, or according to results of the placement examination.

GMAN 160b, German Culture, History, and Politics in Text and Film Marion Gehlker

TTH 11:35–12:50 L5 (0)

An advanced language course focusing on improving upper-level language skills through the discussion of selected aspects of German culture, politics, and history in literary and nonliterary texts and film. Topics include the Weimar Republic, youth movements, social democracy, *Vergangenheitsbewältigung*, and postwar developments. Frequent oral and written assignments; emphasis on vocabulary building. After GMAN 140a or b, 145b, or 150a or b.

GMAN 168a, Current Events in Germany Anthony Niesz

MW 11:35–12:50 L5 (34)

Analysis and discussion of news stories and articles from online German periodicals. Composition and revision of essays on current events of interest to students, with a focus on improving both style and grammar. After GMAN 150a or b or with permission of instructor.

GROUP B COURSES

Courses in this group are open to students who have successfully completed GMAN 150a or b or the equivalent. Conducted in German with readings in German, unless otherwise indicated.

***GMAN 171a, Introduction to German Prose Narrative** Kirk Wetters

TTH 11:35–12:50 L5 (0)

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.

***GMAN 172b, Introduction to German Theater** Paul North

TTH 11:35–12:50 L5, HU (o)

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.

***GMAN 338a⁶, The Poetry of Walther von der Vogelweide** William Whobrey

TTH 11:35–12:50 HU (o)

A survey of one of the Middle Ages' most prolific and versatile poets. Walther's work ranges from the typical high *minnesang* to political satire, moral instruction, parody, and propaganda. Questions of transmission, musicality, artistic rivalry, and patronage. Poems read in Middle High German. Prerequisite: reading knowledge of modern German.

GROUP C COURSES

Unless otherwise indicated, courses in this group are conducted in English with both readings and discussion in English. The courses are open to all students in Yale College.

***GMAN 191a/LITR 334a, Problems of Lyric** Howard Stern

For description see under Literature.

***GMAN 192b/LITR 467b, The Prose Labyrinth** Howard Stern

For description see under Literature.

***GMAN 303a/GMST 303a/LITR 236a, Goethe's Poetic Revolution** Rainer Nägele

TH 1:30–3:20 HU (o)

An introduction to Goethe's poetry, which radically changed the range and language of German poetry and shaped the history of poetry into the twentieth century. Poems read in the original language. Prerequisite: reading knowledge of German.

***GMAN 335a⁶/GMST 335a/LITR 219a, Brecht, Artaud, Müller, and the Modern Theater** Rainer Nägele

W 1:30–3:20 HU Tr (o)

An investigation of three major playwrights and theoreticians of the theater in the twentieth century. Particular attention to the relationship among body, gesture, and language. Discussion in English; texts available in the original German or French.

***GMAN 351b⁶/GMST 351b/LITR 224b, Hölderlin, Kafka, Benjamin** Rainer Nägele

W 1:30–3:20 HU Tr (o)

The relationship between life and literature. Readings include literary texts and theoretical reflections by Hölderlin, Kafka, and Benjamin. Discussion in English; reading knowledge of German strongly encouraged.

***GMAN 356a/GMST 356a/HUMS 294a, Dream and Interpretation** Paul North

T 1:30–3:20 HU (o)

Dreams in literature, film, diaries, and dream books, with reference to Sigmund Freud's *Interpretation of Dreams*.

***GMAN 357a^G/GMST 357a/HUMS 329a, Nietzsche and His Readers** Paul North

W 3:30–5:20 HU (o)

Reading and discussion of Friedrich Nietzsche's major texts, as well as critiques and interpretations by some of his most influential twentieth-century readers.

***GMAN 405a^G/FILM 468a^G/GMST 405a/LITR 394a, Weimar Cinema**

Brigitte Peucker

For description see under Film Studies.

PHIL 403a, Nietzsche: Truth, Value, and Tragedy** Karsten HarriesPHIL 404b, Heidegger: *Being and Time*** Karsten Harries***PLSC 309b^G/PHIL 454b^G, Contemporary Critical Theory** Seyla Benhabib

For description see under Political Science.

READING COURSE

GMAN 100a and 101b, German for Reading Melissa Ingersoll [F],

Marion Gehlker [Sp]

MWF 10:30–11:20 Cr/year only (33)

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 478a or b, Directed Readings or Individual Research in Germanic Languages and Literatures** Paul North

HTBA (o)

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 493b, The Senior Essay Tutorial** Paul North

HTBA (o)

Preparation of an original essay under the direction of a faculty adviser.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

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 from the office of the director of undergraduate studies.

German Studies

Director of undergraduate studies: Paul North, 323 WLH, 432-6401, p.north@yale.edu

FACULTY ASSOCIATED WITH THE MAJOR

Professors David Cameron (*Political Science*), Rüdiger Campe (*German*), Michael Friedmann (*Adjunct*) (*Music*), Timothy Guinnane (*Economics*), Cyrus Hamlin (*Emeritus*) (*German*), *Karsten Harries (*Philosophy*), Carol Jacobs (*German*), Rainer Nägele (*German*), *Brigitte Peucker (*German, Film Studies*), Steven Smith (*Political Science*), Henry Sussman (*German*) (*Visiting*), J. Adam Tooze (*History*), Katie Trumpener (*Comparative Literature, English*), Frank Turner (*History*), Christopher Wood (*History of Art*)

Associate Professor Kirk Wetters (*German*)

Assistant Professor Paul North (*German*)

*Member of the Advisory Committee for the program.

The major in German Studies offers an interdisciplinary approach to the study of the German cultural tradition in history, philosophy, the visual arts, music, film studies, politics, and culture, with a German-language requirement. The major draws on several departments and programs along with core courses in German Studies. It is particularly suited to students wishing to combine interests in German language and culture with intensive work in another discipline.

In German Studies, students have the freedom to develop a program of courses to meet their particular needs and interests. Through consultation with the director of undergraduate studies, each student is expected to define a focus of concentration within the major. Interested students should contact the director of undergraduate studies to begin planning their course of study.

Two majors The German Studies major is particularly well suited for students who wish to fulfill the requirements of two majors. For such students, the focus of concentration within the German Studies major often reflects or augments the other elected major.

Prerequisite Students choosing the German Studies major should have completed GMAN 110a or b and 120a or b or have received equivalent credit through advanced placement or study abroad.

The major The major consists of twelve term courses, for a total of thirteen course credits, including GMAN 130a or b and 140a or b or equivalent; GMAN 150a or b; two courses from the German Modernities series, numbered GMST 180–189; one German literature course numbered GMAN 171–179; and the senior essay. The remaining five courses must include four term courses that together constitute a focus of concentration. One of the courses in the concentration, taken in the spring of the junior year, is designated as the junior seminar. Students in the standard major elect one additional advanced seminar in German literature or culture. Students in the intensive major complete a two-term senior essay instead of taking the additional advanced seminar. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Focus of concentration and junior seminar The junior seminar and three other term courses are chosen from inside or outside the department after consultation with the director of undergraduate studies. This cluster of courses constitutes a focus of concentration in a discipline or area of study related to the major; examples of areas of concentration are history, philosophy, Germanic languages and literatures, psychology, sociology, political and social theory, European studies, film studies, history, humanities, history of art, and music. During the spring term of the junior year, each student selects one seminar in the focus of concentration as the designated junior seminar. This seminar provides the student with bibliographic and research skills that lay a foundation for work on the senior essay, and it culminates in the submission of a substantial term paper, ordinarily twenty-five pages.

Senior requirement for the standard major (one-term senior essay) Seniors in the standard German Studies major enroll in GMST 490a or b, a guided senior essay tutorial course. Students meet on a biweekly basis with the director of undergraduate studies 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 director of undergraduate studies by September 10, 2010; a three-page prospectus and a bibliography are due by October 8. A rough draft must be submitted to the adviser by November 11. The completed essay, due on December 3, is judged by the faculty adviser and a second reader.

Intensive major (two-term senior essay) 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 GMST 491a 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 director of undergraduate studies by October 22, 2010. The student must submit a draft of at least fifteen pages of the essay by December 3 to receive credit for the first term of the course. The second term, GMST 492b, is devoted to completing the essay, which should be substantial (between fifty and sixty pages); the completed essay must be submitted by April 22, 2011. The senior essay is judged by the faculty adviser and a second reader.

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 chapter II of this bulletin.

REQUIREMENTS OF THE MAJOR

Prerequisite GMAN 110a or b and 120a or b or equivalent

Number of courses 12 term courses, totaling 13 course credits, beyond prereq (incl senior essay) for letter grades

Specific courses required GMAN 130a or b, 140a or b, 150a or b; 2 courses numbered GMST 180–189; 1 course numbered GMAN 171–179

Distribution of courses 4 term courses constituting a focus of concentration, 1 of them the junior sem; 1 addtl advanced sem in German lit or culture

Substitution permitted With DUS approval, courses taken on Year or Term Abroad for other courses in major

Senior requirement Senior essay (GMST 490a or b)

Intensive major two-term senior essay (GMST 491a, 492b), instead of 1 addtl advanced sem

GERMAN MODERNITIES

***GMST 181b/HUMS 320b, Ideology, Revolution, Religion** Paul North

MW 11:35–12:50 HU (0)

The tension between radicality and conservatism that characterized German culture from the Enlightenment to World War II. Introduction to the philosophical speculation, sociological critique, psychological theory, and literary and theatrical productions that both tried to resolve and helped to maintain this tension. Readings from the works of Goethe, Kant, Kleist, Marx, Nietzsche, Kafka, and Freud.

GERMAN LITERATURE AND CULTURE

***GMST 200b/HUMS 293b/LITR 211b, Roots of Modernity** R. Howard Bloch, Rüdiger Campe

For description see under Humanities.

***GMST 303a/GMAN 303a/LITR 236a, Goethe's Poetic Revolution** Rainer Nägele

For description see under Germanic Languages & Literatures.

***GMST 335a/GMAN 335a^C/LITR 219a, Brecht, Artaud, Müller, and the Modern Theater** Rainer Nägele

For description see under Germanic Languages & Literatures.

***GMST 351b/GMAN 351b^C/LITR 224b, Hölderlin, Kafka, Benjamin** Rainer Nägele

For description see under Germanic Languages & Literatures.

***GMST 356a/GMAN 356a/HUMS 294a, Dream and Interpretation** Paul North

For description see under Germanic Languages & Literatures.

***GMST 357a/GMAN 357a^C/HUMS 329a, Nietzsche and His Readers** Paul North

For description see under Germanic Languages & Literatures.

***GMST 405a/FILM 468a^G/GMAN 405a^G/LITR 394a, Weimar Cinema**

Brigitte Peucker

For description see under Film Studies.

PHIL 403a, Nietzsche: Truth, Value, and Tragedy** Karsten HarriesPHIL 404b, Heidegger: *Being and Time*** Karsten Harries***PLSC 309b^G/PHIL 454b^G, Contemporary Critical Theory** Seyla Benhabib

For description see under Political Science.

ADVANCED COURSES***GMST 479a or b, Directed Readings or Individual Research in German Studies**

Paul North

HTBA (o)

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.

***GMST 490a or b, The Senior Essay for the Standard Major** Paul North

HTBA (o)

Preparation of a one-term senior essay, typically during the fall term, under the supervision of a member of the faculty.

***GMST 491a and 492b, The Senior Essay for the Intensive Major** Paul North

HTBA (o)

Preparation of a two-term senior essay under the supervision of a member of the faculty.

Global Health Studies

Program adviser: Kaveh Khoshnood, 405 LEPH, 785-2920, healthstudies@yale.edu

GLOBAL HEALTH STUDIES ADVISORY COMMITTEE

Julia Adams (*Sociology*), Elizabeth Bradley (*Public Health*), Sean Brotherton (*Anthropology*), Hannah Brueckner (*Sociology*), Cheryl Doss (*Global Affairs*), Robert DuBrow (*Public Health*), Jane Edwards (*Yale College Dean's Office*), Howard Forman (*School of Medicine*), Marcia Inhorn (*Anthropology*), Kaveh Khoshnood (*Public Health*), William Segraves (*Yale College Dean's Office*), Michael Skonieczny (*Public Health*), David Smith (*Social and Policy Studies*), Dieter Söll (*Molecular Biophysics & Biochemistry*), Christopher Udry (*Economics*), John Wargo (*Forestry & Environmental Studies*), John Warner (*History of Medicine*), Robert Wyman (*Molecular, Cellular, & Developmental Biology*)

Issues related to health are among the most important challenges facing societies, both domestically and globally. Finding solutions to health-related problems requires multi-disciplinary 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. Yale College offers courses through an interdisciplinary health studies framework, bringing together the natural sciences, the social sciences, and the humanities.

To make the best possible use of institutional resources, students are encouraged to form a coherent plan of study in the area of global health. The advisory committee has identified the building blocks for such a plan, with a core of courses in four areas: a course in global health, for example HLTH 230b; a course in health care systems, such as ECON 170a; a research methodology course, such as HLTH 325a or PSYC 235a; and a course in the biological and social determinants of health. Courses in the graduate and professional schools can sometimes fulfill the core areas. All students interested in this field need a working knowledge of statistics, and STAT 100–106, 230b or higher, or PSYC 200b offer excellent preparation. Students expand their program with elective courses from the wide range offered by Yale College.

Students should supplement their classroom experience with applications in the community, whether in the United States or abroad. Internships and research projects developed with the guidance of the faculty build on classroom work and in some cases lead to senior theses and projects.

For information about the five-year B.A.–B.S./M.P.H. degree program offered jointly with the School of Public Health, see under Public Health.

HEALTH STUDIES COURSES

***HLTH 155a/MCDB 106a, Biology of Malaria, Lyme, and Other Vector-Borne Diseases**
Alexia Belperron

For description see under Biology.

HLTH 170a/AMST 247a/HIST 147a/HSBM 202a⁶, Media and Medicine in Modern America John Warner, Gretchen Berland

For description see under History of Science, History of Medicine.

HLTH 215b/PSYC 319b, Health Psychology Benjamin Toll

WF 1–2:15 SO (o)

An introduction to health behaviors and ways in which they can be altered. Health-compromising behaviors such as the use of alcohol, drugs, and tobacco; the impact of health psychology on problems such as stress, pain management, AIDS, and cancer.

***HLTH 230b/INTS 241b, Global Health: Challenges and Promises**

Kaveh Khoshnood

TTH 4–5:15 SO (o)

Overview of pertinent issues in global health challenges of our time, with a focus on resource-limited countries and the health of the poor. Introduction to key concepts of global health and the critical links between health and social and economic development. Emphasis on the importance of a multidisciplinary approach to global health challenges. Enrollment limited to 30 juniors and seniors.

***HLTH 325a/INTS 249a^c/LAST 416a, Methods and Ethics in Global Health Research**

Kaveh Khoshnood

For description see under International Studies.

***HLTH 450b/INTS 349b^c/PLSC 121b, Strategic Thinking in Global Health**

Elizabeth Bradley and staff

M 3:30–5:20 SO (37)

Core principles for the development and implementation of grand strategy in addressing common global health problems. Application of these principles and of strategic problem solving at both conceptual and practical levels. Political and policy analysis, organizational theory, and leadership skills central to addressing global health issues in low- and middle-income countries.

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

For description see under American Studies.

***ANTH 234b/WGSS 234b, Disability and Culture** Karen Nakamura

For description see under Anthropology.

***CHLD 350a or b/PSYC 350a or b, Autism and Related Disorders** Ami Klin,

Fred Volkmar

For description see under Child Study Center.

E&EB 228b^c, Ecology and Evolution of Infectious Diseases Paul Turner

For description see under Biology.

***E&EB 235a, Evolution and Medicine** Stephen Stearns

For description see under Biology.

***E&EB 460b^c, Studies in Evolutionary Medicine I** Stephen Stearns and staff

For description see under Biology.

***E&EB 461a^c, Studies in Evolutionary Medicine II** Paul Turner

For description see under Biology.

***ECON 405b, Health Economics and Public Policy** Amanda Kowalski

***ENGL 328a, Medicine and Ethics in Global Literature** Shital Pravinchandra

HIST 234b/HSBM 235b, Epidemics and Society in the West since 1600

Frank Snowden

For description see under History.

HSBM 215a^c/HIST 140a, Public Health in America, 1793–2000 Naomi Rogers

For description see under History of Science, History of Medicine.

HSBM 225b/HIST 359b, Medicine and Public Health in Latin America, 1820–2000

Mariola Espinosa

For description see under History of Science, History of Medicine.

***HSBM 442a/HIST 430Ja, Disease, Public Health, and Empire** Mariola Espinosa

For description see under History of Science, History of Medicine.

***HSHM 445b/HIST 142Jb/WGSS 453b, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

For description see under History of Science, History of Medicine.

***HUMS 076a, Epidemics in Global Perspective** William Summers

***MCDB 107a, Human Biology** Mitchell Kundel, William Segraves

For description see under Biology.

***MCDB 109b, Immunology and Microorganisms** Paula Kavathas

For description see under Biology.

MCDB 150b^G/HIST 400b, Global Problems of Population Growth Robert Wyman, Fabian Drixler

For description see under Biology.

MCDB 240b, Biology of Reproduction Hugh Taylor, Mary Klein

For description see under Biology.

PLSC 257b/EP&E 343b, Bioethics and Law Stephen Latham

For description see under Political Science.

PLSC 281a^G/RLST 273a^G, Moral, Religious, and Social Issues in Bioethics

David Smith

For description see under Political Science.

PSYC 147b, Animal Models of Clinical Disorders Nelson Donegan

***PSYC 355a and 356b, Clinical Psychology in the Community** Kristi Lockhart

***SOCY 035b/WGSS 035b, Reproductive and Genetic Technologies** Rene Almeling

For description see under Sociology.

WGSS 120a, Women, Food, and Culture Maria Trumpler

***WGSS 323b/AFST 323b/ANTH 239b/SOCY 191b, HIV and AIDS in Africa**

Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Qualified students may take graduate courses at the School of Public Health, subject to the restrictions on graduate and professional school enrollment described in chapter II, section K. A list of graduate and professional school offerings and other resources to support learning in areas related to health can be found on the Health Studies Web site at www.yale.edu/yalecollege/healthstudies/courses.html. Further information about these courses and other graduate offerings can be found in the School of Public Health bulletin.

Greek

(See under Classics and under Hellenic Studies.)

Health Studies

(See under *Global Health Studies*.)

Hebrew

(See under *Near Eastern Languages and Civilizations*.)

Hellenic Studies

Directors: Stathis Kalyvas, 115 Prospect Pl., 432-5386, stathis.kalyvas@yale.edu;
John Geanakoplos, 30 Hillhouse Ave., 432-3397, john.geanakoplos@yale.edu; associate
program chair: George Syrimis, 34 Hillhouse Ave., 432-9342, george.syrimis@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF HELLENIC STUDIES

Professors John Geanakoplos (*Economics*), Stathis Kalyvas (*Political Science*)

Lecturers Konstantina Maragkou (*History*), George Syrimis (*Comparative Literature*)

Lector Maria Kaliambou

Hellenic Studies is a program of the Council on European Studies. 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, 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 associate program chair of the Hellenic Studies program or to contact Kris Mooseker at 432-3431.

MGRK 110a^G, Elementary Modern Greek I Maria Kaliambou

MTWTH 9:25–10:15, 1 HTBA L1 1½ Course cr (61)

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. Credit only on completion of MGRK 120b.

MGRK 120b^G, Elementary Modern Greek II Maria Kaliambou

MTWTH 9:25–10:15, 1 HTBA L2 1½ Course cr (61)

Continuation of MGRK 110a. Prerequisite: MGRK 110a.

MGRK 130a^G, Intermediate Modern Greek I Maria Kaliambou

MTWTH 10:30–11:20, 1 HTBA L3 1½ Course cr (61)

Development of proficiency in understanding, speaking, reading, and writing modern Greek. Extensive use of authentic contemporary resources. Continued familiarization with contemporary Greek culture. Prerequisite: MGRK 120b or satisfactory placement test.

MGRK 140b^G, Intermediate Modern Greek II Maria Kaliambou

MTWTH 10:30–11:20, 1 HTBA L4 1½ Course cr (61)

Continuation of MGRK 130a. Further development of proficiency in the four language skills. In-class presentation of short research projects related to modern Greece. Prerequisite: MGRK 130a or satisfactory placement test.

***MGRK 150a, Greek Oral Literature** Maria Kaliambou

MW 1–2:15 L5 (o)

An advanced language course intended to develop all four language skills. Readings include folktales, myths, legends, and ballads in standard and idiomatic modern Greek. In-depth cultural analysis. Presentation of research projects.

***MGRK 213a/FILM 421a/HUMS 414a/INTS 380a/WGSS 261a, Cinema of Migration**
George Syrimis

F 1:30–3:20 WR, HU (o)

Cinematic representations of the migrant experience in the last thirty years, with some emphasis on the post–Cold War period. Focus on southeastern Europe and its migrant populations. Topics include identity, gender, sexual exploitation and violence, and nationalism and ethnicity.

***MGRK 214b/ENGL 243b/HUMS 428b/LITR 207b/WGSS 215b, Modern Literature and the Eastern Mediterranean** Langdon Hammer, George Syrimis

W 3:30–5:20 HU (o)

The formative influence of C. P. Cavafy in the twentieth-century Anglo-American literary tradition. Nationalism and imperialism, sexuality and aesthetics, biography and art, sapphic verse, the reception of the classical tradition, and the topography of modernity. Writers' fascination with the eastern Mediterranean as an alternative locus for modern Greek, English, and American identities.

MGRK 225b/HIST 243b/INTS 374b, Occupied Europe during World War II

Konstantina Maragkou

TTH 1–2:15 HU (26)

The immediate causes, experience, and consequences of the conquest and occupation of European countries during World War II. Comparison of occupation experiences under different conquerors, with an emphasis on Nazi and Soviet rule. Occupational patterns, resistance and genocide, and the impact of military and diplomatic events on the internal social and political developments of individual European nations. Greece used as a case study.

***MGRK 228a/HIST 205Ja, Greece in the Twentieth Century** Konstantina Maragkou

T 3:30–5:30 HU (o)

The history of modern and contemporary Greece. Recent political developments, economic and cultural aspects, and international relations.

***MGRK 229b/HIST 248Jb, Twentieth-Century Balkan Instability**

Konstantina Maragkou

For description see under History.

***MGRK 450a and 451b, Senior Seminar in Modern Greek Literature** George Syrimis

HTBA L5 (o)

A senior seminar in modern Greek literature for students with advanced proficiency in modern Greek. May be offered toward the major in Ancient and Modern Greek.

***MGRK 481a, Independent Tutorial** Staff

HTBA (o)

For students with advanced language skills in modern Greek who wish to engage in individual study or concentrated reading and research on material not otherwise offered in courses. Applicants submit a detailed project proposal to the language studies coordinator. The student must meet with the instructor for at least one hour each week, and the work must terminate in a term paper or its equivalent.

Hindi

(See under *South Asian Studies*.)

History

Director of undergraduate studies: Jennifer Klein, 216 HGS, 432-1355,
jennifer.klein@yale.edu

FACULTY OF THE DEPARTMENT OF HISTORY

Professors Jean-Christophe Agnew, Abbas Amanat, Ned Blackhawk, David Blight, Daniel Botsman, Paul Bushkovitch, Jon Butler, George Chauncey, Michael Denning, Carlos Eire, Laura Engelstein (*Chair*), John Mack Faragher, Antonia Finnane (*Visiting*), Paul Freedman, Joanne Freeman, John Gaddis, Glenda Gilmore, Bruce Gordon, Robert W. Gordon, Valerie Hansen, Robert Harms, Jonathan Holloway, Paula Hyman, Matthew Jacobson, Gilbert Joseph, Donald Kagan, Paul Kennedy, Daniel Kevles, Benedict Kiernan, Jennifer Klein, Naomi Lamoreaux, Bentley Layton, Mary Lui, Joseph Manning, Ivan Marcus, John Matthews, John Merriman, Joanne Meyerowitz, Peter Perdue, Steven Pincus, Stephen Pitti, Cynthia Russett, Lamin Sanneh, Stuart Schwartz, Frank Snowden, Timothy Snyder, Harry Stout, J. Adam Tooze, Francesca Trivellato, Frank Turner, John Warner, Anders Winroth, Jay Winter, John Witt, Keith Wrightson

Associate Professors Bruno Cabanes, Jane Calvert (*Visiting*), Beverly Gage, Naomi Rogers, Marci Shore

Assistant Professors Paola Bertucci, Patrick Cohrs, Fabian Drixler, Mariola Espinosa, Alan Mikhail, Alyssa Mt. Pleasant, Edward Rugemer, Paul Sabin, Eliyahu Stern, Bruno Strasser, Jenifer Van Vleck, G. Charles Walton, Kariann Yokota

Senior Lecturers Annping Chin, Becky Conekin, Bettyann Kevles, Stuart Semmel

Lecturers Adel Allouche, Kyle Farley, Jay Gitlin, Veronika Grimm, María Jordán, George Levesque, Konstantina Maragkou, William Metcalf, Micha Perry, Jonathan Schell, William Summers, Rebecca Tannenbaum

Unless designated by a star, courses in History are open to all students in Yale College. Unstarred courses, however, are liable to be limited in their enrollment (“capped”) at the beginning of the term, depending on the number of teaching assistants available.

A student who declares a History major is assigned an adviser from among the departmental faculty. The adviser is available throughout the year for consultation about courses and the major. At the beginning of each term, students majoring in History must have their departmental adviser approve and sign their schedules. It is possible for students to change advisers provided they obtain the written consent of the new adviser.

The major The prerequisite for entering the History major is two term courses in history. Courses completed in fulfillment of the prerequisite may be applied to the requirements of the major.

Selection of courses The Department of History strongly urges each student to devise a program of study that, while meeting individual interests and needs, also achieves a balance between diversification and specialization. Exposure to a variety of areas of history is desirable first because only wide-ranging experience can give students confidence in having discovered their own true interests and aptitudes. Equally important, studying various times and societies, including preindustrial ones, prevents provincialism and provides the comparative knowledge essential to a clearer understanding of the area chosen for specialization. Finally, the department assumes that all students understand the vital importance of studying the historical traditions from which their society has developed. One cannot expect to understand another culture without a firm historical grasp of one's own.

Requirements of the major Twelve terms of history are required, which may include the two terms taken as prerequisites. Included in these twelve terms must be: (a) two terms of United States or Canadian history (courses in the colonial period may fulfill this requirement); (b) two terms of European or British history (courses in Greek and Roman, Byzantine, and Russian history may fulfill this requirement); (c) three terms of African, Asian, Latin American, or Middle Eastern history.

Two of these seven terms must be courses in preindustrial history, and they must be chosen from two of the geographical categories listed above. Preindustrial history courses are so marked in their data lines. Students may use the same courses to count toward both geographical and preindustrial requirements. Only in rare cases will the director of undergraduate studies consider petitions from History majors seeking geographical or chronological credit outside of a History course's primary designation.

Two junior seminars (identified by the suffix J on the course number) are required and are normally taken during the junior year, although students are encouraged to take more than two junior seminars. (See below under Junior Seminars for information about pre-enrollment.) Students must choose junior seminars from two different geographical distribution categories. Sophomores contemplating a junior term abroad are urged to consider taking at least one junior seminar in the sophomore year. Residential college seminars that count toward the History major do not fulfill the junior seminar requirement. During senior year, each student must complete a senior departmental essay written under the guidance of a member of the faculty. Juniors may choose their senior essay advisers on line beginning in March.

Credit toward the major will be given only for courses included in the History listing below and in the History course listings included in Online Course Information. All

courses in History of Science, History of Medicine count automatically toward the History major. No substitutions from other departments are allowed.

Library orientation The History department requires all majors to complete a ninety-minute introductory research session for historians by the end of the third week of the junior year. Several library orientation sessions are offered at the beginning of each term. Students are strongly encouraged to take this class during their sophomore year; indeed, sophomores who have not taken the library orientation before the end of February will not be permitted to preregister for the following year's junior seminars. Students may offer no substitutions for this orientation. Students should register on the Web at www.library.yale.edu/instruction/hist. For questions students should contact the director of undergraduate studies.

History of Science, History of Medicine A major in History of Science, History of Medicine is available to students through the auspices of the History department. See under History of Science, History of Medicine.

Placement in advanced courses With a few exceptions, chiefly junior seminars (identified by the suffix J on the course number), history courses are automatically open to freshmen. Courses for the major must be taken at Yale, except with prior permission of the director of undergraduate studies.

Senior departmental essay History is more than past events; it is also the discipline of historical inquiry. As a discipline, it uses many techniques, but its basic method is the collection and careful evaluation of evidence and the written presentation of reasonable conclusions derived from that evidence. To experience history as a discipline, a student must grapple at first hand with the problems and rigors involved in this kind of systematic investigation and exposition. The Department of History therefore requires each student majoring in History to present a historical essay on a subject of the student's choice to the department in the senior year. The range of acceptable topics is wide, but most essays fall into two categories. The first involves the study of a limited problem through research in accessible source materials. The second is a critical assessment of a significant historical controversy or historiographical issue. Whatever topic the student elects, the essay must be interpretive and analytical, not only narrative and descriptive.

In choosing the subject of the senior essay, students should be aware that lack of foreign language expertise is not necessarily a bar to researching a topic in the history of a non-English-speaking area. Many translated materials exist, and for some areas of the world (chiefly Africa, Asia, and Latin America) diaries, letters, and newspapers composed by missionaries, businessmen, and diplomats writing in English are available. Many of these sources are held in Yale's extensive archival collections; others are available on microfilm.

Seniors receive course credit for satisfactory completion of their departmental essays by enrolling in HIST 495a or b and 496a or b. They must also complete a library research colloquium for the senior essay. Students should register for the colloquium on the Web at www.library.yale.edu/instruction/hist.

REQUIREMENTS OF THE MAJOR

Prerequisites 2 term courses in hist

Number of courses 12 term courses (incl prereqs and senior essay)

Substitution permitted None outside Hist dept listing

Distribution of courses 2 courses in hist of U.S. or Canada, 2 in hist of Europe or Britain, 3 in hist of Africa, Asia, Latin America, or Middle East; 2 of preceding must be pre-industrial in different geographical areas; at least 2 junior sems, normally in junior year, in 2 different geographical distribution categories (defined above)

Other Library orientation

Senior requirement Senior essay (HIST 495a and 496b, or 495b and 496a)

History courses numbered 001 to 099 are freshman seminars, with enrollment limited to 18. Courses numbered 100 to 199 are in the history of the United States or Canada; those in the 200s, Europe and Britain; and those in the 300s, the rest of the world. Courses numbered in the 400s address global topics; students must apply to the director of undergraduate studies in History to count a 400-level course toward a particular geographical distribution category. Lecture courses are subject to capping at the beginning of each term.

*DRST 005a and 006b, Directed Studies: Historical and Political Thought

Emily Greenwood, Gwenda-lin Grewal, Charles Hill, Demetra Kasimis, Anthony Kronman, Helene Landemore, Karuna Mantena, Matthew McCarty, Kathryn Slanski, Steven Smith, Norma Thompson

*HIST 001b/AFAM 095b/AMST 001b, African American Freedom Movements in the Twentieth Century

Crystal Feimster

MW 11:35–12:50 HU Fr sem (o)

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.

*HIST 003a, Before 1492: Exploring the Americas

Valerie Hansen, Fabian Drixler

TTH 1–2:15 WR, HU Fr sem, PreInd (RP, o)

Who got here first? Evidence for and against voyages to the Americas before Columbus. Debates about the plausibility – and the significance – of ocean voyages by the Polynesians, Chinese, and Vikings. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

*HIST 010a, Postwar America at Home: 1945–1960

Cynthia Russett

TTH 2:30–3:45 WR, HU Fr sem (o)

Ways in which American culture took shape in the years after World War II. Focus on domestic culture and society during the years when unprecedented prosperity vied with fears of Armageddon. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

HIST 105a/AMST 189a, The Formation of Modern American Culture, 1750–1876

Kariann Yokota

For description see under American Studies.

HIST 106b/AMST 191b, The Formation of Modern American Culture, 1920 to the Present Matthew Jacobson

For description see under American Studies.

HIST 107a/AMST 133a/ER&M 187a, Introduction to American Indian History

Alyssa Mt. Pleasant

MW 2:30–3:45 HU PreInd (37)

Survey of American Indian history, beginning with creation traditions and migration theories and continuing to the present day. Focus on American Indian nations whose homelands are located within the contemporary United States. Complexity and change within American Indian societies, with emphasis on creative adaptations to changing historical circumstances.

[HIST 115a/AMST 188a, The Colonial Period of American History]**HIST 117b/AMST 221b/ER&M 247b, The Peoples of Early America** Ned Blackhawk

MW 9:25–10:15, 1 HTBA HU PreInd (32)

Interactions of Europeans, Africans, and American Indians in the history of early America. Introduction of multiple linguistic, ethnic, imperial, and geographic communities.

HIST 122b/AMST 193b, Origins of U.S. Global Power Jenifer Van Vleck

TTH 1:30–2:20, 1 HTBA HU (26)

Policies, strategies, and ideas that enabled the United States to become a world power. Themes include Manifest Destiny, expansion, and empire; American exceptionalism; national identity; capitalism and consumer culture; and the relation between domestic politics and diplomacy, particularly with regard to race and gender.

HIST 127a/AMST 135a/WGSS 200a, U.S. Lesbian and Gay History George Chauncey

TTH 10:30–11:20, 1 HTBA HU (23)

Introduction to the social, cultural, and political history of lesbians, gay men, and other socially constituted sexual minorities. Focus on understanding categories of sexuality in relation to shifting normative regimes, primarily in the twentieth century. The emergence of homosexuality and heterosexuality as categories of experience and identity; the changing relationship between homosexuality and transgenderism; the development of diverse lesbian and gay subcultures and their representation in popular culture; religion and sexual science; generational change and everyday life; AIDS; and gay, antigay, feminist, and queer movements.

HIST 128a/AMST 213a/ER&M 286a, Mexicans, Mexican Americans, and the U.S.-Mexico Borderlands since 1848 Stephen Pitti

MW 10:30–11:20, 1 HTBA WR, HU (33)

Mexicans and Mexican Americans in the United States since the Mexican War. Particular attention to communities and conflicts in the U.S.-Mexico border region. Topics include the rise of Latino immigration since the mid-nineteenth century, the influence of the Mexican Revolution on the United States, patterns of ethnic and racial conflict in the Southwest, and struggles by immigrant and native-born residents to create new labor and civil rights movements.

HIST 129a/AMST 111a/RLST 111a/WGSS 111a, Sexuality and Religion

Kathryn Lofton

For description see under Religious Studies.

HIST 133b/EP&E 442b/INTS 345b, Strategic, Political, and Moral Dilemmas of the Nuclear Age Jonathan Schell

For description see under International Studies.

HIST 135b/ECON 182b, American Economic History Melinda Miller

For description see under Economics.

HIST 139a/INTS 264a, The United States and the World, 1917–1991 Patrick Cohrs

MW 11:35–12:25, 1 HTBA HU (34)

Traditional and new perspectives on the United States and its search for a “new world order” in the twentieth century. How successive generations of American policy makers and nongovernmental actors sought to redefine the United States’ global responsibilities between World War I and the end of the Cold War. Impact of designs for an “American peace” on the world; influence of global involvement on the United States.

HIST 140a/HSBM 215a^G, Public Health in America, 1793–2000 Naomi Rogers

For description see under History of Science, History of Medicine.

HIST 141b/AMST 141b, The American West John Mack Faragher

TTH 1:30–2:20, 1 HTBA HU (26)

The history of the American West as both frontier and region, real and imagined, from the first contacts between Indians and Europeans in the fifteenth century to the multicultural encounters of the contemporary Sunbelt. Students work with historical texts and images from Yale’s Western Americana Collection.

HIST 147a/AMST 247a/HLTH 170a/HSBM 202a^G, Media and Medicine in Modern America John Warner, Gretchen Berland

For description see under History of Science, History of Medicine.

HIST 152a/ARCH 385a/EP&E 285a/PLSC 279a/SOCY 149a, New Haven and the American City Alan Plattus, Elihu Rubin

For description see under Political Science.

HIST 170a/AMST 270a, Women in America: From the Colonial Period to 1900

Rebecca Tannenbaum

MW 10:30–11:20, 1 HTBA (33)

Survey of the history of women and gender roles from the English settlement of the North American coast to 1900. Emphasis on work and family roles, social and political movements, and regional, racial, and cultural variation.

HIST 171b/AMST 271b/WGSS 201b, Women in America: The Twentieth Century

Joanne Meyerowitz

TTH 10:30–11:20, 1 HTBA HU (23)

U.S. women’s history and the history of gender from 1900 to the present. Changing meanings of femininity, masculinity, sex, gender, and sexuality; intersections of class, race, ethnicity, and gender; women’s labor in industrial and postindustrial economies; women’s participation in politics and social movements; trends in sexual expression, gender

presentation, reproduction, child rearing, and marriage; and feminist and other gender-equity movements.

HIST 174b/HUMS 336b, American Intellectual and Cultural Life in the Twentieth Century Cynthia Russett

TTH 10:30–11:20, 1 HTBA HU (23)

A survey of important intellectual developments from the “Innocent Rebellion” of the pre–World War I period through the 1960s. Topics include coming to terms with the European legacy; intellectuals and the Left in the Depression; the postwar “end of ideology”; and the apocalyptic visions of the 1960s.

HIST 183a/AMST 272a/ER&M 282a, Asian American History, 1800 to the Present Mary Lui

For description see under American Studies.

HIST 184a/AFAM 160a, African American History, 1500–1888 Edward Rugemer

TTH 10:30–11:20, 1 HTBA HU (23)

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.

HIST 187b/AFAM 162b/AMST 162b, African American History: From Emancipation to the Present Jonathan Holloway

For description see under African American Studies.

HIST 193a/SHSM 242a, Molecules, Life, and Disease: Twentieth Century

Bruno Strasser

For description see under History of Science, History of Medicine.

HIST 200a/RLST 161a, History of Catholicism: The First Millennium Carlos Eire

For description see under Religious Studies. PreInd

HIST 201b/RLST 162b, History of Catholicism: The Second Millennium Carlos Eire

For description see under Religious Studies.

HIST 202b, European Civilization, 1648–1945 John Merriman

MW 10:30–11:20, 1 HTBA HU (33)

An overview of the economic, social, political, and intellectual history of modern Europe. 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.

HIST 205a/CLCV 205a, Introduction to Ancient Greek History Donald Kagan

For description see under Classics. PreInd

HIST 210b/HUMS 439b, The Early Middle Ages, 284–1000 Paul Freedman

MW 11:35–12:25, 1 HTBA HU PreInd (34)

Major developments in the political, social, and religious history of western Europe from the accession of Diocletian to the feudal transformation. Topics include the conversion of Europe

to Christianity, the fall of the Roman Empire, the rise of Islam and the Arabs, the “Dark Ages,” Charlemagne and the Carolingian renaissance, and the Viking and Hungarian invasions.

HIST 213a, History of the Vikings Anders Winroth

HTBA HU PreInd (50)

Introduction to the history and culture of Scandinavia between 700 and 1066. Viking raids, skaldic poetry, Icelandic sagas, and northern myths; rune-stones, ships, halls, and swords in literature and history; Viking women, northern trade, colonization, Christianization, and Viking landings in America. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

HIST 217a/CLCV 206a, Introduction to Roman History: The Republic

William Metcalf

For description see under Classics. PreInd

HIST 219a^G/JDST 200a^G/RLST 148a^G, History of the Jews to the Reformation

Ivan Marcus

TTH 11:35–12:50 HU PreInd (24)

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 Middle Eastern or European distributional credit within the major.

HIST 220b^G/JDST 201b^G/RLST 149b^G, History of Jewish Culture, 1500 to the Present

Paula Hyman

For description see under Religious Studies.

HIST 226b^G/HUMS 422b/NELC 326b/RLST 158b^G, Jesus to Muhammad: Ancient Christianity to the Rise of Islam Stephen Davis

For description see under Religious Studies. PreInd

***HIST 227a/SPAN 367a, The Spanish Civil War: Words and Images** Noël Valis

For description see under Spanish.

HIST 230a, Europe since 1870 Stuart Semmel

HTBA HU (50)

A survey of European history during a period of warfare, social dislocation, industrialization, state expansion, nationalism, imperialism, and decolonization. The development of liberalism, conservatism, socialism, communism, and facism. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

HIST 234b/HSBM 235b, Epidemics and Society in the West since 1600

Frank Snowden

MW 10:30–11:20, 1 HTBA HU (33)

The impact of epidemic diseases such as bubonic plague, cholera, malaria, and AIDS on society, public health, and the medical profession in comparative and international perspective. Popular culture and mass hysteria, the mortality revolution, urban renewal and rebuilding, sanitation, the germ theory of disease, the emergence of scientific medicine, and debates over the biomedical model of disease.

HIST 239b, Britain's Empire Stuart Semmel

HTBA HU (50)

Historical survey of one of the most extensive empires in history, with special attention to overseas expansion as it affected Britain's own politics, society, and culture. Questions include how policies in one part of the empire shaped events in others; how British politicians reconciled the empire's sometimes authoritarian nature with liberalism and an expanding democracy at home; and the roles of race, gender, and class in the empire. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

HIST 240b/JDST 294b^G/RLST 237b^G, The Jewish Enlightenment Eliyahu Stern

For description see under Judaic Studies.

HIST 243b/INTS 374b/MGRK 225b, Occupied Europe during World War II

Konstantina Maragkou

For description see under Hellenic Studies.

HIST 248a/JDST 293a^G/RLST 214a^G, Introduction to Modern Jewish Thought

Eliyahu Stern

For description see under Judaic Studies.

HIST 253b, Twentieth-Century Britain Jay Winter

MW 11:35–12:25, 1 HTBA (34)

A survey of twentieth-century British history. Topics include imperialism, liberal reform, World Wars I and II, the rise of labor, family life, popular culture, the European question, Thatcher and Blair, national identity, and the debate over national decline.

HIST 255b, The Experience of War in the Twentieth Century Bruno Cabanes

TTH 10:30–11:20, 1 HTBA HU (23)

An introduction to new approaches in the history of war. Focus on a comparative examination of the actors, forms of violence, ideological stakes, and memories of modern war.

HIST 263a, Eastern Europe to 1914 Timothy Snyder

TTH 2:30–3:20, 1 HTBA HU (27)

Eastern Europe from the medieval state to the rise of modern nationalism. The Ottoman Empire, the Polish-Lithuanian Commonwealth, the Hapsburg monarchy, and various native currents. Themes include religious diversity, the constitution of empire, and the emergence of secular political ideologies.

HIST 264b, Eastern Europe since 1914 Timothy Snyder

TTH 2:30–3:20, 1 HTBA HU (27)

Eastern Europe from the collapse of the old imperial order to the enlargement of the European Union. Main themes include world war, nationalism, fascism, and communism. Special attention to the structural weaknesses of interwar nation-states and postwar communist regimes. Nazi and Soviet occupation as an age of extremes. The collapse of communism. Communism after 1989 and the dissolution of Yugoslavia in the 1990s as parallel European trajectories.

HIST 269a^G/JDST 286a^G/RLST 230a^G, Holocaust in Historical Perspective

Paula Hyman

MW 10:30–11:20, 1 HTBA HU (33)

A survey of the major historical issues raised by the Holocaust, including the roots of Nazism; different theoretical perspectives and ways of accounting for genocide; the behavior of perpetrators, victims, and bystanders; and problems of representation.

HIST 273a, Europe in the Age of Total War, 1914–1945 Jay Winter

MW 11:35–12:25, 1 HTBA HU (34)

A survey of European history that addresses the two world wars and the transformation of European society and culture between 1914 and 1945.

HIST 274b, The Road to Revolution in France, 1661–1799 G. Charles Walton

MW 10:30–11:20, 1 HTBA HU (33)

Social, political, and cultural changes in Old Regime France from the rise of Louis XIV and the absolutist state in the mid-seventeenth century to the outbreak of the French Revolution in 1789. Topics include state building, court culture, civility, enlightenment, the public sphere, and the causes of the Revolution.

HIST 276a, France since 1871 John Merriman

MW 10:30–11:20, 1 HTBA HU (33)

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. One discussion section conducted in French; students in this section may count the course toward the French major.

HIST 279a, Italy since 1900 Frank Snowden

MW 10:30–11:20, 1 HTBA HU (33)

A social, political, and cultural history of Italy since 1900, with attention to issues of health and disease. Topics include industrial development; modernism and the futurist movement; diseases such as malaria, tuberculosis, and pellagra; the condition of women; emigration to the United States; regionalism and the Italian South; political movements and regimes; racism, anti-Semitism, and the Holocaust; World Wars I and II; postwar reconstruction and the "economic miracle"; terrorism; political corruption; and Silvio Berlusconi.

HIST 290a, Russia from the Ninth Century to 1801 Paul Bushkovitch

TTH 1–2:15 HU PreInd (26)

The mainstream of Russian history from the origins of the Kievan state to 1801. Political, social, and economic institutions as they made the transition from orthodoxy to the Enlightenment.

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

Joseph Manning

For description see under Classics. PreInd

HIST 303a, Japan's Modern Revolution Daniel Botsman

MW 10:30–11:20, 1 HTBA HU (33)

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.

HIST 306b, Empires of East Asia Valerie Hansen, Fabian Drixler

TTH 2:30–3:20, 1 HTBA HU (27)

Survey of the history of China, Japan, and Korea from the seventh century to the present. Focus on five separate empires: the Tang, Mongol, Manchu, European, and Japanese. Attention to interactions between East Asian regions and to differing visions of empire.

HIST 314b/HUMS 426b, Early Sources in Chinese Intellectual Traditions

Annping Chin

MW 1–2:15 HU PreInd (36)

Readings in translation of the basic texts of Confucianism, Taoism, and legalism. Examination of what the early Chinese thought about the world and themselves, how they articulated what they thought and organized what they knew, and how they explored the irrational and issues such as fairness and moral appropriateness.

HIST 315a/HUMS 421a, History of Traditional China to 1600 Valerie Hansen

TTH 2:30–3:20, 1 HTBA WR, HU PreInd (o)

A survey of Chinese history from the introduction of oracle bone writing in c. 1200 B.C. to A.D. 1600, and the effects of the discovery of the New World on China. Use of philosophical, religious, and literary texts in translation as well as archaeological and art-historical evidence.

HIST 316b/EAST 320b, History of China, 1550 to the Present Peter Perdue

TTH 1:30–2:20, 1 HTBA HU (26)

Fall of the Ming and rise of the Qing dynasty. Political, economic, and cultural changes in China compared to those in East Asia and the rest of the world. China's first Republic and the impact of foreign imperialism and communism. The People's Republic of China under Mao Zedong and Deng Xiaoping; Taiwan from Chiang Kai-shek to the independence movement. Globalization, environmental stress, and human rights issues in historical perspective.

HIST 334b/AFST 334b, History of Africa Robert Harms

TTH 9:25–10:15, 1 HTBA HU (22)

History of Africa from the origins of humankind to the late twentieth century. Topics include the Bantu expansion, precolonial state formation, the spread of Islam, the era of the slave trade, colonial rule, and postcolonial developments.

HIST 340a/AFST 340a, Africa in the Era of the Slave Trade Robert Harms

TTH 9:25–10:15, 1 HTBA HU PreInd (22)

Examination of the tumultuous changes experienced by African societies during the era of the Atlantic slave trade, approximately 1450–1850. Focus on the complex interaction between the internal dynamics of African societies and the impact of outside forces.

HIST 345b^G/JDST 265b^G/RLST 202b^G, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

TTH 11:35–12:50 HU PreInd (o)

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.

HIST 346b, The Making of Modern Iran, 1501 to the Present Abbas Amanat

MW 11:35–12:50 HU (34)

The political, socioreligious, and cultural history of modern Iran from the Shi'ite revolution and the rise of the Safavid Empire to the present. Discussion of Shi'ism and the state, relations with neighboring countries (the Ottoman Empire and India), Russia and Britain in Qajar Iran, the Babi-Baha'i religion, the constitutional revolution, the Pahlavi dynasty, oil, nationalism and relations with the United States, the causes and the consequences of the Islamic revolution, and Iran in the contemporary Middle East.

HIST 349a, Three Empires of Islam Alan Mikhail

MW 11:35–12:50, 1 HTBA HU PreInd (o)

Three empires of the early modern Muslim world: the Ottomans, the Safavids, and the Mughals. Introduction to the rise and spread of Islam; comparative histories of each of the three empires. Topics include the arts, administration, trade, coffee, the environment, war, education, and religion.

HIST 355a, Colonial Latin America Stuart Schwartz

TTH 1:30–2:20, 1 HTBA HU PreInd (26)

A survey of the conquest and colonization of Latin America from pre-Columbian civilizations through the movements for independence. Emphasis on social and economic themes and the formation of identities in the context of multiracial societies.

HIST 359b/HSBM 225b, Medicine and Public Health in Latin America, 1820–2000

Mariola Espinosa

For description see under History of Science, History of Medicine.

HIST 360a/MMES 171a/NELC 402a, The Islamic Near East from Muhammad to the Mongol Invasion Adel Allouche

For description see under Near Eastern Languages & Civilizations. PreInd

HIST 361b, History of Brazil Stuart Schwartz

MW 10:30–11:20, 1 HTBA HU (33)

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.

HIST 400b/MCDB 150b^c, Global Problems of Population Growth Robert Wyman, Fabian Drixler

For description see under Biology.

JUNIOR SEMINARS

Juniors majoring in History must take at least two junior seminars from two different geographical areas. Seminars on the history of the United States or Canada are numbered 100J to 199J; seminars on Britain and Europe are 200J to 299J; and seminars numbered 300J to 399J cover the rest of the world. Each seminar aims to acquaint students in a substantial and professional way with the literature of a period in history; to train them as far as possible in the use of primary source materials; to introduce them to problems of bibliography, historiography, and historical method; and to give them training in the writing of history.

The relative importance of these objectives in any particular seminar depends on its subject matter, the previous preparation of its students, and the availability of materials.

Each term prospective junior History majors should apply for seminars for the following term using the online junior seminar preregistration site. Preregistration begins after midterm in the fall for seminars offered in the spring term, and after spring recess for seminars offered in the subsequent fall term. Accelerated students holding junior status must notify the undergraduate History administrator in 237 HGS, 432-1359, by October 15 in the fall and by March 25 in the spring in order to be eligible to preregister for the following term's seminars. All students who wish to preregister must declare their major and take the mandatory History library orientation prior to preregistration.

In September and in January, application for admission should be made directly to the instructors of the seminars, who will admit students to remaining vacancies in their seminars. Priority is given to applications from juniors, then seniors, majoring in History, but applications are also accepted from qualified sophomores and from students majoring in other disciplines or programs. The department seeks wherever possible to accommodate students' preferences; for their part, students should recognize that limitations imposed by the size of seminars (normally fifteen students) make accommodation impossible in some instances. HIST 494a or b and residential college seminars that count toward the History major do not fulfill the junior seminar requirement.

***HIST 115Jb, Property Rights in U.S. History** Naomi Lamoreaux

TH 3:30–5:30 WR, HU (o)

The puzzle of how property rights can be simultaneously secure and subject to change. The role of private interests and the state in creation, destruction, allocation, and redefinition of various kinds of property rights (e.g., to land, labor, and ideas) over the past three centuries of U.S. history.

***HIST 122Ja, American Women Religious Leaders and Activists** Cynthia Russett

T 1:30–3:20 HU (o)

American women who have been prominent leaders and activists in different faith traditions. Well-known figures—Anne Hutchinson, Mary Baker Eddy—and less familiar individuals—Jarena Lee, Aimee Semple McPherson, Sally Preisand—who made major contributions to the narrative of American religious history. Topics include Indian women's spirituality, New Age, goddess religion, and the role of Muslim women.

***HIST 124Ja, Colonial American History** Kyle Farley

TH 1:30–3:20 WR, HU PreInd (o)

A history of British colonialism in North America from the founding of Virginia in 1607 through the end of the Seven Years' War in 1763. Topics include economics, Native Americans, politics, regionalism, religion, slavery, and war. The course will focus on the colonies of Massachusetts, Pennsylvania, and Virginia.

***HIST 125Ja/AFAM 427a, Rise and Fall of Atlantic Slavery** Edward Rugemer

W 9:25–11:15 HU PreInd (o)

The emergence of African slavery in the Atlantic world, the transatlantic slave trade, slave societies, movements against slavery by the enslaved and by abolitionist reformers, and the process of emancipation.

***HIST 127Ja/WGSS 427a, Witchcraft in Colonial America** Rebecca Tannenbaum

M 1:30–3:20 WR, HU PreInd (o)

The social, religious, economic, and gender history of British North America as manifested through witchcraft beliefs and trials.

***HIST 128Jb, American Culture in the Twenties and Thirties** Cynthia Russett

W 1:30–3:20 WR, HU (o)

Literature, politics, and social thought examined to determine the intellectual configuration of the decades between the two world wars. Authors may include Malcolm Cowley, John Dos Passos, James Agee, and Sinclair Lewis.

***HIST 131Jb, Urban History in the United States, 1870 to the Present** Jennifer Klein

W 2:30–4:20 WR, HU (o)

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.

***HIST 134Jb, Yale and America: Selected Topics in Social and Cultural History**

Jay Gitlin

TH 3:30–5:20 WR, HU (RP, o)

Relationships 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; and faith and ideology in postwar Yale and America.

***HIST 135Ja, The Age of Hamilton and Jefferson** Joanne Freeman

W 9:25–11:15 WR, HU PreInd (o)

An exploration of 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, and domestic life.

***HIST 136Jb, Imagining Constitutions** Jane Calvert

F 3:30–5:30 WR, HU (o)

A civil constitution as the body politic and a code of laws and principles in early modern Britain and America. Theories of the origins and function of a constitution, limits it should place on government, and, should it prove defective, how and whether the government could be resisted and by whom. Theology and politics, popular sovereignty and political participation, and concepts such as law and legal discernment, liberty, equality, unity, dissent, and safety.

***HIST 141Jb/HSBM 462b/THST 394b, Science and Drama** Bettyann Kevles

W 1:30–3:20 WR, HU (o)

Themes in science, technology, and medicine as they have figured in modern plays written and produced in the United States and Europe. These fictive treatments are compared with scientific and historical reality. Playwrights include Ibsen, Brecht, Copek, Frayn, Stoppard, Molière, and Cassandra Medley.

***HIST 142Jb/HSHM 445b/WGSS 453b, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

For description see under History of Science, History of Medicine.

***HIST 147Ja^G/HSHM 451a/INTS 340a, Science, Arms, and the State** Daniel Kevles
W 1:30–3:20 (36)

A history of chemical, nuclear, and biological weapons in the twentieth century, focusing on the integration in the United States of national security policy making, scientific research, and military innovation. Topics include consequences of weapons development for the scientific community and the civilian economy, public attitudes toward weapons of mass destruction, and political movements to control such weapons.

***HIST 151Ja/AMST 422a/ER&M 435a, Writing Tribal Histories** Ned Blackhawk
TH 9:25–11:15 WR, HU (o)

Historical overview of American Indian tribal communities, particularly since the creation of the United States. Challenges of working with oral histories, government documents, and missionary records.

***HIST 152Ja/AMST 419a/ER&M 450a, Land, Homelands, and American Indian Histories** Alyssa Mt. Pleasant

For description see under American Studies.

***HIST 155Jb/AMST 325b/ER&M 322b, Indian-Colonial Relations in Comparative Perspective** Alyssa Mt. Pleasant

For description see under American Studies. PreInd

***HIST 157Jb/AMST 459b, Topics in Southern California History**
John Mack Faragher

W 2:30–4:20 WR, HU (o)

For more than a century, boosters have promoted southern California as an exemplar of the American future. In contrast, its history is underdeveloped. Study of the history of a place with little public memory.

***HIST 165Ja^G/JDST 297a^G/RLST 192a^G, Religion, Ethnicity, and Identity in American Jewish History** Paula Hyman

For description see under Religious Studies.

***HIST 170Jb, Ideas and Ideologies in U.S. International History** Patrick Cohrs
M 1:30–3:20 WR, HU (o)

The influence of American and foreign ideas and ideologies on U.S. international history. American assumptions about peace and international order from the days of the early republic and the Federalist Papers to the height of the Cold War. Emphasis on American responses to war and international crises, and on the impact of exceptionalist, imperialist, isolationist, “exemplarist,” and capitalist ideologies on U.S. policymaking.

***HIST 180Jb/HSHM 444b, Controversies in Human Evolution, 1859 to the Present**
Miranda Paton

For description see under History of Science, History of Medicine.

***HIST 181Jb, The American Family, 1873 to the Present** Ziv Eisenberg
W 1:30–3:20 WR, HU (o)

The impact of government policies, the law, religion, the market, the media, medicine, and science on family life in the United States since 1873. Topics include marriage (heterosexual and same-sex), divorce, parenthood, childhood, parent-child relationships, adoption, pregnancy, childbirth, family planning, reproduction control, and the politics of “family values.”

***HIST 200Ja/CLCV 406a, Athenian Imperial Democracy** Donald Kagan

For description see under Classics. PreInd

***HIST 205Ja/MGRK 228a, Greece in the Twentieth Century** Konstantina Maragkou

For description see under Hellenic Studies.

***HIST 209Jb/CLCV 423b, The Origins of Byzantium** John Matthews

For description see under Classics. PreInd

***HIST 211Jb/NELC 380b^G/RLST 420b^G, The Making of Monasticism** Bentley Layton

For description see under Religious Studies. PreInd

***HIST 212Jb/HUMS 437b, History of Food and Cuisine** Paul Freedman

For description see under Humanities.

***HIST 213Ja/CLCV 414a^G, Religions of the Roman Empire** Veronika Grimm

For description see under Classics. PreInd

***HIST 215Jb, The Art of Biography** John Gaddis

T 1:30–3:20 WR, HU (o)

A comparative examination of successful as well as unsuccessful biographies, intended to identify both principles and pitfalls.

***HIST 216Ja, Eurasian Encounters before 1500** Anders Winroth

HTBA HU PreInd (o)

People who traveled between Europe and Asia during the Middle Ages. Focus on the Franciscan missionary William Rubruck and on Admiral Zheng He's interpreter Ma Huan. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***HIST 217Jb/CLCV 134b/HSBM 414b, A History of Ancient Greek Medicine**

Veronika Grimm

For description see under Classics. PreInd

***HIST 219Jb^G/RLST 235b^G, Secular and Traditional Worldviews in Modern Western Thought** Eliyahu Stern

W 9:25–11:15 WR, HU (o)

The historical construction of secular and traditional worldviews from the eighteenth century to the twentieth. Attention to recent scholarship on the formation of a secular ideology and its effects on notions of time, space, and knowledge.

***HIST 220Ja, Grand Strategy and the Origins of the Second World War**

Paul Kennedy

T 1:30–3:20 WR, HU (RP, o)

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 major.

***HIST 221Jb⁶/JDST 390b⁶/RLST 217b⁶, Memory, Memoirs, and Modern Jewish History** Paula Hyman

TH 1:30–3:20 WR, HU (o)

Exploration of how memoir writers from the seventeenth century to the twentieth understand their own experience against the backdrop of Jewish history. Focus on the construction of identity and the relation of personal and collective memory, with special attention to the interaction of minority status, gender, and class in a variety of historical contexts. Counts toward only European distributional credit within the major.

***HIST 222Jb, Russia and the Eurasian Steppe** Paul Bushkovitch

W 1:30–3:20 WR, HU PreInd (o)

A study of Russia's interaction with the nomads of the Eurasian steppe. Topics include the Mongol invasion, the Mongol Empire in Asia and the Golden Horde, Islam, nomadic society, and the Russian state. Focus on conquest and settlement.

***HIST 223Ja, The Cultural History of the First World War** Bruno Cabanes

M 1:30–3:20 WR, HU (o)

An introduction to the historiography of the First World War, drawing on recent work in the cultural history of the war. National sentiment, gender relations, cultural mobilization, violence and its impact on soldiers and civilians, mourning, and memory.

***HIST 225Ja, Nineteenth- and Twentieth-Century Colonialism** Daniel Brueckenhaus

W 1:30–3:20 WR, HU (o)

Major themes in the history of nineteenth- and twentieth-century colonialism. Focus on the British and French empires; consideration of German and Belgian colonial history. Mindsets, ideologies, and strategies of European colonizers; experiences and counterstrategies of colonized populations.

***HIST 226Ja, Western Film and History** Stuart Semmel

HTBA HU (50)

Consideration of some films that treat momentous historical events, and others that focus on everyday life. Readings in history, film, criticism, and literary and film theory. Questions include whether historical films can be held to the same standards as written narratives; how films help us understand the methodological choices made by historians; and what films about the past tell us about the present. Offered in Beijing, China. See under Peking University–Yale University Joint Undergraduate Program.

***HIST 228Ja/JDST 268a, Folklore and History in the Jewish Middle Ages**

Micha Perry

For description see under Judaic Studies.

***HIST 229Jb, London, 1560–1760** Keith Wrightson

W 2:30–4:20 WR, HU PreInd (o)

A study of London's growth between 1560 and 1760 from a modest city of perhaps 50,000 people to a metropolis with over 700,000 inhabitants. Themes include the dynamics of growth; birth and death, with particular reference to the plague; migration; household life; villages within the city; London as the center of print culture; the royal court; polite society in the late seventeenth and early eighteenth centuries; the "middle sort of people" and consumerism; the world of the poor; and vice and criminality.

***HIST 231Jb, The Dark Years: Collaboration and Resistance in Vichy France**

John Merriman

T 1:30–3:20 WR, HU (o)

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.

***HIST 232Ja/HUMS 443a/JDST 270a/MMES 342a/RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

For description see under Humanities. PreInd

***HIST 233Jb/HUMS 311b, Phenomenology, Structuralism, Existentialism**

Marci Shore

M 1:30–3:20 WR, HU (o)

The intellectual history of modern Europe. Notions of the self and subjectivity in European modernity. Some attention to philosophy, linguistics, and literary theory. Recommended preparation: course work in intellectual history, philosophy, or literary theory.

***HIST 234Ja, The First World War** Jay Winter

M 1:30–3:20 WR, HU (o)

A survey of recent historical interpretations of the military, social, and cultural history of the war of 1914–18.

***HIST 236Jb, Culture, Dissidence, and Control in Golden Age Spain** María Jordán

W 1:30–3:20 WR, HU PreInd (36)

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.

***HIST 237Ja, Cold War in Europe** Konstantina Maragkou

T 1:30–3:20 HU (o)

Highlights of the Cold War in Europe. Focus on political developments and foreign policy, with attention to the impact of the Cold War on European society.

***HIST 241Ja, Democracy and Peacemaking, 1916–1919** J. Adam Tooze

T 9:25–11:15 HU (o)

The ideological struggle in 1917 between democracy and German militarism occasioned by the Russian Revolution and the American entry into World War I. The bitter ironies of the first attempt to make the world safe for democracy by military means.

***HIST 243Ja^G/HSHM 421a^G, Introduction to the History of Math: Certainty, Uncertainty, and the Infinite** William Summers

For description see under History of Science, History of Medicine.

***HIST 248Jb/MGRK 229b, Twentieth-Century Balkan Instability**

Konstantina Maragkou

W 1:30–3:20 WR, HU (o)

Key moments of instability in the modern Balkan states, focusing on the origins, conduct, and impact of the two world wars, civil wars, and dictatorships.

***HIST 252Ja, History of Free Speech** G. Charles Walton

W 2:30–4:30 WR, HU (o)

The problem of free speech in the early modern and modern eras. Focus on struggles to define the meaning and limits of free expression, from seventeenth-century England through the French Enlightenment to the twentieth-century United States. Interdisciplinary approach draws on history, philosophy, legal and communication studies, and sociology.

***HIST 255Jb, London and Modernity, 1880 to the Present** Becky Conekin

T 1:30–3:20 WR, HU (26)

Aspects of modernity and the changing character of London as a metropolitan center from the late nineteenth century to the present. Social and economic development of the city, urban cultures, historical geography, sexuality, and the imperial and postimperial metropolis.

***HIST 301Jb, Gender and Japanese History** Daniel Botsman

W 1:30–3:20 WR, HU (o)

The broad sweep of Japanese history from ancient times to the post–World War II era, viewed through the lens of gender and sexuality.

***HIST 327Ja, Navigating Life in Nineteenth-Century Japan** Fabian Drixler

T 1:30–3:20 WR, HU (o)

A study of the joys and sorrows of life in nineteenth-century Japan. Topics include finding a mate, becoming a parent, making and keeping friends, seeing the world, and coping with bereavement.

***HIST 330Jb, Imperialism, Race, and Nation Building in Central America**

Carmen Kordick de Cubero

W 1:30–3:20 WR, HU (o)

The Hispanic nations of Central America as they were affected by U.S. imperialism in the nineteenth and twentieth centuries. Tension between similarities and differences among the ethnically diverse countries in the region. Topics include nation building, revolution, and the construction of racial and class identities.

***HIST 347Jb, The Ottoman Empire** Alan Mikhail

TH 3:30–5:30 WR, HU (o)

Major trends in Ottoman history and historiography. The political and imperial history of the ruling Ottoman elite; the culture, politics, and realities of marginal groups such as peasants, women, and minorities. The complex web of relationships between the state and its bureaucrats, peasants, judges, families, and merchants.

***HIST 372Ja/ER&M 342a, Revolutionary Change in Twentieth-Century Latin America** Gilbert Joseph

T 1:30–3:20 WR, HU (o)

Analysis of revolutionary movements in Latin America, including discussion of common North American misconceptions about the movements. Critical examination of popular

images and orthodox interpretations. An interdisciplinary study of the process of revolutionary change at the grassroots level.

***HIST 379Jb/HSBM 447b^c, History of Chinese Science** William Summers

M 1:30–3:20 WR, HU (RP, o)

Major themes in Chinese scientific thinking from antiquity to the twentieth century. Non-Western concepts of nature and the development of science in China; East-West scientific exchanges; and China's role in modern science.

***HIST 380Jb, Makers and Shakers of the Modern Middle East** Abbas Amanat

T 1:30–3:20 WR, HU (o)

The ideas and long-term influences on the Middle East of major statesmen, thinkers, reformers, revolutionaries, women, and Western policy makers since the early nineteenth century; emphasis on Atatürk, Nasser, and Khomeini. Study of primary sources in English as well as biographical studies and general literature on the political and intellectual history of the period.

***HIST 384Jb/MMES 172b/NELC 403b, The Middle East between Crusaders and Mongols** Adel Allouche

T 1:30–3:20 WR, HU PreInd (o)

The impact of the Crusades and the Mongol conquests on the Islamic Middle East. Political, social, and economic changes in the region from the eleventh century to the middle of the fourteenth. Emphasis on the rise of new dynasties as a result of changes in the ethnic mosaic of the Middle East.

***HIST 385Ja, The Middle East and the West: A Cultural Encounter** Abbas Amanat

T 1:30–3:20 WR, HU (o)

The Orient and the Occident as cultural constructs; encounters with Islam and the Middle East since the eighteenth century; evolving Muslim attitudes toward the West; Orientalism and representations of the Middle East in Western literature and media; images of the United States; clash or dialogue of civilizations.

***HIST 386Ja/EVST 386a, Environmental History of the Middle East** Alan Mikhail

M 3:30–5:20 WR, HU (o)

Exploration of how one writes an environmental history of the Middle East. Consideration of what environmental history is; questions of method, sources, and historiography. Topics include irrigation, forestry, agriculture, animal technology, gender and nature, gardens, colonialism, environmentalism, and disease.

***HIST 387Ja/AFST 487a, West African Islam: Jihad Tradition and Its Pacifist Opponents** Lamin Sanneh

W 2:30–4:20 WR, HU (o)

The impact of Islam on state and society, and the encounters of Muslim Africans first with non-Muslim societies in Africa and then with the modern West in the colonial and post-colonial periods. Focus on Muslim religious attitudes and responses to the secular national state and to the Western tradition of the separation of church and state.

***HIST 398Jb/MMES 173b/NELC 404b, Mamluk Egypt** Adel Allouche

TH 1:30–3:20 WR, HU PreInd (o)

A study of the Mamluks, manumitted slaves initially imported to Egypt for military service who established their own rule over Egypt and Syria (1250–1517). Focus on the structure and workings of the Mamluk state. Military, political, economic, and social factors that contributed to the grandeur and, later, the decline of the Mamluk period in Egypt and its conquest by the Ottoman Turks.

***HIST 410Ja/HSBM 458a, Technology and Power** Jenifer Van Vleck

T 1:30–3:20 WR, HU (o)

The relationship between technological development and political, economic, and social power. Case studies such as colonial engineering projects, railway journeys, aviation in Cold War Afghanistan, and rockets in French Guiana illustrate ways that technology has transformed relations of power around the world.

***HIST 411Jb, The Global 1960s** Jenifer Van Vleck

W 2:30–4:20 WR, HU (o)

A comparative, transnational study of social, political, and cultural transformations that occurred during the 1960s, including decolonization, the African American freedom struggle, the Prague Spring, the Cultural Revolution in China, and student movements in Paris, Berkeley, Tokyo, and Mexico City. Examination of the “other” side of the 1960s—a decade that ended with the presidency of Richard Nixon and the ascendance of neoconservatism.

***HIST 420Jb/EVST 315b, War and the Environment** Bruno Cabanes,

Gene Tempest

W 1:30–3:20 WR, HU (o)

Relationships between twentieth-century warfare and its environments. Topics include gas warfare, the Spanish influenza outbreak of 1918, food and hunger, urban environments during civil war, biological warfare, atomic war, Agent Orange, ethnic cleansing, and environmental factors in Afghanistan and Iraq.

***HIST 430Ja/HSBM 442a, Disease, Public Health, and Empire** Mariola Espinosa

For description see under History of Science, History of Medicine.

***HIST 470Jb, A History of Animals** Alan Mikhail

M 2:30–4:20 WR, HU (o)

Introduction to animal studies, a field at the crossroads of environmental history, philosophy, cultural history, and science studies. Topics include the hunt, debates over vivisection, taxonomy, the zoo, gender, genomics, dogs and pedigree, and animals and war.

INDIVIDUAL RESEARCH AND SENIOR ESSAY COURSES

***HIST 494a or b, Individual Writing Tutorial** Jennifer Klein

HTBA (o)

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 a prospectus of the work proposed, a bibliography, and a letter of support

from the member of the faculty who will direct the tutorial to the director of undergraduate studies on the Friday before schedules are due. A form to simplify this process is available from the office of the director of undergraduate studies.

***HIST 495a or b and 496a or b, The Senior Essay** Keith Wrightson

HTBA (o)

There will be a mandatory senior essay meeting on Tuesday, September 7, 2010, in 114 SSS at 4 p.m. Preparation of the required senior departmental essay under the supervision of a member of the faculty. To assist in selection of source materials and of a topic, special library resource and method colloquia are held during the fall term. Students must attend one colloquium; those planning to start their senior essay work in January should attend in September. Students expecting to graduate in May enroll in 495a during the fall term and complete their essays in 496b in the spring term. December graduates enroll in 495b in the spring term and complete their essays in 496a during the following fall term. Students planning to begin their essay in the second term should notify the senior essay director by December 6, 2010. 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 undergraduate History administrator in 237 HGS no later than September 13, 2010 (for HIST 495a), or January 21, 2011 (for HIST 495b). Blank statement forms are available in 237 HGS before the end of a student's junior year, and thereafter in the Senior Essay handbook. In addition to attending at least one library resource and method colloquium and preparing the Statement of Intention, students enrolled in HIST 495a or 495b submit to their advisers a prospectus of the essay and an annotated bibliography during the course of the term, and at least ten pages of the essay or a detailed outline of the entire project by December 6, 2010 (495a), or May 2, 2011 (495b). Those who meet these requirements receive a temporary grade of SAT, 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 495a or b. Students enrolled in HIST 496a or b must submit a completed essay to 211 HGS no later than 5 p.m. on April 4, 2011, in the spring term, or no later than 5 p.m. on December 6, 2010, in the fall term. 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. The essays should take the form of substantial articles, not longer than 12,500 words (approximately forty double-spaced typewritten pages), with the total word count given at the end of the essay. This is a maximum limit; there is no minimum requirement. Length will vary according to the topic and the historical techniques employed. Essays generally run between 10,000 and 12,500 words. The limitation on length is regarded as important because precision, clarity, and conciseness are essential to good historical writing. A brief evaluation of major sources is required. Consult the director of the senior essay course for details.

History of Art

Director of undergraduate studies: Milette Gaifman, 557 LORIA, 432-2687,
milette.gaifman@yale.edu

FACULTY OF THE DEPARTMENT OF HISTORY OF ART

Professors Brian Allen (*Adjunct*), Carol Armstrong, Tim Barringer, Judith Colton (*Emeritus*), Edward Cooke, Jr., David Joselit, Diana Kleiner, Amy Meyers (*Adjunct*), Mary Miller, Robert Nelson, Alexander Nemerov (*Chair*), Jock Reynolds (*Adjunct*), Vincent Scully (*Emeritus*), Robert Thompson, Christopher Wood, Mimi Yiengpruksawan

Associate Professor Lillian Tseng

Assistant Professors J. D. Connor, Milette Gaifman, Jacqueline Jung, Kishwar Rizvi, Tamara Sears, Sebastian Zeidler

Lecturers Theresa Fairbanks-Harris, Jennifer Farrell, Karen Foster, Imogen Hart, Patricia Kane, Ian McClure, Barbara Mundy, Margaret Olin, David Sensabaugh, Scott Wilcox

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.

Requirements of the major Beginning with the Class of 2014, all majors must take two 100-level courses. Majors in the Class of 2013 and previous classes are required to take one 100-level course. These are broad introductory surveys of the European, American, pre-Columbian, African, and Asian traditions. Prospective majors are encouraged to take the surveys as early in their course of study as possible. Students who have taken the Advanced Placement test in art history may be able to receive acceleration credit and should consult with the director of undergraduate studies. Students are also required to take two seminars in History of Art, advanced courses numbered 402–497. (HSAR 498a or b and 499a or b are not considered seminars.) All majors must take HSAR 401a or b, *Critical Approaches to Art History*, during either the fall or the spring term of the junior year.

Intermediate courses, usually lecture courses, are numbered 200–399. Majors must take at least one 200-, 300-, or 400-level course in each of the following four areas: (1) African, African American, Native American, pre-Columbian, Islamic, and Asian; (2) ancient and medieval; (3) Renaissance, baroque, and eighteenth century; (4) nineteenth- and twentieth-century European and American. Students may propose an alternative distribution in the African, Asian, or pre-Columbian traditions. History of Art majors are encouraged to take a course in studio art, which may count toward the major.

On graduation, the student must have no fewer than twelve course credits in History of Art. Under certain circumstances, and only with the permission of the director of undergraduate studies, two of the twelve courses may be taken in other departments. Normally, these substituted courses address subjects closely linked to art history, for instance,

archaeology, history of religion, aesthetics, or visual culture. Courses taken Credit/D/Fail may not be counted toward the requirements of the major.

History of Art majors are urged to study foreign languages. Students considering graduate work should take German and another modern language (usually French or Italian). Those planning to do graduate work on the art of non-European cultures should make special arrangements about language courses with their advisers.

Senior essay The senior essay is a research paper written usually in one term (HSAR 499a or b). 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 or with the director of undergraduate studies. In certain cases, a student may be given permission to write a two-term senior essay.

Procedures The schedules of all majors must be approved and signed by the director of undergraduate studies. Students may consult the following members of the faculty about the major:

BK, to be announced	MC, A. Nemerov
BR, M. Gaifman	PC, D. Kleiner
CC, C. Wood	SY, M. Miller
DC, E. Cooke	SM, to be announced
TD, R. Thompson	ES, to be announced
JE, to be announced	TC, T. Barringer

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 course credits

Distribution of courses *Class of 2014 and subsequent classes*—2 courses at 100 level; *Class of 2013 and previous classes*—1 course at 100 level; *All classes*—2 sems numbered 402–497; at least 1 course at 200, 300, or 400 level in each of 4 areas; 1 studio art course recommended

Specific course required HSAR 401a or b

Substitution permitted With DUS permission, 2 related courses from other depts

Senior requirement Senior essay (HSAR 499a or b)

***HSAR 004a, Visualized Communities** Margaret Olin

TTH 1–2:15 HU Fr sem (0)

An introduction to visual culture. Focus on visual means of creating community, including photographs, signage, gesture, exhibitions, and Web sites. Local examples of visual communities; discussions of the nature of visual rhetoric. Field trips and collaborative research.

HSAR 112a, Introduction to the History of Art: Prehistory to the Renaissance

Milette Gaifman, Jacqueline Jung

MW 11:35–12:25, 1 HTBA HU (34)

Form as meaning in architecture, sculpture, and painting. Selected studies in these arts from prehistory to the Renaissance. Source readings in translation.

HSAR 115b, Introduction to the History of Art: Renaissance to the Present

Alexander Nemerov

TTH 11:35–12:25, 1 HTBA HU (24)

Painting, sculpture, and graphic arts, with some reference to architecture. Major works and artists treated in terms of form, function, and historical context.

HSAR 116b, Introduction to the History of Art: Arts of the Buddhist World

Mimi Yiengpruksawan

TTH 10:30–11:20, 1 HTBA HU (23)

Buddhist art and architecture as a thriving visual and material culture spanning societies across the Asian world, both ancient and modern. Introduction to the discipline of art history and to an area of world art that, while outside the Euro-American canon, is equally relevant to the roles and meanings of art in human cultures.

HSAR 215a/AMST 215a, Nationalism, Style, and Taste: Nineteenth-Century American Decorative Arts and Domestic Architecture Edward Cooke, Jr.

TTH 9–10:15 HU (22)

A survey of American architecture and decorative arts from the Revolution to 1900. Study of buildings, furniture, metals, ceramics, and glass. Topics include the American concept of design, technological advances in American crafts, and the rise of aesthetic consumerism.

HSAR 237a/ARCG 237a/NELC 108a, Ancient Painting and Mosaics Karen Foster

MW 2:30–3:45 HU (37)

Developments in wall painting, vase painting, and mosaics as seen in ancient Egypt, the Aegean Bronze Age, and the Greek, Etruscan, and Roman world.

HSAR 239b^c/ARCG 239b/HUMS 252b/NELC 104b, Art of the Ancient Near East and Aegean Karen Foster

MW 2:30–3:45 HU (37)

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts.

HSAR 243b/ARCG 243b/CLCV 160b, Greek Art and Architecture Milette Gaifman

MW 11:35–12:50 HU (34)

A survey of Greek architecture, sculpture, and painting from the late Geometric period (c. 760 B.C.) to Alexander the Great (c. 323 B.C.), with particular emphasis on social and historical contexts.

HSAR 250a/ARCG 170a/CLCV 170a, Roman Art: Empire, Identity, and Society

Diana Kleiner

TTH 9–10:15 HU (0)

Masterpieces of Roman art from the Republic to Constantine studied in their historical and social contexts. The great Romans and the monuments they commissioned – portraits, triumphal arches, columns, and historical reliefs. The concept of empire and imperial identity, politics and portraiture, the making and unmaking of history through art, and the art of women, children, freedmen, and slaves.

HSAR 252b/ARCG 252b/CLCV 175b, Roman Architecture Diana Kleiner

TTH 9–10:15 HU (0)

The great buildings and engineering marvels of Rome and its empire. Study of city planning and individual monuments and their decoration, including mural painting. Emphasis on developments in Rome, Pompeii, and central Italy; survey of architecture in the provinces.

HSAR 264a/HUMS 423a/MMES 124a, Byzantion, Constantinople, Istanbul

Robert Nelson

For description see under Humanities.

HSAR 278b, Death and Apocalypse in Medieval Art Jacqueline Jung

MW 10:30–11:20, 1 HTBA HU (33)

Attitudes toward death and the afterlife as expressed in art of various media, from the catacombs of early Christian Rome in the third and fourth centuries to the cadaver tombs of late Gothic France in the fifteenth century. Examination of arts associated with the deaths of ordinary individuals, those produced in honor of the saints, and those concerned with the fate of all humanity at the end of time.

HSAR 281a, Seventeenth-Century Pictorial Worlds Christopher Wood

TTH 1:30–2:20, 1 HTBA HU (26)

Painting in Italy, Spain, France, and the Low Countries during the seventeenth century. Major artists considered include Caravaggio, Rubens, Domenichino, Guido Reni, Guercino, Ribera, Velazquez, Poussin, and Rembrandt.

HSAR 308a, Art and Music in Britain from *The Beggar's Opera* to Punk Rock

Tim Barringer

TTH 2:30–3:45 HU (27)

The relationship between art and music in British culture from the courts of the seventeenth century to the present day. Focus on collaborations between musicians and artists and on the juxtaposition of elite and popular strands in British culture. Close examination of key works, from William Lawes's *Britannia Triumphans* and John Gay's *The Beggar's Opera* to the Sex Pistols' "God Save the Queen."

HSAR 315a, Nineteenth-Century French Art Carol Armstrong

MW 10:30–11:20, 1 HTBA HU (33)

European art produced between the French Revolution and the beginning of the twentieth century. Focus on French painting, with additional discussion of Spanish, English, and German art. Some attention to developments in photography, printmaking, and sculpture.

HSAR 321b, Global Contemporary Art David Joselit

TTH 9:25–10:15, 1 HTBA HU (22)

A historical survey of how contemporary art became global in the 1990s. The development of international art networks since the mid-twentieth century in Africa, China, the U.S.S.R./Russia, and Latin America, as well as in Europe and the United States.

HSAR 323a, Early Twentieth-Century Art Sebastian Zeidler

MW 2:30–3:45 HU (37)

Modern art in Europe and America, c. 1880–1945. Topics include individual artists (Rodin, Brancusi), historical avant-gardes (Dadaism, surrealism), the transformation of traditional media such as painting and sculpture, and the invention of collage and photomontage.

HSAR 324b, Building the New: Architecture 1900–1950 Sebastian Zeidler

MW 4–5:15 HU (37)

A survey of key intersections between modern art and architecture in Europe between 1900 and 1950. Futurism in Italy, Bauhaus in Germany, de Stijl group in the Netherlands, Soviet constructivism, and fascism and Stalinism examined from a variety of theoretical and historical perspectives.

HSAR 350b, Chinese Art and the Modern World Lillian Tseng

MW 1–2:15 HU (36)

A thematic introduction to Chinese art from the fifteenth century to the present, with special attention to its interaction with the rest of the world. Media include architecture, painting, porcelain, print, and installations. Chinese gardens in the West, watercolors for international trade, realism and socialist realism, and ink play and abstract expressionism.

HSAR 351a/ARCG 212a, Art and Archaeology in China Lillian Tseng

MW 1–2:15 HU (36)

A thematic introduction to art and archaeology in China from the Neolithic period to the ninth century. Emphasis on the negotiation between traditional practices and modern disciplines and on the reconciliation between writing culture and material culture. Topics include the ambivalence of myth and history and the interaction of center and periphery.

HSAR 356b/EAST 275b/HUMS 424b/LITR 318b, Asian Humanities: Text and Object

Haun Saussy, Mimi Yiengpruksawan

For description see under East Asian Studies.

HSAR 383a/SAST 256a, Art of India, 300 B.C.–A.D. 1650 Tamara Sears

TTH 11:35–12:50, 1 HTBA HU (24)

Introduction to the art and architectural history of the Indian subcontinent from the rise of the Mauryan Empire to the building of the Taj Mahal. The development of early Buddhist and Jain art and of Hindu temples and icons; the efflorescence of Islamic visual culture under the Mughal Empire.

HSAR 385b/SAST 258b, Temple Towns of South Asia Tamara Sears

MW 11:35–12:50 HU (34)

Survey of the history, forms, symbolisms, and meanings of South Asian temple architecture. Focus on Hindu structures, with some examination of Buddhist and Jain buildings.

***HSAR 401a or b, Critical Approaches to Art History** David Joselit [F],

Edward Cooke, Jr. [Sp]

w 1:30–3:20 [F]; T 1:30–3:20 [SP] HU (0)

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.

***HSAR 403a, Aspects of Connoisseurship and Conservation**

Theresa Fairbanks-Harris

TH 1:30–3:20 HU (RP, 26)

A survey of the techniques and materials employed in Western painting, sculpture, and graphic arts from antiquity to the present. Modern examination techniques analyzed as

tools for connoisseurship, dating, and authentication, including study of age, damage, and restoration as they change works of art. General concepts of preservation and conservation.

***HSAR 413a/AMST 341a/FILM 420a, American Visual Culture, 1941–1945**

Alexander Nemerov

M 1:30–3:20 HU (o)

A study of films shown on the home front during World War II, including both propaganda and other genres (musicals, noir, horror, cartoon). Consideration of key artists such as Norman Rockwell. Readings in cultural theory.

***HSAR 424b/ARCG 424b/CLCV 230b, eClavdia: Women in Ancient Rome**

Diana Kleiner

T 1:30–3:20 HU (RP, o)

The contributions of Roman women to one of the greatest cities – and one of the greatest empires – in world history. Lost stories of real-life Roman women recovered from public and residential buildings, portraits, paintings, and other works of Roman art and architecture.

***HSAR 428a, The Body in Medieval Art** Jacqueline Jung

T 1:30–3:20 HU (o)

Approaches to and uses of human bodies in the visual arts of northern and central Europe from around 900 to 1450. Theological conceptions of the body, especially that of Christ; practices surrounding the remnants of holy bodies (relics) and their sumptuous containers; the iconography of death, resurrection, and the afterlife; the depiction of bodies and bodily processes in medical handbooks; and the use of the expressive fictive body (e.g., in sculpture) as a tool for sparking empathy and modeling behavior among beholders.

***HSAR 431b, Bosch and Bruegel** Christopher Wood

W 1:30–3:20 HU (o)

Close study of the paintings, drawings, and prints of Hieronymus Bosch and Pieter Bruegel, two of the most familiar yet most enigmatic artists of the Renaissance. The interplay between “high” and “low” cultures in sixteenth-century Europe; the grotesque and the monstrous; art and magic; art and the demonic; the crisis of the religious image; social hierarchies, family structure, gender roles, rural and urban life, knowledge and technology, war, and dynastic politics.

***HSAR 466b, The Technical Examination of Art** Ian McClure

TH 1:30–3:20 (o)

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 481b, Art and Architecture of the Forbidden City in China** Lillian Tseng

TH 3:30–5:20 HU (o)

The Forbidden City from the Mongol Yuan dynasty to the present. Special attention to the interaction between art and politics as revealed by the city planning, architecture, and visual culture of this highly symbolic complex. Case studies include the Altar to Heaven, the Yuanming Garden, the Tiananmen Square, and the Palace Museum.

***HSAR 487a/SAST 370a, Visualizing Stories in India** Tamara Sears

W 2:30–4:20 HU (37)

Modes of visual narratives in India. Case studies drawn from Hindu, Buddhist, and Jain traditions in a variety of media: stone sculpture, illustrated manuscripts, painted scrolls, and comics.

***HSAR 490a/FILM 320a, Close Analysis of Film** John MacKay

For description see under Film Studies.

***HSAR 498a or b, Independent Tutorial** Milette Gaifman

HTBA (o)

For students who wish to pursue a subject in the history of art not otherwise covered by departmental offerings. May be used for research or directed reading under faculty supervision. A term paper or its equivalent and regular meetings with the adviser are required. To apply for admission, a student should present a prospectus and a bibliography, signed by the adviser, to the director of undergraduate studies. Enrollment limited to History of Art majors.

***HSAR 499a or b, The Senior Essay** Milette Gaifman

HTBA (o)

Preparation of a research paper about thirty pages long under the direction of a qualified instructor. The essay is written in either the fall or the spring term of the senior year, though preferably in the fall term. Students write on subjects of their own choice. During the term before the essay is written, students plan the project in consultation with a qualified instructor or with the director of undergraduate studies. No student is permitted to enroll in HSAR 499a or b without submitting a project statement, with the formal title of the essay and a brief description of the subject to be treated. The statement must be signed by the student's adviser and presented to the director of undergraduate studies before the student's schedule can be approved.

The student must submit a suitable project outline and bibliography to the adviser and the director of undergraduate studies early in the term. The outline should indicate the focus and scope of the essay topic, as well as the proposed research methodology; the bibliography should be annotated. Students must also complete a library research colloquium for the senior essay. For essays submitted in the fall term, the deadline for the outline is September 17; for those in the spring term, January 21. Senior essays written in the fall term are due on December 3; those in the spring term on April 25. Two copies must be submitted to the director of undergraduate studies. Failure to comply with any deadline will be penalized by a lower final grade. No late essay will be considered for a prize in the department.

Permission may be given to write a two-term essay after consultation with an adviser and the director of undergraduate studies. Only those who have begun to do advanced work in a given area and whose project is considered to be of exceptional promise are eligible. The requirements for the one-term senior essay apply to the two-term essay, except that the essay should be from fifty to sixty pages in length.

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 Street.

History of Greece and Rome

(See under *Classics*.)

History of Science, History of Medicine

Director of undergraduate studies: Jennifer Klein, 237 HGS, 432-1355, jennifer.klein@yale.edu; Adviser: Bruno Strasser, SHM L230, 785-2840, bruno.strasser@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF HISTORY OF SCIENCE, HISTORY OF MEDICINE

Professors Dimitri Gutas (*Near Eastern Languages & Civilizations*), Daniel Kevles, Jennifer Klein (*History*), Joanne Meyerowitz (*History*), David Musto, Cynthia Russett (*History*), Frank Snowden (*History*), Frank Turner (*History*), John Warner

Associate Professor Naomi Rogers

Assistant Professors Paola Bertucci, Mariola Espinosa, Bruno Strasser

Senior Lecturer Bettyann Kevles

Lecturers William Summers, Rebecca Tannenbaum (*History*)

History of Science, History of Medicine is an interdisciplinary program of studies leading toward an understanding of the development of science and medicine and their impact on society. It explores intellectual and cultural traditions, institutions, techniques, and practices; the social uses of science and medicine; the creation of science-based technologies; and the relations of science, medicine, and public health to the state. The program offers students considering a career in medicine, public health, or other fields of health care a way of combining the requirements of their preprofessional training with a broad liberal education. It also provides excellent preparation for many other careers in which a contextualized understanding of science and medicine is essential, including areas of law, industry, journalism, museum work, public policy, and government.

The major in History of Science, History of Medicine requires completion of thirteen courses in addition to the prerequisites. The thirteen courses must form a coherent whole, designed in consultation with the Adviser for the major. The prerequisites for the major are two term courses in science, including two terms of laboratory work, and one course chosen from MATH 112a or b or STAT 101a–106a or equivalent. Beyond the prerequisites, the program requires four term courses in History of Science, History of Medicine; one junior seminar in HSHM; a second junior seminar in either History or HSHM; one term course in science at an intermediate level; and four additional courses. These additional courses may be drawn from history, the natural and social sciences, and other areas such as medical anthropology, bioethics, philosophy of science, and medical sociology. Beginning with the Class of 2013, courses taken Credit/D/Fail may not be counted toward the requirements of the major. Students also write a senior essay for two course credits taken as HSHM 490a or b, 491a or b. See under History in the text above for details of preregistration for junior seminars; see under HSHM 490a or b, 491a or b for requirements for the senior essay.

Library orientation All majors are required to complete a ninety-minute introductory research session for historians by the end of the third week of the junior year. Several library orientation sessions are offered at the beginning of each term. Students are strongly encouraged to take this class during their sophomore year; indeed, sophomores who have not taken the library orientation before the end of February will not be permitted to preregister for the following year's junior seminars. Students may offer no substitutions for this orientation. Students should register on the Web at www.library.yale.edu/instruction/hist.

Majors are also required to take a library resource and methods colloquium in the fall term of the senior year. Students planning to begin work on their senior essay in January should attend the colloquium in the previous September.

The undergraduate major is administered by the Department of History in cooperation with the Section of the History of Medicine in the School of Medicine. Questions about the History of Science, History of Medicine major should be directed to the Adviser for the major.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 112a or b or 1 term from STAT 101a–106a or equivalent; 2 term courses in science with 2 terms of lab

Number of courses 13 courses beyond prereqs (incl senior essay)

Distribution of courses 4 courses in HSHM; 1 intermediate science course; 1 HSHM junior sem; 1 junior sem in either HSHM or History; 4 addtl courses

Other Library research session

Senior requirement Senior essay (HSHM 490a or b, 491a or b)

HSHM 202a^G/AMST 247a/HIST 147a/HLTH 170a, Media and Medicine in Modern America John Warner, Gretchen Berland

TTH 10:30–11:20, 1 HTBA HU (23)

Relationships between medicine, health, and the media in the United States from 1880 to the present. The changing role of the media in shaping conceptions of the body, creating new diseases, influencing health and health policy, crafting the image of the medical profession, informing expectations of medicine and constructions of citizenship, and the medicalization of American life.

HSHM 215a^G/HIST 140a, Public Health in America, 1793–2000 Naomi Rogers

MW 11:35–12:25, 1 HTBA (34)

A survey of public health in America from the yellow fever epidemic of 1793 to AIDS and breast cancer activism at the end of the past century. Focusing on medicine and the state, topics include quarantines, failures and successes of medical and social welfare, the experiences of healers and patients, and organized medicine and its critics.

HSHM 225b/HIST 359b, Medicine and Public Health in Latin America, 1820–2000 Mariola Espinosa

TTH 10:30–11:20, 1 HTBA HU (23)

Survey of the history of medicine in Latin America from independence to the present, focusing on the relationships of disease and public health with the construction of state and nation. Medicine's role in the production and reproduction of race and ethnicity, indigenous

medical traditions, international disease-control efforts, and persisting inequalities in health and health care.

HSHM 235b/HIST 234b, Epidemics and Society in the West since 1600

Frank Snowden

For description see under History.

HSHM 242a/HIST 193a, Molecules, Life, and Disease: Twentieth Century

Bruno Strasser

TTH 11:35–12:25, 1 HTBA HU (24)

The emergence of the molecular vision of life and disease in the twentieth century. Topics include the role of technology and research practices, intellectual and political migrations, science policy and philanthropic foundations, constructions of risks and patenting of life, big science and biotechnology, politics of memory, and popular representation of science. Relationships to broad intellectual, social, cultural, and political changes.

***HSHM 414b/CLCV 134b/HIST 217Jb, A History of Ancient Greek Medicine**

Veronika Grimm

For description see under Classics.

***HSHM 421a^c/HIST 243Ja^c, Introduction to the History of Math: Certainty, Uncertainty, and the Infinite** William Summers

TH 1:30–3:20 WR, HU (0)

The history of selected mathematical topics from antiquity until the present time. Not a mathematics course. Illustration of mathematics as a series of intellectual problems rather than technical accomplishments.

***HSHM 442a/HIST 430Ja, Disease, Public Health, and Empire** Mariola Espinosa

M 1:30–3:20 HU (0)

A study of the ways in which diseases and public health measures have shaped imperial and colonial interactions throughout the world. Themes include epidemics and commercial interactions, conceptions of race and health, ideas of healthy climates, tropical medicine and nongovernmental health institutions, and health inequalities.

***HSHM 444b/HIST 180Jb, Controversies in Human Evolution, 1859 to the Present**

Miranda Paton

T 3:30–5:20 WR, HU (0)

Nineteenth- and twentieth-century debates about the causes of human evolution, the phylogenetic history of our species, and the relationship between science and society. Charles Darwin's theory as it has been expanded and modified since 1859 to organize modern research in genetics, paleoanthropology, eugenics, and molecular systematics. Social applications of evolutionary theory.

***HSHM 445b/HIST 142Jb/WGSS 453b, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

T 9:25–11:15 WR, HU (22)

American women from the colonial era to the present as midwives, patients, healers, reformers, revolutionaries, innovators, and entrepreneurs. Ways that women have shaped American health care and medical research.

***HSHM 447b^G/HIST 379Jb, History of Chinese Science** William Summers

For description see under History.

***HSHM 451a/HIST 147Ja^G/INTS 340a, Science, Arms, and the State** Daniel Kevles

For description see under History.

***HSHM 458a/HIST 410Ja, Technology and Power** Jenifer Van Vleck

For description see under History.

***HSHM 462b/HIST 141Jb/THST 394b, Science and Drama** Bettyann Kevles

For description see under History.

***HSHM 470a and 471b, Directed Reading** Jennifer Klein

HTBA (o)

Readings directed by members of the faculty in selected topics in the history of science or the history of medicine. Subjects depend on the interests of students and faculty. Weekly conferences; required papers.

***HSHM 490a or b and 491a or b, The Senior Essay** Jennifer Klein

HTBA (o)

There will be a mandatory senior essay meeting on Tuesday, September 7, 2010, at a time and location to be announced. Research and writing of the required senior essay under the supervision of HSHM or History faculty. To assist in selection of source materials and of a topic, special library resource and methods colloquia are held during the fall term. Students must attend one colloquium; those planning to start their senior essay work in January should attend in September. Students expecting to graduate in May 2011 enroll in 490a in the fall term and complete their essay in 491b in the spring term. Students expecting to graduate in December 2011 enroll in 490b in the spring term, and should notify the senior essay director by December 6, 2010. Each student majoring in HSHM must submit a completed Statement of Intention form signed by the faculty member who has agreed to supervise the essay to the HSHM administrator in 207 HGS no later than September 13, 2010 (for HSHM 490a), or January 21, 2011 (for HSHM 490b). Statement forms are available in 207 HGS and in the HSHM Senior Essay Handbook. Students enrolled in 490a or b must submit to their advisers a prospectus, an annotated bibliography, and at least ten pages of the essay or a detailed outline of the entire project by December 6, 2010 (490a), or May 2, 2011 (490b). Those who meet the requirement receive a temporary grade of SAT, which will be changed to the grade received for the final essay. Failure to meet any requirement may result in the student's being asked to withdraw from HSHM 490a or b. Students enrolled in HSHM 491a or b must submit a completed senior essay to 211 HGS no later than 5 p.m. on April 4, 2011, in the spring term, or no later than 5 p.m. on December 6, 2010, in the fall term. Essays submitted after 5 p.m. will be subject to grade penalties. In order to graduate from Yale College, a student majoring in HSHM must receive a passing grade on the senior essay. The essay should take the form of a substantial article (approximately 12,500 words or 40 double-spaced typed pages). Please note that 12,500 words is the maximum word limit; there is no minimum word limit. The word limit is significant insofar as precision, clarity, and conciseness are essential to good historical writing. More details about the senior essay requirement are available in the HSHM Senior Essay Handbook.

Humanities

Director of undergraduate studies: Norma Thompson, Whitney Humanities Center, 53 Wall St., 432-1313, norma.thompson@yale.edu; director: R. Howard Bloch, 53 Wall St., 432-0670, howard.bloch@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF HUMANITIES

Professors Jeffrey Alexander (*Sociology*), Dudley Andrew (*Film Studies, Comparative Literature*), R. Howard Bloch (*French*), Harold Bloom (*Humanities*), David Bromwich (*English*), Rüdiger Campe (*German*), Janice Carlisle (*English*), Francesco Casetti (*Humanities*), Stephen Davis (*Religious Studies*), Carlos Eire (*History, Religious Studies*), Benjamin Foster (*Near Eastern Languages & Civilizations*), Roberta Frank (*English, Linguistics*), Paul Freedman (*History*), Paul Fry (*English*), Bryan Garsten (*Political Science*), David Gelernter (*Computer Science*), Phyllis Granoff (*Religious Studies*), Beatrice Gruendler (*Near Eastern Languages & Civilizations*), Valerie Hansen (*History*), Karsten Harries (*Philosophy*), Christine Hayes (*Religious Studies*), Edward Kamens (*East Asian Languages & Literatures*), Alice Kaplan (*French*), Ivan Marcus (*History, Religious Studies*), María Rosa Menocal (*Humanities*), Rainer Nägele (*German*), Robert Nelson (*History of Art*), Leon Plantinga (*Emeritus*) (*Music*), Richard Prum (*Ecology & Evolutionary Biology*), Claude Rawson (*English*), Cynthia Russett (*History*), Haun Saussy (*Comparative Literature*), Stuart Schwartz (*History*), William Sledge (*School of Medicine*), Frank Snowden (*History, History of Medicine*), William Summers (*Molecular Biophysics & Biochemistry*), Henry Sussman (*German*), Ivan Szelenyi (*Sociology*), Francesca Trivellato (*History*), Frank Turner (*History*), Anders Winroth (*History*), Mimi Yiengpruksawan (*History of Art*)

Associate Professors Ala Alryyes (*Comparative Literature, English*), Murray Biggs (*Adjunct*) (*Theater Studies, English*), Shannon Craigo-Snell (*Religious Studies*), Emily Greenwood (*Classics*), Barry McCrea (*Comparative Literature*), Kirk Wetters (*German*)

Assistant Professors Angela Capodivacca (*Italian*), John Fisher (*Classics*), David Gabriel (*Comparative Literature*), Jonathan Gilmore (*Philosophy*), David Lummus (*Italian*), Karuna Mantena (*Political Science*), Paul North (*German*), Irene Peirano (*Classics*), Kishwar Rizvi (*History of Art*), Marci Shore (*History*)

Senior Lecturers Peter Cole (*Judaic Studies*), Charles Hill (*Global Affairs*), Jane Levin (*Humanities*), Koichi Shinohara (*Religious Studies, East Asian Studies*), Norma Thompson (*Humanities*)

Lecturers Edward Barnaby (*Comparative Literature*), Jay Elliott (*Humanities*), Hilary Fink (*Slavic Languages & Literatures*), Karen Foster (*Near Eastern Languages & Civilizations*), Veronika Grimm (*Classics, History*), Virginia Jewiss (*Humanities*), David Possen (*Humanities*), Timothy Robinson (*Classics*), Pamela Schirmeister (*Comparative Literature, Humanities*), Sam See (*English*), Kathryn Slanski (*Humanities, Near Eastern Languages & Civilizations*), George Syrimis (*Hellenic Studies*)

Senior Lector II Risa Sodi (*Italian*)

Lector Maria Kaliambou (*European Studies*)

The interdisciplinary program in Humanities is designed to contribute to an integrated understanding of the Western cultural tradition. Selected works of European literature, music, philosophy, and visual arts are studied in relation to each other and to the history of ideas and political institutions. The varied program of study offers many options for students in all years interested in interdisciplinary and broad-based work in the humanities, from special seminars for freshmen to the Franke and Shulman Seminars for senior majors. Most courses are open to nonmajors.

The major in Humanities offers three areas of concentration: the arts in the humanities, intellectual history, and the West and its encounters. The major is intended to emphasize breadth and interdisciplinary effort without sacrificing depth. It brings together traditional disciplines in the humanities such as history, literature, history of art, philosophy, and history of music in a manner that is both broadly based and intensively rigorous.

Prerequisite There is a prerequisite in ancient civilization, which can be satisfied by Directed Studies or by two courses in classical civilization or in ancient Near Eastern civilization.

Requirements of the major In addition to the prerequisite, thirteen term courses are required for the major, including two core seminars in one of the areas of concentration; any five Humanities electives (including Franke and Shulman Seminars), with at least one in each of the three areas of concentration; five additional electives selected to complement the student's area of concentration, with approval of the director of undergraduate studies; and the senior essay, normally written in the spring term of the senior year. Majors in Humanities are strongly encouraged to enroll in at least one term course in literature in a foreign language. Students are expected to declare their intent to major in Humanities in a meeting with the director of undergraduate studies before their junior year.

Core courses Two core seminars must be selected from one area of specialization: the arts in the humanities, intellectual history, or the West and its encounters. All seminars listed under these subheads are core seminars.

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, both the Franke Seminar and the Shulman Seminar include a series of coordinated public lectures. The seminars are for enrolled students; the lecture series is open to the Yale and local communities. Humanities majors may enroll in a Franke or a Shulman Seminar with permission of the director of undergraduate studies and the instructor.

Summer program in Rome Humanities majors who take the spring-term course HUMS 444b, *The City of Rome*, 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, which addresses key issues relevant to all three areas

of concentration in the Humanities major. Further information is available on the Web at www.yale.edu/humanities/summer.html and www.yale.edu/summer.

REQUIREMENTS OF THE MAJOR

Prerequisite Directed Studies, or 2 courses in classical civ or ancient Near Eastern civ

Number of courses 13 term courses beyond prereq (incl senior essay)

Distribution of courses 2 core sems in 1 area of concentration; 5 Humanities electives, at least 1 in each of 3 areas of concentration; 5 addtl electives

Senior requirement Senior essay (HUMS 491a or b)

SEMINARS FOR FRESHMEN

The seminars in this group are designed for freshmen who are interested in the Humanities program but are not enrolled in Directed Studies. Enrollment in each seminar is limited to 18. Preregistration is required; see under Freshman Seminar Program.

***HUMS 075b/SPAN 070b, The Cultures of Medieval Spain** María Rosa Menocal

TTH 2:30–3:45 WR, HU Fr sem (o)

An introduction to texts and monuments from Islamic and Christian Spain that shaped a cultural landscape both unique and influential in European history. Topics include the achievements of the Umayyad Caliphate; the invention of modern Europe's first vernacular poetry; the translation movement that brought the Greek philosophical canon to Latin Christendom; and the adaptation of Arabic forms (architectural as well as literary) in the creation of both the Jewish Golden Age and early Castilian culture.

***HUMS 076a, Epidemics in Global Perspective** William Summers

MW 2:30–3:45 HU, SO Fr sem (o)

Interaction of epidemic diseases and society. The response of government, medicine, and the public to the threat or actual presence of widespread contagious diseases. The notion of major epidemics as one of the key contingencies of history, critically examined through contemporary medical, political, and literary accounts. The changing responses of societies and governments to epidemics as well as the reasons for those responses.

***HUMS 082b/JAPN 002b, Genji's World: Japan's Culture, c. 1000** Edward Kamens

For description see under East Asian Languages & Literatures.

***HUMS 089b/FILM 097b/ITAL 063b, Literature into Film** Millicent Marcus

For description see under Italian.

***HUMS 091b/ENGL 009b, The Sagas of Icelanders** Roberta Frank

For description see under English Language & Literature.

***HUMS 092a/RLST 012a, Divine Law in Historical Perspective** Christine Hayes

TTH 9–10:15 HU Fr sem (o)

The relationship between the concepts of religion and law in classical Jewish and Christian thought. Law as a religious expression, a concession to human weakness, or a debasement of the divine-human relationship; reasons for obeying religious and secular law; the relation of law and morality; the impact of historical theological debates over the law's spirit vs. its letter on contemporary, secular legal arguments concerning the value of law.

THE ARTS IN THE HUMANITIES

*HUMS 218a, Shakespearean Character: Falstaff, Hamlet, Iago, Cleopatra

Harold Bloom

W 1:30–3:20 HU (o)

A close study of four of Shakespeare's most compelling characters: Iago (from *Othello*), Cleopatra (from *Antony and Cleopatra*), Falstaff (from *Henry IV*), and the title character Hamlet.

*HUMS 219b, Shakespeare: *King Lear*, *Macbeth*, *The Winter's Tale*, *The Tempest*

Harold Bloom

W 1:30–3:20 HU (o)

A close study of four late Shakespearean masterworks.

*HUMS 222a, Whitman, Dickinson, Stevens, Hart Crane Harold Bloom

TH 1:30–3:20 HU (o)

A close reading of four major American poets, with Emerson's prose included as a starting point.

*HUMS 225b, Bishop, Merrill, Ammons, Ashbery Harold Bloom

TH 1:30–3:20 HU (o)

A close reading of the poetry of Elizabeth Bishop, James Merrill, A. R. Ammons, and John Ashbery. Emphasis on their relationship to their American precursors.

*HUMS 226a, Classical to Romantic Epic Jane Levin

TTH 1–2:15 HU (26)

The epic as it has been used in different times and countries to express ideas about the hero, the divine, nature, and art. Poets and poems include Homer, Virgil, *Beowulf*, Milton, Pope, Wordsworth, and Whitman.

HUMS 243b/ENGL 360b/LITR 223b/THST 223b, The Foundations of Modern Drama

Murray Biggs

For description see under Theater Studies.

*HUMS 246a/ENGL 321a/LITR 357a, Visual Culture in Literature, Drama, and Film

Edward Barnaby

For description see under Literature.

HUMS 252b/ARCG 239b/HSAR 239b⁶/NELC 104b, Art of the Ancient Near East and Aegean Karen Foster

For description see under History of Art.

*HUMS 254b/ENGL 351b, Satire Claude Rawson

For description see under English Language & Literature.

*HUMS 259a/JDST 312a, Hebrew Poetry in Muslim Spain Peter Cole

For description see under Judaic Studies.

HUMS 260b/PHIL 343b, Philosophy of Art Jonathan Gilmore

For description see under Philosophy.

HUMS 264a/ITAL 157a, Italian through Opera and Film Risa Sodi

For description see under Italian.

***HUMS 288b/ENGL 342b/WGSS 408b, Queer Mythologies** Sam See

For description see under English Language & Literature.

***HUMS 290b/CLCV 264b/LITR 163b, Literary Interpretation in Greece and Rome**

Irene Peirano

For description see under Classics.

***HUMS 291a/LITR 462a, Literary Analysis of Trials** Alice Kaplan

For description see under Literature.

***HUMS 293b/GMST 200b/LITR 211b, Roots of Modernity** R. Howard Bloch,
Rüdiger Campe

TTH 9–10:15 HU (o)

Study of principal literary, visual, and musical works, artistic movements, social thought, and scientific and technological developments from the last decades of the nineteenth century to the Great War.

***HUMS 294a/GMAN 356a/GMST 356a, Dream and Interpretation** Paul North

For description see under Germanic Languages & Literatures.

***HUMS 295a/ENGL 353a/LITR 463a, Medieval Celtic Literature** David Gabriel

For description see under Literature.

***HUMS 296b/ENGL 210b, Reading and Writing in Renaissance England**

David Scott Kastan

For description see under English Language & Literature.

***HUMS 297b/ITAL 205b/LITR 337b, Italian Food and Literature** Risa Sodi

For description see under Italian.

***HUMS 298b/CLCV 223b/LITR 164b, Love and Desire in the Classical Tradition**

Emily Greenwood, Caroline Stark

For description see under Classics.

INTELLECTUAL HISTORY

***HUMS 299a, Rhetoric and Political Order** Norma Thompson

TTH 2:30–3:45 HU (o)

A study of rhetoric as an indispensable element of politics. Rhetorical perceptions of the sophist Gorgias and the philosophers Plato and Aristotle; foundations of modern rhetoric in Machiavelli, Jane Austen, and Abraham Lincoln; and contemporary rhetorics of gender, social science, natural science, and democratic theory.

***HUMS 300b, Oratory in Statecraft** Charles Hill

TTH 2:30–3:45 HU (o)

A seminar and practicum in oratory, the first tool of leadership. A study of oratory as it provides direction, builds support, and drives action on a strategic agenda. Analysis of speeches in antiquity, the early modern era, and the unique American voice: Edwards to Lincoln to King.

HUMS 302a/PLSC 290a/SOCY 151a, Foundations of Modern Social Theory

Emily Erikson

For description see under Sociology.

***HUMS 311b/HIST 233Jb, Phenomenology, Structuralism, Existentialism**

Marci Shore

For description see under History.

HUMS 314b/CLCV 292b/LITR 162b, Ancient Greece and Rome in Historical Fiction

Emily Greenwood

For description see under Classics.

HUMS 316a/RLST 163a^G, Reason, Faith, and Feeling: Early Modern Christian Thought

Shannon Craigo-Snell

For description see under Religious Studies.

HUMS 317b/RLST 164b^G, History, Hope, and the Self: Modern Christian Thought

Shannon Craigo-Snell

For description see under Religious Studies.

***HUMS 319b/PHIL 324b, Prudence and Ethics**

Jay Elliott

TTH 2:30–3:45 HU (o)

Prudence as a central concept for understanding action, practical reason, and ethics. Focus on the tradition that flows from Aristotle to Thomas Aquinas and their twentieth-century inheritors and critics.

***HUMS 320b/GMST 181b, Ideology, Revolution, Religion**

Paul North

For description see under German Studies.

***HUMS 329a/GMAN 357a^G/GMST 357a, Nietzsche and His Readers**

Paul North

For description see under Germanic Languages & Literatures.

HUMS 336b/HIST 174b, American Intellectual and Cultural Life in the Twentieth Century

Cynthia Russett

For description see under History.

***HUMS 354a/ENGL 276a, Ways of Knowing in Nineteenth-Century American Literature**

Pamela Schirmeister

For description see under English Language & Literature.

HUMS 375b/FILM 333b/LITR 351b, Early Film Theory and Modernity

Francesco Casetti

For description see under Film Studies.

***HUMS 391b/PHIL 329b, Kierkegaard and the Examined Life**

David Possen

TTH 9–10:15 HU (o)

Kierkegaard's effort to revive the philosophy of Socrates in a modern setting. Implications for ethics, epistemology, the philosophy of religion, and philosophical psychology.

***HUMS 399b/LITR 399b, Defining Life**

Ala Alryyes

For description see under Literature.

HUMS 407a/CPSC 150a, Computer Science and the Modern Intellectual Agenda

David Gelernter

For description see under Computer Science.

HUMS 408b/CPSC 151b, The Graphical User Interface David Gelernter

For description see under Computer Science.

THE WEST AND ITS ENCOUNTERS***HUMS 414a/FILM 421a/INTS 380a/MGRK 213a/WGSS 261a, Cinema of Migration**

George Syrimis

For description see under Hellenic Studies.

***HUMS 415a, Washington, D.C.** Charles Hill

F 1:30–3:20 HU (o)

From swampy river landing to war-threatened capital to world power center, the city of Washington has produced a distinctive, intertwined culture – expressed through literature, architecture, film, autobiography, natural history, and the arts – that represents the United States to the world while often in tension with America itself.

HUMS 418a/RLST 130a/SAST 367a, Traditional Literature of India, China, and Japan

Koichi Shinohara, Phyllis Granoff

MW 2:30–3:45 HU (o)

Introduction to literary works that shaped the great civilizations of Asia. Focus on traditional literature from India, China, and Japan. Readings range from religious and philosophical texts to literature of the court, poetry, drama, and epics.

HUMS 421a/HIST 315a, History of Traditional China to 1600 Valerie Hansen

For description see under History.

HUMS 422b/HIST 226b^c/NELC 326b/RLST 158b^c, Jesus to Muhammad: Ancient Christianity to the Rise of Islam Stephen Davis

For description see under Religious Studies.

HUMS 423a/HSAR 264a/MMES 124a, Byzantion, Constantinople, Istanbul

Robert Nelson

TTH 10:30–11:20, 1 HTBA HU (23)

Byzantion, Constantinople, Istanbul, one city by three names, straddles Europe and Asia. The life and monuments of one of the world's most interesting and beautiful cities from antiquity to the present, Homer to Pamuk, and church to mosque.

HUMS 424b/EAST 275b/HSAR 356b/LITR 318b, Asian Humanities: Text and Object

Haun Saussy, Mimi Yiengpruksawan

For description see under East Asian Studies.

***HUMS 425b/LITR 465b, Travel and Quests in Early World Literature** David Gabriel

For description see under Literature.

HUMS 426b/HIST 314b, Early Sources in Chinese Intellectual Traditions

Annping Chin

For description see under History.

***HUMS 427b/LITR 262b, The Practice of Literary Translation** Barry McCrea

HTBA HU (0)

Intensive readings in the history and theory of translation paired with practice in translating. Case studies from ancient languages (the Bible, Greek and Latin classics), medieval languages (classical Arabic literature), and modern languages (poetic texts).

***HUMS 428b/ENGL 243b/LITR 207b/MGRK 214b/WGSS 215b, Modern Literature and the Eastern Mediterranean** Langdon Hammer, George Syrimis

For description see under Hellenic Studies.

HUMS 438b/NELC 101b, Origins of Western Civilization: The Near East from Alexander to Muhammad Benjamin Foster

MW 9–10:15 HU (32)

Cultural and historical survey of Hellenistic, eastern Roman, Parthian, Byzantine, and Sassanian empires in the Near East. Emphasis on mutual influences of Near Eastern and classical worlds, the rise of Christianity and Islam in Near Eastern contexts, and the division of East and West between conflicting ideas of unity.

HUMS 439b/HIST 210b, The Early Middle Ages, 284–1000 Paul Freedman

For description see under History.

HUMS 440a/MMES 102a/NELC 102a, Introduction to the Middle East

Benjamin Foster

For description see under Near Eastern Languages & Civilizations.

HUMS 441a/NELC 121a, The Hero in the Ancient Near East Kathryn Slanski

For description see under Near Eastern Languages & Civilizations.

***HUMS 442b/CLCV 312b/NELC 315b, Translating the Hero** Kathryn Slanski

W 3:30–5:20 HU (0)

Relationships between masterworks of ancient Near Eastern and Greek literature and their reworkings by Western authors and artists. Traditional notions of heroism, such as the righteous sufferer, the epic hero, and the tragic hero. Adaptation and transformation of ancient heroic themes in modern literature and film. Manipulation of ancient sources in the retelling of stories and themes; the mechanics of transmission and borrowing; questions of archetype.

***HUMS 443a/HIST 232Ja/JDST 270a/MMES 342a/RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

T 1:30–3:20 HU (0)

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. For History majors, counts toward either European or Middle Eastern distributional credit, upon application to the director of undergraduate studies.

HUMS 444b, The City of Rome Virginia Jewiss

TTH 11:35–12:50 HU (24)

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. (Formerly HUMS 396b)

THE FRANKE SEMINAR

***HUMS 437b/HIST 212Jb, History of Food and Cuisine** Paul Freedman

MW 2:30–3:45 HU (o)

The history of food and culinary styles from prehistory to the present, with a particular focus on Europe and the United States. How societies gathered and prepared food. Changing taste preferences over time. The influence of consumers on trade, colonization, and cultural exchange. The impact of colonialism, technology, and globalization. The current food scene and its implications for health, the environment, and cultural shifts.

THE SHULMAN SEMINAR

***HUMS 475b/PHIL 452b, Evolution of Beauty** Jonathan Gilmore, Richard Prum

TH 2:30–4:20 HU (o)

A wide-ranging philosophical and scientific inquiry into the evolution and roles of beauty in human and natural worlds. Topics include the evolution of beauty among nonhuman animals; innate aesthetic preferences; the relation between beauty and art; aesthetic realism vs. aesthetic relativism; beauty and sexual selection.

INDIVIDUAL RESEARCH AND SENIOR ESSAY COURSES

***HUMS 470a and 471b, Special Studies in the Humanities** Norma Thompson

HTBA (o)

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 481a, Senior Seminar: Reading and Writing across the Disciplines**

María Rosa Menocal

T 1:30–3:20 HU (o)

An overview of issues in cross-disciplinary studies in the humanities, through cases from the medieval period of European culture. Topics include reading and writing across languages and cultures and across time periods; and the integration of historical and aesthetic analyses. Intended to prepare majors for writing the senior essay.

***HUMS 491a or b, The Senior Essay** Norma Thompson

HTBA (o)

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 19, 2010, if the essay is to

be submitted during the spring term, by April 25, 2011, for yearlong or fall-term essays. A rough draft of the essay is due at noon on March 21, 2011, for spring-term essays or on November 1, 2010, for fall-term essays. The final essay is due at noon on April 11, 2011, for spring-term essays or on December 3, 2010, for fall-term essays; late essays will be penalized by a lower grade.

Indonesian

(See under *Southeast Asia Studies*.)

International Studies

Director of undergraduate studies: Jason Lyall, 138 Rosenkranz Hall, 432-3418, jason.lyall@yale.edu, www.yale.edu/macmillan/iac/bainternational

FACULTY ASSOCIATED WITH THE PROGRAM OF INTERNATIONAL STUDIES

Professors Julia Adams (*Sociology*), Elizabeth Bradley (*Public Health*), David Cameron (*Political Science*), Deborah Davis (*Sociology*), Eduardo Engel (*Economics*), John Gaddis (*History*), Jolyon Howorth (*Global Affairs, Political Science*) (*Visiting*), Stathis Kalyvas (*Political Science*), John Kane (*Global Affairs*) (*Visiting*), Dean Karlan (*Economics*), Paul Kennedy (*History*), Daniel Kevles (*History*), James Levinsohn (*Director*) (*Global Affairs, School of Management*), Nicoli Nattrass (*Global Affairs*) (*Visiting*), Catherine Panter-Brick (*Global Affairs, Anthropology*), Annabel Patterson (*Emeritus*) (*English*), Patricia Pessar (*Adjunct*) (*American Studies, Anthropology*), Thomas Pogge (*Political Science, Philosophy*), Douglas Rae (*School of Management, Political Science*), Frances Rosenbluth (*Political Science*), Kenneth Scheve (*Political Science*), Jeremy Seekings (*Global Affairs*) (*Visiting*), Ian Shapiro (*Political Science*), T. N. Srinivasan (*Economics*), Alec Stone Sweet (*Political Science, Law School*), Ivan Szelenyi (*Sociology*), Steven Wilkinson (*Political Science*), Elisabeth Wood (*Political Science*)

Associate Professors Keith Darden (*Political Science*), Thad Dunning (*Political Science*), Keller Easterling (*School of Architecture*), Beverly Gage (*History*), Pierre Landry (*Political Science*), Ellen Lust (*Political Science*)

Assistant Professors Patrick Cohrs (*History*), Susan Hyde (*Political Science*), Sigrun Kahl (*Political Science*), Kaveh Khoshnood (*Public Health*), Jason Lyall (*Political Science*), Nikolay Marinov (*Political Science*), Nancy Qian (*Economics*), Jun Saito (*Political Science*), Vivek Sharma (*Political Science*), Jessica Weiss (*Political Science*)

Senior Lecturer Boris Kapustin (*Ethics, Politics, & Economics, Global Affairs*)

Lecturers Jasmina Beširević-Regan (*Sociology*), Leslie Curry (*Public Health*), Cheryl Doss (*Global Affairs, Economics*), Stuart Gottlieb (*Political Science*), Lloyd Grieger (*Global Affairs*), Matthew Kocher (*Global Affairs, Political Science*), Jean Krasno (*Political Science*), Stephen Latham (*Political Science, School of Management*), Konstantina Maragkou (*European Studies, History*), Walter Mead (*Global Affairs*), Jonathan Schell (*Global Affairs*), James Silk (*Law School*), Michael Skonieczny (*Public Health*), George Syrimis (*Comparative Literature*), Nils Weidmann (*Global Affairs*)

Senior Fellows Linda Jewell (*Global Affairs*), Flynt Leverett (*Global Affairs*), Hillary Leverett (*Global Affairs*), Rakesh Mohan (*Global Affairs, School of Management*), Marwan Muasher (*Global Affairs*)

The program in International Studies is designed for students who seek to combine the discipline-based requirements of a first major with an understanding, drawn from several disciplines, of the transformations occurring on this planet in their interconnected socio-economic, environmental, political, and cultural dimensions. No student may major in International Studies by itself; it must be a second major. The number of students accepted into this major is limited.

The International Studies major requires mastery at an advanced level in one modern foreign language or intermediate-level proficiency in two foreign languages; courses in introductory economics (both macro- and microeconomics); and familiarity with the history, society, or politics of at least one country or region other than the United States. Students are also required to take one course in each of five areas that provide alternative lenses for analyzing international affairs: analytic and research methods, statecraft and power, ethnicity and culture, international political economy, and science and technology. The capstone of the International Studies major is a two-term seminar course in which a group of students and a faculty member study topics connected to a single broad theme and/or a region of the world.

Students interested in applying to the International Studies major should elect courses during the freshman and sophomore years with an awareness of the foreign language and economics requirements of the major. Admission to the major takes place during the sophomore year. Application forms are available on line at www.yale.edu/macmillan/iac/bainternational.

Students should note that, in accordance with the academic regulations concerning two majors (see "Two Majors" in chapter II, section K), each major must be completed independently of the other, with no more than two term courses overlapping. Although senior essays or projects may, with permission of both directors of undergraduate studies, be coordinated, they may not overlap in course credits earned. Close and continuous consultation between the student, the director of undergraduate studies, and appropriate faculty members is extremely important.

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. Forms must be submitted no later than the due date for course schedules in the student's final term of enrollment.

Requirements of the major In addition to fulfilling the requirements of the primary major, a student pursuing International Studies as a second major must complete eleven term courses, including the capstone seminar, and meet the major's language requirement. Up to two courses in the major may be taken on a Credit/D/Fail basis. Students are expected to choose their courses from the following categories:

1. One term course focused on international ideas and institutions, selected from International Studies courses numbered 170–179.

2. One term course in each of the following five lens areas: analytic and research methods, statecraft and power, ethnicity and culture, international political economy, and science and technology. A list of preapproved courses is available from the International Studies office or on the program Web site. Additional courses may meet a lens requirement with approval from the director of undergraduate studies.
3. One term course in microeconomics and one in macroeconomics.
4. One term course in the history, culture, or politics of a region or country other than the United States.
5. One two-term seminar course (the senior requirement).

Language requirement Majors in International Studies must demonstrate advanced ability in one, or intermediate-level ability in two, modern languages other than English. This requirement is normally met by the completion of two courses at the L5 level in one language or courses in two languages at the L4 level. Grades in language courses do not count toward Distinction in the Major.

Senior requirement Each student takes a two-term capstone seminar course. These seminars are working groups of about fifteen students directed by a faculty member and organized around a unifying theme or topic selected to reflect student and faculty interests. Each group produces a set of closely related, article-length research papers, with each student's paper comprising the senior essay. Senior essays should draw on foreign language as well as English sources.

Capstone seminars vary from year to year. Selected topics for 2010–2011 are indicated in the titles of the capstone seminars below.

REQUIREMENTS OF THE MAJOR

International Studies can be taken only as a second major. Specific course selection and choices of linked majors should be made in consultation with the DUS.

Prerequisites None

Number of courses 11 (incl capstone sem; excluding lang req)

Distribution of courses 1 term course numbered INTS 170–179; 1 course in each of 5 lens areas; 1 term course each in micro- and macroeconomics; 1 course in hist, culture, or politics of a country or region other than the U.S.

Language requirement Advanced ability in one, or intermediate-level ability in two, modern langs other than English

Senior requirement Two-term capstone sem with essay

INTS 101a, Gateway to Global Affairs James Levinsohn

TTH 1–2:15, 1 HTBA SO (26)

Introduction to critical thinking about current international issues. Topics in global affairs are presented by outside experts on each issue and include globalization and the United States, AIDS in sub-Saharan Africa, the role of international law, and negotiating peace.

INTS 172b, International Ideas and Institutions: Contemporary Challenges

Jolyon Howorth

MW 11:35–12:50, 1 HTBA SO (34)

Introduction to the contemporary study of international relations. Topics include reasons why countries go to war and why they enter into alliances; the effectiveness of international peacekeeping efforts; the determinants of consequences of international trade; and the role of international organizations such as the World Trade Organization, the World Bank, and the International Monetary Fund.

INTS 173a, U.S. Leadership and International Order John Kane

TTH 10:30–11:20, 1 HTBA SO (23)

International order and the leadership role that the United States has played in the world since World War II. Roles the United States might, can, or should play in the future in light of recent foreign policy misadventures, economic stress, and forecasts of relative decline.

INTS 201a, Applied Quantitative Analysis Lloyd Grieger

MW 1–2:15, 1 HTBA (36)

Mathematical fundamentals that underlie analytical approaches in public policy and the social sciences. Development of mathematical skills in areas such as linear functions, single and multiple variable differentiation, exponential functions, and optimization. Statistical approaches include descriptive statistics, principles of sampling, hypothesis tests, simple linear regression, multiple regression, and models for analyzing categorical outcomes.

***INTS 241b/HLTH 230b, Global Health: Challenges and Promises**

Kaveh Khoshnood

For description see under Global Health Studies.

INTS 247a^G/PLSC 360a, Comparative and International Bioethics Stephen Latham

For description see under Political Science.

***INTS 249a^G/HLTH 325a/LAST 416a, Methods and Ethics in Global Health Research**

Kaveh Khoshnood

F 9:25–11:15 SO (RP, O)

Introduction to research methods in global health that recognize the influence of political, economic, social, and cultural factors. Quantitative, qualitative, and mixed-method approaches; ethical aspects of conducting research in resource-constrained settings; the process of obtaining human subjects' approval. Students develop proposals for short-term global health research projects conducted in resource-constrained settings. Prerequisite or corequisite: a course in statistics, or with permission of instructor.

***INTS 255a, Energy, International Security, and the Global Economy** Flynt Leverett

M 1:30–3:20 SO (36)

Economic, political, and strategic implications of ongoing trends in international energy markets, particularly those for crude oil and natural gas.

***INTS 260b/PLSC 144b, Topics in International Security** Jason Lyall

For description see under Political Science.

***INTS 261b^G, U.S. Public Diplomacy in the Twenty-First Century** Linda Jewell

T 1:30–3:20 SO (O)

Practices, institutions, and critical issues in public diplomacy explored from the perspective of a diplomatic practitioner. Media relations, cultural diplomacy, and international broadcasting; the role of government agencies beyond the State Department in formulating

and carrying out public diplomacy; the role of nongovernmental actors; the impact of the information revolution on traditional diplomacy.

***INTS 262b, The United States and the Middle East** Hillary Leverett

M 1:30–3:20 SO (36)

Strategic challenges facing U.S. policymakers in the Middle East. Historical evolution of U.S. policy in the Middle East. Development of an analytic framework for understanding current policy debates.

INTS 264a/HIST 139a, The United States and the World, 1917–1991 Patrick Cohrs

For description see under History.

***INTS 268b/PLSC 199b, The Rise and Decline of Empires** Matthew Kocher

For description see under Political Science.

***INTS 269b/EP&E 312b/PLSC 297b, Moral Choices in Politics** Boris Kapustin

T 1:30–3:20 SO (0)

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.

***INTS 307a/PLSC 399a^C, Anti-Americanism and Popular Protest** Jessica Weiss

For description see under Political Science.

INTS 310a/PLSC 165a, International Security Matthew Kocher

For description see under Political Science.

***INTS 311a/MMES 187a, The Middle East Peace Process, 1991 to the Present**

Marwan Muasher

M 9:25–11:15 SO (RP, 0)

Negotiations and conflict resolution in the Arab-Israeli conflict, from the Madrid Peace Conference in 1991 to the present. The players involved and the different narratives within and among all sides; opponents of the peace process and their success in derailing peace efforts; possible reasons for the failure to achieve an end to the conflict; alternative scenarios and possible breakthroughs. Includes a simulation of negotiations during which students assume the roles of Palestinians, Syrians, Israelis, Arabs, and Americans and attempt to devise a lasting solution to the conflict.

***INTS 317b^C/MMES 188b, Contemporary Arab Political Reform** Marwan Muasher

M 9:25–11:15 SO (0)

The pace of political reform in the Arab world. Causes of political stagnation; the influence of Arab nationalism and Islamic political forces on the process of reform; the knowledge, freedom, and gender gaps that separate the Arab region from the rest of the world; recent efforts by government and nongovernment actors to push reform forward; whether Arab regimes are capable of reforming themselves; what role outside players should have in the reform process.

INTS 326b/AFST 356b/LAST 412b/PLSC 356b, Collective Action and Social Movements Elisabeth Wood

For description see under Political Science.

INTS 327b/PLSC 449b, Ethnic Conflict Steven Wilkinson

For description see under Political Science.

***INTS 328b/AFST 328b/PLSC 158b, Nationalism** Keith Darden

For description see under Political Science.

***INTS 333a^c/EP&E 240a/PLSC 428a, Comparative Welfare Policy in Developing Countries** Jeremy Seekings

W 2:30–4:20 SO (o)

Examination of public and private welfare systems in the developing world. Analysis of the evolving relationships between kin or community and states and market. Particular attention is paid to the politics of contemporary reforms.

***INTS 335b/EP&E 362b/PLSC 151b^c, International Dimensions of Democratization**

Nikolay Marinov

For description see under Political Science.

INTS 337b/PLSC 145b, International Political Economy Kenneth Scheve

For description see under Political Science.

***INTS 340a/HIST 147Ja^c/HSHM 451a, Science, Arms, and the State** Daniel Kevles

For description see under History.

INTS 342a^c/ARCH 341a^c, Globalization Space Keller Easterling

For description see under Architecture.

INTS 345b/EP&E 442b/HIST 133b, Strategic, Political, and Moral Dilemmas of the Nuclear Age Jonathan Schell

TTH 11:35–12:50 HU, SO (24)

A chronological inquiry into the central questions raised by the invention, deployment, and use of nuclear weapons. Topics include the impact of nuclear weapons on the theory and practice of war, nuclear deterrence, disarmament, proliferation, preemptive war, and the human capacity for self-extinction.

***INTS 347a/AFST 360a/EP&E 365a/PLSC 417a, The Political Economy of AIDS in Africa** Nicoli Nattrass and staff

HTBA SO (o)

The impact of and responses to the AIDS pandemic in Africa examined from a comparative perspective. Focus on South and southern Africa. Some background in social science and economics desirable.

***INTS 349b^c/HLTH 450b/PLSC 121b, Strategic Thinking in Global Health**

Elizabeth Bradley and staff

For description see under Global Health Studies.

INTS 352b/ECON 325b, Economics of Developing Countries Nancy Qian

For description see under Economics.

INTS 355b/EAST 356b/PLSC 433b, East Asian Capitalism Jun Saito

For description see under Political Science.

***INTS 357b/EP&E 250b/PLSC 354b^c, The European Union** David Cameron

For description see under Political Science.

INTS 358a/ECON 300a, International Trade Theory and Policy T. N. Srinivasan,
Ernesto Zedillo

For description see under Economics.

INTS 361b/PLSC 188b, International Human Rights Staff

HTBA SO (RP, 50)

Introduction to human rights issues in theory and practice. Concepts, instruments, and mechanisms of international law, including human rights treaties and regional systems; international enforcement dilemmas such as the use of force and humanitarian intervention; issues of accountability through international and domestic prosecutions and truth commissions; and critical issues such as women's rights, cultural relativism, NGO advocacy, corporate accountability, and social and economic rights. Limited enrollment.

***INTS 363a/EP&E 353a/PLSC 305a, Critique of Political Violence** Boris Kapustin

TH 11:30–3:20 SO (o)

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.

INTS 364a/PLSC 156a, International Organizations Susan Hyde

For description see under Political Science.

***INTS 371b/PLSC 164b^c, The Causes of War** Keith Darden

For description see under Political Science.

INTS 373b/PLSC 187b, Terrorism and Counterterrorism Stuart Gottlieb

MW 11:35–12:50, 1 HTBA SO (34)

The origins and evolution of modern terrorism, and strategies employed to confront and combat terrorism. Assessment of a variety of terrorist organizations and the multidimensional causes of terrorist violence. Analysis of the strengths and weaknesses of counterterrorism strategies, with a particular focus on ways in which the threat of global terrorism might affect the healthy functioning of democratic states. Enrollment limited to juniors and seniors.

INTS 374b/HIST 243b/MGRK 225b, Occupied Europe during World War II

Konstantina Maragkou

For description see under Hellenic Studies.

INTS 376a/PLSC 148a, Central Issues in American Foreign Policy Stuart Gottlieb

MW 11:35–12:50, 1 HTBA SO (34)

The sources, substance, and enduring themes of American foreign policy. Overview of America's rise to global power in the nineteenth and twentieth centuries and American foreign policy decision making during the Cold War and the post–Cold War era. Focus on current challenges, including the war on terrorism, the proliferation of weapons of mass destruction, the conflict in Iraq, and America's role in global institutions and the world economy. Enrollment limited to juniors and seniors.

***INTS 378a^G/PLSC 184a, The United Nations and the Maintenance of International Security** Jean Krasno

For description see under Political Science.

***INTS 380a/FILM 421a/HUMS 414a/MGRK 213a/WGSS 261a, Cinema of Migration**

George Syrimis

For description see under Hellenic Studies.

***INTS 384a/EP&E 269a/ER&M 362a/SOCY 363a, Genocide and Ethnic Conflict**

Jasmina Beširević-Regan

For description see under Sociology.

***INTS 387a/PLSC 407a, The Politics of Nationalism and Ethnicity** Matthew Kocher

W 9:25–11:15 (o)

Ethnicity and nationalism studied in the context of alternative social bases of political and social mobilization. Focus on the null hypothesis, that ethnicity and nationalism should not be treated as distinctive social forms. Discussion of what is distinctive about ethnicity and nationalism, and how it might be beneficial to separate nationalism and ethnicity from the study of other identity types.

***INTS 398a/AFST 398a/ER&M 398a, Race and Class in Comparative Perspective**

Jeremy Seekings

T 2:30–4:20 SO (o)

The evolution and character of class stratification and racial inequalities in South Africa, Brazil, and the United States. Twentieth-century analyses of the three societies, including studies of caste and their critiques by Marxist theory. Contemporary issues such as urban inequalities, middle classes and underclasses, identity, and political mobilization.

CAPSTONE SEMINARS

***INTS 401a and 402b, International Cooperation** Nikolay Marinov

M 3:30–5:20 SO (o)

An examination of the reasons governments enter into international arrangements, such as World Bank and IMF agreements, trade accords, alliances, and treaties. The effects of these arrangements on measures of material well-being such as economic growth, income distribution, infant mortality rates, and the environment. Open to senior International Studies majors only.

***INTS 416a, Democracy in World Politics II** Ian Shapiro

TH 3:30–5:20 SO (o)

Preparation of the senior essay on a topic related to democracy in the twenty-first century. Open to senior International Studies majors only. Prerequisite: INTS <415b>.

***INTS 443b/EAST 410b/SOCY 310b, Civic Life in Modern China I** Deborah Davis

W 1:30–3:20 SO (o)

The character of civil society and the public sphere under various political conditions. The possibilities for civic action by citizens. Issues of civic engagement, citizenship, and state-society relations. Students design summer research projects. Preference given to junior International Studies majors with at least one Yale course on modern China or with

extended residence in China. Nonmajors admitted with permission of instructor as space permits. Fulfills the capstone seminar requirement for the International Studies major when followed by INTS 444a.

[INTS 444a, Civic Life in Modern China II]

***INTS 451a, The International Novel I** Annabel Patterson

T 1:30–3:20 HU (26)

The rise of the international novel in the twentieth century. The relationship of the international novel to war, competing world religions, redrawn boundaries, translation, book prizes, and new media. Readings include twelve novels written from 1924 to 2004 that cross cultural, religious, and political borders and demonstrate complexity of form and narrative method. Open to nonmajors with permission of instructor.

INTS 452b, The International Novel II Annabel Patterson

T 1:30–3:20 HU (o)

Continuation of INTS 451a. Open to senior International Studies majors only. Prerequisite: INTS 451a.

***INTS 481a, Order, Conflict, and Violence I** Vivek Sharma

T 9:25–11:15 (o)

Introduction to and critical analysis of a range of social science approaches to problems of order, conflict, and violence, including assumptions that underlie the various methods. Readings focus on works by Yale faculty members, with some attention to the writings of other historians and anthropologists. Preference given to senior International Studies majors. Nonmajors admitted with permission of instructor as space permits.

***INTS 482b, Order, Conflict, and Violence II** Vivek Sharma

T 9:25–11:15 (o)

Continuation of INTS 481a. Open to senior International Studies majors only. Prerequisite: INTS 481a.

***INTS 486a, Political Consolidation in the Middle East II** Ellen Lust

T 9:25–11:15 SO (o)

Preparation of the senior essay on a topic related to forces that lead Middle Eastern social and political systems to settle into an equilibrium. Open to senior International Studies majors only. Prerequisite: INTS <485b>.

isiZulu

(See under African Studies.)

Islamic Studies

(See under History, under History of Art, under Humanities, under Modern Middle East Studies, under Near Eastern Languages and Civilizations, under Political Science, and under Religious Studies.)

Italian

Director of undergraduate studies: Angela Capodivacca, Rm. 407, 82–90 Wall St., 432-0597, angela.capodivacca@yale.edu

FACULTY OF THE DEPARTMENT OF ITALIAN

Professors Millicent Marcus, Giuseppe Mazzotta (*Chair*)

Assistant Professors Angela Capodivacca, David Lummus

Senior Lector II Risa Sodi

Senior Lectors Anna Iacovella, Michael Farina, Monica Georgeo

The major in Italian is a liberal arts major designed to explore Italy's vital role in the development of the humanistic values and disciplines that have infused Western culture over several centuries. Central to the major in Italian is the conviction that study of another language yields the important benefit of enlightening students about their own culture while instructing them about a foreign one. Core courses provide students with a solid linguistic, literary, and historical background in Italian. Additional offerings range across several disciplines, including the study of film, philosophy, comparative literature, history, political theory, art, religious studies, theater, architecture, and music.

Requirements of the major Candidates for the major should have completed a course in Italian at the level of 130a (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.

The major normally consists of eleven term courses. 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 eight courses must include either ITAL 150a or 151b and a course on Dante's *Divine Comedy* as well as four courses covering different periods in Italian literature: one in the Middle Ages (in addition to the one on Dante's *Divine Comedy*), one in the Renaissance, and two in Italian literature after 1600. The aim of these six foundation courses is to provide students with both a broad acquaintance with the major works of Italy's literary tradition and a more detailed knowledge of specific periods in Italian literature. Students are also strongly encouraged to use their elective courses to expand their knowledge of either the *Trecento* (fourteenth century) or the *Cinquecento* (sixteenth century). 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.

In completing their programs, students are required to elect two courses in other languages and literatures, history of art, history, or philosophy that are related to their field of study and approved by the director of undergraduate studies. Any graduate course in another national literature or in linguistics may be substituted for one of these two courses. Some knowledge of Latin is desirable.

Senior requirement In the fall or spring of the senior year, all students majoring in Italian must present a departmental essay written in Italian and completed under the direction

of a faculty adviser in ITAL 491a or b. The essay should demonstrate careful reading and research on a topic approved by the adviser in consultation with the director of undergraduate studies. A recommended length for the essay is thirty pages. Prospectus and draft deadlines are determined by the adviser; the final deadline is determined by the director of undergraduate studies. The senior requirement culminates in a meeting with department faculty to discuss the thesis and the student's overall experience of study in the major.

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 director of undergraduate studies 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 in this chapter.

The department's course offerings vary greatly from year to year. Students interested in planning course work in Italian that extends beyond the current academic year should consult the director of undergraduate studies.

For the Year or Term Abroad program, see chapter II.

Placement All students who have not taken Italian at Yale are expected to take the departmental placement test, with the exception of students who have no previous knowledge of Italian. The departmental placement examination will be given at the beginning of the fall term on Tuesday, August 31, at 9 a.m.

REQUIREMENTS OF THE MAJOR

Prerequisite ITAL 130a or equivalent

Number of courses 11 term courses beyond prereq

Distribution of courses 8 term courses in Italian dept numbered 140 or above, incl 1 in Middle Ages (in addition to 1 on Dante's *Divine Comedy*), 1 in Renaissance, and 2 in Italian lit after 1600, at least 5 of these conducted in Italian; 2 term courses in other langs or lits, hist of art, hist, or phil approved by DUS

Specific courses required ITAL 150a or 151b; ITAL 310a or equivalent

Substitution permitted Any grad course in another national lit or in ling for 1 of the 2 courses in other depts, with DUS permission

Senior requirement Senior essay (ITAL 491a or b) and oral interview

GROUP A COURSES

***ITAL 110a, Elementary Italian I** Staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (61)

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. Credit only on completion of ITAL 120b.

***ITAL 120b, Elementary Italian II** Staff

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (61)
Continuation of ITAL 110a.

***ITAL 125a or b, Intensive Elementary Italian** Michael Farina

MTWTHF 9:25–11:15 L1–L2 2 Course cr (32)

An accelerated beginning course in Italian that covers in one term the material taught in ITAL 110a and 120b. Admits to ITAL 130a or 145a or b. Enrollment limited to 15.

***ITAL 130a, Intermediate Italian I** Staff

5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (61)

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 140b. Conducted in Italian. Prerequisite: ITAL 120b or equivalent.

***ITAL 140b, Intermediate Italian II** Anna Iacovella

3 HTBA For sections see www.yale.edu/oci L4 (61)

Continuation of ITAL 130a. 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.

***ITAL 145a or b, Intensive Intermediate Italian** Monica Georgeo

MTWTHF 9:25–11:15 L3–L4 2 Course cr (32)

An accelerated intermediate course in Italian that covers in one term the material taught in ITAL 130a and 140b. Continued practice in the four basic skills begun at the elementary level. Emphasis on grammar review, vocabulary enrichment, and appreciation of literary texts. Admits to Group B courses. Enrollment limited to 15. Prerequisite: ITAL 120b or 125a or b.

GROUP B COURSES

Group B courses are conducted in Italian and are open to students who have passed ITAL 140b or 145a or b and to others with the consent of the director of undergraduate studies and of the instructor.

ITAL 150a, Composition, Conversation, and Popular Culture Risa Sodi and staff

3 HTBA L5 (0)

Discussion of social, political, and literary issues in order to improve active command of the language. Development of advanced reading skills through magazine and newspaper articles, essays, short stories, films, and a novel; enhancement of writing skills through experiments with reviews, essays, creative writing, and business and informal Italian. Classroom emphasis on advanced speaking skills and vocabulary building.

***ITAL 151b, Advanced Italian Workshop: Writing and Conversation** Michael Farina

MW 1–2:15 L5 (0)

Development of advanced writing and speaking skills. Close readings and extensive practice writing in a variety of genres, which may include autobiography, biography, jokes, letter, essay, poem, news article, comic strip, children's book, and short story. Popular narrative genres such as the *giallo* and *romanzo rosa*. Creation and performance of short dramatic texts.

***ITAL 153b, Theater Practicum: Pirandello** Monica Georgeo

TTH 1–2:15 L5, HU (26)

An in-depth study of Pirandello's *Enrico IV*, culminating in a staged performance of the play in Italian. May be taken more than once for credit.

***ITAL 154a, Contemporary Italian Culture** Anna Iacovella

MW 1–2:15 L5, HU (0)

Introduction to contemporary Italian social, political, artistic, and literary culture. Readings in novels, short stories, poetry, theater, and popular culture (music, graphic novels, and journalism). Italian culture within a larger European and global context.

ITAL 157a/HUMS 264a, Italian through Opera and Film Risa Sodi

MWF 10:30–11:20 L5, HU (33)

Exploration of opera and contemporary Italian film to improve Italian grammar and conversational skills. Exercises include performances and presentations. Works include the operas *La Bohème*, *Otello*, and *I pagliacci* and the films *Storia di ragazzi e ragazze*, *Caro diario*, and *La stanza del figlio*.

***ITAL 161b, Selected Readings in Italian Prose** Risa Sodi

TTH 9–10:15 L5, HU (0)

Study of representative prose works from the Middle Ages to the present. Texts by Machiavelli, Collodi, Verga, and a variety of twentieth-century novelists and short-story writers.

***ITAL 210a, Italian Romanticism** Giuseppe Mazzotta, Mattia Acetosio

TTH 9–10:15 L5, HU (0)

Literary and intellectual achievements of the Italian romantic era. Authors include Ugo Foscolo, Giacomo Leopardi, and Alessandro Manzoni. Italian contributions to the European debate on romanticism. Topics include individuality, national identity, and the question of history.

***ITAL 334b, Dante, Petrarch, Boccaccio** Angela Capodivacca

W 2:30–4:20 L5, HU (37)

Comparison of Dante, Petrarch, and Boccaccio, the “three crowns” of the Italian literary tradition. Investigation of how these writers’ works engage issues of authorship and authority in dialogue with one another and as part of each author’s attempt to ensure the future representation of his work as a foundational text.

***ITAL 470a and 471b, Special Studies in Italian Literature** Angela Capodivacca

HTBA (0)

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** Angela Capodivacca

HTBA (0)

A research essay on a subject selected by the student in consultation with the faculty adviser.

GROUP C COURSES

Group C courses are conducted in English and are open to students without previous study of Italian. Majors in Italian are required to read the material and write their papers in Italian.

***ITAL 063b/FILM 097b/HUMS 089b, Literature into Film** Millicent Marcus

TTH 4–5:15 HU Fr sem Tr (0)

Strategies employed by filmmakers who adapt literary works to the screen. Detailed comparisons between cinematic adaptations and the novels, plays, and short stories on which they are based. Focus on close textual interpretation and in-depth analysis of video clips. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***ITAL 205b/HUMS 297b/LITR 337b, Italian Food and Literature** Risa Sodi

TH 2:30–4:20 HU Tr (27)

The intersection of food and literature in Italy from the Middle Ages and the Renaissance (Dante, Boccaccio, and the earliest cookbooks) to the modern age (the futurists, Calvino, and others). Discussion of foodways, or how food is tied to religions, holidays, gender roles and identities, and domestic economies. Consideration of film.

ITAL 310a/LITR 183a, Dante in Translation Giuseppe Mazzotta

TTH 1–2:15 HU Tr (26)

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. One discussion section conducted in Italian.

READING COURSE

ITAL 101b, Italian for Reading Risa Sodi

TTH 11:35–12:50 (24)

Fundamental grammar structures and basic vocabulary through the reading of texts in various fields (primarily humanities and social sciences, and others as determined by student interest). Intended for graduate and undergraduate students preparing for Italian reading examinations for graduate school who have had no (or minimal) prior study of Italian. Conducted in English. Does not satisfy the foreign language requirement.

Japanese

(See under *East Asian Languages and Literatures*.)

Japanese Studies

(See under *East Asian Studies*.)

Judaic Studies

Director of undergraduate studies: Christine Hayes, 451 College St., 432-0843, christine.hayes@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF JUDAIC STUDIES

Professors Leslie Brisman (*English*), Steven Fraade (*Chair*) (*Religious Studies*), Christine Hayes (*Religious Studies*), Paula Hyman (*History, Religious Studies*), Ivan Marcus (*History, Religious Studies*), María Rosa Menocal (*Spanish & Portuguese*), Vered Noam (*Religious Studies*), Steven Smith (*Political Science*), Laura Wexler (*Women's, Gender, & Sexuality Studies, American Studies*), Robert Wilson (*Religious Studies*)

Associate Professor Marci Shore (*History*)

Assistant Professor Eliyahu Stern (*History*)

Senior Lecturer Peter Cole (*Visiting*)

Lecturers Margaret Olin (*Divinity School, History of Art, Religious Studies*), Micha Perry (*History*), Sandra Valabregue-Perry (*Religious Studies*)

Senior Lector II Ayala Dvoretzky

Senior Lector Shiri Goren

Lector Orna Goldman

Judaic Studies enables students to develop a substantial knowledge of the history, religion, literature, languages, and culture of the Jews. Jewish society, texts, ideologies, and institutions are examined in comparative perspective in the context of the history and culture of nations in which Jews have lived and created throughout the ages.

The program in Judaic Studies offers courses that encompass all the major epochs of Jewish history: the biblical period, which includes biblical literature and archaeology; the classical period, which includes the literature and history of rabbinic Judaism and its antecedents; the medieval period, which includes Jewish history and literature in both Christian and Islamic lands; the early modern period, which includes Jewish history from the fifteenth through the eighteenth centuries; and the modern period, which includes the history and literature of Jews and Judaism from the late eighteenth to the twenty-first centuries and the impact of different facets of modernization.

The Judaic Studies major, especially as a second major with Economics, Political Science, English, or History, offers intensive background training for those considering admission to graduate or professional schools and to those planning careers in journalism, international relations, foreign service, publishing, the rabbinate, international law, politics, or social work. The interdisciplinary character of the program provides students with both a broad liberal arts background and an intensive preparation in the historical and religious experience of the Jewish culture.

Students considering the major in Judaic Studies should contact the director of undergraduate studies as early as possible.

Requirements of the major The major in Judaic Studies requires thirteen term courses, including the senior essay course. Prerequisite or corequisite to the major is a year of elementary modern Hebrew (HEBR 110a, 120b) or its equivalent. The major consists of a Hebrew language and literature requirement, a set of core requirements, and two areas of concentration.

Hebrew language and literature Each student majoring in Judaic Studies must attain the equivalent of the second year of modern Hebrew (HEBR 130a, 140b). In addition, each student must take two term courses in which Hebrew literature is studied in Hebrew, for which HEBR 130a and 140b (but not HEBR 110a or 120b) may count. Students who fulfill the Hebrew language requirement by passing an examination rather than by enrolling in HEBR 110a, 120b, 130a, and 140b must take two other term courses in which Hebrew literature is studied in Hebrew. Students concentrating in Hebrew Bible may, in consultation with the director of undergraduate studies, substitute two years of biblical Hebrew for the language and literature requirements.

Core requirements Each student must elect at least three from the following: (1) one term course in Hebrew Bible (e.g., RLST 145a); (2) one term course in rabbinic literature; (3) JDST 200a, History of the Jews to the Reformation; (4) JDST 201b, History of Jewish Culture, 1500 to the Present; (5) JDST 202b, Judaism: Continuity and Change; (6) a term survey course in Hebrew and Jewish literature.

Areas of concentration Students must select two areas of concentration. The standard areas are ancient Israel/Hebrew Bible; Judaism of Second Temple and Talmudic times; Jewish history and civilization of medieval and early modern times; modern Jewish history and civilization; and Jewish/Hebrew literature (requires study of literature in Hebrew). With the approval of the director of undergraduate studies, students may design their own areas of concentration.

In each of the two areas of concentration, students choose three term courses in consultation with the director of undergraduate studies. These are normally expected to include one introductory course; one seminar taken in junior year and requiring a final research paper; and one relevant course in an area outside Judaic Studies, such as a course relating to the larger historical 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 or Hebrew literature. Most seminars listed under “Electives within the Major” may be counted as junior seminars in a student’s areas of concentration with permission of the director of undergraduate studies.

Senior requirement Students are expected to write a one- or two-term senior essay (JDST 491a and 492b). If a one-term senior essay is chosen, the student must complete an additional seminar. The one-term essay normally relates to one of the student’s areas of concentration, while the seminar relates to the other. A two-term essay should relate to both of the student’s areas of concentration. The senior essay, whether completed during one or two terms, should build on one or both of the student’s junior seminar papers.

Study in Israel Students majoring in Judaic Studies should be aware of the numerous opportunities for study and travel in Israel. Those interested in either a summer or an extended stay in Israel should consult the director of undergraduate studies.

REQUIREMENTS OF THE MAJOR

Prerequisites HEBR 110a, 120b or equivalents

Number of courses 13 term courses (incl senior essay)

Specific courses required HEBR 130a, 140b or equivalents

Distribution of courses 3 term courses from (1) Hebrew Bible (e.g., RLST 145a), (2) rabbinic lit, (3) JDST 200a, (4) JDST 201b, (5) JDST 202b, (6) survey of Hebrew and Jewish lit; 2 areas of concentration, with 3 courses in each (normally 1 intro, 1 junior sem, 1 outside Judaic Studies related to concentration) for a total of 6

Substitution permitted 2 years of biblical Hebrew for HEBR 130a, 140b or equivalents for students with an area of concentration in Hebrew Bible

Senior requirement Two-term senior essay (JDST 491a, 492b), or one-term senior essay and addtl sem

CORE COURSES

JDST 200a^G/HIST 219a^G/RLST 148a^G, History of the Jews to the Reformation

Ivan Marcus

For description see under History.

JDST 201b^G/HIST 220b^G/RLST 149b^G, History of Jewish Culture, 1500 to the Present

Paula Hyman

For description see under Religious Studies.

[JDST 202b/RLST 146b, Judaism: Continuity and Change]

SPECIAL PROJECTS

***JDST 471a or b, Individual Tutorial** Christine Hayes

HTBA (o)

For students who wish, under faculty supervision, to investigate an area in Judaic Studies not covered by regular course offerings. May be used for research or for directed reading, but in either case a long essay or several short ones are required. To apply for admission, a student should present a prospectus with bibliography and a letter of support from the faculty member who will direct the work to the director of undergraduate studies.

THE SENIOR ESSAY COURSE

***JDST 491a and 492b, The Senior Essay** Christine Hayes

HTBA (o)

The essay, written under the supervision of a faculty member, should be a substantial paper between 6,500 and 8,000 words for one term and between 12,500 and 15,000 words for two terms.

ELECTIVES WITHIN THE MAJOR

Biblical Period

RLST 145a, Introduction to the Old Testament (Hebrew Bible) Christine Hayes

Classical Period

***JDST 400b/RLST 408b^c, Midrash Seminar: Exodus 32 and Its Midrashic Development** Christine Hayes

For description see under Religious Studies.

***JDST 411a^c/RLST 415a^c, The Scroll of Fasting and Collective Memory** Vered Noam
TH 1:30–3:20 L5, HU (o)

Study of Megillat Ta'anit, the Scroll of Fasting, which commemorates historical events from the Second Temple era. Some attention to the Scholium, a later commentary on Megillat Ta'anit. The purpose of the Scroll; the nature and significance of the events included in it; ways in which the Sages tried to shape the national memory; the date and provenance of the Scholium and the credibility of its traditions. Prerequisite: reading proficiency in Hebrew.

Medieval and Early Modern Periods

JDST 265b^c/HIST 345b^c/RLST 202b^c, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

For description see under History.

***JDST 268a/HIST 228Ja, Folklore and History in the Jewish Middle Ages**
Micha Perry

TH 1:30–3:20 HU (o)

Jewish legends, stories, fairytales, myths, and other works of folklore from the ninth century through the sixteenth. Their literary structure and historical value. Use of folklore methodology.

***JDST 270a/HIST 232Ja/HUMS 443a/MMES 342a/RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

For description see under Humanities.

***JDST 272a^c/RLST 295a^c, Al-Ghazali and Maimonides** Frank Griffel

For description see under Religious Studies.

***JDST 275b/RLST 234b, Kabbalah and Philosophy in the Jewish Middle Ages**
Sandra Valabregue-Perry

T 3:30–5:20 HU (o)

The historical development of and interactions between Kabbalah and philosophy in the Middle Ages. Topics include polemics, interpretations of symbols and images, and theologies and conceptions of God.

***JDST 277a^c/RLST 224a^c, Major Trends in Kabbalah** Sandra Valabregue-Perry
M 3:30–5:20 HU (o)

Introduction to Jewish mystical texts from the Bible to the twentieth century. Biblical mystical visions, magic in rabbinic literature, *Hekhalot* literature, the Book of Creation, medieval kabbalah, the Book of Splendor (Zohar), Italian kabbalah, Lurianic kabbalah, Hasidism, and modern and new age kabbalah. Readings in translation.

***JDST 312a/HUMS 259a, Hebrew Poetry in Muslim Spain** Peter Cole

W 9:25–11:15 HU Tr (32)

Introduction to the Golden Age of Hebrew Poetry in Muslim Andalusia from the tenth century through the twelfth. Major figures of the period and the cultural and philosophical questions they confronted. The Judeo-Arabic social context in which the poetry emerged; critical issues pertaining to the study and transmission of this literature. Readings from the works of several poets. Readings in translation. Additional readings in Hebrew available.

Modern Period

JDST 286a^G/HIST 269a^G/RLST 230a^G, Holocaust in Historical Perspective

Paula Hyman

For description see under History.

***JDST 290a/AFAM 280a/PLSC 268a, Black and Jewish Community Politics**

Khalilah Brown-Dean

For description see under Political Science.

JDST 293a^G/HIST 248a/RLST 214a^G, Introduction to Modern Jewish Thought

Eliyahu Stern

MW 11:35–12:50 HU (34)

An overview of Jewish philosophical trends, movements, and thinkers from the seventeenth to twenty-first century. Topics include enlightenment, historicism, socialism, secularism, religious radicalism, and Zionism.

JDST 294b^G/HIST 240b/RLST 237b^G, The Jewish Enlightenment Eliyahu Stern

MW 2:30–3:45 HU (37)

An overview of the eighteenth- and nineteenth-century transnational Jewish Enlightenment movement. Focus on the origins of modernity and the breakdown of traditional society. Topics include religious reform, separation between public and private spheres, emancipation, acculturation, and anti-Semitism.

***JDST 295a/MMES 154a/NELC 154a^G, Israeli Identity and Culture, 1948 to the Present** Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***JDST 297a^G/HIST 165Ja^G/RLST 192a^G, Religion, Ethnicity, and Identity in American Jewish History** Paula Hyman

For description see under Religious Studies.

***JDST 306b/MMES 157b/NELC 157b^G, Israeli Narratives** Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***JDST 390b^G/HIST 221Jb^G/RLST 217b^G, Memory, Memoirs, and Modern Jewish History** Paula Hyman

For description see under History.

HEBREW LANGUAGE AND LITERATURE

***JDST 213a/HEBR 150a^G/MMES 150a, Advanced Modern Hebrew: Israeli Society**

Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***JDST 405a/HEBR 156a^c/MMES 216a, Dynamics of Israeli Culture** Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***JDST 409b/HEBR 159b^c/MMES 159b, Conversational Hebrew: Israeli Media**

Shiri Goren

For description see under Near Eastern Languages & Civilizations.

GRADUATE AND PROFESSIONAL SCHOOL COURSES OF INTEREST TO UNDERGRADUATES

Qualified students may elect relevant courses in the Graduate School with permission of the director of graduate studies, the director of undergraduate studies, and the instructor of the course. They may also offer toward the degree as many as four courses taken in professional schools of the University with permission of the instructors, the director of undergraduate studies, and the dean or registrar of the schools involved. (See “Courses in the Yale Graduate and Professional Schools” in chapter II, section K.) A complete list and descriptions of relevant graduate and professional school courses are available from the director of undergraduate studies.

Kiswahili

(See under African Studies.)

Korean

(See under East Asian Languages and Literatures.)

Latin

(See under Classics.)

Latin American Studies

Director of undergraduate studies: Aníbal González, Rm. 226, 82–90 Wall St., 432-1149, anibal.gonzalez@yale.edu, www.yale.edu/macmillan/lais

FACULTY ASSOCIATED WITH THE PROGRAM OF LATIN AMERICAN STUDIES

Professors Rolena Adorno (*Spanish & Portuguese*), Mark Ashton (*Forestry & Environmental Studies*), Ned Blackhawk (*History, American Studies*), Garry Brewer (*School of Management*), Richard Burger (*Anthropology*), Alicia Schmidt Camacho (*American Studies*), Hazel Carby (*African American Studies, American Studies*), Amy Chua (*Law School*), Carlos Eire (*History, Religious Studies*), Eduardo Engel (*Economics*), Paul Freedman (*History*), Aníbal González (*Spanish & Portuguese*), Roberto González Echevarría (*Spanish & Portuguese*), K. David Jackson (*Spanish & Portuguese*), Gilbert Joseph (*History*),

Professors (*cont.*)

Stathis Kalyvas (*Political Science*), Enrique Mayer (*Anthropology*), Robert Mendelsohn (*Forestry & Environmental Studies*), María Rosa Menocal (*Spanish & Portuguese*), Mary Miller (*History of Art*), Florencia Montagnini (*Forestry & Environmental Studies*), Patricia Pessar (*Adjunct*) (*American Studies, Anthropology*), Stephen Pitti (*History*), Susan Rose-Ackerman (*Law School, Political Science*), T. Paul Schultz (*Economics*), Stuart Schwartz (*History*), Susan Stokes (*Political Science*), Robert Thompson (*History of Art*), Noël Valis (*Spanish & Portuguese*), Michael Veal (*Music*), Elisabeth Wood (*Political Science*)

Associate Professors Moira Fradinger (*Comparative Literature*), Leonard Munstermann (*Public Health*)

Assistant Professors Jafari Allen (*Anthropology, African American Studies*), Robert Bailiss (*Forestry & Environmental Studies*), Sean Brotherton (*Anthropology*), Susan Byrne (*Spanish & Portuguese*), Thad Dunning (*Political Science*), Mariola Espinosa (*School of Medicine*), Ernesto Estrella (*Spanish & Portuguese*), Paulo Moreira (*Spanish & Portuguese*), Paulina Ochoa Espejo (*Political Science*), Kevin Poole (*Spanish & Portuguese*), Ana De La O Torres (*Political Science*)

Senior Lectors Sybil Alexandrov, Marta Almeida, Teresa Carballal, Mercedes Carreras, Sebastián Díaz, Oscar González-Barreto, María Jordán, Juliana Ramos-Ruano, Lisette Reymundi, Lourdes Sabé-Colom, Terry Seymour, Margherita Tórtora, Sonia Valle

Lectors Pilar Asensio, Yovanna Cifuentes, Ame Cividanes, Maripaz García, Bárbara Saffile

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 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. Though all students choose courses in both the humanities and the social sciences, they are expected to concentrate on one or the other.

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 director of undergraduate studies. 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.

The major itself requires twelve term courses: one introductory course approved by the director of undergraduate studies; eight courses related to Latin America from departmental offerings or from the list of electives below; two further electives, preferably seminars;

and the senior essay, LAST 491a or b. The eight Latin American content courses must be selected from the following categories: two courses in the social sciences (anthropology, economics, political science, or sociology), two courses in history, two courses in Spanish American or Brazilian literatures beyond the language requirement, one course in history of art or theater studies, and a seminar. Recommended courses are SPAN 266a and 267b.

Students must enroll in three seminars or upper-level courses during their junior and senior years. For a list of seminars students should consult the director of undergraduate studies. Elective seminars must be approved by the director of undergraduate studies.

The senior essay is a research paper written usually in one term (LAST 491a or b). 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, students may undertake field research in Latin America. Support for research is available to recipients of an Albert Bildner Travel Prize, for which application should be made in the spring of the junior year. Students may also apply for summer travel grants through the Council on Latin American and Iberian Studies. Information about these and other grants is available on the Web at <http://studentgrants.yale.edu>.

Students are strongly encouraged to take advantage of study abroad opportunities during summers or through the Year or Term Abroad program.

REQUIREMENTS OF THE MAJOR

Prerequisites 2 years of 1 lang (Spanish or Portuguese), 1 year of the other

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

Distribution of courses 1 intro course approved by DUS; 8 courses related to Latin America in specified fields, one a sem from approved list; 2 electives; 3 sems or upper-level courses in junior and senior years

Senior requirement Senior essay (LAST 491a or b)

ELECTIVES WITHIN THE MAJOR

Students wishing to count toward the major courses that do not appear on this list should consult with the director of undergraduate studies.

***LAST 406b/AFST 420b/EP&E 246b/PLSC 430b, The Politics of Development**

Assistance David Simon

For description see under Political Science.

LAST 412b/AFST 356b/INTS 326b/PLSC 356b, Collective Action and Social

Movements Elisabeth Wood

For description see under Political Science.

***LAST 416a/HLTH 325a/INTS 249a^G, Methods and Ethics in Global Health Research**

Kaveh Khoshnood

For description see under International Studies.

***AFAM 347a, Caribbean Lives: Psychosocial Aspects** Ezra Griffith

***AMST 277a/ER&M 284a, Introduction to Chicano and Latino Literatures**

Birgit Rasmussen

For description see under American Studies.

HIST 355a, Colonial Latin America Stuart Schwartz

***HIST 372Ja/ER&M 342a, Revolutionary Change in Twentieth-Century Latin America** Gilbert Joseph

For description see under History.

HSHM 225b/HIST 359b, Medicine and Public Health in Latin America, 1820–2000

Mariola Espinosa

For description see under History of Science, History of Medicine.

***LITR 420a/SPAN 393a, The Jungle Books** Roberto González Echevarría

For description see under Literature.

PLSC 347b/AFST 347b, Post-Conflict Politics David Simon

For description see under Political Science.

***PLSC 423b/EP&E 243b, Political Economy of Poverty Alleviation**

Ana De La O Torres

For description see under Political Science.

***PLSC 463b/EP&E 260b, Political Violence and Its Participants** Elisabeth Wood

For description see under Political Science.

***PORT 001b, Latin American Short Fiction** Paulo Moreira

***PORT 010a, Portraits of Brazil** K. David Jackson

PORT 130a, Intermediate Portuguese I Marta Almeida

***PORT 150a, Advanced Practice in Portuguese** Paulo Moreira

PORT 246a/SPAN 245a, Latin American Film: Brazil, Mexico, and Argentina

Paulo Moreira

For description see under Portuguese.

PORT 249b, Introduction to Brazilian Culture Paulo Moreira

***PORT 394a/LITR 294a/SPAN 385a, World Cities and Narratives**

K. David Jackson

For description see under Portuguese.

***SPAN 220a, Theater and Poetry Workshop** Sonia Valle

***SPAN 223b, Spanish in Film: An Introduction to the New Latin American Cinema**

Margherita Tórtora

***SPAN 224a or b, Spanish in Politics, International Relations, and the Media**

Teresa Carballal

SPAN 226b, The Unity and Diversity of Spanish Lissette Reymundi

SPAN 243a or b, Advanced Spanish Grammar Terry Seymour

SPAN 244a or b, Writing in Spanish Margherita Tórtora, Pilar Asensio

SPAN 246a, Introduction to the Cultures of Spain Ernesto Estrella

***SPAN 247b, Introduction to the Cultures of Latin America**

Roberto González Echevarría

SPAN 261a, Studies in Spanish Literature I Kevin Poole

SPAN 262b, Studies in Spanish Literature II Noël Valis

SPAN 266a, Studies in Latin American Literature I Aníbal González

SPAN 267b, Studies in Latin American Literature II Ernesto Estrella

***SPAN 307a, Hispanic Poetry off the Page** Ernesto Estrella

***SPAN 343a, Humor in Contemporary Spanish American Narrative** Aníbal González

***SPAN 344b, Narrative and Music in Hispanic Caribbean Culture** Aníbal González

***SPAN 367a/HIST 227a, The Spanish Civil War: Words and Images** Noël Valis

For description see under Spanish.

SPAN 368b, The Pilgrimage Road to Santiago Kevin Poole

DIRECTED READING AND SENIOR ESSAY COURSES

***LAST 471a or b, Directed Reading** Enrique Mayer

HTBA (o)

For students who wish to investigate an area of Latin American Studies not covered by regular offerings. The project must terminate with a term paper or its equivalent. No more than one term of credit may be earned. To apply for admission, a student should present a prospectus and a bibliography to the director of undergraduate studies no later than one day before the course selection period concludes. Written approval from the faculty member who will direct the student's reading and writing must accompany the prospectus.

***LAST 491a or b, The Senior Essay** Aníbal González

HTBA (o)

Preparation of a research paper about forty pages long under the direction of a faculty adviser, in either the fall or the spring term. Students write on subjects of their own choice. During the term before the essay is written, students plan the project in consultation with a qualified adviser or the director of undergraduate studies. The student must submit a suitable project outline and bibliography to the adviser and the director of undergraduate studies by the third week of the term. The outline should indicate the focus and scope of the essay topic, as well as the proposed research methodology. Permission may be given to write a two-term essay after consultation with an adviser and the director of undergraduate studies and after submission of a project statement. Only those who have begun to do advanced work in a given area are eligible. The requirements for the one-term senior essay apply to the two-term essay, except that the two-term essay should be substantially longer.

OTHER COURSES RELEVANT TO THE MAJOR

A list of courses intended as a guide to students in preparing their programs is available at the office of the director of undergraduate studies. 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 and the director of undergraduate studies.

Lesbian and Gay Studies

Courses in lesbian, gay, bisexual, transgender, and queer studies are offered through the Women's, Gender, and Sexuality Studies program. See under that program for specific course listings.

Linguistics

Director of undergraduate studies: Raffaella Zanuttini, Rm. 209, 370 Temple St., 432-2452, raffaella.zanuttini@yale.edu [F]; Laurence Horn, Room 208, 370 Temple St., 432-2457, laurence.horn@yale.edu [Sp]

FACULTY OF THE DEPARTMENT OF LINGUISTICS

Professors Stephen Anderson (*Chair, Fall*), Robert Frank (*Chair, Spring*), Roberta Frank, Laurence Horn, Stanley Insler, Frank Keil, Zoltán Szabó, Raffaella Zanuttini

Associate Professors Ann Biersteker (*Adjunct*), Claire Bowern, Darya Kavitskaya, Maria Piñango

Assistant Professors Ashwini Deo, Gaja Jarosz, Jelena Krivokapić

Lecturers Timothy Hunter, Einar Mencl, Erich Round, Tamina Stephenson, Matthew Wolf

Linguistics is the scientific study of language. The major in Linguistics offers a program of studies leading toward an understanding of phonological, grammatical, and semantic structure and of various approaches to descriptive, experimental, and historical linguistics. It also includes course work leading to proficiency in one or two foreign languages. 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.

The normal prerequisite for the major is LING 110b or 117a with a grade of B+ or better. This requirement may be waived by the director of undergraduate studies for students who have taken other linguistics courses. Fourteen additional term courses are required for the major, distributed as follows:

1. Breadth requirement (four courses). All majors must take introductory courses in the core areas of phonology (LING 132a) and syntax (LING 153a). In addition, at least one course must be taken in any two of the six remaining core areas: 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 (phonetics, phonology, morphology, syntax, semantics/pragmatics, computational linguistics, language and mind/brain, and historical linguistics), students must take two additional courses beyond the introductory course.
3. Language requirement (three courses). Three term courses (or the equivalent) in one or two foreign languages beyond the elementary level are required; courses designated L3 or higher are normally accepted. This requirement may be fulfilled in part in the freshman or sophomore years.
4. Electives (three courses). Three additional courses relating to linguistics are required. Electives may be selected from Linguistics courses or from approved courses with substantial linguistic content in other departments (including foreign language courses). With the approval of the director of undergraduate studies, one course bearing a less direct relation to linguistics from another program (e.g., Anthropology, Classics, Cognitive Science, Computer Science, English, Philosophy, or Psychology) may be applied to this requirement if it is relevant to the student's program.
5. Research requirement (two courses). Research Methods in Linguistics (LING 490a) and the Senior Essay (LING 491b) are required, and are usually taken in sequence during the senior year.

REQUIREMENTS OF THE MAJOR

Prerequisites LING 110b, 117a, or equivalent, with a grade of B+ or higher

Number of courses 14 term courses beyond prereq (incl senior req)

Specific courses required LING 132a, 153a, 490a

Distribution of courses One course each in 2 of 6 core areas other than phonology and syntax; 2 courses beyond intro level in one of 8 core areas; 3 language courses at level L3 or higher; 3 electives

Senior requirement Senior essay (LING 491b)

INTRODUCTORY COURSES

Unless otherwise indicated, the courses in this group have no prerequisites.

***LING 008a, Language Diversity and Endangerment** Stephen Anderson

MW 2:30–3:45 SO Fr sem (o)

Introduction to the complexity of the question, "How many languages are there in the world?" Geographical and historical survey of the world's languages; consideration of the ways in which languages can differ from one another. Language endangerment and the threat to world linguistic diversity it poses.

LING 108b, Structure and History of English Words Laurence Horn

TTH 1–2:15 HU (o)

Sources and resources of the English lexicon. The development and internal structure of English words, especially those of classical origin. Application of linguistic principles to the study of etymology, word meaning, and semantic change. Focus on understanding the richness of the English vocabulary and its cultural roots while acquiring tools to analyze words and their elements.

LING 110b^G, Language: Introduction to Linguistics Darya Kavitskaya

MW 2:30–3:45 SO (37)

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.

LING 112a^G, Historical Linguistics Claire Bower

MW 1–2:15 HU (36)

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. Language change and linguistic theory. The role of language contact in language change.

LING 115a^G/SKRT 110a, Introductory Sanskrit I David Brick

For description see under South Asian Studies.

LING 117a^G/PSYC 137a, Language and Mind Maria Piñango

TTH 11:35–12:50 SO (24)

Knowledge of language as a component of the mind: mental grammars, the nature and subdivisions of linguistic knowledge in connection with the brain. The logical problem of language acquisition. The “universal grammar hypothesis” according to which all humans have an innate ability to acquire language. The connection between language acquisition and general cognitive abilities.

LING 120a^G/PSYC 318a, General Phonetics Jelena Krivokapić

TTH 9–10:15 SO (22)

Investigation of possible ways of describing the speech sounds of human languages. Tools to be developed: acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds.

LING 125b^G/SKRT 120b, Introductory Sanskrit II David Brick

For description see under South Asian Studies.

LING 130a^G/PSYC 322a, Evolution of Language Stephen Anderson

TTH 2:30–3:45 (0)

The origin and evolution of human language from an interdisciplinary perspective. Topics include the design features of language, the structure of evolutionary theory, elementary molecular genetics and genetic evidence for language evolution, cognitive continuity and discontinuity with other species, hominid evolutionary history, domain specificity and generality of the language faculty, evidence for evolutionary shaping of physical and cognitive structures.

[LING 140b^G/CGSC 320b, Computational Models in Cognitive Science]**[LING 146b^G/PSYC 329b, Language, Sex, and Gender]*****LING 147b^G, Indigenous Languages of Australia** Claire Bower, Erich Round

TH 9:25–11:15 SO (0)

A general introduction to the indigenous languages of Australia. Issues in phonology, morphology, syntax, sociolinguistics, prehistory (e.g., theories of colonization and spread), and language endangerment and revitalization. Prerequisite: a course in linguistics.

[LING 149b/PSYC 149b, Animal Communication and Human Language]**LING 153a^G, Syntax I** Raffaella Zanuttini

TTH 1–2:15 SO (o)

An introduction to the syntax of natural language. Generative syntactic theory and key theoretical concepts. Syntactic description and argumentation. Topics include the structure of clauses and noun phrases, movement operations, and the notion of parameter.

LING 169a^G, Meaning Laurence Horn

MW 11:35–12:50 SO (34)

Approaches to truth-conditional and lexical semantics of natural language. Survey of propositional and predicate logic. Compositional theories of sense, reference, and belief contexts; entailment, presupposition, and implicature. The relations between semantics and pragmatics.

LING 224a^G, Formal Foundations of Linguistic Theories I Gaja Jarosz

MW 11:35–12:50 QR (34)

Mathematical methods in linguistics. Set theory, logic and formal systems, model theory, lambda calculus, formal language theory, elementary statistics, and probability.

INTERMEDIATE AND ADVANCED COURSES**LING 132a^G, Introduction to Phonological Analysis** Darya Kavitskaya

TTH 11:35–12:50 SO (24)

The structure of sound systems in particular languages. Phonemic and morphophonemic analysis, distinctive-feature theory, formulation of rules, and problems of rule interpretation. Emphasis on problem solving. Prerequisite: LING 120a, or a grade of B or above in LING 110b.

LING 135b^G, Phonological Theory Gaja Jarosz

MW 1–2:15 SO (o)

Topics in the architecture of a theory of sound structure. Motivations for replacing a system of ordered rules with a system of ranked constraints. Optimality Theory: universals, violability, constraint types and their interactions. Interaction of phonology and morphology, as well as relationship of phonological theory to language acquisition and learnability. Opacity, lexical phonology, and serial versions of Optimality Theory. Prerequisite: LING 132a or permission of instructor.

LING 138a/SKRT 130a, Intermediate Sanskrit I David Brick

For description see under South Asian Studies.

***LING 141a^G/PSYC 327a, Language and Computation** Gaja Jarosz

MW 2:30–3:45 QR, SO (o)

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.

LING 148b/SKRT 140b, Intermediate Sanskrit II David Brick

For description see under South Asian Studies.

***LING 180b^G, Morphology** Darya Kavitskaya

MW 11:35–12:50 SO (o)

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 132a and 153a, or permission of instructor.

***LING 200b^G, Experimentation in Linguistics** Jelena Krivokapić, Maria Piñango

W 9:25–11:15 SO (o)

Principles and techniques of experimental design and research in linguistics. Linguistic theory as the basis for framing experimental questions. The development of theoretically informed hypotheses, notions of control and confounds, human subject research, statistical analysis, data reporting, and dissemination.

LING 212b^G, Linguistic Change Ashwini Deo

MW 9–10:15 SO (o)

Principles governing linguistic change in phonology and morphology. Status and independence of proposed mechanisms of change. Relations between the principles of historical change and universals of language. Systematic change as the basis of linguistic comparison; assessment of other attempts at establishing linguistic relatedness. Prerequisites: LING 112a, 132a, and 153a.

***LING 221a^G, Intonation** Jelena Krivokapić

TTH 4–5:15 SO (o)

Introduction of a phonological model of intonation for English and a standard system for transcribing intonation contours and prosodic structure. Extension of the model to other languages. Prerequisite: LING 120a or permission of instructor.

LING 226b^G, Formal Foundations of Linguistic Theories II Robert Frank

TTH 9–10:15 QR, SO (22)

A study of frameworks for the representation of linguistic knowledge, focusing on the issues of expressiveness (generative capacity) and computational complexity. Constrained grammar formalisms (tree adjoining grammars, categorial grammars, dependency grammars, minimalist grammars), model-theoretic approaches to grammatical representation, probabilistic and optimization-based grammars (optimality theory, harmonic grammars, maximum entropy, stochastic grammars). Prerequisite: LING 224a.

***LING 230b^G, Techniques in Neurolinguistics** Einar Mencl

T 9:25–11:15 (22)

Introduction to common techniques and research in cognitive neuroimaging, with applications to the study of language. Techniques include MRI acquisition, preprocessing, single- and multisubject data analysis, visualization, and network analysis. Review of ERP and MEG. Topics include speech production and perception, literacy, and dyslexia. Prerequisite: LING 110b or permission of instructor.

LING 231b^G/PSYC 331b, Neurolinguistics Maria Piñango

TTH 11:35–12:50 SO (o)

The study of language as a cognitive neuroscience. The interaction between linguistic theory and neurological evidence from brain damage, degenerative diseases (e.g., Alzheimer's disease), mental illness (e.g., schizophrenia), neuroimaging, and neurophysiology. The

connection of language as a neurocognitive system to other systems such as memory and music.

***LING 236b^C, Articulatory Phonology** Jelena Krivokapić

F 9:25–11:15 SO (32)

Introduction to phonology as a system for combining units of speech (constriction gestures of the vocal organs) into larger structures. Analysis of articulatory movement data; modeling using techniques of dynamical systems. Emphasis on universal versus language-particular aspects of gestural combination and coordination. Prerequisite: LING 120a or permission of instructor.

***LING 240b^C, Topics in Phonology: Crossing the Phonology/Morphology Interface**

Matthew Wolf

TH 2:30–4:30 SO (o)

Phonologically conditioned morphological patterns (allomorph selection, deponency, affix order, paradigm gaps) and morphologically conditioned phonological patterns (process morphology, exceptions and/or lexically specific alternations). Connections between phonology and morphology; information that can and cannot cross the interface between them.

***LING 241b^C, Field Methods** Claire Bower

TTH 2:30–3:45 SO (o)

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 in Linguistics, and to others with permission of instructor.

***LING 242a^C, Harmonies** Darya Kavitskaya

TH 1:30–3:20 SO (o)

Vowel and consonant harmony in the world's languages. Typologies and theoretical models of local and nonlocal assimilation. Interaction of vowel harmony with vowel epenthesis and deletion. The relation of harmonies and morphology. Prerequisite: two courses in phonology.

***LING 244a^C, Old Iranian: Avestan** Stanley Insler

TH 2:30–4:30 (RP, 27)

An introduction to the language and texts of the Avesta, the sacred writings of the Zoroastrians. Prerequisite: one year of an ancient Indoeuropean language such as Latin, Greek, or Sanskrit.

***LING 246a^C, Vedic Poetry** Stanley Insler

T 2:30–4:30 (RP, 27)

An introduction to the language and poetry of the Rigveda, the oldest and most important text of ancient India. Prerequisite: one year of Sanskrit.

***LING 251b^C, Learnability and Development** Gaja Jarosz

W 3:30–5:20 SO (37)

An investigation of language learning from an integrated perspective of computational learning and language development. Topics include formal learning theory, formal and computational modeling of language acquisition, statistical learning in infants and machines, and nativism versus empiricism. Development and learnability at various

levels of linguistic structure. Prerequisite: LING 141a required; a course in theoretical linguistics recommended.

LING 254b^G, Syntax II Robert Frank

TTH 1–2:15 SO (o)

Recent developments in syntactic theory: government and binding, principles and parameters, and minimalist frameworks. In-depth examination of the basic modules of grammar, including lexicon, X-bar theory, theta-theory, case theory, and movement theory. Comparison and critical evaluation of specific syntactic analyses. Prerequisite: LING 153a.

LING 257a^G, Classic Readings in Syntax Raffaella Zanuttini

MW 1–2:15 SO (o)

Foundational ideas in generative syntax. How these ideas have evolved, how they are currently expressed, and how they fare in accounting for new patterns of data. Prerequisite: LING 153a.

***LING 260a^G/PSYC 360a, Topics in Syntax: The Mental Lexicon** Maria Piñango

M 1:30–3:20 SO (o)

Definitions of lexical knowledge; views of the lexicon as a repository of information vs. a “generative” system; the case of idioms; the lexicon and the grammar-conceptual structure interface; acquisition of the lexicon.

***LING 263b^G, Semantics** Ashwini Deo

MW 2:30–3:45 QR, SO (o)

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.

***LING 270a^G/PHIL 431a^G, Topics in Semantics: Modality** Tamina Stephenson

W 1:30–3:20 SO (RP, o)

The semantics of modal expressions such as “must” and “can.” Emphasis on indicative and counterfactual conditional constructions. Prerequisite: LING 263b.

LING 271a/PHIL 271a, Philosophy of Language Zoltán Szabó, Justin Khoo

For description see under Philosophy.

[LING 275a^G, Pragmatics]

***LING 276b^G, Implicature and Pragmatic Theory** Laurence Horn

W 1:30–3:20 SO (RP, o)

Diverse approaches to the characterization of what is said and what is meant. Pragmatic intrusion into truth-conditional meaning in neo-Gricean pragmatics and relevance theory; the problem of “embedded implicatures” and the grammatical view of scalar implicature. Experimental studies of implicature and the grammar/pragmatics interface. Prerequisite: one course in semantics or pragmatics, or permission of instructor.

***LING 290a^G, Negation and Polarity** Laurence Horn

T 2:30–4:20 SO (RP, o)

Meaning and expression of negation and negative polarity. Asymmetry of negation vs. affirmation. Semantic and pragmatic factors in the meaning of negative sentences: contradictory vs. contrary opposition; metalinguistic vs. descriptive uses of negation. Cross-linguistic

expression of affixal negation, negative polarity, and negative concord. The roles of configuration, scope, entailment, and implicature in the licensing of polarity items.

***LING 471a and 472b, Special Projects** Raffaella Zanuttini [F], Laurence Horn [Sp]
HTBA (o)

Special projects set up by students with the help of a faculty adviser and the director of undergraduate studies to cover material not otherwise offered by the department. The project must terminate with at least a term paper or its equivalent and must have the approval of the director of undergraduate studies. Only one term of credit for a project may count toward the major; no more than two terms may count toward the bachelor's degree.

***LING 490a^G/PSYC 372a, Research Methods in Linguistics** Claire Bowers
W 3:30–5:20 (o)

An introduction to research methods in linguistics. Observational and experimental approaches to research in the field. Topics include collection and organization of linguistic data, basic field methods, and use of language corpora and databases. Introduction to research in language acquisition and language change. Prerequisites: one course in syntax and one course in phonology.

***LING 491b, The Senior Essay** Laurence Horn
W 4–5:50 (o)

A weekly colloquium in which senior Linguistics majors, in rotation, make presentations of research material that will culminate in the development of their senior essays. Under the guidance of departmental faculty (or in some cases supporting faculty in other departments), students select a topic, present material related to the research on that topic, give preliminary versions of their essay, and complete the essay. Prerequisite: LING 490a.

RELATED COURSES

ANTH 120a, Language, Culture, and Identity J. Joseph Errington

CPSC 463b^G, Machine Learning Dana Angluin

CPSC 470a^G, Artificial Intelligence Brian Scassellati

***GREK 403a^G, Comparative Greek Grammar** John Fisher
For description see under Classics.

PHIL 267a^G, Mathematical Logic Sun-Joo Shin

***PHIL 425b^G, Frege** Susanne Bobzien

***PSYC 407b/CGSC 407b, Cognitive Science of Causality** Frank Keil
For description see under Psychology.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in linguistics and in related fields such as anthropology, philosophy, and psychology appear in Online Course Information, www.yale.edu/oci. Such courses may be taken by undergraduates with permission of the director of graduate studies and the instructor.

The Literature Major

Director of undergraduate studies: Katerina Clark, Rm. 102, 451 College St., 432-4750, maryjane.stevens@yale.edu

FACULTY OF THE LITERATURE MAJOR

Professors Dudley Andrew (*Chair*), Katerina Clark, Roberto González Echevarría, Carol Jacobs, Pericles Lewis, Rainer Nägele, David Quint, Haun Saussy, Katie Trumpener

Associate Professors Ala Alryyes, Moira Fradinger, Barry McCrea

Assistant Professor David Gabriel

Senior Lecturer Richard Maxwell

Lecturers Edward Barnaby, Jan Hagens

Senior Lectors Howard Stern, Henry Sussman

The Literature Major allows students to address fundamental questions about the nature, function, and value of literature in a broadly comparative context. Majors read and write about a wide variety of literary works across periods, genres, and national traditions. They investigate traditional and contemporary approaches to literary study, ancient and modern literary theory, and the relationship of literature to film and to other branches of the arts and sciences.

The Literature Major offers students the freedom to construct a program of study that reflects their intellectual goals. All students planning to major in Literature should register with the director of undergraduate studies, who will work with them to develop a coherent, well-focused sequence of courses suited to their individual interests.

The major offers a number of its own courses, which constitute the core of the program. 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, Film Studies, French, German, Italian, Near Eastern Languages and Civilizations, Portuguese, Slavic Languages and Literatures, and Spanish. Courses in film studies count toward the major in the same way as courses in literature. Students with a particular interest in film may wish to elect the film track within the Literature major, described below.

The experience of reading a foreign literature in the original language enables us to understand the nature of both language and literature more fully. Prospective Literature 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. Students interested in graduate study in comparative literature should be aware that many programs require reading knowledge of two or three foreign languages.

Prerequisites Completion of the Yale College foreign language distributional requirement is a prerequisite for entry into the major. Two specific courses are also prerequisites, LITR 120a, Introduction to Narrative, and 122b, World Poetry and Performance. These

courses may be taken in either order, but at least one of them must be completed in either the freshman or the sophomore year.

The standard major The Literature Major requires fourteen term courses, including two prerequisites, one required course, two core seminars, and the senior requirement. Students must take LITR 300b, *Introduction to Theory of Literature*, in the sophomore or junior year. Students take an additional three courses in a foreign literature, in which they read the texts in the original language. Students may also elect to include in their major two courses in a related discipline that has direct bearing on their study of literature, such as English, history of art, philosophy, anthropology, music, or theater studies. One of these elective courses may be in creative writing. A third elective from a related discipline may be applied to the major with permission of the director of undergraduate studies.

Core seminars In core seminars, LITR 400–480, students focus intensively on particular texts, films, literary and cultural issues, and theoretical problems. Students are required to take at least two core seminars, preferably one in the junior and one in the senior year. The seminars provide training in literary interpretation and theory, preparing students for the senior essay.

Pre-1800 course requirement The Literature Major requires at least one course in literature before 1800. Because both genres and individual works of literature refer to, emulate, challenge, and rewrite older works and conventions, students benefit from acquiring a degree of historical perspective. All courses listed under “The Ancient World” and “Medieval and Early Modern Literature to 1800” fulfill the pre-1800 requirement. Courses from other departments may also fulfill the requirement.

Poetry or drama requirement In addition to LITR 122b and the pre-1800 course, all students must take one course in poetry or drama. The course may be one offered in a program other than Literature.

All majors are required to take at least three additional term courses, beyond the foreign language distributional requirement, in an ancient or modern foreign literature, in which the literature is read in the original language. One or more courses can be taken at a basic literature level (normally equivalent to the third year of language study); however, at least one course must be taken at an advanced level (normally equivalent to the fourth year of language study or higher). Students are encouraged to continue developing their foreign language skills by taking advanced language courses and may, with permission of the director of undergraduate studies, substitute one language course at the L5 level for one of the three required foreign literature courses.

A literature course in translation is sometimes suitable as a foreign literature course. In such cases, Literature majors are expected to request additional assignments from their instructors that demonstrate they have engaged with the texts in the original language. They should fill out a form, signed by the instructor, attesting to their intent to do so. This form is available in the department office in Room 102, 451 College St.; students should submit it to the director of undergraduate studies along with their course schedule.

Nonnative speakers of English who are granted permission by Yale College to complete the foreign language distributional requirement by taking ENGL 114a or b, 120a or b, or

450b may take three additional English literature courses to fulfill the foreign literature requirement of the Literature Major, or they may fulfill the major requirements in a third language.

The senior essay In the senior essay, required of all majors, students develop a research topic of their choice and work closely with a faculty adviser. Normally, the essay makes use of texts in the language of their original composition. Any exceptions must be approved by the director of undergraduate studies. Deadlines for the prospectus, the rough draft, and the completed essay are listed in the course descriptions of the senior essay course (LITR 491a or b and 492a or b, 493a or b).

The senior essay may be written over one term (LITR 491a or b) or over two terms (LITR 492a or b, 493a or b). Alternatively, students may fulfill the senior essay requirement within the context of a core seminar (the senior seminar essay). Because no more than five students per seminar may elect this option, students should petition the instructor promptly at the beginning of the term. It is understood that students choosing the senior seminar essay will work closely with the instructor throughout the term and produce a substantial paper, approximately thirty pages. Students earn one course credit for the seminar in which the essay is written; no additional course credit is awarded for the essay itself.

Students with an especially well-developed project may petition to write a yearlong senior essay. Interested juniors must apply to the curriculum committee 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 492a during the fall term and complete their essays in 493b in the spring term. December graduates enroll in 492b in the spring term and complete their essays in 493a during the following fall term. Students planning to begin their essay in the spring term should notify the director of undergraduate studies by the last day of classes in the fall term.

Film track Students may elect to pursue a film-intensive concentration within the Literature Major. Students in the film track must fulfill the same requirements as those in the standard Literature track, with the following exceptions. Film-track students take LITR 143b, *World Cinema*, instead of LITR 122b as one of the prerequisites to the major. They take two foreign literature courses rather than three; neither may be substituted with an advanced language course. In addition, students in the film track must take one course in film theory and three electives in the field of film studies.

Intensive major Students in the intensive major complete three courses in a second literature, in which literature is read in the original language, in place of three electives. If the additional literature is in English, intensive majors must demonstrate proficiency at the intermediate (L4) level in a second foreign language.

Year or term abroad The Literature Major encourages students to consider spending a summer, a term, or a year abroad. Courses taken on international programs may, with permission of the director of undergraduate studies, be applied to the Literature Major's foreign literature requirement.

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 major. 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.

<i>Language</i>	<i>Basic Literature Course</i>	<i>Advanced Literature Course</i>
Arabic	ARBC 150a, 151b	ARBC 165a or 166b
Chinese	CHNS 150a, 151b	CHNS 170a, 171b
French	FREN 170a or b	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 131a or 141b	Ancient Greek courses numbered 400 or higher
Biblical Hebrew	HEBR 137a, 147b	By arrangement with instructor
Modern Hebrew	HEBR 151b	HEBR 151b
Italian	Courses in Italian numbered 200 or higher	Courses in Italian numbered 200 or higher
Japanese	JAPN 150a, 151b	JAPN 170a or 171b
Korean	KREN 150a, 151b	KREN 470a or 471b
Latin	LATN 131a or 141b	Latin courses numbered 400 or higher
Persian	PERS 150a	PERS 150a
Portuguese	By arrangement with instructor	By arrangement with instructor
Russian	RUSS 150a, 151b	Courses in Russian numbered 170 or higher
Spanish	SPAN 261a, 262b, 266a, or 267b	Courses in Spanish numbered 300 or higher

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

REQUIREMENTS OF THE MAJOR

Prerequisites *Both tracks*—LITR 120a; completion of Yale College foreign lang distributional req; *Standard track*—LITR 122b; *Film track*—LITR 143b

Number of courses *Both tracks*—12 term courses beyond prereqs (incl senior essay)

Required course *Both tracks*—LITR 300b

Distribution of courses *Both tracks*—1 course in lit before 1800; 1 course in poetry or drama; 2 core sems; *Standard track*—3 courses in 1 foreign lit, as specified; *Film track*—2 courses in 1 foreign lit, as specified; 1 course in film theory; 3 electives in film studies

Substitution permitted *Standard track*—For 2 electives, 2 courses in another discipline, incl 1 in creative writing; a third course in another discipline for a lit elective, with DUS permission; 1 advanced lang course for 1 of 3 req foreign lit courses, with DUS permission

Senior requirement *Both tracks*—One-term senior essay (LITR 491a or b); or two-term senior essay (LITR 492a and 493b, or 492b and 493a); or 1 core sem (LITR 400–480) with senior sem essay

Intensive major 3 addtl lit courses in a second lang in place of 3 electives; demonstrated command of a second foreign lang

PREREQUISITES AND REQUIRED COURSES

LITR 120a, Introduction to Narrative David Quint and staff

3 HTBA For sections see www.yale.edu/oci WR, HU (o)

A team-taught course that examines how narratives work and what they do. Emphasis on fictional form, the mechanics of plot, and questions of time and duration. Texts are drawn from a variety of periods and cultures, and include folktales, short stories, novels, case studies, graphic novels, and films.

LITR 122b, World Poetry and Performance David Gabriel and staff

MW 1–2:15 WR, HU (o)

A team-taught course that examines lyric and epic poetry, drama, film, song, and performance. Texts are drawn from a broad range of cultures and time periods, from the ancient Near East to our own time. Emphasis on how poetic and dramatic forms shape the stories they tell, on the social and cultural uses to which these forms are put, on the relationship between text and performance, and on historical and cross-cultural connections among texts.

LITR 143b/FILM 240b, World Cinema Dudley Andrew

MW 11:35–12:25, 1 HTBA; screenings M 6:30–9 p.m. HU (34)

An examination of the varieties of films that have been produced around the globe. Different functions served by the medium, particularly since World War II; analysis and contextualization of selected films from four continents.

LITR 300b⁶/ENGL 300b, Introduction to Theory of Literature Haun Saussy

TTH 11:35–12:25, 1 HTBA HU (24)

An examination of concepts and assumptions in contemporary views of literature. Theories of meaning, interpretation, and representation. Critical analysis of formalist, psychoanalytic, structuralist, poststructuralist, Marxist, and feminist approaches to theory and to literature.

THE ANCIENT WORLD

***LITR 154a/ENGL 395a, The Bible as Literature** Leslie Brisman

For description see under English Language & Literature.

LITR 158a/CLCV 254a, Introduction to Greek Literature Victor Bers

For description see under Classics.

LITR 159b/CLCV 255b, Introduction to Latin Literature Kirk Freudenburg

For description see under Classics.

LITR 162b/CLCV 292b/HUMS 314b, Ancient Greece and Rome in Historical Fiction

Emily Greenwood

For description see under Classics.

***LITR 163b/CLCV 264b/HUMS 290b, Literary Interpretation in Greece and Rome**

Irene Peirano

For description see under Classics.

***LITR 164b/CLCV 223b/HUMS 298b, Love and Desire in the Classical Tradition**

Emily Greenwood, Caroline Stark

For description see under Classics.

MEDIEVAL AND EARLY MODERN LITERATURE TO 1800

LITR 172a^G/CHNS 200a^G, Man and Nature in Chinese Literature Kang-i Sun Chang
For description see under East Asian Languages & Literatures.

LITR 183a/ITAL 310a, Dante in Translation Giuseppe Mazzotta
For description see under Italian.

EUROPEAN LITERATURE SINCE 1800

LITR 206b/RSEE 255b/RUSS 255b, Studies in the Novel: Tolstoy
Vladimir Alexandrov
For description see under Slavic Languages & Literatures.

***LITR 207b/ENGL 243b/HUMS 428b/MGRK 214b/WGSS 215b, Modern Literature and the Eastern Mediterranean** Langdon Hammer, George Syrimis
For description see under Hellenic Studies.

LITR 208a/RSEE 256a/RUSS 256a, Studies in the Novel: Dostoevsky
Molly Brunson
For description see under Slavic Languages & Literatures.

***LITR 211b/GMST 200b/HUMS 293b, Roots of Modernity** R. Howard Bloch, Rüdiger Campe
For description see under Humanities.

***LITR 219a/GMAN 335a^G/GMST 335a, Brecht, Artaud, Müller, and the Modern Theater** Rainer Nägele
For description see under Germanic Languages & Literatures.

***LITR 220b/CZEC 301b/RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes
For description see under Slavic Languages & Literatures.

LITR 223b/ENGL 360b/HUMS 243b/THST 223b, The Foundations of Modern Drama
Murray Biggs
For description see under Theater Studies.

***LITR 224b/GMAN 351b^G/GMST 351b, Hölderlin, Kafka, Benjamin** Rainer Nägele
For description see under Germanic Languages & Literatures.

***LITR 236a/GMAN 303a/GMST 303a, Goethe's Poetic Revolution** Rainer Nägele
For description see under Germanic Languages & Literatures.

NON-EUROPEAN LITERATURE SINCE 1800

***LITR 251b/JAPN 251b^G, Japanese Literature after 1970** John Treat
For description see under East Asian Languages & Literatures.

***LITR 258a/AMST 326a/CHNS 265a/ER&M 300a/FILM 435a, Chinese Diaspora and the Americas in Fiction and Film** Jing Tsu
For description see under East Asian Languages & Literatures.

LITERARY THEORY AND SPECIAL TOPICS

***LITR 262b/HUMS 427b, The Practice of Literary Translation** Barry McCrea

For description see under Humanities.

***LITR 265a/AFST 412a/FREN 412a/MMES 162a/WGSS 412a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev

For description see under French.

***LITR 294a/PORT 394a/SPAN 385a, World Cities and Narratives** K. David Jackson

For description see under Portuguese.

LITR 318b/EAST 275b/HSAR 356b/HUMS 424b, Asian Humanities: Text and Object

Haun Saussy, Mimi Yiengpruksawan

For description see under East Asian Studies.

***LITR 334a/GMAN 191a, Problems of Lyric** Howard Stern

MW 4–5:15 HU (o)

Masterpieces of European and American lyric studied in relation to the various determinants of poetry: grammar and logic, meter and rhyme, self-consciousness and performativity, myth and theme. Poets include Brecht, Rilke, Goethe, Frost, and Elizabeth Bishop. Reading knowledge of German or French useful but not required.

***LITR 337b/HUMS 297b/ITAL 205b, Italian Food and Literature** Risa Sodi

For description see under Italian.

FILM

LITR 351b/FILM 333b/HUMS 375b, Early Film Theory and Modernity

Francesco Casetti

For description see under Film Studies.

LITR 354a/FILM 312a, Theory of Media John MacKay, Francesco Casetti

For description see under Film Studies.

***LITR 357a/ENGL 321a/HUMS 246a, Visual Culture in Literature, Drama, and Film**

Edward Barnaby

TH 1:30–3:20 HU (o)

A discussion of texts that address the transformation of visual culture and the act of seeing in modern industrial society. The dynamics such texts reveal in relationships between individuals and mass culture, authenticity and commodity, theory and ideology. Questions of imperialism, rationalism, industrialism, voyeurism, tourism, and realism as inscribed in landscape, architecture, painting, photography, theater, and cinema.

***LITR 380b/FILM 411b, The Films of Alfred Hitchcock** Brigitte Peucker

For description see under Film Studies.

LITR 381a/FILM 260a^G/FREN 395a, French New Wave Cinema Dudley Andrew, Michael Cramer

For description see under Film Studies.

***LITR 384a/FILM 446a/JAPN 270a^G, Japanese Cinema before 1960** Aaron Gerow

For description see under East Asian Languages & Literatures.

***LITR 394a/FILM 468a^G/GMAN 405a^G/GMST 405a, Weimar Cinema**

Brigitte Peucker

For description see under Film Studies.

***LITR 399b/HUMS 399b, Defining Life** Ala Alryyes

W 1:30–3:20 HU (o)

Definitions and representations of life across a variety of disciplines. Topics include creation, the nature of the soul and human consciousness, and boundaries between human and other categories such as animal, machine, or thing. Readings from philosophy, law, literature, and current biomedical and political debates regarding the beginning and end of life.

CORE SEMINARS

Two seminars are required for Literature majors; nonmajors may be admitted with permission of the instructor.

***LITR 420a/SPAN 393a, The Jungle Books** Roberto González Echevarría

TTH 2:30–3:45 WR, HU Tr (o)

A study of novels, stories, and films about a journey to the jungle in search of personal fulfillment and the origins of history. Authors include Alvar Núñez Cabeza de Vaca, Arthur Conan Doyle, Joseph Conrad, André Malraux, Alejo Carpentier, W. H. Hudson, Claude Lévi-Strauss, José Eustasio Rivera, and Mario Vargas Llosa.

***LITR 432b^G, Literatures of World War II: Homefront Narratives** Katie Trumpener

M 9:25–11:15; screenings HTBA HU (o)

Examination of quotidian, civilian World War II experiences in many parts of Europe. Modes of literary 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.

LITR 440a/ENGL 422a, James Joyce's *Ulysses Pericles Lewis

For description see under English Language & Literature.

***LITR 462a/HUMS 291a, Literary Analysis of Trials** Alice Kaplan

M 2:30–4:20 HU (o)

Novels, films, and nonfiction treatments of historically significant trials.

***LITR 463a/ENGL 353a/HUMS 295a, Medieval Celtic Literature** David Gabriel

T 1:30–3:20 HU Tr (o)

Major texts of Celtic literature, focusing on works from the birth of vernacular literature in the Middle Ages to the early modern period. Cultural, historical, and literary issues surrounding works in the Irish and Welsh languages; literary culture in Breton, Cornish, Scottish Gaelic, and Manx. Genres include lyric and bardic poetry, heroic and religious narrative, and early Arthurian works. Readings in English translation; no knowledge of Celtic languages assumed.

***LITR 464a, The Idea of Oral Literature** Haun Saussy

MW 11:35–12:50 HU (o)

History of ideas about “oral literature,” a paradoxical term. Examination of texts collected by ethnographers, folklorists, and linguists. Mnemonic devices, formal properties, and

contexts of performance; transformations of oral texts into print, recorded, and electronic media.

***LITR 465b/HUMS 425b, Travel and Quests in Early World Literature** David Gabriel
T 1:30–3:20 HU (o)

Journeys of all types—Viking voyage of discovery, saintly pilgrimage, Zen journey to enlightenment, knightly quest—that speak to the core of the human experience. Literature of travel, journeys, and quests in the ancient and medieval world; focus on the motivation behind travel and on the repercussions of translating such journeys into literary form.

***LITR 466a/FILM 429a, War in Literature and Film** Katerina Clark
TTH 1–2:15 HU (o)

Representations of war in literature and film; reasons for changes over time in portrayals of war. Texts by Stendahl, Tolstoy, Juenger, Remarque, Malraux, and Vonnegut; films by Eisenstein, Tarkovsky, Joris Ivens, Coppola, Spielberg, and Altman.

***LITR 467b/GMAN 192b, The Prose Labyrinth** Howard Stern
MW 4–5:15 HU (37)

Short prose (prismatic, encyclopedic, labyrinthine) considered as a characteristic genre of twentieth-century literature. Works by Benjamin, Shklovsky, Ponge, Queneau, Calvino, and Cortázar. All readings available in English.

***LITR 469a, The World as Theater** Jan Hagens
TTH 1–2:15 HU (o)

Dramatic texts in the Western tradition that display the world as a theater. Their aesthetics, dramatic structure, historical significance, and assertions about human psychology, individual and societal action, and the meaning of life.

***LITR 470b, Faust** Jan Hagens
TTH 1–2:15 HU (o)

The development of the Faust motif through time, from the legend's origins in the Renaissance-Reformation period to twentieth-century variations. Readings from the English adaptation of the original German chapbook, Marlowe's *Doctor Faustus*, Goethe's *Faust (Part I)*, and Thomas Mann's *Doctor Faustus*; screenings of films with a Faustian theme.

***LITR 488a or b, Directed Reading and/or Individual Research** Katerina Clark
HTBA (o)

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.

SENIOR COURSES

***LITR 491a or b, The Senior Essay** Katerina Clark
HTBA (o)

An independent writing and research project. The senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 10 (for LITR 491a) or January 21 (for LITR 491b), a three-page prospectus signed by the student's

adviser; (2) by October 22 (for LITR 491a) or March 1 (for LITR 491b), a full rough draft (not notes); (3) by December 3 (for LITR 491a) or April 15 (for LITR 491b), the completed essay. The minimum length for an essay is twenty-five pages. Students are urged to arrange a topic and adviser early in the term before the term in which the essay is to be written.

***LITR 492a or b and 493a or b, The Yearlong Senior Essay** Katerina Clark

HTBA Cr/year only (o)

An extended research project. Students must petition the curriculum committee for permission to enroll by the last day of classes in the term preceding enrollment in LITR 492a or b. For students expecting to graduate in May, the senior essay is due in the office of the director of undergraduate studies according to the following schedule: (1) by September 10, a three-page prospectus signed by the student's adviser; (2) by January 21, a full rough draft (not notes); (3) by April 15, the completed essay. December graduates should consult the director of undergraduate studies for required deadlines. The minimum length for a yearlong senior essay is forty pages.

Management Sciences

(See under *Operations Research*.)

Mathematics

(SEE ALSO APPLIED MATHEMATICS.)

Director of undergraduate studies: Roger Howe, 220B LOM, 432-4686,
howe@math.yale.edu

FACULTY OF THE DEPARTMENT OF MATHEMATICS

Professors Donald Brown, Andrew Casson, Ronald Coifman, Igor Frenkel, Howard Garland, Alexander Goncharov, Roger Howe, Peter Jones, Mikhail Kapranov, Benoit Mandelbrot (*Emeritus*), Gregory Margulis, Yair Minsky, Vincent Moncrief, Steven Orszag, David Pollard, Vladimir Rokhlin, Peter Schultheiss (*Emeritus*), Gregg Zuckerman

J. W. Gibbs Assistant Professors Yael Algom-Kfir, Ian Biringer, Dennis Borisov, Corina Calinescu, Tobias Dyckerhoff, Matt Feiszli, Amanda Folsom, Marketa Havlickova, Anna Lachowska, Jaejeong Lee, Garving Kevin Luli, Sam Payne, Neta Rabin, Zhenqi Wang, Andrew Wells

Adjunct Professors Michael Frame, Gil Kalai, Alex Lubotzky

Lecturer Matthew Hirn

Operations Research Faculty Eric Denardo

Statistics Faculty Andrew Barron, Joseph Chang, John Hartigan (*Emeritus*), Balaji Raman

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.

B.A. and B.S. degree programs The prerequisite for each program is calculus through the level of MATH 120a or b, or the equivalent. Each program normally consists of ten term courses in Mathematics numbered 222 and higher, including MATH 480a or b. These ten may include no more than five term courses from other institutions. Each student is expected to take vector calculus and linear algebra, either Math 230a and MATH 231b, or one of MATH 222a or b or 225a or b and Math 250a. 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. Specific courses in each category are listed below. Beginning with the Class of 2012, each major program must include at least two courses selected from the three core areas: real analysis (MATH 300b or 301a or higher), algebra (MATH 350a or higher), and complex analysis (MATH 310a or higher). Taking courses from all three core areas is strongly recommended.

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, Operations Research, Physics, Statistics, 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 director of undergraduate studies.

A candidate for the B.S. degree must take at least two advanced term courses in the physical sciences, such as CHEM 328a, 332a, 333b, or PHYS 401a, 402b, in addition to the ten term courses required for the B.A. degree. Such courses require the approval of the director of undergraduate studies; written approval is advised.

Any student interested in pursuing further study in pure mathematics should include MATH 301a, 305b, 310a, 350a, 370b, and either 430b or 435b in his or her program, and should consider taking one or more graduate-level courses. Students interested in applications of mathematics should include MATH 300b or 301a, 310a, 350a, and a selection of courses among 241a, 242b, 244a, 246a or b, 251b, 260b, 435b, and CPSC 440b.

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

The intensive major Candidates for a degree with an intensive major in Mathematics are 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 MATH 350 and 399; *analysis*: MATH 301a, 305b, 310a; *algebraic topology*: MATH 301a, 350a; *logic and foundations*: MATH 270a. Beginning with the Class of 2012, intensive majors must take courses in all three of the core areas: real analysis (MATH 300b or 301a or higher), algebra (MATH 350a or higher), and complex analysis (MATH 310a or higher). Also beginning with the Class of 2012, only those students who have completed the intensive major are eligible for Distinction in the Major.

Senior requirement During the senior year students majoring in Mathematics normally take the senior seminar (MATH 480a or b). Alternatively, with the consent of the director of undergraduate studies, highly qualified students may write a senior essay in MATH 470a or b 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.

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 will be 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) a reading knowledge of mathematical literature in a foreign language of importance for mathematical research (normally French, German, or Russian); (3) satisfactory performance on a general oral examination.

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. During spring term of the sophomore year candidates must submit a proposal that foresees this level of achievement by the end of junior year to the director of undergraduate studies. If approved by the department this proposal will be forwarded to the Dean's Office; see "Simultaneous Award of the Bachelor's and Master's Degrees" in chapter II, section K. Students' status and progress will be reviewed before they are permitted to continue in the program in the senior year.

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 will be 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.

Placement in courses The department offers a three-term sequence in calculus, MATH 112a or b, 115a or b, and 120a or b. Students who have not taken calculus at Yale and who wish to enroll in calculus must take the online placement examination found on the department Web page (www.math.yale.edu). At the beginning of each term a calculus preregistration session is held in 432 DL. To enroll in a calculus course a student must bring the results of the placement exam, as well as other pertinent information such as Advanced Placement test scores, to the preregistration session. Advisers will be on hand to assist each student in enrolling in the appropriate course.

MATH 112a or b 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 115a or b presupposes familiarity with the topics covered in MATH 112a or b. MATH 120a or b presupposes familiarity with the topics covered in MATH 115a or b.

MATH 230a, 231b is an advanced course in linear algebra and introductory analysis for students with exceptionally strong backgrounds in mathematics. Students who wish to

enroll in MATH 230a should consult the instructor of the course. After MATH 115a or b, students with a strong interest in abstract mathematics should consider taking MATH 230a, 231b.

REQUIREMENTS OF THE MAJOR

Prerequisite MATH 120a or b or equivalent

Number of courses *B.A.* — 10 term courses numbered 222 or higher, incl MATH 480a or b; *B.S.* — same, with 2 addtl courses in physical sciences

Distribution of courses *Class of 2011* — *B.A.* — 2 courses in each of 3 categories chosen from (a) analysis, (b) algebra and number theory, (c) stat and applied math, (d) geometry and topology, (e) logic and foundations; *B.S.* — same, with 2 addtl advanced courses in physical sciences approved by DUS; *Class of 2012 and later* — *B.A. and B.S.* — same as for Class of 2011, with 2 courses from core areas of real analysis, algebra, and complex analysis, as specified

Specific courses required MATH 230a and 231b; or MATH 222a or b or 225a or b, and MATH 250a

Substitution permitted With DUS permission, certain courses in Applied Math, Comp Sci, Engineering & Applied Science, Econ, Operations Research, Philosophy, Physics, Statistics

Senior requirement Senior sem (MATH 480a or b) or, with DUS permission, senior essay (MATH 470a or b) and oral report

Intensive major *Class of 2011* — 2 grad courses or equivalent independent study counted among the required courses; *Class of 2012 and later* — same, with courses in all 3 core areas

Introductory courses MATH 112a or b, 115a or b, 118a or b, 120a or b, 190a

Analysis MATH 231b, 246a or b, 250a, 262b, 300b, 301a, 305b, 310a, 315b, 320a, 325b

Statistics and applied mathematics MATH 241a, 242b, 244a, 246a or b, 251b, 260b, 262b, 310a, 330b, 400a; CPSC 201a or b, 365b, 440b

Algebra and number theory MATH 222a or b, 225a or b, 230a, 244a, 350a, 353a, 360b, 370b, 380a, 381b, 440a

Geometry and topology MATH 228a, 290b, 360b, 430b, 435b, 440a

Logic and foundations MATH 270a; PHIL 267a, 427b

INTRODUCTORY COURSES

These courses do not count toward the requirements of a major in Mathematics. Students wishing to enroll in MATH 112a or b, 115a or b, or 120a or b are expected to preregister for a specific section. In the fall, preregistration is on Tuesday, August 31, 2010, from 9:30 a.m. to 4 p.m. in 432 DL; in the spring, preregistration is on Monday, January 10, 2011, from 9:30 a.m. to 4 p.m., also in 432 DL. Students who have not taken calculus at Yale must complete the online placement exam at www.math.yale.edu/public_html/placement.html before preregistering. Those who do not preregister may be excluded from sections that are full.

MATH 108b, Estimation and Error Roger Howe

TTH 4–5:15 QR (27)

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.

***MATH 112a or b, Calculus of Functions of One Variable I** Gregg Zuckerman and staff

HTBA For sections see www.yale.edu/oci QR (69)

Limits and their properties. Definitions and some techniques of differentiation and the evaluation of definite integrals, with applications. Students are instructed in use of the software package Mathematica, which is used in graphical, symbolic, and numerical methods and is required on some problem sets. No prior acquaintance with calculus or computing assumed.

***MATH 115a or b, Calculus of Functions of One Variable II** Andrew Casson and staff

HTBA For sections see www.yale.edu/oci QR (69)

A continuation of MATH 112a or b. 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 112a or b or equivalent; open to freshmen with some preparation in calculus.

***MATH 118a or b, Introduction to Functions of Several Variables** Neta Rabin [F], Zhenqi Wang [Sp]

MWF 9:25-10:15 [F]; MWF 10:30-11:20 [SP] (69)

Calculus of several variables and some linear algebra. Intended for students in the social sciences, especially Economics. Covers parts of MATH 120a or b and MATH 222a or b. May not be taken after MATH 120a or b or 222a or b. Prerequisite: MATH 112a or b.

***MATH 120a or b, Calculus of Functions of Several Variables** Michael Frame, Yair Minsky, and staff

HTBA For sections see www.yale.edu/oci QR (69)

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 115a or b, or with permission of instructor.

MATH 190a, Fractal Geometry Michael Frame

TTH 2:30-3:45 QR (27)

A visual introduction to the geometry of fractals and the dynamics of chaos, accessible to students not majoring in science. Study of mathematical patterns repeating on many levels and expressions of these patterns in nature, art, music, and literature.

INTERMEDIATE AND ADVANCED COURSES

The courses in this group count toward the requirements of a major in Mathematics.

MATH 222a or b/AMTH 222a or b, Linear Algebra with Applications Jaejeong Lee and staff

HTBA For sections see www.yale.edu/oci QR (50)

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

MATH 225a or b, Linear Algebra and Matrix Theory Howard Garland [F],
Yael Algom-Kfir [Sp]

TTH 9-10:15 [F]; MWF 11:35-12:25 [SP] QR (50)

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 120a or b. May not be taken after MATH 222a or b.

MATH 228a, From Euclid to Einstein Roger Howe

MWF 2:30-3:20 QR (37)

An introduction to the fundamental role of symmetry in geometry. The role of transformations in Euclidean geometry; use of transformations to describe non-Euclidean geometries; a geometric interpretation of Einstein's special theory of relativity. A geometric introduction to linear algebra.

***MATH 230a, Vector Calculus and Linear Algebra I** Ian Biringer

MWF 9:25-10:15 QR (32)

A careful study of the calculus of functions of several variables, combined with linear algebra.

***MATH 231b, Vector Calculus and Linear Algebra II** Ian Biringer

MWF 9:25-10:15 QR (32)

Continuation of MATH 230a. Application of linear algebra to differential calculus. Inverse and implicit function theorems; the idea of a manifold; integration of differential forms; general Stokes' theorem.

MATH 241a/STAT 241a^c, Probability Theory Balaji Raman

For description see under Statistics.

MATH 242b/STAT 242b^c, Theory of Statistics Lisha Chen

For description see under Statistics.

MATH 244a/AMTH 244a, Discrete Mathematics Matthew Hirn

TTH 11:35-12:50 QR (24)

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 115a or b or equivalent.

MATH 246a or b, Ordinary Differential Equations Garving Kevin Luli [F],
Vincent Moncrief [Sp]

TTH 2:30-3:45 [F]; MWF 9:25-10:15 [SP] QR (69)

First-order equations, second-order equations, linear systems with constant coefficients. Numerical solution methods. Geometric and algebraic properties of differential equations. After MATH 120a or b or equivalent; after or concurrently with MATH 222a or b or 225a or b or equivalent.

MATH 247b/G&G 247b, Partial Differential Equations John Wettlaufer and staff

TTH 1–2:15 QR (o)

Introduction to partial differential equations, wave equation, Laplace's equation, heat equation, method of characteristics, calculus of variations, series and transform methods, and numerical methods. Prerequisites: MATH 222a or b or 225a or b, MATH 246a or b, and ENAS 194a or b, or equivalents.

MATH 250a, Vector Analysis Matt Feiszli

MWF 9:25–10:15 QR (32)

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. After MATH 120a or b, and 222a or b or 225a or b or equivalent.

MATH 251b/STAT 251b^C, Stochastic Processes Staff

For description see under Statistics.

MATH 260b/AMTH 260b, Basic Analysis in Function Spaces Ronald Coifman

TTH 1–2:15 QR (26)

The standard basic functional analytic tools needed by scientists and users of mathematics. MATH 260b is a natural continuation of PHYS 301a.

MATH 262b, Wavelet Theory Matt Feiszli

MWF 10:30–11:20 QR (33)

Introduction to time-frequency analysis and the L^2 theory of wavelets. Fourier transform, Shannon sampling theorem, continuous and discrete wavelet transforms, construction of wavelet bases and frames, multiresolution analysis, and applications in signal processing.

MATH 270a, Set Theory Gregg Zuckerman

MWF 1:30–2:20 QR (36)

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 120a or b or equivalent.

[MATH 290b, Fractal Geometry: Concepts and Applications]

MATH 300b, Topics in Analysis Matt Feiszli

MWF 11:35–12:25 QR (34)

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 230a, 231b should take MATH 301a instead of this course. After MATH 250a or with permission of instructor.

***MATH 301a, Introduction to Analysis** Peter Jones

TTH 1–2:15 QR (26)

Foundations of real analysis, including metric spaces and point set topology, infinite series, and function spaces. After MATH 230a, 231b or equivalent.

MATH 305b, Real Analysis Yair Minsky

MWF 11:35–12:25 QR (34)

The Lebesgue integral, Fourier series, applications to differential equations. After MATH 301a or with permission of instructor.

MATH 310a, Introduction to Complex Analysis Gregory Margulis

TTH 11:35–12:50 QR (24)

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 231b or 250a or equivalent.

***MATH 315b⁶, Intermediate Complex Analysis** Igor Frenkel

MW 2:30–3:45 QR (RP, 37)

Continuation of MATH 310a. 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 310a.

***MATH 320a⁶, Measure Theory and Integration** Garving Kevin Luli

TTH 1–2:15 QR (RP, 26)

Construction and limit theorems for measures and integrals on general spaces; product measures; L_p spaces; integral representation of linear functionals. After MATH 305b or equivalent.

***MATH 325b⁶, Introduction to Functional Analysis** Gregory Margulis

MWF 11:35–12:25 QR (RP, 34)

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 320a.

MATH 330b/STAT 330b⁶, Advanced Probability David Pollard

For description see under Statistics.

MATH 350a, Introduction to Abstract Algebra Andrew Casson

MWF 10:30–11:20 QR (33)

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 222a or b or equivalent.

MATH 353a, Introduction to Representation Theory Anna Lachowska

TTH 2:30–3:45 QR (27)

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 222a or b or equivalent.

[MATH 360b, Introduction to Lie Groups]**MATH 370b, Fields and Galois Theory** Marketa Havlickova

TTH 11:35–12:50 QR (24)

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 350a.

MATH 380a, Modern Algebra I Gregg Zuckerman

MW 2:30–3:45 QR (RP, 37)

A survey of algebraic constructions and theories at a sophisticated level. Topics include categorical language, free groups and other free objects in categories, general theory of rings and modules, artinian rings, and introduction to homological algebra. After MATH 350a and 370b.

MATH 381b^G, Modern Algebra II Sam Payne

TTH 2:30–3:45 QR (RP, 27)

Topics in commutative algebra: general extension of fields; Noetherian, local, and Dedekind rings. Introduction to valuation theory. Rudiments of algebraic geometry. After MATH 380a.

[MATH 400a, Introduction to Mathematical Mechanics]**[MATH 430b, Introduction to Algebraic Topology]****MATH 435b, Differential Geometry** Andrew Casson

TTH 9–10:15 QR (22)

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 231b or 250a or equivalent.

MATH 440a, Introduction to Algebraic Geometry Tobias Dyckerhoff

TTH 11:35–12:50 QR (o)

An introduction to algebraic geometry through the study of algebraic curves. Topics include curves in the projective plane and their intersection theory; Bezout's theorem; divisors and line bundles; the Riemann-Hurwitz formula; hyperelliptic curves; and the Riemann-Roch theorem. Prerequisites: MATH 310a, 350a, and some background in differential forms.

MATH 470a or b, Individual Studies Roger Howe

HTBA (o)

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 480a or b, Senior Seminar: Mathematical Topics** StaffHTBA For sections see www.yale.edu/oci (69)

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.

COURSES RELEVANT TO THE MAJOR IN OTHER DEPARTMENTS

Two of the following courses may, with permission of the director of undergraduate studies, be counted with Mathematics courses toward the requirements of the major.

CPSC 201a or b, Introduction to Computer Science Dana Angluin [F],
Holly Rushmeier [Sp]

CPSC 365b, Design and Analysis of Algorithms Daniel Spielman

CPSC 440b^G, Numerical Computation Vladimir Rokhlin

OPRS 235a/AMTH 235a, Optimization Eric Denardo
For description see under Operations Research.

PHIL 267a^G, Mathematical Logic Sun-Joo Shin

***PHIL 427b^G, Computability and Logic** Sun-Joo Shin

GRADUATE COURSES OF INTEREST

Each year the Mathematics and Statistics 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 directors of undergraduate studies whose permission, with that of the relevant director of graduate studies, is required for admission.

Mathematics and Computer Science

(See under Computer Science and Mathematics.)

Mathematics and Economics

(See under Economics and Mathematics.)

Mathematics and Philosophy

The Mathematics and Philosophy major allows students to explore those areas where philosophy and mathematics meet, in particular, mathematical and philosophical logic and the philosophy of mathematics.

The prerequisite for the major is MATH 120a or b. The major requires twelve term courses including the prerequisite, at least four of which must be in Mathematics at the 200 level or higher and five of which must be in Philosophy. All Philosophy courses are eligible for credit toward the major, with the exception of First-Order Logic (PHIL 115a). Required courses include Set Theory (MATH 270a), Mathematical Logic (PHIL 267a), Computability and Logic (PHIL 427b), an advanced Philosophy course (other than PHIL 267a or 427b) with a substantive logical component, and one seminar in either Mathematics or Philosophy, other than PHIL 427b, that fulfills the senior requirement (see below). Set Theory (MATH 270a) and Mathematical Logic (PHIL 267a) must be taken before the end of the junior year; it is strongly recommended that they be taken earlier.

Senior requirement Each year certain seminars offered by the Mathematics and Philosophy departments are designated as fulfilling the senior requirement of this 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 fulfilling the senior requirement for 2010–2011 is MATH 480a or b, Senior Seminar: Mathematical Topics. For Philosophy seminars that fulfill the senior requirement, consult the director of undergraduate studies in Philosophy.

A typical program satisfying the major might consist of MATH 120a or b, 222a or b, 225a or b, 270a, 300b, 350a, and a designated seminar; PHIL 126b, 267a, 427b, a designated seminar (other than PHIL 427b), and two additional electives.

Majors should consult Roger Howe, 220B LOM, 432-4686, howe@math.yale.edu (adviser in Mathematics), and Kenneth Winkler, 406A C, 432-1679, kenneth.winkler@yale.edu (adviser in Philosophy).

REQUIREMENTS OF THE MAJOR

Prerequisite MATH 120a or b

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

Distribution of courses At least 5 in Math and 5 in Phil

Specific courses required MATH 270a, PHIL 267a, 427b

Senior requirement Senior sem

Mathematics and Physics

The major in Mathematics and Physics allows students to explore the productive interaction between the two subjects more extensively than either individual major. A minimum of fourteen term courses in Mathematics and Physics above the sophomore level is required, with at least six courses in each of the two subjects. A senior essay, or a project from PHYS 471a or 472b, 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 essay or project to the Mathematics department. Majors should consult Vincent Moncrief, 64 SPL, 432-6930.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120a or b or equivalent; PHYS 180a, 181b, or 200a, 201b, or 260a, 261b; PHYS 205La or Lb and 206La or Lb

Number of courses 14 term courses beyond prereqs

Distribution of courses 6 in Math at or above the level of MATH 222a or b; 6 advanced Physics courses selected in consultation with DUS

Senior requirement Senior essay or project from PHYS 471a or 472b on topic acceptable to both depts; oral report on essay or project to Math dept

Mechanical Engineering

Director of undergraduate studies: Marshall Long, 201 BCT, 432-4229,
marshall.long@yale.edu

FACULTY OF THE DEPARTMENT OF MECHANICAL ENGINEERING

Professors Ira Bernstein (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, Amable Liñan-Martinez (*Adjunct*), Marshall Long, Udo Schwarz, Mitchell Smooke (*Chair*), Forman Williams (*Adjunct*)

Associate Professors Corey O'Hern, Ainissa Ramirez, Jan Schroers

Assistant Professors Aaron Dollar, Eric Dufresne, John Morrell, Nicholas Ouellette, †Hongxing Tang

Lecturers Beth Anne Bennett, Kailasnath Purushothaman

†A joint appointment with Electrical Engineering.

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 CFD design, data acquisition, control, and manufacturing), the interfacing of MEMS and actuators via microprocessors to measure and control (e.g., in flow control, robot control, and optimization of automobile performance), and the advent of new materials (composite, shape-memory alloy, ceramic, superconducting) for new applications (e.g., prosthetic devices, biomaterials, stealth aircraft). These new 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 be constantly aware both of the finiteness of Earth's resources and its environment and of the burden that engineering works place on them.

The educational mission of the Department of Mechanical Engineering is to provide an excellent education that will prepare students to become members of the next generation of mechanical engineers. To implement this mission, the department adheres to the following set of educational objectives: to provide a balanced technical and nontechnical education to enable graduates to enter highly selective graduate schools and/or to pursue technical careers in industry or government laboratories; to enable graduates to improve and adapt their skills to accommodate rapid technological changes; to prepare graduates to communicate effectively and to understand the ethical responsibilities and impact on society of their profession. To achieve these objectives, the following fundamental educational goals have been established for the Department of Mechanical Engineering: to provide a comprehensive introduction to basic science and mathematics, which form the foundation of mechanical engineering; to provide a thorough training in methods of analytical, experimental, and 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; to instill in students an understanding of their professional and ethical responsibilities, which affect society and their profession.

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 115a or b) by the end of their freshman year.

A student's undergraduate engineering program usually culminates in one or more special project courses (MENG 471a, 472b), in which the student pursues a particular 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, preferably no later than the beginning of the sophomore year.

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.

The prerequisites in mathematics are MATH 112a or b, 115a or b, and ENAS 151a or b, or the equivalent. The basic science prerequisites are PHYS 200a, 201b, or 180a, 181b; one laboratory from PHYS 165La or 205La or Lb, and one from PHYS 166Lb or 206La or Lb, or equivalents.

Nineteen term courses beyond the prerequisites are required as follows:

1. Advanced mathematics: ENAS 194a or b and MATH 222a or b or 225a or b

2. Mechanical engineering and related: MENG 211a, 280a, 285b, 286Lb, 361a, 363Lb, 383a, 389b, 390b, 471a or 472b (the senior requirement), 489a, ENAS 130b, EENG 200a, and at least one term course in chemistry (e.g., CHEM 112a, 113b, 114a, 115b, or 118a)
3. Technical electives: Three approved technical electives chosen in consultation with the director of undergraduate studies.

The curriculum in this program is arranged in prescribed patterns, but some departures from it are possible with approval of the director of undergraduate studies.

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. The major requires twelve approved term courses in engineering, which can cover a broad array of topics within the subject provided that they contribute to a coherent program. Students should consult with the director of undergraduate studies at the beginning of their sophomore year.

The prerequisites in mathematics are MATH 112a or b, 115a or b, and ENAS 151a or b, or the equivalent. The basic science prerequisites are PHYS 180a, 181b, or 200a, 201b; one laboratory from PHYS 165La or 205La or Lb, and one from PHYS 166Lb, 206La or Lb, or MENG 286Lb.

The program requires twelve approved term courses beyond the prerequisites, including the senior project.

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, 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 prerequisites in mathematics are MATH 112a or b and 115a or b. The basic science prerequisite is physics at least to the level of PHYS <150a>, <151b> or 170a, 171b.

The program requires eight approved term courses beyond the prerequisites, including the senior project.

Senior requirement In all B.S. and B.A. degree programs, students must successfully complete a project (MENG 471a or 472b) during their senior year.

Courses for majors in the humanities and social sciences Mechanics and mechanical engineering content can be found in several courses intended for those not majoring in science. See under Engineering and Applied Science.

REQUIREMENTS OF THE MAJOR

MECHANICAL ENGINEERING, B.S.

Prerequisites MATH 112a or b, 115a or b, and ENAS 151a or b, or equivalent; PHYS 200a, 201b, or 180a, 181b, and 2 labs (1 from PHYS 165La or 205La or Lb, and 1 from PHYS 166Lb or 206La or Lb, or equivalents)

Number of courses 19 term courses beyond prereqs (incl senior project)

Specific courses required ENAS 130b and 194a or b; EENG 200a; MATH 222a or b or 225a or b; MENG 211a, 280a, 285b, 286Lb, 361a, 363Lb, 383a, 389b, 390b, 489a

Distribution of courses 3 technical electives chosen in consultation with DUS; 1 term course in chem

Substitution permitted With DUS approval

Senior requirement Senior project (MENG 471a or 472b)

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

Prerequisites B.S. — MATH 112a or b, 115a or b, and ENAS 151a or b, or equivalent; PHYS 180a, 181b (or 200a, 201b), and 2 labs (1 from PHYS 165La or 205La or Lb; 1 from PHYS 166Lb, 206La or Lb, or MENG 286Lb); B.A. — MATH 112a or b, 115a or b; Physics at least at level of <150a>, <151b> or 170a, 171b

Number of courses B.S. — 12 term courses beyond prereqs (incl senior project); B.A. — 8 term courses beyond prereqs (incl senior project)

Substitution permitted With DUS approval

Senior requirement *Both degrees* — senior project (MENG 471a or 472b)

MENG 185b, Mechanical Design Aaron Dollar

MWF 10:30–11:20 SC (RP, 33)

A course designed for potential majors in mechanical engineering, with units on design, material science, structural mechanics, utilization of a machine shop, mechanical dissection, and computers in mechanical engineering. Includes a design project competition. Prerequisite: physics at the level of PHYS 180a, or permission of instructor.

MENG 211a, Thermodynamics for Mechanical Engineers Eric Dufresne

MWF 11:35–12:25 QR, SC (RP, 34)

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 180a or 200a, and MATH 115a or b.

MENG 280a, Mechanical Engineering I: Strength and Deformation of Mechanical Elements Jan Schroers

TTH 9–10:15 QR, SC (RP, 22)

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 180a or 200a, and MATH 115a or b.

MENG 285b, Introduction to Materials Science Udo Schwarz

TTH 1–2:15 QR, SC (RP, 26)

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; corrosion; thermal and electrical conduction. Prerequisites: MATH 120a or b or ENAS 151a or b, and PHYS 180a, 181b.

MENG 286Lb, Solid Mechanics and Materials Science Laboratory Jan Schroers

TTH 11:35–12:50 SC ½ Course cr (RP, 0)

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.

CENG 315b/ENVE 315b, Transport Phenomena Michael Loewenberg

For description see under Chemical Engineering.

MENG 361a, Mechanical Engineering II: Fluid Mechanics Mitchell Smooke

TTH 9–10:15 QR, SC (RP, 22)

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 194a or b or equivalent, and physics at least at the level of PHYS <150a> or 170a.

***MENG 363Lb, Fluid Mechanics and Thermodynamics Laboratory**

Nicholas Ouellette

HTBA SC (RP, 0)

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 211a and 361a.

MENG 383a, Mechanical Engineering III: Dynamics Corey O'Hern

MWF 9:25–10:15 QR, SC (RP, 32)

Kinematics and dynamics of particles and systems of particles. Relative motion; systems with constraints. Rigid body mechanics; gyroscopes. Prerequisites: PHYS 180a or 200a, and MATH 120a or b or ENAS 151a or b.

***MENG 385a, Materials Science of Microelectromechanical Systems (MEMS)**

Ainissa Ramirez

MW 1–2:15 (0)

An introduction to the principles, fabrication, and design of microelectromechanical systems (MEMS) and devices. Emphasis on materials for these devices and on the processes for micromachining. Concepts of actuation and sensing by capacitive, thermal, piezoelectric, and electrostatic means. Prerequisites: PHYS 180a, 181b, and MATH 120a or b or ENAS 151a or b, or equivalents; or permission of instructor.

MENG 389b, Mechanical Engineering IV: Fluid and Thermal Energy Science

Kailasnath Purushothaman

MWF 9:25–10:15 QR, SC (RP, 32)

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 211a, 361a, and ENAS 194a or b; or permission of instructor.

MENG 390b, Mechatronics Laboratory John Morrell

HTBA QR (RP, o)

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 194a or b or equivalent, ENAS 130b, and EENG 200a; or permission of instructor.

MENG 400a^G, Computer-Aided Engineering Marshall Long

TTH 1–2:15 QR (RP, 26)

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 130b or permission of instructor.

***MENG 402La^G/EENG 402La^G, Nano and Microsystem Technology**

Hongxing Tang

For description see under Electrical Engineering.

MENG 440a/ENAS 440a^G, Applied Numerical Methods I Beth Anne Bennett

For description see under Engineering & Applied Science.

MENG 441b/ENAS 441b^G, Applied Numerical Methods II Beth Anne Bennett

For description see under Engineering & Applied Science.

MENG 457b/BENG 457b^G, Biomechanics Staff

For description see under Biomedical Engineering.

MENG 463a^G, Theoretical Fluid Dynamics Nicholas Ouellette

MWF 10:30–11:20 QR, SC (RP, 33)

Derivation of the equations of fluid motion from basic principles. Potential theory, viscous flow, flow with vorticity. Topics in hydrodynamics, gas dynamics, stability, and turbulence. Prerequisite: MENG 361a or equivalent.

MENG 469b, Aerodynamics Juan Fernández de la Mora

MWF 11:35–12:25 QR, SC (34)

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. Prerequisite: MENG 361a or permission of instructor.

***MENG 471a and 472b, Special Projects** Marshall Long

HTBA (o)

Faculty-supervised individual or small-group projects with emphasis on research (laboratory or theory), engineering design (required for the ABET-accredited program), or tutorial

study. Students are expected to consult the director of undergraduate studies and appropriate faculty members to discuss ideas and suggestions for topics. These courses may be taken at any time during the student's career when appropriate and may be taken more than once. Permission of adviser and director of undergraduate studies required.

MENG 489a^c, Mechanical Design: Process and Implementation John Morrell

HTBA SC (RP, O)

Study of the design process, including concept generation, project management, teamwork, detail design, and communication skills. Student teams implement a real-world design project with hardware objectives that can be achieved in a term, and a problem definition that allows room for creative solutions. Prerequisite: MENG 280a, 361a, or permission of instructor.

Middle East Studies

(See under Modern Middle East Studies and under Near Eastern Languages and Civilizations.)

Modern Middle East Studies

Directors of undergraduate studies: Andrew March, 135 RKZ, 432-1478, andrew.march@yale.edu; Colleen Manassa, 321 HGS, 436-8181, colleen.manassa@yale.edu

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*), Owen Fiss (*Law School*), Benjamin Foster (*Near Eastern Languages & Civilizations*), Steven Fraade (*Religious Studies*), Eckart Frahm (*Near Eastern Languages & Civilizations*), Frank Griffel (*Religious Studies*), Beatrice Gruendler (*Near Eastern Languages & Civilizations*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Christine Hayes (*Religious Studies*), Paula Hyman (*History*), Marcia Inhorn (*Anthropology*), Stanley Insler (*Linguistics*), Anthony Kronman (*Law School*), James Leckman (*Psychology, School of Medicine*), Ivan Marcus (*History*), Robert Nelson (*History of Art*), Asghar Rastegar (*School of Medicine*), W. Michael Reisman (*Law School*), Lamin Sanneh (*Divinity School*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

Associate Professors Ala Alryyes (*Comparative Literature*), Ellen Lust (*Political Science*), Colleen Manassa (*Near Eastern Languages & Civilizations*)

Assistant Professors Narges Erami (*Anthropology*), Zareena Grewal (*American Studies*), Kaveh Khoshnood (*Public Health*), Adria Lawrence (*Political Science*), Andrew March (*Political Science*), Alan Mikhail (*History*), Ahmed Mobarak (*School of Management*), Hala Khamis Nassar (*Near Eastern Languages & Civilizations*), Kishwar Rizvi (*History of Art*), Edwige Tamalet-Talbayev (*French*), Jonathan Wyrzten (*Sociology*)

Senior Lecturers Tolga Koker (*Economics*), Marwan Muasher (*Global Affairs*)

Lecturers Adel Allouche (*History, Religious Studies*), Karen Foster (*History of Art*), Kathryn Slanski (*Near Eastern Languages & Civilizations*)

Senior Lector II Ayala Dvoretzky

Senior Lectors Fereshteh Amanat-Kowssar, Shiri Goren

Lectors Sarab al-Ani, Muhammad Aziz, Etem Erol, Orna Goldman, Ghassan Husseinali, Shady Nasser

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, using any of its four major languages, Arabic, Hebrew, Persian, and Turkish. Courses are selected from the Department of Near Eastern Languages and Civilizations and from other departments in the humanities and social sciences, including Anthropology, History, History of Art, Judaic Studies, Political Science, and Religious Studies. The Modern Middle East Studies major gives students the language skills necessary to understand complex issues of the Middle East and serves as excellent preparation for graduate study or for business and professional careers in which an understanding of that region is essential.

Prerequisites There are no prerequisites, but prospective majors should keep the language requirement in mind while planning their course schedules (see below).

Language requirement All students are required to complete a year of language training at the third- or fourth-year level, depending on their level of competence. Students may apply two courses at the third- or fourth-year level of language study toward the twelve-course major requirement. Courses that may be applied toward the major include ARBC 150a, 151b, and PERS 150a.

Requirements of the major Twelve term courses are required for the major, including three foundational courses, one each in modern thought, classical thought, and the modern Middle East. Six electives on the modern Middle East examine culture and thought, history, religion, politics, and society. Elective courses must be spread geographically and substantively; they must focus on at least two different subregions and originate in at least two different departments. The proposed course of study requires the approval of the director of undergraduate studies.

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. The student selects a faculty adviser with competence in an appropriate language. A prospectus and outline signed by the adviser must be submitted to the director of undergraduate studies 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 description of the senior essay course (MMES 498a, 499b) for additional information. Alternatively, 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 3 foundational courses, 1 each in modern thought, classical thought, and the modern Middle East; 6 electives spread geographically and substantively, focusing on at least 2 subregions and from at least 2 depts

Language requirement One year of third- or fourth-year study in a Middle Eastern lang

Senior requirement Senior essay (MMES 498a, 499b) or essay written in an addtl sem

FOUNDATIONAL COURSES

Modern Thought

***MMES 216a/HEBR 156a^c/JDST 405a, Dynamics of Israeli Culture** Shiri Goren
For description see under Near Eastern Languages & Civilizations.

***MMES 261b/FREN 414b, The Algerian War of Independence and Its Literature**
Edwige Tamalet-Talbayev
For description see under French.

MMES 290a/PLSC 435a/RLST 290a, Islam Today: Jihad and Fundamentalism
Frank Griffel
For description see under Religious Studies.

***MMES 407a/NELC 407a^c, Modern Arab Thought** Hala Khamis Nassar
For description see under Near Eastern Languages & Civilizations.

Classical Thought

MMES 192b/RLST 170b, The Religion of Islam Gerhard Böwering
For description see under Religious Studies.

***MMES 342a/HIST 232Ja/HUMS 443a/JDST 270a/RLST 201a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus
For description see under Humanities.

***MMES 490a/NELC 490a^c, Introduction to Classical Arabic and Islamic Studies**
Dimitri Gutas
For description see under Near Eastern Languages & Civilizations.

The Modern Middle East

MMES 102a/HUMS 440a/NELC 102a, Introduction to the Middle East
Benjamin Foster
For description see under Near Eastern Languages & Civilizations.

MMES 481b/PLSC 394b, Introduction to Middle East Politics Ellen Lust
For description see under Political Science.

***MMES 493b/NELC 491b^c/WGSS 493b, Introduction to Modern Middle Eastern Studies** Hala Khamis Nassar
For description see under Near Eastern Languages & Civilizations.

ELECTIVE COURSES

MMES 124a/HSAR 264a/HUMS 423a, Byzantion, Constantinople, Istanbul

Robert Nelson

For description see under Humanities.

***MMES 150a/HEBR 150a^G/JDST 213a, Advanced Modern Hebrew: Israeli Society**

Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***MMES 154a/JDST 295a/NELC 154a^G, Israeli Identity and Culture, 1948 to the Present** Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***MMES 157b/JDST 306b/NELC 157b^G, Israeli Narratives** Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***MMES 159b/HEBR 159b^G/JDST 409b, Conversational Hebrew: Israeli Media**

Shiri Goren

For description see under Near Eastern Languages & Civilizations.

***MMES 162a/AFST 412a/FREN 412a/LITR 265a/WGSS 412a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev

For description see under French.

MMES 171a/HIST 360a/NELC 402a, The Islamic Near East from Muhammad to the Mongol Invasion Adel Allouche

For description see under Near Eastern Languages & Civilizations.

***MMES 172b/HIST 384Jb/NELC 403b, The Middle East between Crusaders and Mongols** Adel Allouche

For description see under History.

***MMES 173b/HIST 398Jb/NELC 404b, Mamluk Egypt** Adel Allouche

For description see under History.

***MMES 181b/AFST 389b/PLSC 389b, Middle East Exceptionalism** Adria Lawrence and staff

For description see under Political Science.

***MMES 187a/INTS 311a, The Middle East Peace Process, 1991 to the Present**

Marwan Muasher

For description see under International Studies.

***MMES 188b/INTS 317b^G, Contemporary Arab Political Reform** Marwan Muasher

For description see under International Studies.

***MMES 270b/PERS 170b, Salaam Cinema** Fereshteh Amanat-Kowssar

For description see under Near Eastern Languages & Civilizations.

***MMES 311a/WGSS 327a, Constructing the Self: From Autobiography to Facebook** Geetanjali Singh Chanda

For description see under Women's, Gender, & Sexuality Studies.

THE SENIOR ESSAY COURSE

***MMES 498a and 499b, Senior Essay** Andrew March

HTBA (o)

The senior essay is a research paper of at least thirty pages (sixty pages for a two-term essay) prepared under the supervision of a faculty member in accordance with the following schedule: (1) by the end of the second week of classes of the first term, students meet with advisers to discuss the essay's topic, approach, sources, and bibliography. Note: students planning to write the essay in the second term (MMES 499b) 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 modern Middle 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 modern Middle 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, 115 Prospect St., room 344, by 4 p.m. on the last day of reading period. A late essay will receive a lower grade. Senior essays are graded by faculty associated with the Modern Middle East Studies program unless, for exceptional reasons, different arrangements for another reader have been made in advance with the director of undergraduate studies and the faculty adviser.

Molecular Biophysics and Biochemistry

Director of undergraduate studies: Michael Koelle, CE 28A SHM, 737-5808,
madeline.cavanaugh@yale.edu, www.mbb.yale.edu

FACULTY OF THE DEPARTMENT OF MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

Professors Susan Baserga, †Ronald Breaker, †Gary Brudvig, †Daniel DiMaio, Donald Engelman, Alan Garen, Mark Gerstein, Nigel Grindley, Mark Hochstrasser, William Konigsberg, †I. George Miller, †Peter Moore, †Thomas Pollard, Anna Marie Pyle, Lynne Regan, †David Schatz, Dieter Söll, Mark Solomon, Joan Steitz, Thomas Steitz, Scott Strobel, †William Summers, Patrick Sung, Kenneth Williams (*Adjunct*), †Sandra Wolin

Associate Professors Thomas Biederer, Enrique de la Cruz, Michael Koelle, Anthony Koleske, Andrew Miranker

Assistant Professors Yorgo Modis, A. Elizabeth Rhoades, Christian Schlieker, Hongwei Wang, Yong Xiong

Lecturers Carol Bascom-Slack, Kaury Kucera, Aruna Pawashe

†A joint appointment with primary affiliation in another department.

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.

Basic science prerequisites The basic science courses required of all majors include one term of introductory biology (MCDB 120a or E&EB 122b); a general chemistry course with laboratory (CHEM 112a, 113b, or 114a, 115b, and 116La, 117Lb; or 118a and 119La); a year course in organic chemistry with laboratory (CHEM 124a, 125b and 126La, 127Lb; or 220a or b and 221a or b, or 225b and 227a, accompanied by the two-term sequence 222La or Lb, 223La or Lb); one term of physical chemistry (CHEM 328a); two terms of calculus (MATH 112a or b and 115a or b); and one year of physics (PHYS 180a, 181b, or 200a, 201b; 170a, 171b are allowed only with permission of the director of undergraduate studies). The B.A. major also requires one term of biology laboratory (MCDB 121La or E&EB 123Lb). Any of these prerequisites may be satisfied by receiving scores on Advanced Placement tests sufficient to earn acceleration credits in the particular subjects, even if the student does not choose to accelerate.

B.S. degree Ten courses are required beyond the prerequisites: MB&B 300a, 301b, 302b, 360Lb, and 490b; two additional upper-level MB&B electives, one of which must be a lecture course; one quantitative reasoning elective (MATH 120a or b or above, STAT 105a or above, CPSC 201a or b or above, or ENAS 130b or above); one biology elective at the 200 level or higher; 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 470a, 471b, and 478a, 479b may count toward these electives. Students may substitute CHEM 333b for MB&B 302b. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores. MB&B 360Lb, normally required for the B.S. degree, will not be offered in spring 2011. In place of 360Lb, students may count MB&B 251La or Lb toward the requirements of the major.

B.A. degree Seven courses are required beyond the prerequisites: MB&B 251La or Lb, 300a, 301b, 302b, and 490b; one additional upper-level MB&B elective; and one quantitative reasoning elective (MATH 120a or b or above, STAT 105a or above, CPSC 201a or b or above, or ENAS 130b or above). Students choose the elective courses in consultation with a faculty adviser (see below). Students may substitute CHEM 333b for MB&B 302b. The quantitative reasoning requirement may not be fulfilled by Advanced Placement test scores.

Senior requirement The senior requirement for both the B.S. and the B.A. is fulfilled by successful completion of MB&B 490b, The Senior Project. 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.

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

Recommended courses All B.S. majors are encouraged to include MB&B 470a or 471b among their MB&B electives. The prerequisites in either general or organic chemistry should be taken in the freshman 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 194a or b, MATH 246a or b, or PHYS 301a) and a full year of physical chemistry (CHEM 328a or 332a, and 333b). In place of one term of biophysics (MB&B 302b) they may elect a full year of upper-level biophysics (MB&B 420a and 421b). Such revisions to the basic curriculum must be made in consultation with the faculty adviser.

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 by more advanced ones in their freshman 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 300a, 301b) after one term of organic chemistry (CHEM 220a or b or 225b).

<i>Freshman</i>	<i>Sophomore</i>	<i>Junior</i>	<i>Senior</i>
MCDB 120a or E&EB 122b	CHEM 220a, 221b; 222La, 223Lb	MB&B 300a, 301b	CHEM 328a
CHEM 112a, 113b; 116La, 117Lb	MATH 112a, 115b	One quantitative reasoning elective PHYS 180a, 181b; 165La, 166Lb	MB&B 302b One MB&B elective MB&B 490b
<i>And, for B.A. major:</i> MCDB 121La or E&EB 123Lb		<i>And, for B.A. major:</i> MB&B 251La or Lb <i>And, for B.S. major:</i> MB&B 360Lb	<i>And, for B.S. major:</i> One biology elective One science elective A second MB&B elective

MB&B Faculty Committee on the Undergraduate Major Committee members are available for consultation throughout the year and are the only faculty advisers eligible to approve and sign MB&B majors' course schedules at the beginning of each term. Members acting as faculty advisers are:

<i>Class of 2011:</i>	A. E. Rhoades, 218 BASS (432-5342) Y. Xiong, 423A JWG (436-2608)
<i>Class of 2012:</i>	D. Söll, 238 BASS (432-6200) Y. Modis, 430 BASS (432-4330)
<i>Class of 2013:</i>	E. de la Cruz, 423C JWG (432-5424) W. Konigsberg, CE 14A SHM (785-4599)
<i>Class of 2014:</i>	J. Steitz, 136E BCMM (737-4418)
<i>Director of B.S./M.S. degree program:</i>	M. Koelle, CE 28A SHM (737-5808)

REQUIREMENTS OF THE MAJOR

Prerequisites *B.S.* — MCDB 120a or E&EB 122b; CHEM 112a, 113b or 114a, 115b and 116La, 117Lb (or 118a, 119La); year course in organic chem (CHEM 124a, 125b, or 220a or b, 221a or b, or 225b, 227a, with labs); 1 term of physical chem (CHEM 328a); MATH 112a or b, 115a or b; PHYS 180a, 181b (or 200a, 201b); *B.A.* — same, plus MCDB 121La or E&EB 123Lb

Number of courses *B.S.* — 10 term courses beyond prereqs, incl senior req, for letter grades; *B.A.* — 7 term courses beyond prereqs, incl senior req, for letter grades

Specific courses required *B.S.* — MB&B 300a, 301b, 302b, 360Lb; *B.A.* — MB&B 251La or Lb, 300a, 301b, 302b

Distribution of courses *B.S.* — 2 addtl MB&B electives, as specified; 1 quantitative reasoning elective, 1 biology elective, and 1 science elective, all as specified; *B.A.* — 1 addtl MB&B elective and 1 quantitative reasoning elective, as specified

Substitution permitted CHEM 333b for MB&B 302b

Senior requirement Senior project (MB&B 490b)

MB&B 105a or b/MCDB 105a or b, An Issues Approach to Biology Dieter Söll and staff

For description see under Biology.

***MB&B 110b, Current Issues in Biological Science** William Summers

T 1:30–3:20 SC (o)

Students identify a scientific problem and then plan and execute a program of individualized learning aimed at the particular scientific knowledge required to understand and analyze the chosen problem. Intended to help students develop self-education skills as applied to scientific understanding, apply those skills to acquire some specific scientific knowledge, and understand the process by which scientific knowledge and understanding are achieved. For non-science majors.

***MB&B 111a, The Science of Human Hormones** Kaury Kucera

TTH 2:30–3:45 SC (o)

A scientific study of human hormones and how they shape the human experience. Molecular mechanisms of hormone action in normal function; hormone abuse and molecular malfunction. Specific hormones and hormone pathways, including their biology, biochemistry, and relevance to disease and medicine. Topics include diabetes, steroid hormone abuse, and longevity.

MB&B 130b, Nutrition, Diets, and Health William Summers

TTH 10:30–11:20, 1 HTBA (23)

An introduction to the science of human nutrition and health. Basic biology and chemistry of foods, digestion, and metabolism; some consideration of supplements, diets, and nutritional disorders. No prerequisites.

MB&B 200a/MCDB 300a^G, Biochemistry L. Nicholas Ornston and staff

For description see under Biology.

***MB&B 230b/MCDB 230b, Rain Forest Expedition and Laboratory** Scott Strobel and staff

MWF 10:30–11:20 SC (33)

Preparation for a two-week expedition to one of the world's rain forests during spring break and for a ten-week summer laboratory experience using samples collected during the expedition. Integrated topics draw on the fields of ecology, microbiology, chemistry, pharmacology, molecular biology, and bioinformatics. Students participate in an original scientific project from field biology to natural product characterization. After one year of introductory biology or equivalent; after or concurrently with one term of organic chemistry. Limited enrollment. Funding for major travel expenses and summer research provided.

MB&B 251La or Lb/MCDB 301La or Lb, Laboratory for Biochemistry

William Konigsberg, Aruna Pawashe

TTH 1–5 SC ½ Course cr (0)

An introduction to current experimental methods in molecular biology. After or concurrently with MB&B 200a or 300a. Limited enrollment. Preregistration required; e-mail William Konigsberg prior to the first week of classes.

MB&B 300a^G, Principles of Biochemistry I Michael Koelle, Donald Engelman

TTH 11:35–12:50 SC (24)

Discussion of the physical, structural, and functional properties of proteins, lipids, and carbohydrates, three major classes of molecules in living organisms. Energy metabolism, hormone signaling, and muscle contraction as examples of complex biological processes whose underlying mechanisms can be understood by identifying and analyzing the molecules responsible for these phenomena. After CHEM 125b, 220a or b, or 225b. May be taken concurrently with CHEM 220a with permission of instructor.

MB&B 301b^G, Principles of Biochemistry II Joan Steitz, Patrick Sung

TTH 11:35–12:50 SC (24)

A continuation of MB&B 300a that considers the chemistry and metabolism of nucleic acids, the mechanism and regulation of protein and nucleic acid synthesis, and selected topics in macromolecular biochemistry. Prerequisite: MB&B 300a or permission of instructor.

MB&B 302b, Principles of Biophysics Yorgo Modis, Enrique De La Cruz

MW 1–2:15 SC (36)

An introduction to the theoretical basis of biophysical concepts and approaches with selected examples and applications. Prerequisites: MB&B 300a and CHEM 328a.

[MB&B 360Lb^c, Laboratory for Biochemistry and Biophysics]

MB&B 405a^c, Molecular Genetics of Prokaryotes Nigel Grindley

MW 11:35–12:50 SC (RP, 34)

Molecular aspects of storage, replication, evolution, and expression of genetic material in prokaryotes. After MB&B 200a, or 300a and 301b, or with permission of instructor.

MB&B 420a^c, Macromolecular Structure and Biophysical Analysis Andrew Miranker and staff

TTH 11:35–12:50 SC (24)

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: MB&B 301b and 302b.

MB&B 421b^c, Macromolecular Interactions and Dynamic Properties

A. Elizabeth Rhoades and staff

MW 11:35–12:50 SC (34)

Examination of the dynamic properties, interactions, and catalytic activities of macromolecules. Topics include macromolecular folding; binding interfaces; ligand interactions; the properties of membrane proteins, enzymes, ribozymes, and molecular motors; and modern methods for analysis of macromolecular associations and dynamic properties. Prerequisites: MB&B 301b and 302b.

MB&B 425a^c/MCDB 425a^c, Basic Concepts of Genetic Analysis Tian Xu and staff

MW 11:35–12:50 SC (0)

An examination of the universal principles of genetic analysis in eukaryotes. Reading and analysis of primary papers illustrating the best of genetic analysis in the study of a variety of biological issues. Focus on the concepts and logic underlying modern genetic analysis. Prerequisite: MCDB 200b or equivalent.

MB&B 435a^c, Mathematical Methods in Biophysics A. Elizabeth Rhoades and staff

MWF 10:30–11:20 QR, SC (0)

Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data. Statistics and error analysis, differential equations, linear algebra, and Fourier transforms. Analysis of real data from research groups in MB&B. Prerequisites: MATH 120a or b and MB&B 300a or equivalents, or with permission of instructors.

MB&B 443b^c, Advanced Eukaryotic Molecular Biology Mark Hochstrasser and staff

TTH 11:35–12:50 SC (RP, 24)

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 300a and 301b, or permission of instructor.

***MB&B 445b, Methods and Logic in Molecular Biology** Anthony Koleske and staff

TH 7–8:50 p.m. SC (RP, 0)

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 300a and 301b.

MB&B 449a, Medical Impact of Basic Science Joan Steitz and staff

MW 1–2:15 SC (o)

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 300a and 301b or equivalent, or permission of instructor.

MB&B 452b^c/MCDB 452b^c, Bioinformatics: Practical Application of Simulation and Data Mining Mark Gerstein

MW 1–2:15 SC (o)

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 301b and MATH 115a or b, or permission of instructor.

***MB&B 470a and 471b, Research in Biochemistry and Biophysics**

Christian Schlieker

HTBA (o)

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. A required organizational meeting will be held at the beginning of each term. 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. No more than two course credits count as electives toward the B.S. degree. Enrollment limited to junior and senior MB&B majors. Prerequisite: MB&B 251La or Lb or 360Lb.

***MB&B 478a and 479b, Intensive Research in Biochemistry and Biophysics**

Christian Schlieker

HTBA 2 Course cr per term (o)

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. A required organizational meeting will be held at the beginning of each term. 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 251La or Lb or 360Lb.

★**MB&B 490b, The Senior Project** Hongwei Wang, Christian Schlieker

HTBA (o)

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.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in molecular biophysics and biochemistry, biology, and the biomedical sciences that may be of interest to undergraduates are listed in the bulletin of the Graduate School, and many are posted at <http://bbs.yale.edu>. Additional information is available from the directors of undergraduate and graduate studies. Undergraduates with an appropriate background may enroll with the permission of the director of graduate studies and the instructor.

Molecular, Cellular, and Developmental Biology

Director of undergraduate studies: Douglas Kankel, 754 KBT, 432-3839, crystal.adamchek@yale.edu, www.biology.yale.edu

Students interested in the area of molecular, cellular, and developmental biology may find courses and major requirements listed under Biology, Area II. Students should consult an adviser from the appropriate list in that section.

The faculty roster for the Department of Molecular, Cellular, and Developmental Biology may be found under Biology. The department offers undergraduate courses in an area of concentration in the Biology major. See under Biology, Area II.

Music

Director of undergraduate studies: Craig Wright, 469 College St., 432-2986, dus.music@yale.edu

FACULTY OF THE DEPARTMENT OF MUSIC

Professors Richard Cohn, Allen Forte (*Emeritus*), Michael Friedmann (*Adjunct*), Daniel Harrison (*Chair*), James Hepokoski, Richard Lalli (*Adjunct*), Patrick McCreless, Robert Mealy (*Adjunct*), Leon Plantinga (*Emeritus*), Ellen Rosand, Michael Veal, Craig Wright

Associate Professors Kathryn Alexander (*Adjunct*), Shinik Hahm (*Adjunct*), Ian Quinn, Toshiyuki Shimada (*Adjunct*), Sarah Weiss

Assistant Professors Seth Brodsky, Brian Kane, Michael Klingbeil, Gundula Kreuzer, Eve Poudrier

Lecturers Daniel Egan, Andrew Gerle, Craig Harwood, Grant Herreid, Annette Jolles, Sarah Kohane, Sarita Kwok, Judith Malafronte, Joshua Rosenblum, Wendy Sharp

The Department of Music offers introductory and advanced instruction in the history of music, the theory of music, composition, music technology, and performance. Level I

courses, which are introductory courses numbered below 200, are open to all undergraduates and require no previous experience in music. Level II courses, numbered in the 200s, require a familiarity with music notation. Intermediate courses, Level III, are numbered in the 300s; they require the ability to read music. Advanced courses, Level IV, are numbered in the 400s and are for seniors, juniors, and qualified sophomores. Level III and IV courses are intended primarily for students majoring in Music, but they may be elected by others who meet the stated prerequisites.

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 (MUSI 360a or b, 361a or b, 460a or b, and 461a or b). Of these four credits, only two may be applied to the major in Music. See "Individual Instruction in Performance" below for course descriptions.

The major The Music major provides a general music program in the humanities, as well as preparation for graduate studies or for careers in music. The standard major consists of twelve term courses, eleven of which must be numbered 300 or above, excluding the prerequisites, MUSI 210a or b, 211a or b, 218a or b, and 219a or b. To gain a comprehensive familiarity with the history and theory of music, a student majoring in Music completes a survey of music history from the medieval period to the present as well as a two-course music theory requirement. The three survey courses in music history are MUSI 350a, 351b, and 352a. A fourth survey course in world music is required, MUSI 353b. Students choose two courses from the music theory series numbered 301 through 311 to satisfy the music theory requirement. Also required is one course designated "Senior sem" during the senior year. Five additional term courses in music chosen from Levels II, III, and IV (only one of which is from Level II) complete the major. Prospective majors are advised to begin the required courses by their sophomore year. For the Class of 2012 and subsequent classes, courses taken Credit/D/Fail may not be counted toward the requirements of the major.

Students intending to go on to graduate work are advised to study German and French to achieve at least a reading knowledge of those languages. All Music majors are urged to undertake regular studies in musical performance.

The intensive major The intensive major is for students of high standing who are qualified to do independent and original work in the history or theory of music or in composition. Those admitted to this major elect MUSI 490a, 491b in the senior year.

Senior requirement Each student majoring in Music must satisfy a senior departmental requirement by electing a senior seminar (designated "Senior sem" in the course listing) during one of the final two terms. The final essay or composition for the senior seminar should provide an appropriate culmination to the student's work in the major and in Yale College. In exceptional circumstances, a graduate seminar in the Music department may substitute for the senior seminar; this requires permission both from the director of graduate studies and from the director of undergraduate studies. Senior seminars are also open to interested juniors with the permission of the instructor and the director of undergraduate studies, but one designated senior seminar must be taken in the senior year to fulfill the senior requirement.

B.A./M.M. Program Students in Yale College possessing outstanding ability in performance or composition may anticipate, through their undergraduate programs, one year of the Master of Music program in the School of Music, provided they have completed four terms of performance (MUSI 360a or b, 361a or b, 460a or b, and 461a or b) and MUSI 210a or b and 211a or b by the end of the junior year.

The program is open to majors both in Music and in other subjects. Majors in subjects other than Music may present four courses toward the M.M. degree in addition to four terms of performance. These courses normally include two from the music theory sequence numbered 301–311 and two from MUSI 350a, 351b, 352a, and 353b, taken by the end of the junior year.

Candidates admitted to the B.A./M.M. program are expected to sit for placement examinations and juries in the School of Music at the beginning of their senior year. They must take lessons and MUS 544, the School of Music Seminar in the Major, in that year and they are advised to take two terms of a performance ensemble if their schedules permit. Students seeking the B.A./M.M. degree in an orchestral instrument are required to participate in the Yale Symphony or the School of Music Philharmonia during their senior year. Composers, singers, and keyboard players should consult their principal teacher about requirements in the senior year beyond the lessons and seminar.

Interested students should consult their principal teacher at the beginning of the first term of their junior year and file an application in the Office of Student Affairs at the School of Music.

Students who have accelerated the undergraduate program are ineligible to apply for the B.A./M.M. program.

REQUIREMENTS OF THE MAJOR

Prerequisites MUSI 210a or b, 211a or b, 218a or b, and 219a or b, or equivalents

Number of courses 12 term courses beyond prereqs, 11 numbered 300 or above

Specific courses required MUSI 350a, 351b, 352a, 353b, and 2 from 301–311

Distribution of courses 5 addtl courses from Levels II, III, IV, of which only 1 is from Level II

Senior requirement 1 senior sem

Intensive major Senior sem and senior essay or project (MUSI 490a, 491b)

FRESHMAN SEMINARS

***MUSI 001b, Exploring the Nature of Genius** Craig Wright

MW 11:35–12:50 WR, HU Fr sem (34)

Manifestations of genius explored in the works of selected creators: Hildegard von Bingen, Brunelleschi, Leonardo da Vinci, Shakespeare, Mozart, Picasso, and Stravinsky. A rudimentary introduction to medieval chant; Renaissance art, architecture, and drama; music of the classical period; and avant-garde painting and dance of the twentieth century. Introductory studies in cognitive psychology, focusing on the phenomenon of the prodigy and the nature of exceptional artistic creativity. Historical readings reveal the “what” of genius, while psychological studies may shed light on the “why” and the “how.” Recommended

preparation: ability to read musical notation. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***MUSI 002a, The Role of the Performer in the Musical Experience**

Michael Friedmann

TTH 1–2:15 HU Fr sem (26)

Various models of the role of the performer in the composer-performer-audience partnership that comprises the musical experience; the music of Beethoven used as a case study. Audio and video recordings are used to introduce concepts of interpretation, stylistic approaches associated with specific historical periods, the performer as intermediary for the composer's wishes, and the performer's use of repertoire as a platform for personal expression. Recommended preparation: ability to read musical scores. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***MUSI 008a, Music Cultures of the World** Michael Veal

MW 11:35–12:50 WR, HU Fr sem (0)

An introduction to selected music cultures of the world, including those of South Asia (Hindustani and Carnatic classical music), Indonesia (Balinese, Javanese, and Sundanese gamelan), West Africa (traditional musics of Ghana, Mali, and Guinea), and the Caribbean (Cuba and Jamaica). Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***MUSI 023a, Music and Melancholy** Seth Brodsky

TTH 11:35–12:50 WR, HU Fr sem (RP, 0)

Melancholy and its influence on Western music from the Middle Ages through the present day. Melancholy and artistic genius; melancholy, idleness, and immobility; and melancholy as sadness and fear "without cause." How music functions as melancholy's private symptom (the composer as melancholic, music as melancholy's product, expression, or depiction); melancholy's public agent (melancholy as trend, style, public persona, cultural capital); and melancholy's cure or coping mechanism (concepts of musical genius and the restorative powers of the creative act). Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***MUSI 095b, Creativity, Music, and Technology** Kathryn Alexander

TTH 1–2:15 HU Fr sem (26)

The developmental history of technology in music creativity, with attention to aesthetics, invention, and repertoire. Focus on genres of technological music, including electroacoustic, musique concrete, synthetic, tape, electronica, and interactive performance, as well as sound design in visual media. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

LEVEL I

MUSI 110a or b, Introduction to the Elements of Music

HTBA For sections see www.yale.edu/oci HU (50)

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 112a, Listening to Music Craig Wright

TTH 10:30–11:20, 1 HTBA HU (23)

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.

MUSI 130a, Introduction to the History of Western Music: 900 to 1800

Seth Brodsky

MW 2:30–3:45 HU (37)

An introduction to the principal styles of Western art music through an examination of works by outstanding composers, beginning with Gregorian chant and ending with the music of Haydn and Mozart. No prerequisites.

MUSI 131b, Introduction to the History of Western Music: 1800 to the Present

Gundula Kreuzer

MW 2:30–3:45 HU (37)

A survey of nineteenth- and twentieth-century composers, genres, and styles of music in Europe and America, with an emphasis on ways of listening. No prerequisites.

LEVEL II**MUSI 205a or b, Tonal Harmony and Form**HTBA For sections see www.yale.edu/oci HU (50)

A thorough review of musical rudiments – scales, keys, chords, rhythm, notation – followed by a study of the fundamentals of tonal harmony and form. Emphasis on listening skills – how to hear what is happening harmonically and formally in tonal pieces without following a score. Intended for non–music majors who have proficiency in reading music. Students who have not taken MUSI 110a or b must take the music theory placement test at 1:30 p.m. on Monday, August 30, or 6 p.m. on Tuesday, August 31, 2010, in 119 WLH, or 6:30 p.m. on Monday, January 10, 2011, in 119 WLH. To be followed by MUSI 210a or b.

MUSI 210a or b, Elementary Studies in Analysis and Model Composition IHTBA For sections see www.yale.edu/oci HU (RP, O)

Practical investigation of the basic principles of tonal harmony, counterpoint, and composition through exercises in analysis, motivic development, phrase rhythm, texture, form, performance, and model composition. Recommended to be taken concurrently with MUSI 218a or b or 219a or b. Admission after MUSI 205a or b or by the music theory placement test, given at 1:30 p.m. on Monday, August 30, or 6 p.m. on Tuesday, August 31, 2010, in 119 WLH, or 6:30 p.m. on Monday, January 10, 2011, in 119 WLH. To be followed by MUSI 211a or b.

MUSI 211a or b, Elementary Studies in Analysis and Model Composition IIHTBA For sections see www.yale.edu/oci HU (RP, O)

Continuation of MUSI 210a or b. Recommended to be taken concurrently with MUSI 218a or b or 219a or b. Admission after MUSI 210a or b or by the music theory placement test, given at 1:30 p.m. on Monday, August 30, or 6 p.m. on Tuesday, August 31, 2010, in 119 WLH, or 6:30 p.m. on Monday, January 10, 2011, in 119 WLH.

***MUSI 214a, Introduction to Musical Theater Songwriting** Andrew Gerle

F 1:30–3:20 HU (RP, 0)

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. Prerequisite: MUSI 205a or b. Enrollment limited to 12.

***MUSI 218a or b, Elementary Musicianship I** Sarita KwokHTBA For sections see www.yale.edu/oci ½ Course cr (RP, 50)

Exercises in melodic and harmonic dictation, sight-singing, keyboard harmony, and aural analysis. Recommended to be taken concurrently with MUSI 210a or b or 211a or b.

***MUSI 219a or b, Elementary Musicianship II** Sarita KwokHTBA For sections see www.yale.edu/oci ½ Course cr (RP, 50)

Continuation of MUSI 218a or b. Prerequisite: MUSI 218a or b. Recommended to be taken concurrently with MUSI 210a or b or 211a or b.

***MUSI 220a and 221b, The Performance of Chamber Music** Wendy Sharp

HTBA ½ Course cr per term (RP, 0)

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.

***MUSI 222a or b, The Performance of Vocal Music** Richard Lalli

T 6–8 p.m. HU (RP, 0)

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 course credit, but not for distributional credit. For audition information e-mail richard.lalli@yale.edu.

***MUSI 223a, The Performance of Early Music** Judith Malafrente

T 3:30–5:20 HU (RP, 0)

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 course credit, but not for distributional credit. For audition information e-mail judith.malafrente@yale.edu.

***MUSI 227a or b, Rhetoric and Early Instrumental Performance** Robert Mealy

M 7–8:50 p.m. HU (RP, 37)

Techniques and styles of historical instrumental performance, concentrating on virtuosic chamber music of the seventeenth and eighteenth centuries. Emphasis on fluency in various musical languages. Study of original musical sources and contemporary writing about performance. Admission by audition only. May be repeated for course credit, but not for distributional credit. For audition information e-mail robert.mealy@yale.edu.

***MUSI 228a/THST 224a, Musical Theater Performance I** Annette Jolles

F 1:30–3:20 HU (RP, O)

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 211a or b and 219a or b, or with permission of instructor. Admission by audition only. May be repeated for course credit, but not for distributional credit. For audition information e-mail dan.egan@yale.edu.

***MUSI 229b/THST 226b, Musical Theater Performance II** Annette Jolles

M 1:30–3:20 (RP, O)

Study of basic elements of the collaborative process and their effect on musical theater performance. Topics include choreography, music direction, and originating new works. Analysis of texts, scripts, and taped or filmed performances; applications in students’ own performance. Prerequisites: MUSI 211a or b and 219a or b, or with permission of instructor. Admission by audition only. May be repeated for credit. For audition information e-mail dan.egan@yale.edu.

***MUSI 246b/THST 236b, American Musical Theater History** Daniel Egan

TH 1:30–3:20 WR, HU (RP, O)

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.

MUSI 265b/AFAM 253b, Jazz in Transition, 1960–1980 Michael Veal

MW 11:35–12:50 HU (O)

Stylistic currents in jazz that evolved during the 1960s and 1970s, as jazz was influenced by various popular, experimental, and world musics. Focus on the work of Miles Davis, John Coltrane, Ornette Coleman, and Sun Ra.

LEVEL III

All courses numbered 300 and above require the ability to read music.

***MUSI 302a, Tonal Counterpoint: Analysis and Composition** Daniel Harrison

WF 2:30–3:45 HU Core (O)

Intermediate studies in the theory, analysis, and composition of the music of the early and mid-eighteenth century. Prerequisite: MUSI 211a or b. Enrollment limited to 18. Preference to Music majors according to class.

MUSI 304b, Nineteenth-Century Music: Analysis and Model Composition

Richard Cohn

MW 1–2:15 HU Core (O)

Studies in the theory, analysis, and composition of music of the nineteenth century. Prerequisite: MUSI 211a or b. Enrollment limited to 18. Preference to Music majors according to class.

MUSI 308b, Rhythm and Temporality in Music of the Twentieth Century

Eve Poudrier

MW 9–10:15 HU Core (O)

A survey of compositional techniques and analytical tools that address rhythm, meter, and tempo in twentieth-century music. Critical thinking about musical temporality, analytical methods, and their practical applications. Prerequisite: MUSI 211a or b. Enrollment limited to 18. Preference to Music majors according to class.

***MUSI 312a, Composition Seminar I** Kathryn Alexander, Michael Klingbeil

TH 2:30–4:20 (o)

Intermediate project-oriented studies in music composition, acoustic and/or technological. Survey of contemporary techniques in a broad range of styles and syntax, including both concert and vernacular music genres. Prerequisite: MUSI 205a or b or the equivalent. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should submit one or two scores and recordings to the Department of Music by September 8, 2010.

***MUSI 313b, Composition Seminar II** Kathryn Alexander, Michael Klingbeil

TH 2:30–4:20 (RP, o)

Continuation of MUSI 312a. Prerequisite: MUSI 205a or b or the equivalent. Admission by audition only. May be repeated for credit. Enrollment limited to 20. To audition, students should submit one or two scores and recordings to the Department of Music by January 13, 2011.

***MUSI 314b, Composition of Musical Theater** Joshua Rosenblum

F 1:30–3:20 HU (RP, o)

Intermediate and advanced project-oriented studies in composition of musical theater. Prerequisite: MUSI 210a or b. May be repeated for credit. Enrollment limited to 12.

***MUSI 315a, Twentieth-Century American Concert Life** James O'Leary

MW 1–2:15 HU (RP, o)

The role of the audience in American concert music of the twentieth century, including how audiences have approached and consumed music. Attention to venues and genres such as the Metropolitan Opera at the turn of the century, the Cotton Club in the 1920s, Broadway in the early 1940s, countercultural music of the late 1960s, and classical music at the end of the century.

***MUSI 319a, Advanced Musicianship II** Michael Friedmann

MWF 9:25–10:15 (32)

Development of students' ability to recognize and generate structures and processes particular to music of the twentieth century. Student composers and advanced performers of post-tonal music expand their perceptive skills. Course activities include singing (and playing), dictation, identification, improvisation, and recognition. Musical examples from the works of Schoenberg, Bartók, Debussy, and Stravinsky. Enrollment limited to 14.

***MUSI 322a/THST 318a, Analyzing, Directing, and Performing Early Opera**

Grant Herreid, Toni Dorfman

TH 4–6 p.m. HU (RP, o)

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 and directors. Prerequisites: MUSI 211a or b and 219a or b. Admission by audition only. May be repeated for course credit, but not for distributional credit. For audition information e-mail grant.herreid@yale.edu.

***MUSI 323a, Introduction to Conducting** Toshiyuki Shimada

TTH 1–2:15 (26)

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 324b, Intermediate Conducting** Toshiyuki Shimada

TTH 1–2:15 (26)

Intermediate studies in baton technique and score preparation. After MUSI 323a.

***MUSI 325a, Fundamentals of Music, Multimedia Art, and Technology**

Michael Klingbeil

T 1:30–3:20 HU (26)

Fundamental principles of electroacoustic music and multimedia technology. Acoustics, psychoacoustics, sound recording and reproduction, digital audio, image processing, and computer graphics. Exercises in synthesis and signal processing, MIDI, animation, and digital video. Enrollment limited to 25.

***MUSI 334b, Analysis and Performance of Early Music** Judith Malafronte,

Grant Herreid

T 3:30–5:20 HU (0)

Continuation of MUSI 223a. Analytical techniques applied to interpretation and performance of early music. Emphasis on the improvement of musical and sight-reading skills. Students in this class form the nucleus of the Yale Collegium Musicum and participate in a concert series at the Beinecke Library. Prerequisite: MUSI 223a or equivalent. Admission by audition only. May be repeated for course credit, but not for distributional credit. For audition information e-mail judith.malafronte@yale.edu.

***MUSI 337a, Stephen Sondheim and the American Musical Theater Tradition**

Daniel Egan

M 2:30–4:20 HU (RP, 0)

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.

[MUSI 343a/CGSC 343a, Music Cognition]

***MUSI 350a, History of Western Music: Middle Ages and Renaissance**

Craig Wright

MW 11:35–12:50, 1 HTBA HU Core (34)

A detailed investigation of the history of musical style from A.D. 900 to 1600. Preference to Music majors according to class.

***MUSI 351b, History of Western Music: Baroque and Classical** James Hepokoski

TTH 11:35–12:50, 1 HTBA HU Core (24)

A detailed investigation of the history of musical style from 1600 to 1800. Preference to Music majors according to class.

[MUSI 352a, History of Western Music: The Nineteenth and Twentieth Centuries]**[MUSI 353b/AFST 353b, Topics in World Music]*****MUSI 354a, Klezmer Music** Craig Harwood

W 9:25–11:15 HU (o)

An overview of klezmer music, history, and culture. Topics include the roots of klezmer, the lifestyle of klezmer musicians, early klezmer instrumentation, the first klezmer recordings, Russian klezmer ensembles during the Soviet period, Eastern European wedding rituals, klezmer in America, the klezmer revival, and issues of ethnicity and identity related to klezmer music and culture.

MUSI 357b/SAST 259b, Indian Music Theory and Practice Stan Scott

For description see under South Asian Studies.

[MUSI 395b, Composition and Performance of Music, Multimedia Art, and Technology]***MUSI 398b/AFAM 387b/AMST 398b, The Electric Music of Miles Davis**

Michael Veal

M 2:30–4:20 HU (o)

The controversial “electric period” of Miles Davis, 1968–1975. Survey of works by Davis and by several of his sidemen: Wayne Shorter, Herbie Hancock, Chick Corea, and Josef Zawinul. Works include *Filles de Kilimanjaro*, *In a Silent Way*, *Bitches Brew*, *On the Corner*, *Agharta*, and *Pangaea*.

LEVEL IV***MUSI 412a, Composition Seminar III** Kathryn Alexander, Michael Klingbeil

TH 2:30–4:20 (o)

Advanced project-oriented studies in music composition, acoustic and/or technological. Prerequisite: MUSI 312a and 313b, or 325a. Admission by audition only. May be repeated for credit. Enrollment limited to 10. To audition, students should submit one or two scores and recordings of work completed in MUSI 312a, 313b, 325a, 412a, or 413b to the Department of Music by September 8, 2010.

***MUSI 413b, Composition Seminar IV** Kathryn Alexander, Michael Klingbeil

TH 2:30–4:20 (o)

Continuation of MUSI 412a. Prerequisite: MUSI 312a and 313b, or 325a. Admission by audition only. May be repeated for credit. Enrollment limited to 10. To audition, students should submit one or two scores and recordings of work completed in MUSI 312a, 313b, 325a, 412a, or 413b to the Department of Music by January 13, 2011.

***MUSI 450b^c, Special Topics in Music, Multimedia Art, and Technology**

Michael Klingbeil

W 9:25–11:15 HU (o)

The relationship among tuning, timbre, and harmony; implications for analysis and composition. Topics include equal temperaments, just intonation, microtonal composition, pitch perception, theories of consonance and dissonance, spectral analysis and resynthesis, scale design, and spectral composition.

[MUSI 466b, Music and Multimedia Art]

Senior Seminars

*MUSI 442a, *Rhythm, Meter, and Musical Time* Richard Cohn

TTH 11:35–12:50 HU Senior sem (o)

Analytical models of rhythm and meter and their applications to nineteenth- and twentieth-century Western classical repertory (Beethoven, Brahms, Dvorák, Bartók, Reich). Extensions to jazz and to genres from Ghana, India, Indonesia, and southeastern Europe.

*MUSI 464a, *Baroque Opera* Ellen Rosand

W 2:30–4:20 HU Senior sem (o)

A chronological investigation of baroque opera in the main centers of Europe, moving from Italy through France, Germany, Spain, and England. Consideration of such issues as literary sources, genre, text-music relationships, the role of singers, operatic patronage, and changes in the reception of the genre from the period of its origins to today. Study of six operas, ranging from Monteverdi's *Orfeo* (1607) to Handel's *Giulio Cesare* (1724).

*MUSI 482b, *Intertextuality in Twentieth-Century Composition* Seth Brodsky

W 2:30–4:20 HU Senior sem (RP, o)

Intertextuality and influence in twentieth-century composition; focus on the composer as both an original author and a reader/arranger of other texts. Case studies explore tension between musical texts that overtly exhibit, reveal, or flaunt the presence of other musical texts and those that appear to repress, conceal, or deny such a presence. Readings on intertextuality by Bakhtin, Borges, Kristeva, Barthes, Foucault, and Bloom.

*MUSI 483b⁶, *Brahms and Schoenberg* Michael Friedmann

T 2:30–4:30 HU Senior sem (o)

The relationship between the music of Brahms and that of Schoenberg through the perspectives of analytic listening and compositional intention. Schoenberg's claim of continuity with Austro-German tonal composers, especially Brahms.

INDIVIDUAL STUDY COURSES

*MUSI 471a and 472b, *Individual Study* Craig Wright

HTBA (o)

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 490a and 491b, *Senior Essay for Intensive Majors in the History, Theory, or Composition of Music* Craig Wright

HTBA (o)

Preparation of an original composition or essay under the direction of a faculty adviser. Music majors enroll for two terms; students in the music track of the Computing and the Arts major elect either term. Admission to the course upon submission to the department of the senior essay proposal by the fall registration deadline of the senior year, and approval of the director of undergraduate studies. Original composition project proposals also require an audition.

Students in Yale College are eligible to take certain courses in the School of Music and are advised to consult its bulletin.

INDIVIDUAL INSTRUCTION IN PERFORMANCE

***MUSI 360a or b, Performance: First Term** Craig Wright

1 HTBA (o)

Individual instruction in the study and interpretation of musical literature. Academic credit is granted to students who demonstrate an appropriate level of proficiency in audition. Enrollment requires previous completion of or concurrent registration in a required music theory course. Students must take the Music department's music theory placement test to determine their placement in the 200-level music theory sequence. A score of 4 or 5 on the Advanced Placement test in Music Theory does not satisfy the music theory prerequisites for performance instruction. After or concurrently with MUSI 205a or b or 210a or b, as determined by the music theory placement test. Students register for the section specific to their instrument: see www.yale.edu/oci for section information. Although the faculty of the School of Music attempts to accommodate those who qualify for credit instruction, it cannot guarantee they will be enrolled with the teacher of their choice. Students who do not qualify for academic credit may also receive lessons. Students accepted for noncredit instruction are charged \$550 for twelve hour lessons per term; \$350 is charged for twelve half-hour lessons per term. The fees are added to the Student Financial Services bill and are not refundable after the first two weeks of lessons in each term. The half-hour fee is waived for juniors and seniors who are majors in Music. Auditions (both for credit and not for credit) for assignment to instructors for freshmen and returning students will be held at the beginning of the fall term. To arrange for an audition, students must sign up at <http://apply.music.yale.edu/lessons>.

***MUSI 361a or b, Performance: Second Term** Craig Wright

1 HTBA (o)

Continuation of MUSI 360a or b. Enrollment requires previous completion of or concurrent registration in an additional required music theory course. Prerequisite: MUSI 360a or b; after or concurrently with MUSI 210a or b or MUSI 211a or b, as determined by the music theory placement test.

***MUSI 460a or b, Performance: Third Term** Craig Wright

1 HTBA (o)

Continuation of MUSI 361a or b. Prerequisite: MUSI 361a or b.

***MUSI 461a or b, Performance: Fourth Term** Craig Wright

1 HTBA (o)

Continuation of MUSI 460a or b. Prerequisite: MUSI 460a or b. Students beyond their fourth term of performance instruction register first in MUS 540 in the School of Music, and then in MUS 640. No Yale College degree credit is offered for these courses.

PERTINENT COURSES IN ANOTHER PROGRAM

***THST 412b, Libretto Writing for Musical Theater** Rachel Sheinkin

***THST 414a, Lyric Writing for Musical Theater** Michael Korie

Near Eastern Languages and Civilizations

Director of undergraduate studies: Colleen Manassa, 321 HGS, 436-8181,
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FACULTY OF THE DEPARTMENT OF NEAR EASTERN LANGUAGES AND CIVILIZATIONS

Professors John Darnell, Benjamin Foster, Eckart Frahm, Beatrice Gruendler,
Dimitri Gutas, Bentley Layton, Harvey Weiss

Associate Professor Colleen Manassa

Assistant Professor Hala Khamis Nassar

Lecturers Adel Allouche, Karen Foster, Kathryn Slanski

Senior Lector II Ayala Dvoretzky

Senior Lectors Fereshteh Amanat-Kowssar, Shiri Goren

Lectors Sarab al-Ani, Muhammad Aziz, Aaron Butts, Etem Erol, Ghassan Husseinali,
Shady Nasser

The major in Near Eastern Languages and Civilizations is a liberal arts major that gives students a sound competence in a Near Eastern language and a broad knowledge of the literatures, civilizations, history, and archaeology of the Near East. The major also provides essential preparation for graduate or professional work in which a knowledge of Near Eastern languages, history, and archaeology is required.

Depending on the student's interests, the major is built around study of one or more Near Eastern languages, leading to a concentration in the ancient Near East (Mesopotamia, Egypt, or Syria-Palestine), in Hebrew language and literature, or in Arabic and Islamic studies.

Requirements of the major Twelve term courses in the department, or their equivalent, are required for the major. No more than six course credits from other institutions will be accepted toward this requirement. The course work includes at least two years of study of a Near Eastern language and no fewer than three term courses in the history and civilizations of the Near East, at least one term of which must be in the ancient and one in the Islamic Near East. Students should develop coherent programs of study in one of three areas of concentration:

1. Ancient Near Eastern languages and civilizations, with emphasis on Mesopotamia, Egypt, or Syria-Palestine. Students interested in Mesopotamia take at least two years of Akkadian, as well as courses in the history and civilizations of the ancient Near East. Students interested in Egypt take at least two years of Egyptian, as well as courses in the history and civilizations of ancient Egypt. Students interested in Syria-Palestine take at least two years of biblical Hebrew, as well as courses in the history and civilizations of the ancient Near East.
2. Hebrew language and literature. Students take two years or more of Hebrew (ancient or modern, but in any case at least two years of one period of the language), and courses in Hebrew literature, the history and civilizations of the ancient Near East, and Near Eastern Judaism.

3. Arabic and Islamic studies. ARBC 120b is a prerequisite for this area and counts as one term course toward the twelve required. Students take at least two years of Arabic beyond the prerequisite, and courses selected from Arabic literature, Arab civilization, Islamic religion, Near Eastern history, and Persian or Turkish language. In their senior year, students take either NELC 490a, Introduction to Classical Arabic and Islamic Studies, or 491b, Introduction to Modern Middle Eastern Studies. In exceptional cases, students may take both. Majors in this area of concentration are strongly advised to begin their language training as early as possible, and certainly not later than the sophomore year. Students should consult Dimitri Gutas, 316 HGS, 432-2947.

Well-qualified students who have acquired the requisite background in undergraduate courses may, with the permission of the instructor, the director of undergraduate studies, and the director of graduate studies, be admitted to graduate courses where no suitable undergraduate courses exist. In addition, courses from such other departments and programs as Archaeological Studies, History, History of Art, Judaic Studies, Political Science, and Religious Studies, as well as college seminars, are routinely accepted for credit toward the major if they deal with Near Eastern topics.

All course schedules must be approved by the director of undergraduate studies.

Senior essay To derive full benefit from the major, students should acquire practical experience in using Near Eastern languages for research purposes. Therefore all students in the major undertake a senior essay that involves substantial use of materials in one or more Near Eastern languages. 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 492a and/or 493b, 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 director of undergraduate studies 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 extensive essay, the senior essay may be approved as a year course after consultation with the adviser and the director of undergraduate studies. 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.

Languages currently offered by the Department of Near Eastern Languages and Civilizations include Akkadian, Arabic, Egyptian, Hebrew, 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.

REQUIREMENTS OF THE MAJOR

Prerequisites *Arabic and Islamic studies* — ARBC 120b; *All other areas* — none

Number of courses 12 term courses (incl senior essay)

Distribution of courses 2 years of a Near Eastern lang; 3 courses in Near Eastern hist and civ, incl 1 in ancient and 1 in Islamic Near East; area of concentration as specified

Specific course required *Arabic and Islamic studies*—NELC 490a or 491b

Senior requirement Senior essay using materials in 1 or more Near Eastern langs (in NELC 492a and/or 493b or in dept sem)

NEAR EASTERN HISTORY AND CIVILIZATIONS

Introductory and Survey Courses

***NELC 001a/ARCG 001a, Egypt and Northeast Africa: A Multidisciplinary Approach**
Colleen Manassa

TTH 11:35–12:50 WR, HU (24)

Examination of approximately 10,000 years of Nile Valley cultural history, with an introduction to the historical and archaeological study of Egypt and Nubia. Consideration of the Nile Valley as the meeting place of the cultures and societies of northeast Africa. Various written and visual sources are used, including the collections of the Yale Peabody Museum and the Yale University Art Gallery. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

NELC 101b/HUMS 438b, Origins of Western Civilization: The Near East from Alexander to Muhammad Benjamin Foster
For description see under Humanities.

NELC 102a/HUMS 440a/MMES 102a, Introduction to the Middle East
Benjamin Foster

MW 9–10:15; disc. F 9:25–10:15 HU (32)

Introduction to the history and cultures of the Middle East from the rise of Islam to the present, including the Arab world, Iran, Turkey, and Israel. Emphasis on factors important for understanding the Middle East today.

Ancient, Classical, and Medieval

NELC 104b/ARCG 239b/HSAR 239b^c/HUMS 252b, Art of the Ancient Near East and Aegean Karen Foster
For description see under History of Art.

NELC 108a/ARCG 237a/HSAR 237a, Ancient Painting and Mosaics Karen Foster
For description see under History of Art.

***NELC 109b^c/ARCG 244b^c, The Age of Akhenaton** John Darnell, Karen Foster, Colleen Manassa

T 2:30–4:30 HU (0)

Study of the period of the Egyptian pharaoh Akhenaton (reigned 1353–1336 B.C.E.), often termed the Amarna Revolution, from historical, literary, religious, artistic, and archaeological perspectives. Consideration of the wider Egyptian, ancient Near Eastern, African, and Mediterranean contexts. Examination of the international diplomacy, solar theology, and artistic developments of the period. Reading of primary source material in translation.

NELC 121a/HUMS 441a, The Hero in the Ancient Near East Kathryn Slanski

TTH 10:30–11:20, 1 HTBA WR, HU (o)

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.

***NELC 188b^G/ANTH 473b^G/ARCG 473b^G/EVST 473b, Civilizations and Collapse**

Harvey Weiss

For description see under Anthropology.

***NELC 315b/CLCV 312b/HUMS 442b, Translating the Hero** Kathryn Slanski

For description see under Humanities.

NELC 326b/HIST 226b^G/HUMS 422b/RLST 158b^G, Jesus to Muhammad: Ancient Christianity to the Rise of Islam Stephen Davis

For description see under Religious Studies.

***NELC 380b^G/HIST 211Jb/RLST 420b^G, The Making of Monasticism**

Bentley Layton

For description see under Religious Studies.

NELC 402a/HIST 360a/MMES 171a, The Islamic Near East from Muhammad to the Mongol Invasion Adel Allouche

TTH 11:35–12:50 HU (24)

The shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1258. The origins of Islamic society; conquests and social and political assimilation under the Umayyads and Abbasids; the changing nature of political legitimacy and sovereignty under the caliphate; provincial decentralization and new sources of social and religious power.

***NELC 403b/HIST 384Jb/MMES 172b, The Middle East between Crusaders and Mongols** Adel Allouche

For description see under History.

***NELC 404b/HIST 398Jb/MMES 173b, Mamluk Egypt** Adel Allouche

For description see under History.

Modern

***NELC 154a^G/JDST 295a/MMES 154a, Israeli Identity and Culture, 1948 to the Present** Shiri Goren

TTH 11:35–12:50 HU (o)

Introduction to contemporary culture and representations of Israeli society. Themes of national and personal identity formation, gender, Zionism and post-Zionism, women's writings, Israeli-Palestinian relations, the role of Russian immigrants, and the place of Jews of North African origin.

***NELC 157b^G/JDST 306b/MMES 157b, Israeli Narratives** Shiri Goren

TH 2:30–4:20 HU Tr (o)

Close reading of major Israeli novels in translation with attention to how their themes and forms relate to the Israeli condition. Theories of war and peace, migration, nationalism, and

gender. Authors include Oz, Yehoshua, Grossman, Matalon, Castel-Bloom, Shalev, and Kashua. No knowledge of Hebrew required.

***NELC 407a^C/MMES 407a, Modern Arab Thought** Hala Khamis Nassar

TH 1:30–3:20 HU (o)

Major trends of twentieth-century Arab thought critically examined through readings in translation from a wide range of thinkers. Issues are analyzed in the context of the historical-colonial, postcolonial, and neocolonial background from which they emerged.

***NELC 481b, Introducing Palestine: Literary Survey** Hala Khamis Nassar

TH 7–8:50 p.m. HU Tr (o)

A survey of genres in Palestinian literature. Themes include resistance, occupation, exile, diaspora, gender and sexuality, and authoritarian and patriarchal relations. Readings in translation.

LANGUAGES AND LITERATURES OF THE ANCIENT NEAR EAST

Akkadian

AKKD 110a^C, Elementary Akkadian I Benjamin Foster

TTH 9–10:15 L1 (RP, 22)

Introduction to the language of ancient Babylonia and its cuneiform writing system, with exercises in reading, translation, and composition. Credit only on completion of AKKD 120b.

AKKD 120b^C, Elementary Akkadian II Benjamin Foster

TTH 9–10:15 L2 (RP, 22)

Continuation of AKKD 110a. Prerequisite: AKKD 110a.

Egyptian

EGYP 110a, Introduction to Classical Hieroglyphic Egyptian I Julia Hsieh

TTH 9–10:15 L1 (RP, 0)

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. Credit only on completion of EGYP 120b.

EGYP 120b, Introduction to Classical Hieroglyphic Egyptian II Julia Hsieh

TTH 9–10:15 L2 (RP, 0)

Continuation of EGYP 110a. Prerequisite: EGYP 110a.

***EGYP 131a, Intermediate Egyptian I: Literary Texts** Colleen Manassa

W 2:30–4:30 L3 (RP, 0)

Close reading of Middle Egyptian literary texts; introduction to the hieratic (cursive) Egyptian script. Readings include the Middle Kingdom stories of Sinuhe and the Eloquent Peasant and excerpts from Wisdom Literature. Prerequisite: EGYP 120b. Counts as L4 if taken after EGYP 141b.

***EGYP 141b, Intermediate Egyptian II: Historical Texts** Colleen Manassa

HTBA L3 (RP, 0)

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: EGY 120b. Counts as L4 if taken after EGY 131a.

***EGYP 151b^G, Intermediate Egyptian III: Late Egyptian Stories** Colleen Manassa

TH 3:30–5:20 (o)

Narrative tales from the New Kingdom, including the *Tale of the Two Brothers*, the *Story of Apophis and Seqenenre*, the *Taking of Joppa*, and the *Tale of Woe*, read primarily in the hieratic script. Introduction to the combination of Middle and Late Egyptian grammar that characterizes the literary production of the New Kingdom, with particular reference to Ramesside monumental inscriptions, including the papyrus versions of the Kadesh Battle texts. Prerequisite: EGY 141b.

***EGYP 157a^G, Ancient Egyptian Love Poetry** John Darnell

M 3:30–5:20 (o)

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: EGY 141b.

Syriac

Students wishing to study Syriac should consult the director of undergraduate studies.

HEBREW LANGUAGE AND LITERATURE

HEBR 110a^G, Elementary Modern Hebrew I Ayala Dvoretzky and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

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. Credit only on completion of HEBR 120b.

HEBR 120b^G, Elementary Modern Hebrew II Staff

5 HTBA For sections www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of HEBR 110a. Prerequisite: HEBR 110a or equivalent.

HEBR 130a^G, Intermediate Modern Hebrew I Ayala Dvoretzky

MW 1–2:15, 1 HTBA L3 (RP, 36)

Review and continuation of grammatical study, leading to a deeper understanding of style and usage. Focus on selected readings, writing, comprehension, and speaking skills. Prerequisite: HEBR 120b or equivalent.

HEBR 140b^G, Intermediate Modern Hebrew II Ayala Dvoretzky

MW 1–2:15, 1 HTBA L4 (RP, 36)

Continuation of HEBR 130a. Prerequisite: HEBR 130a or equivalent.

***HEBR 150a^G/JDST 213a/MMES 150a, Advanced Modern Hebrew: Israeli Society**

Shiri Goren

TTH 4–5:15 L5 (RP, 27)

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 140b or equivalent.

***HEBR 151b^c, Introduction to Modern Israeli Literature** Ayala Dvoretzky

MW 11:35–12:50 L5 (0)

Fiction, poetry, films, drama, and magazine articles representative of contemporary cultural, social, and political issues in Israeli life. Conducted in Hebrew. Prerequisite: HEBR 140b or equivalent.

***HEBR 156a^c/JDST 405a/MMES 216a, Dynamics of Israeli Culture** Shiri Goren

TTH 2:30–3:45 L5, HU (RP, 0)

Controversies in Israeli society as revealed in novels, films, poetry, newspaper articles, Web sites, art, advertisements, and television shows. Themes include migration and the construction of the Sabra character; ethnicity and race; the emergence of the Mizrahi voice; women in Israeli society; private and collective memory; the minority discourse of the Druze and Russian Jews; and Israeli masculinity and queer culture. Conducted in Hebrew. Papers may be written in English or Hebrew. Prerequisite: HEBR 140b or permission of instructor.

***HEBR 159b^c/JDST 409b/MMES 159b, Conversational Hebrew: Israeli Media**

Shiri Goren

TTH 11:35–12:50 L5 (RP, 24)

An advanced Hebrew course for students interested in practicing and enhancing conversational skills. Focus on listening comprehension and on various forms of discussion, including practical situations, online interactions, and content analysis. Prerequisite: HEBR 140b or permission of instructor.

Biblical Hebrew

HEBR 117a, Elementary Biblical Hebrew I Staff

MW 9–10:15 L1 (RP, 32)

An introduction to biblical Hebrew. Intensive instruction in grammar and vocabulary, supplemented by readings from the Bible. Credit only on completion of HEBR 127b. No prior knowledge of Hebrew required.

HEBR 127b, Elementary Biblical Hebrew II Staff

MW 9–10:15 L2 (RP, 32)

Continuation of HEBR 117a. Prerequisite: HEBR 117a.

[HEBR 137a, Intermediate Biblical Hebrew I]

[HEBR 147b, Intermediate Biblical Hebrew II]

ARABIC AND ISLAMIC STUDIES

Arabic

ARBC 110a^c, Elementary Modern Standard Arabic I Shady Nasser and staff

5 HTBA For sections www.yale.edu/oci L1 1½ Course cr (RP, 61)

Development of a basic knowledge of Modern Standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the growth of speaking, listening, reading, and writing skills. Credit only on completion of ARBC 120b.

ARBC 120b^G, Elementary Modern Standard Arabic II Shady Nasser and staff5 HTBA For sections www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of ARBC 110a. Prerequisite: ARBC 110a or equivalent.

ARBC 130a^G, Intermediate Modern Standard Arabic I Shady Nasser and staff5 HTBA For sections www.yale.edu/oci L3 1½ Course cr (RP, 61)

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 120b or permission of instructor.

ARBC 136a, Intermediate Classical Arabic I Matteo Giovanni

MW 11:35–12:50 L3 (RP, 34)

Introduction to classical Arabic, with emphasis on analytical reading skills, grammar, and prose composition. Readings from the Qur'an, Islamic theology, and literature and history of the Middle East, as well as Jewish and Christian religious texts in Arabic. Prerequisite: ARBC 120b or permission of instructor. May be taken concurrently with ARBC 130a or 150a.

ARBC 140b^G, Intermediate Modern Standard Arabic II Shady Nasser and staff5 HTBA For sections www.yale.edu/oci L4 1½ Course cr (RP, 61)

Continuation of ARBC 130a. Prerequisite: ARBC 130a or equivalent.

ARBC 146b, Intermediate Classical Arabic II Matteo Giovanni

MW 11:35–12:50 L4 (RP, 34)

Continuation of ARBC 136a. Prerequisite: ARBC 136a or permission of instructor. May be taken concurrently with ARBC 140b or 151b.

***ARBC 150a^G, Advanced Modern Standard Arabic I** Shady Nasser

MWF 11:35–12:25, 1 HTBA L5 (RP, 34)

Further development of listening, writing, and speaking skills. For students who already have a substantial background in Modern Standard Arabic. Prerequisite: ARBC 140b or permission of instructor.

***ARBC 151b^G, Advanced Modern Standard Arabic II** Shady Nasser

MWF 11:35–12:25, 1 HTBA L5 (RP, 34)

Continuation of ARBC 150a. Prerequisite: ARBC 150a or permission of instructor.

ARBC 158a^G, Advanced Classical Arabic I Shady Nasser

MW 1–2:15 HU (36)

Development of an advanced understanding of Arabic grammar and morphology through close reading of the grammar of Ibn Malik (the *Alfiyyah*). Advanced training in sentence structure through *i'rab*. Prerequisite: ARBC 151b or 146b.**ARBC 159b^G, Advanced Classical Arabic II** Shady Nasser

MW 1–2:15 HU (36)

Continuation of ARBC 158a. Prerequisite: ARBC 158a.

***ARBC 165a^G, Arabic Seminar** Dimitri Gutas, Beatrice Gruendler

T 3:30–5:20 L5 (RP, 0)

Study and interpretation of classical Arabic texts for advanced students. Prerequisite: ARBC 146b, 151b, or permission of instructor. May be repeated for credit.

***ARBC 166b⁶, Modern Arabic Seminar** Hala Khamis Nassar

T 1:30–3:20 L5 (RP, 0)

Study and interpretation of modern Arabic prose and poetry for advanced students. Prerequisite: ARBC 140b.

***ARBC 471a or b, Directed Reading and Research** Dimitri Gutas

HTBA (o)

For students who wish to pursue a topic or body of texts not available in the department's regular curriculum. Approval of the plan of study by both the director of undergraduate studies and a member of the department who agrees to serve as instructor is required. Student and instructor meet regularly throughout the term. The course culminates in either a piece of written work or a final examination.

*Persian****PERS 110a⁶, Elementary Persian I** Fereshteh Amanat-Kowssar

MTWTHF 9:25–10:15 L1 1½ Course cr (RP, 32)

An introduction to modern Persian, with emphasis on grammar and syntax as well as writing and reading simple prose. Students are introduced to colloquial Persian and are encouraged to speak the language from the outset. Credit only on completion of PERS 120b.

PERS 120b⁶, Elementary Persian II Fereshteh Amanat-Kowssar

MTWTHF 9:25–10:15 L2 1½ Course cr (RP, 32)

Continuation of PERS 110a. Prerequisite: PERS 110a.

PERS 130a⁶, Intermediate Persian I Staff

MTWTHF 10:30–11:20 L3 1½ Course cr (RP, 0)

Intermediate study of grammar and readings in Persian, emphasizing rules and usage of colloquial Persian. Prerequisite: PERS 120b.

PERS 140b⁶, Intermediate Persian II Staff

MTWTHF 10:30–11:20 L4 1½ Course cr (RP, 0)

Continuation of PERS 130a. Prerequisite: PERS 130a.

***PERS 150a⁶, Thematic Survey of Modern Persian Literature**

Fereshteh Amanat-Kowssar

MW 11:35–12:50 L5, HU (RP, 34)

A survey of modern Persian literature. Themes include the depiction of women, minorities, the West, and Westerners. Discussion of language and society in works by Jalal Al-Ahmad, Sadeq Chubak, Simin Daneshvar, and Sadiq Hedayat. Prerequisite: PERS 140b or equivalent.

***PERS 170b/MMES 270b, Salaam Cinema** Fereshteh Amanat-Kowssar

TTH 1–2:15 HU (o)

Iranian cinema as representative of Iranian culture and as political phenomenon. Art movies contrasted with those produced under more direct government control. Prerequisite: PERS 140b or equivalent.

*Turkish***TKSH 110a⁶, Elementary Modern Turkish I** Etem Erol

MTWTHF 10:30–11:20 L1 1½ Course cr (RP, 33)

Development of a basic knowledge of modern Turkish, with emphasis on grammatical analysis, vocabulary acquisition, and reading and writing skills. Credit only on completion of TKSH 120b.

TKSH 120b^C, Elementary Modern Turkish II Etem Erol

MTWTHF 10:30–11:20 L2 1½ Course cr (RP, 33)

Continuation of TKSH 110a. Prerequisite: TKSH 110a or permission of instructor.

TKSH 130a^C, Intermediate Turkish I Etem Erol

TTH 11:35–12:50 L3 (RP, 24)

Continued study of modern Turkish, with emphasis on advanced syntax, vocabulary acquisition, and the beginnings of free oral and written expression. Prerequisite: TKSH 120b or permission of instructor.

TKSH 140b^C, Intermediate Turkish II Etem Erol

TTH 11:35–12:50 L4 (RP, 24)

Continuation of TKSH 130a. Prerequisite: TKSH 130a.

TKSH 150a^C, Advanced Turkish Etem Erol

HTBA L5 (RP, 0)

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 140b.

COURSES FOR MAJORS

***NELC 490a^C/MMES 490a, Introduction to Classical Arabic and Islamic Studies**

Dimitri Gutas

W 2:30–4:20 (0)

Comprehensive survey of subjects treated in Arabic and Islamic studies, with representative readings from each. Methods and techniques of scholarship in the field; emphasis on acquiring familiarity with bibliographical and other research tools. Enrollment limited to senior majors in Near Eastern Languages and Civilizations, except by permission of instructor.

***NELC 491b^C/MMES 493b/WGSS 493b, Introduction to Modern Middle Eastern Studies** Hala Khamis Nassar

TH 3:30–5:20 HU (0)

Survey of debates in the modern and contemporary Arab world about heritage, secularism, religion, language, gender equality, modernization, and tradition. Resources in translation include a cross section of Arab and Western writings from the late nineteenth century to the present. Focus on gender identities in relation to nationalism, Islamism, and the West, and how they are reflected in different genres.

***NELC 492a and 493b, The Senior Essay** Colleen Manassa

HTBA (0)

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 first 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 493b) 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, 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.

GRADUATE AND PROFESSIONAL SCHOOL COURSES OF INTEREST TO UNDERGRADUATES

Some Graduate School courses are open to qualified undergraduates with permission of the instructor and of the director of graduate studies. For course descriptions see www.yale.edu/oci. (Also see "Courses in the Yale Graduate and Professional Schools" in chapter II, section K, of this bulletin.)

Operations Research

Coordinator: Eric Denardo, 502 DL, 432-7276, eric.denardo@yale.edu

Professors Eric Denardo, Edward Kaplan, Herbert Scarf, Arthur Swersey

Operations research is concerned with the organization and management of productive activities. Operations research includes mathematical analysis of techniques of optimization, efficient organization of production, calculation of operating characteristics of complex systems, and application of these and other techniques to operating problems throughout business and government. The subject, also known as management science, is closely related to computer science, economics, statistics, engineering, and pure and applied mathematics.

To practice operations research, one must identify the objectives of the operation under study, describe alternative actions, define measures of effectiveness for them, create a model of the system under study, and select the action that best meets the stated objectives.

Operations research has four major subfields. Mathematical programming concerns the optimal operation of systems with many variables that are linked by simple relationships. Stochastic processes describes the evolution over time of systems whose "laws of motion" are affected by chance. Game theory describes models of cooperation and competition between members of an organization or participants in a market. Production and inventory control is a family of models that applies to manufacturing and service systems. Operations

research can prepare the mathematically inclined student for a career in the management of technology or in administration, for graduate study in the mathematical sciences, or for graduate study in management. Yale College offers no major in this subject.

OPRS 235a/AMTH 235a, Optimization Eric Denardo

TTH 1–2:15 QR (26)

Resource allocation problems solved by linear programming and its generalizations: the simplex method, duality, the Karush-Kuhn-Tucker conditions for nonlinear programs, economic equilibria, and selected applications. Prerequisite: MATH 118a or b, 222a or b, or 225a or b, or equivalent.

OPRS 237a/AMTH 237a, Stochastic Models of Decision Making Eric Denardo

TTH 9–10:15 QR (22)

Decisions under uncertainty; queues and inventories, Markov chains, decision analysis and dynamic programming, simulation. Applications. Prerequisites: MATH 222a or b or 225a or b, and STAT 241a, or equivalents.

Peking University–Yale University Joint Undergraduate Program

The Peking University–Yale University Joint Undergraduate Program in Beijing is open to Yale College sophomores, juniors, and, in some cases, first-term seniors, and to students in the Peking University Yuanpei College. Yale students from all majors who are in good academic standing may apply for a fall term, a spring term, or an academic year. The program carries full Yale course credit and counts as a term of enrollment. No prior Chinese language knowledge is required for Yale participants, although each student must take an appropriate level language course while enrolled in the program. All other courses are taught in English by Yale and Peking University faculty members. Further information about the program, the courses offered, and the application process can be found on the Web at www.yale.edu/iefp/pku-yale or at the Center for International Experience, 55 Whitney Avenue, fourth floor.

CHNS 125b, Intensive Elementary Modern Chinese Ningping Yu

For description see under East Asian Languages & Literatures.

***CHNS 130a, Intermediate Modern Chinese I** Ling Mu and staff

For description see under East Asian Languages & Literatures.

***CHNS 140b, Intermediate Modern Chinese II** Ling Mu and staff

For description see under East Asian Languages & Literatures.

***CHNS 150a, Advanced Modern Chinese I** Rongzhen Li, Haiwen Wang, and staff

For description see under East Asian Languages & Literatures.

***CHNS 151b, Advanced Modern Chinese II** Rongzhen Li and staff

For description see under East Asian Languages & Literatures.

CHNS 204a or b, Introduction to Chinese Civilization Tina Lu

For description see under East Asian Languages & Literatures.

***CHNS 205b, Intertextuality** Tina Lu

For description see under East Asian Languages & Literatures.

***CHNS 225a, The Dream of the Red Chamber** Tina Lu

For description see under East Asian Languages & Literatures.

HIST 213a, History of the Vikings Anders Winroth

***HIST 216Ja, Eurasian Encounters before 1500** Anders Winroth

***HIST 226Ja, Western Film and History** Stuart Semmel

HIST 230a, Europe since 1870 Stuart Semmel

HIST 239b, Britain's Empire Stuart Semmel

***YPKU 470a and 471b, Direct Enrollment in Peking University** Ningping Yu

HTBA (50)

Direct enrollment in a course offered by Peking University.

Persian

(See under Near Eastern Languages and Civilizations.)

Perspectives on Science and Engineering

(See under Science.)

Philosophy

Director of undergraduate studies: Kenneth Winkler, 406A C, 432-1679, kenneth.winkler@yale.edu [F]; Sun-Joo Shin, 204A C, 432-6971, sun-joo.shin@yale.edu [Sp]

FACULTY OF THE DEPARTMENT OF PHILOSOPHY

Professors George Bealer, Seyla Benhabib, Susanne Bobzien, Jules Coleman, Stephen Darwall, Michael Della Rocca, Keith DeRose, Tamar Gendler (*Chair*), John Hare, Karsten Harries, Verity Harte, Laurence Horn, Shelly Kagan, Thomas Pogge, Scott Shapiro, Sun-Joo Shin, Steven Smith, Zoltán Szabó, Kenneth Winkler

Associate Professor Matthew Smith

Assistant Professors Jonathan Gilmore, Joshua Knobe, Jill North, Barbara Sattler, Bruno Whittle

Lecturers Facundo Alonso, Mark Phelan, Raul Saucedo, Tamina Stephenson

Courses numbered 100 through 199 are introductory. They are open to all students and have no prerequisites. Courses numbered 200 through 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 through 479 are seminars. These advanced 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. Students with questions should consult the instructor.

The standard major The Philosophy major requires twelve 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 the introductory sequence in philosophy (PHIL 125a and 126b) or both terms of Directed Studies, and (b) an additional, third course in history of philosophy. Majors must take two courses in metaphysics and epistemology and two courses in ethics and value theory. Majors must also take two seminars and satisfy the senior requirement as described below. Prerequisite to the major are two introductory or intermediate philosophy courses.

All courses in Philosophy count toward the twelve-course requirement. With approval from the director of undergraduate studies, 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, including PHIL 115a, First-Order Logic, do not count toward a 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 this bulletin. In rare cases, a course will be designated as counting toward a second group (though no single course can be counted by the same student toward two group requirements). In addition, students may petition to have a course count toward a group other than the one it is listed under in this bulletin, 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.

Although it is not required, majors are strongly encouraged to take a course in logic, for example, PHIL 115a, and to do so before the end of the sophomore year. Logic is one of the essential tools in philosophy, and competence is assumed in intermediate and advanced classes, some of which require a background in logic as a prerequisite.

The 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 that are delineated in the syllabus or during the first class session, and that 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. In special cases, students may meet the senior requirement through either a one-term or two-term independent project supervised by an instructor (PHIL 490a, 491b). Students must petition to fulfill the senior requirement through an independent project, and approval is not guaranteed. Applicants must submit a proposal to the director of undergraduate studies, in consultation with an appropriate supervisor, by the end of the term prior to beginning the independent study.

Each major should, by October 1 of the junior year, secure the agreement of a member of the Philosophy department to serve as adviser for the year. The adviser aids the student in choosing courses and in planning for the senior year. All senior majors must have their schedules signed by the director of undergraduate studies.

Psychology track The psychology track is designed for students interested in both philosophy and psychology. Prerequisite to the major in the psychology track are two courses in philosophy or 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 125a and 126b or DRST 003a and 004b, (b) two seminars, one of which may be in the Psychology department, with the approval of the director of undergraduate studies, and (c) 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 (c) must be approved by the director of undergraduate studies. The five psychology courses must include PSYC 110a or b or its equivalent. Each major must also satisfy the senior requirement as described above for the standard major.

Students interested in philosophy and psychology should also consider the philosophy track in the Psychology department and the major in Cognitive Science.

Other majors involving philosophy Majors in Mathematics and Philosophy and in Physics and Philosophy are also available. For information, see under those headings.

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

Distribution of courses *Standard track*—3 courses in hist of phil (incl DRST 003a and 004b, or PHIL 125a and 126b), 2 in metaphysics and epistemology, and 2 in ethics and value theory; 2 phil sems; *Psychology track*—7 courses in phil, as specified; 5 in psych

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

Senior requirement *Both tracks*—a third sem in phil, or substantial written work in a tutorial (PHIL 490a, 491b)

***DRST 003a and 004b, Directed Studies: Philosophy** Stephen Darwall, Jay Elliott, Jonathan Gilmore, Paul Grimstad, John Hare, Verity Harte, David Possen, Barbara Sattler, Ludger Viefhues, Kenneth Winkler

INTRODUCTORY COURSES

PHIL 115a, First-Order Logic Sun-Joo Shin

TTH 1:30–2:20, 1 HTBA QR (26)

An introduction to formal logic. Study of the formal deductive systems and semantics for both propositional and predicate logic. Some discussion of metatheory.

History of Philosophy

PHIL 125a/CLCV 125a, Introduction: Ancient Philosophy Susanne Bobzien

MW 1:30–2:20, 1 HTBA HU (36)

An introduction to the main developments in 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 126b.

PHIL 126b, Introduction: Modern Philosophy from Descartes to Kant Keith DeRose

TTH 11:35–12:25, 1 HTBA HU (24)

An introduction to major figures in the history of modern philosophy, with critical readings of Descartes, Leibniz, Locke, Berkeley, Hume, Reid, and Kant. Intended to be taken in conjunction with PHIL 125a, although PHIL 125a is not a prerequisite.

Ethics and Value Theory

PHIL 175a, Introduction to Ethics Stephen Darwall

TTH 10:30–11:20, 1 HTBA HU (23)

An examination of three central traditions in ethical philosophy in the West, as typified by Aristotle, Kant, and Mill, together with a radical critique by Nietzsche. Questions of normative ethics, such as what has value and what constitutes moral obligation; some attention to metaethics.

PHIL 178a, Introduction: Political Philosophy Thomas Pogge

MW 2:30–3:20, 1 HTBA HU (0)

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.

PHIL 180a/PLSC 191a, Ethics and International Affairs Thomas Pogge

MW 10:30–11:20, 1 HTBA HU (33)

Moral reflection taken beyond state boundaries. Traditional questions about state conduct and international relations as well as more recent questions about intergovernmental agencies, nongovernmental organizations, and the design of global institutional arrangements.

PHIL 181b/CGSC 281b, Philosophy and the Science of Human Nature

Tamar Gendler

TTH 10:30–11:20, 1 HTBA HU (23)

Classical theories of human nature examined in light of recent developments in the social sciences. Plato's discussion of innate ideas and current research on infant development;

Aristotle's conception of character and modern research in social psychology; Epictetus's writings on human flourishing and contemporary work on happiness; Nietzsche's genealogy of morals and findings from cognitive science.

INTERMEDIATE COURSES

History of Philosophy

PHIL 215b/GREK 410b^G, Plato's *Republic* Verity Harte

For description see under Classics.

Metaphysics and Epistemology

PHIL 267a^G, Mathematical Logic Sun-Joo Shin

TTH 2:30–3:20, 1 HTBA QR (27)

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 115a or permission of instructor.

PHIL 271a/LING 271a, Philosophy of Language Zoltán Szabó, Justin Khoo

MW 11:35–12:50 HU (34)

An introduction to contemporary philosophy of language, organized around four broad topics: meaning, reference, context, and communication. Introduction to the use of logical notation.

PHIL 273a/CGSC 273a, Mind and Thought Mark Phelan

TTH 11:35–12:50 HU (o)

The nature of thought. Questions about our ability to entertain a limitless number of novel thoughts and whether thoughts are structured as sentences, built from simpler components similar to words.

PHIL 283b, Philosophy of Physics Jill North

MW 1:30–2:20, 1 HTBA QR, SC (36)

An introduction to the philosophical foundations of physics, with the goal of understanding the theoretical framework and quantitative methods of different physical theories. Analysis of both conceptual and quantitative problems in classical mechanics, classical electromagnetism, statistical mechanics, thermodynamics, special and general relativity, and quantum mechanics.

PHIL 301b, Causation Zoltán Szabó

TTH 11:35–12:50 HU (o)

The metaphysics of causation. Topics include what sorts of entities are causes and effects, how causation differs from mere regularity, the causal efficacy of the mind, free will, and natural teleology. Prerequisite: a course in philosophy.

Ethics and Value Theory

***PHIL 324b/HUMS 319b, Prudence and Ethics** Jay Elliott

For description see under Humanities.

PHIL 326b, The Philosophy of Religion John Hare

MW 11:35–12:25, 1 HTBA HU (34)

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.

PHIL 327a^G/PLSC 326a^G, Borders, Culture, and Citizenship Seyla Benhabib

For description see under Political Science.

***PHIL 329b/HUMS 391b, Kierkegaard and the Examined Life** David Possen

For description see under Humanities.

PHIL 343b/HUMS 260b, Philosophy of Art Jonathan Gilmore

MW 3:30–4:20, 1 HTBA HU (37)

A broadly focused investigation into philosophical questions raised by art and literature. Topics include art and politics, the concept of art, censorship, expression, metaphor, autonomy, art and knowledge, museum display, audiences, high vs. low art, formalism, interpretation, evaluation, narrative, and style.

SEMINARS

History of Philosophy

PHIL 400a^G/GREK 431a^G, Plato's *Sophist Verity Harte, Barbara Sattler

W 3:30–5:20 HU (0)

A reading of the Greek text of Plato's *Sophist*, a work central to Plato's later philosophy and his engagement with Parmenides. Philosophical issues raised by the text include the nature of sophistry, of being and not-being, of language, and the possibility of falsehood in thought and speech. Prerequisites: two terms of classical Greek; PHIL 125a or equivalent.

***PHIL 401b^G/CLCV 418b, Theories of Emotion in Greco-Roman Antiquity**

Verity Harte

W 3:30–5:20 HU (0)

Theories of emotions from Greco-Roman antiquity, particularly those of Plato, Aristotle, and the Stoics, considered with a view to exploring the nature of emotions and their role in human life and psychology. Prerequisite: PHIL 125a or equivalent.

***PHIL 403a, Nietzsche: Truth, Value, and Tragedy** Karsten Harries

T 1:30–3:20 HU (0)

An examination of Nietzsche's understanding of tragedy as the only acceptable answer to nihilism, given the death of God.

PHIL 404b, Heidegger: *Being and Time Karsten Harries

M 1:30–3:20 HU (0)

A critical reading of Heidegger's most important work.

***PHIL 406a^G, Locke and Berkeley** Kenneth Winkler

W 7–8:50 p.m. HU (0)

A close study of Locke's *Essay concerning Human Understanding* and of several works by Berkeley, including his works on vision. Topics include innate ideas, abstraction, the association of ideas, primary and secondary qualities, substance and essence, causation, liberty, identity, linguistic signification, and skepticism. Prerequisite: PHIL 126b, DRST 004b, or equivalent.

***PHIL 407b^G/PLSC 320b^G, Rousseau at 300** Steven Smith

For description see under Political Science.

Metaphysics and Epistemology

***PHIL 425b^G, Frege** Susanne Bobzien

F 1:30–3:20 HU (o)

Reading and evaluation of selected articles by Gottlob Frege. Focus on Frege's contributions and relevance to modern philosophy of language and philosophical logic (as opposed to his contributions to the philosophy of mathematics).

***PHIL 427b^G, Computability and Logic** Sun-Joo Shin

W 1:30–3:20 QR, HU (36)

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 267a or permission of instructor.

***PHIL 430b^G, Intention, Belief, and Rationality** Facundo Alonso

T 3:30–5:20 HU (o)

Attitudes such as intention and belief as they are subject to norms of consistency, coherence, and stability. Examination of the nature and strength of such norms. The relation between practical and theoretical rationality.

***PHIL 431a^G/LING 270a^G, Topics in Semantics: Modality** Tamina Stephenson

For description see under Linguistics.

***PHIL 432a^G, Metaphysics: Universals and Particulars** George Bealer

W 3:30–5:20 HU (o)

The development of category theory from Aristotle's *Categories* to the contemporary two-category theory of particulars and universals. Arguments for and against contemporary theory; critical comparison with Aristotelian theory.

***PHIL 433b^G, Philosophy of Mind: The Waning of Materialism** George Bealer

TH 1:30–3:20 HU (o)

Despite its hegemony in our universities, an ever-growing number of our best philosophers have come to reject materialism or to have serious and specific doubts about its ultimate viability. Examination of reasons for this turnabout.

***PHIL 434b^G, Philosophical Logic** George Bealer, Raul Saucedo

W 3:30–5:20 HU (o)

A study of formal and philosophical issues at the intersection of logic and ontology, with special attention to quantification, identity, and existence. Readings from Frege, Quine, Boolos, Fine, and Williamson. Prerequisite: a course in logic.

***PHIL 435a^G, Direction of Time** Jill North

M 1:30–3:20 HU (36)

Attempts to explain the temporal asymmetries we experience at the macroscopic level—coffee cools and ice melts, we have memories of the past and not the future, and so on—given that the underlying laws of physics are symmetric in time. Questions include whether it is possible to have a unified explanation for the different asymmetries we experience and

whether time itself has a direction. Consideration of how the probabilities required by the explanations should be understood metaphysically.

***PHIL 436b^G/PHYS 427b, Philosophy of Quantum Mechanics** Jill North

W 3:30–5:20 HU, SC (37)

Examination of a wide range of philosophical issues as informed by quantum mechanics. Evaluation of different, and controversial, interpretations of quantum mechanics, comparing their views of the world's ontology. Issues include the measurement problem, superposition, non-locality, the wave function, configuration space, probability, and compatibility with relativity.

Ethics and Value Theory

***PHIL 450a^G, Hobbes and Kant on Right, Justice, and Law** Stephen Darwall

W 7–8:50 p.m. HU (o)

The philosophy of right, justice, and law of Thomas Hobbes and Immanuel Kant. Contemporary philosophy influenced by Hobbes and Kant.

***PHIL 451b^G, Recent Work in Ethical Theory** Stephen Darwall

W 7–8:50 p.m. HU (o)

A study of recently published works on ethics and its foundations. Issues include the grounds of normativity and rightness and the role of the virtues.

***PHIL 452b/HUMS 475b, Evolution of Beauty** Jonathan Gilmore, Richard Prum

For description see under Humanities.

PHIL 453b^G, Sidgwick's *Methods of Ethics Shelly Kagan

TH 1:30–3:20 HU (o)

Henry Sidgwick's *Methods of Ethics* is one of the greatest works of moral philosophy of the nineteenth century. A systematic and careful study of three basic approaches to ethics—egoism, utilitarianism, and intuitionism (commonsense deontology)—the *Methods* is a masterpiece that is widely praised but less frequently read, since it is both long and demanding. Prerequisite: a class in moral philosophy.

***PHIL 454b^G/PLSC 309b^G, Contemporary Critical Theory** Seyla Benhabib

For description see under Political Science.

***PHIL 455b^G/EP&E 334b, Normative Ethics** Shelly Kagan

For description see under Ethics, Politics, & Economics.

TUTORIAL AND SENIOR ESSAY COURSES

***PHIL 480b, Tutorial** Kenneth Winkler

HTBA (o)

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 to do 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 and 491b, The Senior Essay** Kenneth Winkler

HTBA (o)

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 490a in the fall or 491b in the spring. Students completing a two-term project should enroll in both 490a and 491b. The deadline for senior essays completed in the fall is December 3; the deadline for both one- and two-term senior essays completed in the spring is April 22.

**GRADUATE, DIVINITY, AND LAW SCHOOL COURSES
THAT COUNT TOWARD THE MAJOR**

Some Graduate, Divinity, and Law School courses are open to qualified undergraduates with permission of the instructor and the director of graduate studies or the dean or registrar of the Divinity or the Law School. (See “Courses in the Yale Graduate and Professional Schools” in chapter II, section K.) With permission of the director of undergraduate studies, relevant Graduate, Divinity, and Law School courses may count toward the major. Course descriptions appear in the Graduate, Divinity, and Law School bulletins.

Philosophy and Mathematics

(*See under Mathematics and Philosophy.*)

Philosophy and Physics

(*See under Physics and Philosophy.*)

Physics

Director of undergraduate studies: Peter Parker, 206B WNSL, 432-3601,
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FACULTY OF THE DEPARTMENT OF PHYSICS

Professors †Charles Ahn, Yoram Alhassid, Thomas Appelquist, †Charles Bailyn, O. Keith Baker, Charles Baltay, Sean Barrett, Cornelius Beausang (*Adjunct*), †Hui Cao, Richard Casten, †Richard Chang (*Emeritus*), †Paolo Coppi, David DeMille, †Michel Devoret, †Paul Fleury, Moshe Gai (*Adjunct*), Steven Girvin, Leonid Glazman, †Robert Grober, Martin Gutzwiller (*Adjunct*), John Harris, †Victor Henrich, Jay Hirshfield (*Adjunct*), Francesco Iachello, Dmitry Kharzeev (*Adjunct*), Steven Lamoreaux, William Marciano (*Adjunct*), Simon Mochrie, Vincent Moncrief, †Priyamvada Natarajan, Peter Parker, †Daniel Prober, Nicholas Read, †Vladimir Rokhlin, Jack Sandweiss, †Robert Schoelkopf, Ramamurti Shankar, †A. Douglas Stone, Paul Tipton, †John Tully, Thomas Ullrich (*Adjunct*), C. Megan Urry (*Chair*), †Pieter van Dokkum, †Xiao-Jing Wang, †John Wettlaufer, Michael Zeller (*Emeritus*)

Associate Professors †Jerzy Blawdziewicz, Richard Easter, Bonnie Fleming, Jack Harris, †Sohrab Ismail-Beigi, Karyn Le Hur, Daniel McKinsey, †Corey O'Hern, Witold Skiba

Assistant Professors Helen Caines, Sarah Demers, †Eric Dufresne, †Thierry Emonet, Walter Goldberger, Tobias Golling, Daisuke Nagai, †Jill North, Nikhil Padmanabhan, †A. Elizabeth Rhoades, Volker Werner

Lecturers Sidney Cahn, Stephen Irons

†A joint appointment with primary affiliation in another department.

Physics forms a foundation for all other sciences. The various undergraduate courses and degree programs offered by the Physics department provide students with a thorough preparation in physics for any career. To satisfy the needs of science students and to provide the general background in physics that should be part of a liberal education, the department offers five different introductory sequences and two different degree programs for Physics majors. Combined majors are also available in mathematics and physics (see Mathematics and Physics), astronomy and physics (see Astronomy), and philosophy and physics (see Physics and Philosophy). Applied Physics is a closely related major (see Applied Physics).

Introductory lecture courses with no calculus prerequisite

1. PHYS 110b (one term) and 120a (one term) are for students with little or no previous experience in physics who do not plan to major in the natural sciences. Neither course has a mathematics requirement, and neither course satisfies the medical school requirement.
2. PHYS 170a, 171b (two terms) is for students with little background in physics and mathematics who will probably not major in the physical sciences but who may be interested in the medical and biological sciences. There is no mathematics prerequisite other than high school mathematics, but MATH 112a and 115b should be taken concurrently.

Introductory calculus-based lecture courses

1. PHYS 180a, 181b (two terms) is for students with some previous background in physics and mathematics who plan to major in the physical sciences. Calculus at the level of MATH 112a or b is a prerequisite; MATH 115a and 120b should be taken concurrently.
2. PHYS 200a, 201b (two terms) is for students with a strong background in mathematics and physics who plan to major in the physical sciences. Calculus at the level of MATH 115a or b is presumed. MATH 120a should be taken concurrently with PHYS 200a. It is suggested that MATH 222b or 225b be taken concurrently with PHYS 201b.
3. PHYS 260a, 261b (two terms) is intended for students who have had excellent training in and have a flair for mathematical methods and quantitative analysis; a solid foundation in physics is required. MATH 230a, 231b or the equivalent should be taken concurrently with PHYS 260a, 261b.

If students have the appropriate mathematics background, they are advised to take a calculus-based physics course. Sir Isaac Newton developed calculus while trying to describe the world around him; it is the natural language of physics. Students enrolled in one of the

calculus-based introductory courses will be invited to a series of Chairman's Teas, which provide an opportunity to discuss topics on the frontiers of physics with faculty and peers. Completion of a calculus-based course also prepares students for the 340-level series of advanced physics electives, which cover special topics of interest to both majors and nonmajors.

PHYS 170a, 180a, 200a, and 260a meet at the same time so that students are easily able to change levels if necessary. Questions about placement should be addressed to the director of undergraduate studies.

Introductory laboratories Two different introductory laboratory sequences are offered: PHYS 165La, 166Lb, and the PHYS 205La or Lb, 206La or Lb sequence. 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. Students should register for a section of the appropriate laboratory course during the first week of classes by logging onto *classesv2.yale.edu*.

1. PHYS 165La, 166Lb (two terms) is an introductory laboratory for students without a strong high school physics laboratory preparation. Related lecture courses are PHYS 170a, 171b, and PHYS 180a, 181b.
2. PHYS 205La or Lb, 206La or Lb (two terms) is for students who plan to major in the physical sciences. Related lecture courses are PHYS 180a, 181b, PHYS 200a, 201b, and PHYS 260a, 261b. Students who take the lecture courses in freshman year are advised to start this laboratory sequence with PHYS 205Lb in the spring of freshman year, or with 205La 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 180a, 181b, or 200a, 201b, or 260a, 261b). The offerings for 2010–2011 include PHYS 342a, Introduction to Earth and Environmental Physics, 343b, Gravity, Astrophysics, and Cosmology, and 344b, Quantum and Nanoscale Physics.

Major degree programs Two different majors are offered in Physics: the B.S. and the B.S. with an intensive major. Students in either program acquire advanced training in physics, math, and related topics through the core courses. They use electives to design individualized programs with more depth or breadth, depending on their needs and interests. Both programs are excellent preparation for a wide variety of postgraduate activities, including professional school in business, law, or medicine; graduate school in engineering or other sciences; or careers in business, consulting, financial services, government service, or teaching.

The B.S. program with an intensive major prepares students to study physics in graduate school. The intensive program is distinguished by depth of study in advanced physics courses; a research experience is required. The director of undergraduate studies can help students in the B.S. program prepare for graduate school in physics by recommending appropriate electives to supplement the core courses.

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

B.S. degree program The prerequisites are 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 170a, 171b with MATH 112a, 115b; or PHYS 180a, 181b with MATH 115a, 120b; or PHYS 200a, 201b with MATH 120a, 225b or 222b; or PHYS 260a, 261b with MATH 230a, 231b or equivalent. In addition, the laboratory sequence PHYS 205La or Lb, 206La or Lb or PHYS 165La, 166Lb is required. Students who take these physics and mathematics courses starting in their freshman 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 freshman year at the appropriate level.

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 301a. Three courses at the core of the major involve advanced study of fundamental topics common to all branches of physics, and must be taken in order. The first two, PHYS 401a and 402b, pertain to advanced classical physics (mechanics, statistical physics and thermodynamics, and electromagnetism), and the third, APHY 439a or PHYS 440b, covers quantum mechanics. Three advanced elective courses are also required. Suitable advanced courses include the PHYS 340-level electives, an advanced laboratory such as PHYS 382Lb, 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 director of undergraduate studies. In order to pursue their individual interests in sufficient depth, many students choose to take more than the required number of advanced courses.

Senior requirement for the B.S. degree program The senior requirement for the B.S. is fulfilled by receiving a passing grade on a one-term research project in PHYS 471a or 472b or equivalent. Students should consult the director of undergraduate studies for further information.

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. 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 301a. 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 410a), statistical physics and thermodynamics (PHYS 420a), and electromagnetism (PHYS 430b). Two other courses incorporate quantum mechanics (PHYS 440b and 441a). These courses must be taken in order because the ideas build progressively: PHYS 410a precedes 440b, which precedes 441a, 420a, and 430b.

Because experiment is at the heart of the discipline, the intensive major requires one term of advanced laboratory (PHYS 382Lb or equivalent) and at least two terms of independent research (PHYS 471a, 472b or equivalent). One advanced elective course is required to complete the program. Suitable advanced courses include the PHYS 340-level electives, 400-level courses in Physics, and graduate 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 director

of undergraduate studies. In order to pursue their individual interests in sufficient depth, many students choose to take more than ten advanced courses.

Senior requirement for the 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 471a, 472b or equivalent. Students should consult the director of undergraduate studies for further information.

Sequence of courses For both the regular B.S. degree and the B.S. degree with an intensive major, students are advised to begin the program in their freshman 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:

<i>Freshman or Sophomore</i>	<i>Sophomore or Junior</i>	<i>Senior</i>
PHYS 170a, 171b or 180a, 181b, or 200a, 201b, or 260a, 261b	PHYS 206La	APHY 439a or PHYS 440b
PHYS 205Lb	PHYS 301a	PHYS 471a or 472b
Mathematics corequisites	PHYS 401a	Two advanced electives
	PHYS 402b	
	One advanced elective	

A program for a student completing the intensive major in three years might be:

<i>Freshman or Sophomore</i>	<i>Sophomore or Junior</i>	<i>Senior</i>
PHYS 170a, 171b or 180a, 181b, or 200a, 201b, or 260a, 261b	PHYS 206La	PHYS 441a
PHYS 205Lb	PHYS 301a	PHYS 420a
Mathematics corequisites	PHYS 410a	PHYS 430b
	PHYS 440b	PHYS 471a
	PHYS 382Lb	PHYS 472b
		One advanced elective

Approval of programs All Physics majors in the sophomore, junior, and senior classes must have their programs approved by the director of undergraduate studies. Freshmen and undeclared sophomores who are interested in Physics or related majors are encouraged to meet with the director of undergraduate studies to discuss their questions and proposed programs.

REQUIREMENTS OF THE MAJOR

B.S. DEGREE

Prerequisites PHYS 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b, with appropriate math coreqs; PHYS 205La or Lb, 206La or Lb, or PHYS 165La, 166Lb

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

Distribution of courses 3 advanced electives approved by DUS

Specific courses required PHYS 301a or other advanced math course; PHYS 401a, 402b, and either APHY 439a or PHYS 440b, in sequence

Senior requirement PHYS 471a or 472b or equivalent

B.S. DEGREE, INTENSIVE MAJOR

Prerequisites PHYS 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b, with appropriate math coreqs; PHYS 205La or Lb, 206La or Lb, or PHYS 165La, 166Lb

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

Distribution of courses 1 advanced elective approved by DUS

Specific courses required PHYS 301a or other advanced math course; PHYS 410a, 440b, 441a, 420a, 430b, in sequence; PHYS 382Lb

Senior requirement PHYS 471a and 472b or equivalent

***PHYS 050a/APHY 050a, Science of Modern Technology** Daniel Prober

For description see under Applied Physics.

***PHYS 060b/APHY 060b/ENAS 060b, Energy Technology and Society** Paul Fleury

For description see under Engineering & Applied Science.

***PHYS 095a, Radiation and the Universe** Peter Parker

TTH 2:30–3:45 SC Fr sem (0)

An exploration of nuclear physics in the cosmos and on Earth, without intense mathematics. Nuclei as the heart of matter and the cores of stars; nuclear reactions as they power the stars and are responsible for the existence of every element; the role of radioactivity in our lives, including nuclear medicine, X rays, nuclear power, nuclear weapons, and terrorism. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***PHYS 101b, Movie Physics** Francis Robinson

MW 2:30–3:45 QR, SC (37)

A critical evaluation of Hollywood action movies using the laws of physics and Fermi-type estimation techniques to distinguish between fictional and real movie physics. Enrollment limited to freshmen and sophomores.

PHYS 110b, Developments in Modern Physics Sarah Demers

MW 1–2:15 QR, SC (36)

An introduction to modern physics and quantitative reasoning. Topics include subatomic particles, electromagnetic waves, black holes, galaxies, and the fate of the universe. Study of the stages of descriptive modeling, with examples ranging from Newtonian physics to Einstein's theory of relativity. See comparison of introductory sequences and laboratories in the text above.

***PHYS 120a, Quantum Physics and Beyond** Helen Caines

M 3:30–5:30 SC (37)

Current topics in modern physics, beginning with quantum physics and continuing through subatomic physics, special and general relativity, cosmology, astrophysics, and string theory. See comparison of introductory sequences and laboratories in the text above.

PHYS 165La and 166Lb, General Physics Laboratory Richard Casten

HTBA For sections see www.yale.edu/oci SC ½ Course cr per term (RP, 0)

A variety of individually self-contained experiments are roughly coordinated with the lectures in PHYS 170a, 171b, and 180a, 181b and illustrate and develop physical principles covered in those lectures.

PHYS 170a and 171b, University Physics for the Life Sciences Simon Mochrie

MWF 11:35–12:25 QR, SC (34)

An introduction to classical physics with special emphasis on applications drawn from the life sciences and medicine. Fall-term topics include vectors, kinematics, Newton's laws of motion, oscillations and waves, gravitation, elasticity, statics, diffusion, fluids, and thermodynamics. Spring-term topics include electricity and magnetism, circuits, light and optics, sound, and modern physics. Essential calculus is introduced as needed. Concurrently with MATH 112a, 115b. See comparison of introductory sequences and laboratories in the text above.

PHYS 180a and 181b, University Physics Richard Easther [F],

Sohrab Ismail-Beigi [Sp]

MWF 11:35–12:25 QR, SC (34)

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, optics, special relativity, and quantum physics. Concurrently with MATH 115a and 120b or equivalents. See comparison of introductory sequences and laboratories in the text above. May not be taken for credit after PHYS 170a, 171b.

PHYS 200a and 201b, Fundamentals of Physics Paul Tipton

MW 11:35–12:50 QR, SC (34)

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 115a or b or equivalent. See comparison of introductory sequences and laboratories in the text above.

PHYS 205La or Lb and 206La or Lb, Modern Physical Measurement

Bonnie Fleming [F], David DeMille [Sp]

HTBA For sections see www.yale.edu/oci SC ½ Course cr per term (RP, o)

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.

***PHYS 260a and 261b, Intensive Introductory Physics** Charles Baltay

MW 11:35–12:50 QR, SC (34)

The major branches of physics—classical and relativistic dynamics, gravitation, electromagnetism, heat and thermodynamics, statistical mechanics, quantum physics—at a sophisticated level. For students majoring in the physical sciences, Mathematics, and Philosophy who have excellent training in and a flair for mathematical methods and quantitative analysis. Concurrently with MATH 230a and 231b, or PHYS 301a, or equivalent.

PHYS 295a/ASTR 255a, Research Methods in Astrophysics Charles Bailyn
For description see under Astronomy.

PHYS 301a, Introduction to Mathematical Methods of Physics O. Keith Baker
TTH 11:35–12:50 QR (24)

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 401a or 410a. Prerequisite: PHYS 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b, or permission of instructor.

PHYS 320b, Science and Public Policy Bonnie Fleming
TTH 1–2:15 SO (0)

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.

PHYS 342a/G&G 342a, Introduction to Earth and Environmental Physics
Steven Lamoreaux

TTH 2:30–3:45 QR, SC (27)

A broad introduction to the physical, chemical, and biological processes that affect the climate and other features of the Earth. Emphasis on anthropogenic activity that affects the environment; attention to issues of energy extraction from natural resources and subsequent waste disposal. Recommended preparation: familiarity with basic calculus. Prerequisite: PHYS 180a, 181b, or 200a, 201b, or 260a, 261b, or permission of instructor.

PHYS 343b/ASTR 343b, Gravity, Astrophysics, and Cosmology Nikhil Padmanabhan
TTH 11:35–12:50 QR, SC (24)

In-depth discussion of the physics underlying several recent discoveries in astrophysics and cosmology, including extrasolar planets, black holes, and the accelerating universe. Prerequisite: PHYS 180a, 181b, or 200a, 201b, or 260a, 261b, or permission of instructor.

PHYS 344b, Quantum and Nanoscale Physics Sean Barrett
TTH 11:35–12:50 QR, SC (24)

An introduction to cutting-edge developments in physics involving quantum information and/or nanotechnology. Background concepts in quantum mechanics, electromagnetism, and optics are introduced as necessary. Prerequisite: PHYS 180a, 181b, or 200a, 201b, or 260a, 261b, or permission of instructor. PHYS 301a or other advanced mathematics course recommended.

PHYS 382Lb^G, Experimental Research Studies Steven Lamoreaux
MW 1:30–4:20 SC (0)

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. Prerequisite: PHYS 206La or Lb. After or concurrently with PHYS 439a or 440b, or with permission of instructor.

PHYS 401a, Advanced Classical Physics: From Newton to Einstein I

Ramamurti Shankar

MW 11:35–12:50 QR, SC (34)

The first term of a two-term sequence in 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 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b. Concurrently with PHYS 301a or other advanced mathematics course.

PHYS 402b, Advanced Classical Physics: From Newton to Einstein II Witold Skiba

MW 11:35–12:50 QR, SC (34)

Continuation of PHYS 401a. Prerequisite: PHYS 401a.

PHYS 410a, Classical Mechanics A. Douglas Stone

MW 11:35–12:50 QR, SC (34)

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 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b. Concurrently with PHYS 301a or other advanced mathematics course.

PHYS 420a, Statistical Thermodynamics Daisuke Nagai

MW 11:35–12:50 QR, SC (34)

An introduction to the laws of thermodynamics and their theoretical explanation by statistical mechanics. Applications to gases, solids, phase equilibrium, chemical equilibrium, and boson and fermion systems. Prerequisites: PHYS 301a and 410a or equivalents.

***PHYS 427b/PHIL 436b^c, Philosophy of Quantum Mechanics** Jill North

For description see under Philosophy.

PHYS 430b, Electromagnetic Fields and Optics Volker Werner

MWF 11:35–12:25 QR, SC (34)

Electrostatics, magnetic fields of steady currents, electromagnetic waves, and relativistic dynamics. Provides a working knowledge of electrodynamics. Prerequisites: PHYS 301a and 410a or equivalents.

PHYS 439a/APHY 439a^c, Basic Quantum Mechanics Robert Schoelkopf

For description see under Applied Physics.

PHYS 440b, Quantum Mechanics and Natural Phenomena I Karyn Le Hur

MWF 10:30–11:20 QR, SC (33)

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. Prerequisites: PHYS 410a or 401a.

PHYS 441a, Quantum Mechanics and Natural Phenomena II Karyn Le Hur

MWF 11:35–12:25 QR, SC (34)

Continuation of PHYS 440b. Prerequisite: PHYS 440b.

PHYS 442a, Introduction to Nuclear and Elementary Particle Physics

Daniel McKinsey

TTH 1–2:15 QR, SC (26)

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.

PHYS 448a/APHY 448a^G, Solid-State Physics I Paul Fleury

For description see under Applied Physics.

PHYS 449b/APHY 449b^G, Solid-State Physics II Daniel Prober

For description see under Applied Physics.

PHYS 458a^G/APHY 458a^G, Principles of Optics with Applications Hui Cao

For description see under Applied Physics.

PHYS 460a^G, Mathematical Methods of Physics Nicholas Read

MW 9–10:15 QR (32)

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 301a or other advanced mathematics course.

[PHYS 461b^G/ASTR 461b, Relativity, Astrophysics, and Cosmology]

***PHYS 471a and 472b, Independent Projects in Physics** Sean Barrett

HTBA (RP, O)

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 submitted. For students with a strong background in Physics course work.

Physics and Astronomy

(See under *Astronomy*.)

Physics and Mathematics

(See under *Mathematics and Physics*.)

Physics and Philosophy

Prospective majors in Physics and Philosophy are advised to begin taking the prerequisites during their freshman 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; any introductory Physics lecture sequence numbered 170 or higher; PHYS 165La and 166Lb, or the PHYS 205La or Lb, 206La or Lb laboratory sequence; one introductory Philosophy course.

Beyond the prerequisites, students take seven courses in Physics approved by the director of undergraduate studies and numbered 301 or higher, including (1) PHYS 301a or the equivalent, (2) PHYS 439a or 440b, and (3) PHYS 382Lb; and six courses in Philosophy or in History of Science, History of Medicine, including PHIL 125a and 126b, one course in logic above the introductory level, and a Philosophy seminar selected with the approval of the directors of undergraduate studies. Seniors must complete one of the following: (1) Physics senior essay; (2) PHYS 471a or 472b; (3) PHIL 490a or 491b (senior essay); (4) PHIL 480b (tutorial) in an appropriate subject; (5) an appropriate Philosophy seminar with the approval of the director of undergraduate studies in Philosophy.

Majors should consult Peter Parker (Physics), 206B WNSL, 432-3601, dus.physics@yale.edu, and Kenneth Winkler (Philosophy), 406A C, 432-1679, kenneth.winkler@yale.edu.

REQUIREMENTS OF THE MAJOR

Prerequisites MATH 120a or b; PHYS 170a, 171b, or 180a, 181b, or 200a, 201b, or 260a, 261b; PHYS 165La, 166Lb, or 205La or Lb, 206La or Lb; 1 intro Phil course

Number of courses 13 term courses beyond prereqs, not incl senior req

Distribution of courses 7 Physics courses at level 301 or higher approved by DUS; 6 courses in Philosophy or History of Science, History of Medicine, incl 1 in logic above intro level and a Philosophy sem, as specified

Specific courses required PHYS 301a or equivalent; PHYS 439a or 440b; PHYS 382Lb; PHIL 125a, 126b

Senior requirement 1 from Physics senior essay, PHYS 471a or 472b, PHIL 490a or 491b, PHIL 480b on appropriate topic, or approved Philosophy sem

Polish

(See under Slavic Languages and Literatures.)

Political Science

Director of undergraduate studies: Peter Swenson, 115 Prospect St., 432-5236, peter.swenson@yale.edu

FACULTY OF THE DEPARTMENT OF POLITICAL SCIENCE

Professors Bruce Ackerman, Akhil Amar, Seyla Benhabib, Paul Bracken, David Cameron, Bryan Garsten, Alan Gerber, Donald Green, Jacob Hacker, Jolyon Howorth (*Visiting*), Stathis Kalyvas, Joseph LaPalombara (*Emeritus*), David Mayhew, Douglas Rae, John Roemer, Susan Rose-Ackerman, Frances Rosenbluth, Bruce Russett, Nicholas Sambanis, Kenneth Scheve, James Scott, Ian Shapiro, Stephen Skowronek (*Chair*), Steven Smith, Susan Stokes, Alec Stone Sweet, Peter Swenson, John Wargo, Steven Wilkinson, Elisabeth Wood

Associate Professors Keith Darden, Thad Dunning, Gregory Huber, Pierre Landry, Ellen Lust

Assistant Professors Christopher Blattman, Khalilah Brown-Dean, John Bullock, Daniel Butler, Seok-ju Cho, Alexandre Debs, Samuel DeCanio, Justin Fox, Susan Hyde, Sigrun Kahl, H       Landemore, Adria Lawrence, Jason Lyall, Karuna Mantena, Andrew March, Nikolay Marinov, Nuno Monteiro, Paulina Ochoa Espejo, Ato Kwamena Onoma, Eleanor Powell, Jun Saito, Vivek Sharma, Tariq Thachil, Ana De La O Torres, Jessica Weiss

Senior Lecturers Boris Kapustin, David Smith

Lecturers Steven Bilakovics, Harry Blair, Thomas Donahue, Alexandra Dufresne, Cynthia Farrar, Alvin Felzenberg, Michael Fotos, Stuart Gottlieb, Elizabeth Hanson, Cynthia Horan, Alexander Kirshner, William Kissick, Matthew Kocher, Dominka Koter, Jean Krasno, Stephen Latham, Mark Oppenheimer, Robert Person, David Simon, James Sleeper, John Bryan Starr, Annalisa Zinn

Advising Students majoring in Political Science are expected to choose a member of the Political Science faculty as an adviser. Students are also encouraged to seek advice from other members of the department working in their particular field of interest. Majors must secure written approval of course selections each term from the adviser or another member of the department. All subsequent changes in a student's major program must also be approved. Seniors' schedules must be approved by the director of undergraduate studies.

Students are urged to take the initiative in shaping a coherent program suited to their interests. If they intend to write a senior essay requiring substantial empirical analysis, they should plan to acquire sufficient training in statistics or other methods, as appropriate. Students should consult with their advisers frequently. The director of undergraduate studies and other members of the department can give advice about special programs or problems. Opportunities for two majors, study abroad, and work-and-study arrangements are normally discussed with the director of undergraduate studies. More information on advising can be found on the department's Web site at www.yale.edu/polisci/undergrad/advising.html.

The standard major Eleven term courses of political science are required. (One term of DRST 005a, 006b may count as a political science course.) To fulfill the standard major's distributional requirement, students must take two courses each in three of five fields of political science – international relations, American government, political philosophy, analytical political theory, and comparative government. Students expecting to major in Political Science should take several introductory-level courses in the department early in their college careers. This allows a student to make an informed choice of a field for specialization. Introductory courses count toward the overall course requirement and toward the distributional requirement. Students are also urged to take related offerings in other departments. They may petition to have appropriate courses in other departments count toward the requirements of the major. College seminars count only when taught by a member of the Political Science faculty.

Senior requirement Students majoring in Political Science are required to take at least two seminars taught by members of the Political Science department. One seminar must be

taken in the senior year. Admission to seminars is at the instructor's discretion. Students must complete a substantial paper, as described in "Senior essays" below, in at least one class taken during the senior year, either a seminar or a course specifically designated for that purpose (PLSC 480a or b). Senior essays are due on the last day of classes in the term in which the essay is written. In order to graduate from Yale College, a student majoring in Political Science must achieve a passing grade on the senior essay by the end of the senior year.

Seminar preregistration Political Science majors are given first preference for admission to departmental seminars. The department has instituted a preregistration system that allows instructors of seminars to preregister up to twelve majors prior to the start of each term. The system is administered by the office of the director of undergraduate studies. All majors are eligible to participate in preregistration.

Senior essays The senior essay provides an appropriate intellectual culmination to the student's work in the major and in Yale College. It should ordinarily be written on a topic in an area in which the student has previously done course work. It should rest on extensive research that is appropriate to the subject matter. The suggested length is approximately twenty-five 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. The student should consult regularly with the seminar instructor or adviser. More extensive information about the senior essay can be found on the department's Web site at www.yale.edu/polisci/undergrad/senior_essay.html.

The yearlong senior essay Students who wish to undertake a more extensive research project than is possible in a single term may fulfill the senior requirement by enrolling in the two-term course sequence PLSC 490a, The Senior Colloquium, and 491b, The Senior Essay. In PLSC 490a students develop a research prospectus for the senior essay and begin their research. PLSC 490a counts as a seminar in the major. In PLSC 491b students write the essay under the supervision of a member of the faculty who specializes in the area being investigated. Yearlong senior essays are expected to be substantially longer than a regular term paper. While there is no fixed length, yearlong essays are normally fifty to sixty pages long. Yearlong senior essays are due on the last day of classes in the spring term.

Admission to the yearlong senior essay Majors who wish to enroll in the yearlong senior essay apply for admission in the spring of their junior year. The deadline for the Class of 2012 is April 1, 2011. Students should submit to the office of the director of undergraduate studies: (1) a two-page statement of project, signed by a faculty adviser who has agreed to supervise the student's essay, and (2) an up-to-date transcript. Normally a successful candidate will have at least an A- average in political science courses and a B+ average outside the major. It is expected that no more than fifteen students will be admitted.

The major with an interdisciplinary concentration Students majoring in Political Science may choose an interdisciplinary concentration, which allows them to pursue an area of study that crosses conventional disciplinary and department boundaries. Examples of interdisciplinary concentrations are international studies, urban studies, health politics and policy, and political economy. Students choosing such a concentration are required to

take twelve term courses toward the major, at least seven of which must be in the field of concentration. As many as three courses in the concentration may be taken in other departments, with the approval of the director of undergraduate studies. In addition to taking seven courses in their field of concentration, interdisciplinary concentration majors must take two courses in each of two other fields in the department. The senior requirement is the same as for the standard major, with the proviso that the essay must be written on a subject that falls within the field of concentration.

The intensive major The intensive major gives students an opportunity to undertake extensive research on a topic of interest. To carry out this research, the student takes PLSC 474b, a directed reading and research course, in the sixth term of enrollment. In the seventh term the student takes PLSC 490a, The Senior Colloquium (see above under “The yearlong senior essay”). In the eighth term the student takes PLSC 493b, the independent senior essay course for intensive majors. All other requirements for the intensive major are identical to those for the standard major or interdisciplinary concentration major.

Admission to the intensive major Juniors wishing to pursue an intensive major must apply to the director of undergraduate studies by November 19, 2010. Admission is based on performance and promise. The director of undergraduate studies and the prospective senior essay adviser serve as advisers to candidates for the intensive major in the junior year.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses *Standard major*—11 term courses; *Interdisciplinary concentration*—12 term courses

Distribution of courses *Standard major*—2 courses each in 3 of the 5 departmental fields; *Interdisciplinary concentration*—2 courses each in 2 fields in addition to 7 in field of concentration

Substitution permitted *Standard major*—relevant courses by petition to DUS; *Interdisciplinary concentration*—up to 3 courses in other depts with DUS approval; other courses by petition to DUS

Intensive major 11 term courses; 2 courses each in 3 fields; PLSC 474b, 490a, 493b; *Intensive major with interdisciplinary concentration*—12 term courses as specified, up to 3 of which may be from other depts; PLSC 474b, 490a, 493b

Senior requirement 2 seminars, 1 in senior year, and senior essay

INTRODUCTORY COURSES

PLSC 111a, Introduction to International Relations Jolyon Howorth

MW 10:30–11:20, 1 HTBA SO (33)

World affairs in the unsettled aftermath of a half-century of Cold War traumas. The relative positions of the United States, Japan and Germany, Russia, China, and the Third World. The spread of capitalistic markets and democratic forms; nongovernmental activity across nation-state boundaries; and the precariousness of the status quo.

PLSC 113b, Introduction to American Politics Samuel DeCanio

MW 3:30–4:20, 1 HTBA SO (37)

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.

PLSC 114a, Introduction to Political Philosophy Steven Smith

MW 11:35–12:25, 1 HTBA SO (34)

A study of the first and most fundamental of all political concepts, the regime or constitution. Definition of a regime; evaluation of various kinds of regimes; the kinds of citizens that different regimes produce; differences between ancient and modern conceptions of constitutional government. Readings from Plato, Aristotle, Machiavelli, Hobbes, Locke, Rousseau, and Tocqueville.

PLSC 116a, Introduction to Comparative Politics Adria Lawrence

TTH 10:30–11:20, 1 HTBA SO (23)

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.

PLSC 118b, The Moral Foundations of Politics Ian Shapiro

MW 10:30–11:20, 1 HTBA SO (33)

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 the works of Bentham, Mill, Marx, Rawls, Nozick, Rorty, and MacIntyre.

INTERNATIONAL RELATIONS

***PLSC 121b/HLTH 450b/INTS 349b^C, Strategic Thinking in Global Health**

Elizabeth Bradley and staff

For description see under Global Health Studies.

PLSC 126b^C, The Balance of Power Nuno Monteiro

MW 4:30–5:20, 1 HTBA SO (37)

The role of the balance of power in international relations since the turn of the twentieth century, with special attention to post–Cold War events and trends. Consideration of different theoretical views about the balance of power.

***PLSC 140b^C, Military Power** Nuno Monteiro

T 9:25–11:15 SO (0)

The foundations, applications, evolution, and limits of military power. Clausewitz's *On War* read in conjunction with contemporary works. Military power in relation to international and domestic politics.

***PLSC 141a/EP&E 317a/INTS 360a, Ethics of Humanitarian Intervention**

Annalisa Zinn

T 7–8:50 p.m. SO (0)

Key ethical dilemmas accompanying the practice of humanitarian intervention. Ethical and political obligations of states to protect citizens of other states, justifications for “killing in order to save,” who can legitimately make the decision to intervene, and what criteria should guide humanitarian interventions in the twenty-first century.

***PLSC 144b/INTS 260b, Topics in International Security** Jason Lyall

W 9:25–11:15 SO (0)

An introduction to leading theoretical explanations for inter- and intrastate conflict. Origins, conduct, and outcomes of wars; determinants of military effectiveness; uses and limits of state coercion; the rise of transnational terrorism; and military occupation and state-building. Various historical eras and national experiences are explored.

PLSC 145b/INTS 337b, International Political Economy Kenneth Scheve

MW 10:30–11:20, 1 HTBA SO (33)

An examination of how domestic and international politics influence economic relations between countries. Why governments promote or oppose globalization, cooperate economically in some situations but not others, and sometimes adopt bad economic policies. The politics of trade, international investment, finance, immigration, and environmental policy making. Recommended preparation: introductory economics and statistics.

PLSC 146a/EVST 245a/F&ES 245a, International Environmental Policy and**Governance** Benjamin Cashore

For description see under Environmental Studies.

***PLSC 147b/EP&E 249b, The United Nations and Collective Security** Jean Krasno

For description see under Ethics, Politics, & Economics.

PLSC 148a/INTS 376a, Central Issues in American Foreign Policy Stuart Gottlieb

For description see under International Studies.

***PLSC 151b^c/EP&E 362b/INTS 335b, International Dimensions of Democratization**

Nikolay Marinov

M 1:30–3:20 SO (0)

The role played by international factors such as socialization, coercion, and emulation in the current wave of democratizations around the world. Focus on the extent to which democratic processes can be affected from the outside.

***PLSC 152a/EP&E 245a, Global Firms and National Governments**

Joseph LaPalombara

M 1:30–3:20 SO (0)

Challenges for political policy makers, governmental regulators, and managers of global corporations when corporations make direct investments in foreign countries. Special attention to emergent exclusionary measures in advanced industrial countries.

***PLSC 154a, Gypsies, Tramps, and Thieves** Alec Stone Sweet

T 1:30–3:20 SO (26)

How groups who have chosen to live outside, or on the margins of, society govern themselves through construction and maintenance of a defining culture, law, and methods of dispute resolution. Cases studies include the Roma in Europe, hoboes and other transient workers in North America, pirates in the eighteenth and nineteenth centuries, and the Sicilian Mafia.

PLSC 156a/INTS 364a, International Organizations Susan Hyde

TTH 2:30–3:45 SO (0)

The role international organizations play in solving global problems of political economy, security, development, human rights, democracy promotion, and the environment. Debates over the effects and relative importance of international organizations in world politics, using international relations theory, case studies, and history of specific issue areas.

PLSC 159a/AFST 159a, Africa in International Relations David Simon

TTH 9–10:15 SO (22)

The international interactions of sub-Saharan African countries. Patterns of interactions within the continent, as well as those between Africa and the rest of the world. Topics include both political and economic relations, with special attention to relations between the United States and African peoples and countries.

***PLSC 162b^G, Japan and the World** Jun Saito

M 9:25–11:15 SO (0)

The historical development of Japan's international relations since the late Tokugawa period; World War II and its legacy; domestic institutions and foreign policy; implications for the United States; and interactions between nationalism and regionalism.

***PLSC 163b^G, Domestic Politics and International Conflicts** Alexandre Debs

W 1:30–3:20 SO (36)

The relationship between domestic political institutions and countries' inclinations to wage war. Topics include the democratic peace and diversionary use of force. Introduction to game theory as a technique in widespread use for the study of international conflict. No prior knowledge of game theory is required.

***PLSC 164b^G/INTS 371b, The Causes of War** Keith Darden

W 1:30–3:20 SO (0)

Examination of classical and contemporary theories of the causes of war. Consideration of historical cases that spawned such theories, including the Peloponnesian War, the Thirty Years' War, and World Wars I and II.

PLSC 165a/INTS 310a, International Security Matthew Kocher

MW 2:30–3:20, 1 HTBA SO (37)

An introduction to international security. General theories of state interests and behavior; the causes, conduct, and regulation of violence among nations.

PLSC 166a, The New Europe David Cameron

TTH 10:30–11:20, 1 HTBA SO (23)

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.

***PLSC 169a, Classics of World Politics** Bruce Russett

T 1:30–3:20 SO (26)

Examination of classic political theory from Thucydides to the present. Attention to historical context and contemporary relevance. Enrollment limited to sophomores.

PLSC 172a^G, Strategy, Technology, and War Paul Bracken

TTH 11:35–12:50 SO (24)

The interrelationship of strategy, foreign policy, and technology as it has shaped international relations from Napoleon to the global information grid. Transformations arising from political change and technological advance. Topics include the role of “big” military organizations in the United States, Europe, and Asia; organizing for defense and intelligence; arms control; and the challenge of a second nuclear age.

***PLSC 175a/RSEE 223a, After Communism: The Politics of the Post-Soviet States**

Robert Person

W 3:30–5:20 SO (o)

In relation to all fifteen post-Soviet states, an examination of why states with such similar histories, and a similar burden of the communist legacy, have produced such different political and economic trajectories after years of independence.

***PLSC 183b^c, Europe, the United States, and the Iraq Crisis** Jolyon Howorth

M 1:30–3:20 SO (o)

Examination of the contrasting relations between the main European powers and the United States in their approaches to Iraq in order to understand the divisions attending the 2003 war and the subsequent transfer of sovereignty. Topics include the Iran-Iraq War (1980–88), the first Persian Gulf crisis (1990–91), the sanctions regime (1991–2002), problems of peacekeeping and nation building, and the Obama exit strategy.

***PLSC 184a/INTS 378a^c, The United Nations and the Maintenance of International Security** Jean Krasno

W 1:30–3:20 SO (o)

The evolution of the United Nations and its role in a post–Cold War international system both in preventive diplomacy, with its use of force for peacekeeping and peace enforcement, and in peace building.

***PLSC 185a^c/EP&E 241a, Secession and Political Boundaries** Nicholas Sambanis

T 1:30–3:20 SO (o)

The political economy of decentralization, secession, and the formation of political boundaries. Exploration of why some countries have stable borders while others face demands, sometimes violent, for redrawing them; conditions under which regions are likely to demand autonomy; decentralization as a way to ameliorate or escalate conflicts. Recommended preparation: experience in data analysis and statistics.

PLSC 187b/INTS 373b, Terrorism and Counterterrorism Stuart Gottlieb

For description see under International Studies.

PLSC 188b/INTS 361b, International Human Rights Staff

For description see under International Studies.

PLSC 191a/PHIL 180a, Ethics and International Affairs Thomas Pogge

For description see under Philosophy.

***PLSC 199b/INTS 268b, The Rise and Decline of Empires** Matthew Kocher

M 1:30–3:20 SO (o)

Construction of a theory of empire, building on the new interest in “empire” consequent to American military preponderance. Theory and practice of historical empires, with a focus on the governance of the peripheral regions that most closely correspond historically to failed or rogue states.

AMERICAN GOVERNMENT

***PLSC 200b^c/EVST 355b, Political Economy of Environmental Policy**

Susan Rose-Ackerman

T 1:30–3:20 SO (26)

Tensions between economic analyses and political realities of environmental problems. Roles of the legislature, the executive, and the courts; federalism and the democratic potential of participatory policy making. Focus on the United States, with selected international cases. Prerequisite: introductory microeconomics and a course with a substantive policy focus.

***PLSC 207a, Political Economy of Representation in the United States**

Daniel Butler

W 1:30–3:20 SO (o)

Aspects of political representation, defined as the correspondence between citizen preferences and public policies. Topics include race and representation, the correspondence between representation and participation, and the effect of elections and other institutions on representation.

***PLSC 208b^c/EP&E 247b, The American Welfare State in Comparative Perspective**

Jacob Hacker

M 1:30–3:20 SO (o)

Causes and consequences of America's social welfare framework. Competing analytic and normative perspectives in the context of selected policy issues and political episodes, including health care, retirement pensions, economic inequality, the New Deal, the Great Society, and current debates over Medicare and Social Security.

PLSC 209a, The United States Congress Eleanor Powell

TTH 2:30–3:20, 1 HTBA SO (o)

A critical investigation of the United States Congress, the primary democratic institution in the American political system. Focus on individual members of Congress, institutional features, and the role of Congress within the larger separation-of-powers system.

***PLSC 210a^c, Political Preferences and American Political Behavior** Gregory Huber

M 1:30–3:20 SO (o)

Introduction to research methods and topics in American politics. Focus on ideas about choice that are useful for the study of politics. Topics include utility theory, heuristics and biases, proximity vs. directional voting, Bayesian updating, retrospective voting, priming and framing, the role of emotion, and the consequences of political ignorance.

***PLSC 212a, Democracy and Sustainability** Michael Fotos

TH 1:30–3:20 SO (o)

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.

PLSC 215b/EVST 255b/F&ES 255b, Environmental Politics and Law John Wargo

For description see under Environmental Studies.

***PLSC 217a⁶, U.S. National Elections** David Mayhew

W 1:30–3:20 SO (o)

An investigation of electoral realignments, voting for president and Congress, voter turnout, incumbency advantage, nominations, and campaign finance.

PLSC 226b, Parties, Elections, and Policy Making David Mayhew

TTH 10:30–11:20, 1 HTBA SO (23)

A survey of electoral history, party ideologies, party competition, campaigns, turnout, voter coalitions, congressional and presidential elections, Southern politics, and policy making.

***PLSC 227b/EP&E 310b, Refugee Law and Policy** Alexandra Dufresne

For description see under Ethics, Politics, & Economics.

***PLSC 230a, Parties and Leaders in Congress** Eleanor Powell

M 1:30–3:20 WR, SO (o)

Political parties, party leaders, and committee leaders in the legislative policy-making process. The strengths and weaknesses of parties, agenda setting, and paths to congressional leadership. Individuals from Sam Rayburn to Nancy Pelosi and from LBJ to Harry Reid.

PLSC 231b/PSYC 123b, The Psychology, Biology, and Politics of Food Kelly Brownell

For description see under Psychology.

PLSC 233a, Constitutional Law Akhil Amar

MW 1–2:15 SO (36)

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.

***PLSC 234a⁶/EP&E 389a, The Politics, Law, and Economics of Affirmative Action**

Ian Shapiro, Michael Graetz

M 3:30–5:20 SO (o)

The politics, law, and economics of affirmative action, principally in the United States. Arguments for and against affirmative action. Focus on education, employment, and political representation.

***PLSC 239b⁶, Experimental Methods in Political Science** Alan Gerber

M 3:30–5:20 SO (o)

An introduction to experimental methods as they can be used to study politics. Strengths and weaknesses of experimental and nonexperimental studies. Applications include effects of television advertising, formation of political attitudes, and causes of voter turnout. Design and implementation of an experiment. Recommended preparation: introductory statistics.

***PLSC 241a/AFAM 283a, Voting Rights and Representation** Khalilah Brown-Dean

T 1:30–3:20 SO (o)

Evaluation of historical and contemporary efforts of minority groups to secure and protect access to the franchise. Particular emphasis on the politics of linking African Americans' ballots with substantive political representation.

***PLSC 243b, Communication and Congress** Alvin Felzenberg

M 3:30–5:20 SO (o)

Influence of the media on Congressional priorities; impact of actions taken by Congress on how the old and new media cover the legislative branch. How Congress develops, conveys, and acts upon information. Topics include legislative oversight, executive-legislative relations, the role of money in politics, political recruitment, and legislative apportionment.

***PLSC 244a/EP&E 324a, Journalism, Liberalism, Democracy** James Sleeper

T 1:30–3:20 SO (o)

The news media's role in configuring the democratic public sphere, from the early synergy of print capitalism and liberalism through the corporate consolidation of mass media and the recent fragmentation and fluidity of "news." Classical-humanist and civic-republican responses to these trends.

***PLSC 245a, Urban Politics and Policy** Cynthia Horan

TH 1:30–3:20 SO (o)

Approaches to urban politics and political economy. Application of theories to contemporary policy issues such as policing, metropolitan disparities, and inner-city revitalization.

***PLSC 248a/EP&E 367a, The Political Economy of Health Care** Peter Swenson

M 1:30–3:20 SO (o)

Economic and political factors affecting the quality, financing, and delivery of health care in America from the early twentieth century to the present, with some international comparisons. Topics include the century-long struggle for guaranteed health insurance, the emergence of the private, employer-based system, and the politics of quality and cost-effectiveness of health care delivery. Recommended preparation: introductory microeconomics.

***PLSC 249b, Public Opinion** Samuel DeCanio

T 3:30–5:20 SO (o)

Public opinion in democratic societies. Voter ignorance, representation, elite manipulation of public opinion, and attitude formation.

***PLSC 251b⁶/AMST 468b, Progressivism: Theory and Practice** Stephen Skowronek

W 3:30–5:20 SO (37)

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.

***PLSC 254a, American Founding Debates** Steven Bilakovics

TH 1:30–3:20 SO (o)

Consideration of whether the Constitution should be rewritten and improved. Relevance of our founding document to modern times. Debates between the Federalists and Anti-Federalists.

***PLSC 255b, Politics and the Media in the United States** Daniel Butler

W 1:30–3:20 SO (o)

Major ideas, theories, and evidence in the study of political communication, in particular the effects of the mass media on public discourse, politics, and American government.

Democracy and deliberation; the political economy of news production; the creation and effects of political campaigns; and the use of critical and scientific methods in the study of politics and communication.

***PLSC 256b/EP&E 248b, American Political Institutions** Michael Fotos

TH 1:30–3:20 SO (o)

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.

PLSC 257b/EP&E 343b, Bioethics and Law Stephen Latham

TTH 9–10:15, 1 HTBA SO (22)

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.

***PLSC 260a, Public Schools and Politics** John Starr

T 3:30–5:30 SO (RP, o)

Investigation of how political decisions that affect public schools are made at local, state, and federal levels. Case studies from both districts and states. Preference to students with training and experience in national, state, and local politics.

***PLSC 263a/AFAM 421a/ER&M 234a, Race and Ethnicity in American Politics**

Khalilah Brown-Dean

T 1:30–3:20 SO (o)

Race and ethnicity in American politics. The social construction of race; intersections between race and gender; black, Latino, and Asian American public opinion and political participation; minority representation; the relationship among race, racism, and public policy; immigration and citizenship; state politics; the psychology of racial politics; and the role of race in campaigns.

***PLSC 264b, Big City Politics in America: New York, Los Angeles, Chicago**

Cynthia Horan

TH 3:30–5:20 SO (o)

How globalization and responses to it are changing the politics of New York, Los Angeles, and Chicago. Focus on economic restructuring, government reorganization, transformations of urban space, immigration, racial conflicts, and grassroots mobilization.

***PLSC 268a/AFAM 280a/JDST 290a, Black and Jewish Community Politics**

Khalilah Brown-Dean

T 9:25–11:15 SO (o)

Patterns of political conflict and coalescence between black and Jewish communities in the United States. Attention to issues of identity, leadership, mobilization, and participation. Emphasis on the political motivations and consequences of events such as Oceanhill-Brownsville, Crown Heights, the civil rights movement, and the burning of Southern churches and synagogues. Prerequisite: PLSC 113b.

***PLSC 272a, U.S. Party Formation** Samuel DeCanio

T 3:30–5:20 SO (o)

The ideological development of the Republican and Democratic parties. The rise of contemporary American ideological divisions; economic regulatory issues generating partisan conflict during the nineteenth and twentieth centuries.

***PLSC 274b, Exploring the American Dream** Steven Bilakovics

TH 1:30–3:20 SO (o)

The American Dream, one of the central features of American political, economic, and religious thought. Changing conceptions of the American way of life from the time of the Pilgrims to the present.

***PLSC 275b^c, Inequality and American Politics** Jacob Hacker

M 9:25–11:15 SO (o)

The role of politics and public policy in abetting the hyperconcentration of income at the top of the economic ladder in the United States, and the ways in which this hyperconcentration has in turn transformed American politics. Topics include changes in corporate governance and executive compensation, tax policy, campaign finance, the revolving door between government and the private sector, and the role of unions.

***PLSC 277b, Politics and the New Media** Cynthia Farrar

M 1:30–3:20 SO (o)

A study of changes taking place in contemporary American journalism. The impact of these changes on government and political campaigns.

PLSC 279a/ARCH 385a/EP&E 285a/HIST 152a/SOCY 149a, New Haven and the American City Alan Plattus, Elihu Rubin

HTBA SO (o)

New Haven as a window on the problems and promise of American urbanism. New Haven compared with New York, New Orleans, Louisville, Cleveland, Houston, Denver, and San Francisco. Emphasis on the historical development of transportation, manufacturing, housing, governance, and culture. Problems of planning, education, class, and race.

***PLSC 280b, Poverty, Politics, and Policy in the American City** Cynthia Horan

W 1:30–3:20 SO (o)

Examination of how politics informs the formulation and implementation of policies to address urban poverty. Consideration of alternative explanations for poverty and alternative government strategies. Focus on efforts by local organizations and communities to improve their situations within the context of government actions.

POLITICAL PHILOSOPHY

PLSC 281a^c/RLST 273a^c, Moral, Religious, and Social Issues in Bioethics

David Smith

TTH 10:30–11:20, 1 HTBA SO (23)

A selective survey of issues in biomedical ethics. Comparison of different points of view about biomedical issues, including religious vs. secular and liberal vs. conservative. Special attention to issues in research and at the beginning and end of life.

PLSC 285a/RLST 175a^c, Bioethics: Freedom, Justice, and Religion David Smith

TTH 11:35–12:50 SO (o)

Moral issues that arise in care for the terminally ill, set in the context of social, political, philosophical, and religious argument about justice in the payment for and distribution of health care. Focus on organ transplantation, treatment of dementia, and care for the dying.

PLSC 290a/HUMS 302a/SOCY 151a, Foundations of Modern Social Theory

Emily Erikson

For description see under Sociology.

***PLSC 297b/EP&E 312b/INTS 269b, Moral Choices in Politics** Boris Kapustin

For description see under International Studies.

***PLSC 302b^c, Aristotle's Political Thought** Bryan Garsten

T 7–8:50 p.m. SO (o)

A careful reading of Aristotle's *Nicomachean Ethics* and *Politics*, along with selected debates in the secondary literature. Consideration of Aristotle's place in recent political theory.

***PLSC 305a/EP&E 353a/INTS 363a, Critique of Political Violence** Boris Kapustin

For description see under International Studies.

***PLSC 309b^c/PHIL 454b^c, Contemporary Critical Theory** Seyla Benhabib

W 1:30–3:20 SO (o)

Critical theory after Jürgen Habermas's "theory of communicative action." Challenges of a postnational society, the rise of a global worldwide net, increasing multiculturalism, the end of secularism, and a worldwide economic crisis. Habermas's response, as well as that of the third generation of critical theorists, to these issues.

***PLSC 310b^c, Borders** Paulina Ochoa Espejo

T 3:30–5:20 SO (o)

Examination of the concept of borders by relating theoretical debates to historical and contemporary political problems. Topics include the question of what a border is, under what conditions borders are appropriate, how borders are indicated (signs, lines, barbed-wire fences, walls), who governs borders, and how they should be governed.

***PLSC 314a^c, Means and Ends in Politics** Karuna Mantena

W 9:25–11:15 SO (o)

Principles of political action (means) and political ideals (ends), with consideration of the tensions between idealism and realism, philosophy and politics, moral and political judgment, practice and theory, and intention and consequences. Readings from Aristotle, Machiavelli, Burke, Weber, Arendt, and Gandhi.

***PLSC 320b^c/PHIL 407b^c, Rousseau at 300** Steven Smith

T 1:30–3:20 SO (o)

A sample of the many different faces of Jean-Jacques Rousseau (1712–78) in anticipation of the tercentenary of his birth. Major political works, selections from educational writings, a novel, autobiographies, and an opera. Rousseau's legacies in politics, culture, philosophy, and morality.

PLSC 322b, Empire and Modern Political Thought Karuna Mantena

TTH 4–5:15 SO (27)

The role of European expansion in the development of modern political thought. How the imperial experience – discovery of new peoples, conquest, colonial settlement, and global commerce – affected the formation of such central concepts of political theory as reason, freedom, rights, sovereignty, property, and progress. Readings in Vitoria, Montaigne, Hobbes, Grotius, Locke, Diderot, Smith, Kant, Burke, Mill, Marx, and Arendt.

PLSC 323a, Justice in Western Thought Hélène Landemore

TTH 2:30–3:45 SO (27)

Exploration of different conceptions of justice and the just society in Western political thought from Plato to Rawls.

PLSC 326a^G/PHIL 327a^G, Borders, Culture, and Citizenship Seyla Benhabib

TTH 2:30–3:20, 1 HTBA SO (o)

New patterns of migration, increasing demands for multicultural rights, and transnational effects of globalization faced by contemporary societies. Changes to the institution of citizenship in liberal democracies; shifting distinctions between rights of citizenship, residency, and migration; whether long-term residents should be allowed to participate in politics.

***PLSC 327a/EP&E 220a, Collective Choice and Political Morality** Thomas Donahue

For description see under Ethics, Politics, & Economics.

***PLSC 329b^G/RLST 197b^G, Islamic Law and Ethics** Andrew March

TH 9:25–11:15 SO (o)

Introduction to Islamic legal and ethical thought for advanced students of ethics, law, or political philosophy. The history of (Sunni) Islamic jurisprudence and positive law; doctrines and debates on the epistemic status of legal-ethical knowledge and the hermeneutical and analytic methods for deriving it; study of a substantive problem in Islamic legal and ethical thought.

***PLSC 333b^G/EP&E 392b, Topics in Democratic Theory** Ian Shapiro

M 3:30–5:20 SO (37)

An examination of recent work in democratic theory. Particular attention to competing definitions of democracy; transitions to democracy; systems of democratic representation; tensions between democracy and other goods; and democracy and world politics.

***PLSC 337b/EP&E 382b, Democracy and the Politics of Opposition**

Alexander Kirshner

For description see under Ethics, Politics, & Economics.

***PLSC 338a/EP&E 383a, Democracy and Constitutionalism** Alexander Kirshner

For description see under Ethics, Politics, & Economics.

PLSC 339b, Constitutional Democracy: Principles and Dilemmas Bryan Garsten

MW 10:30–11:20, 1 HTBA SO (33)

Philosophical debates about constitutional democracy. What it means to be a citizen, the power of the executive, the role of political parties, the place of the military in a republic, the purpose of courts, and the meaning of elections. Readings include contemporary news items and historical and philosophical texts.

ANALYTICAL POLITICAL THEORY

***PLSC 340b^G, Qualitative Field Research** Adria Lawrence

T 3:30–5:20 SO (RP, O)

Introduction to qualitative field research methods. Basic techniques for collecting, interpreting, and analyzing ethnographic data. Emphasis on the core ethnographic techniques of participant observation and in-depth interviewing.

***PLSC 343b/ECON 473b/EP&E 227b, Equality** John Roemer

For description see under Ethics, Politics, & Economics.

PLSC 344b^G, Game Theory and Political Science Justin Fox

TTH 4–5:15, 1 HTBA QR, SO (27)

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 159a toward the major.

COMPARATIVE GOVERNMENT

PLSC 347b/AFST 347b, Post-Conflict Politics David Simon

MW 1–2:15 SO (36)

Issues and challenges faced by countries emerging from domestic conflict. Focus on elements of peace-building—demilitarization, post-conflict elections, institution-building, and reconstruction—and on modes of transitional justice from international criminal courts to truth and reconciliation processes.

***PLSC 351a/SAST 243a, Democracy in South Asia** Tariq Thachil

TH 3:30–5:20 SO (O)

The development and difficulties of democratic politics in South Asia. Colonial legacies to democracy, the evolution of caste politics, the effects of a growing middle class, and the nature of social movements and ethnic conflict in structuring political life.

***PLSC 354b^G/EP&E 250b/INTS 357b, The European Union** David Cameron

T 1:30–3:20 SO (O)

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.

PLSC 356b/AFST 356b/INTS 326b/LAST 412b, Collective Action and Social Movements Elisabeth Wood

TTH 4–5:15 SO (O)

The emergence and evolution of collective mobilizations for social change, among them demonstrations, land occupations, strikes, abortion clinic blockades, revolutions, and genocide. Case studies are drawn from environmental justice, living wage, and South

African labor movements, as well as from religious mobilization, social movements in Central America, and the Rwandan genocide. Theoretical approaches to political opportunity, social networks, and social preferences.

PLSC 360a/INTS 247a^G, Comparative and International Bioethics Stephen Latham

TTH 9–10:15, 1 HTBA SO (o)

Approaches in different countries, both developed and developing, to a number of core issues in biomedical ethics: organ transplants, end-of-life care, human-subject research, and access to health care. Readings in primary and secondary sources, including international treaties and standards.

***PLSC 365b/SLAV 207b^G, Languages and Politics** Robert Greenberg

For description see under Slavic Languages & Literatures.

***PLSC 368a/EP&E 251a, Global Politics** Stathis Kalyvas

T 1:30–3:20 SO (o)

Major issues in current international politics, from political economy to international security. Development of broad analytic and synthetic skills through focus on themes such as the politics of economic crisis, global governance, state failure, international intervention, and environmental management.

***PLSC 372a/EP&E 242a, Politics and Markets** Peter Swenson

For description see under Ethics, Politics, & Economics.

***PLSC 379a^G, Japanese Politics and Political Economy** Jun Saito

M 9:25–11:15 SO (o)

Japan's political institutions and their effect on the policy-making process. Japan's emerging role in the world political economy.

PLSC 385b/AFST 385b, Introduction to African Politics Ato Kwamena Onoma

MW 1–2:15 SO (36)

Themes in contemporary African politics, including the impact of colonialism, the challenges of geography, and the effects of economic and political reform attempts and of efforts at resistance. Comparative introduction to the politics of various African countries.

***PLSC 388a^G, Public Opinion in China** Pierre Landry

TH 1:30–3:20 SO (o)

Evaluation of research on public opinion in China since the 1990s. Substantive and theoretical debates that survey-based literature has generated; practical use of these data sources in students' work.

***PLSC 389b/AFST 389b/MMES 181b, Middle East Exceptionalism** Adria Lawrence and staff

F 1:30–3:20 SO (o)

The Middle East and North Africa in comparative perspective. Evaluation of claims that the region's states are exceptionally violent, authoritarian, or religious. Themes include gender, Islam, nation and state formation, oil wealth, terrorism, and war.

***PLSC 390a^G/EAST 357a, State and Society in Post-Mao China** Jessica Weiss

T 3:30–5:20 SO (o)

State-society relations in the People's Republic of China. Popular protest and social mobilization, media commercialization and the Internet, and prospects for political reform and democratization.

PLSC 394b/MMES 481b, Introduction to Middle East Politics Ellen Lust

TTH 9:25–10:15, 1 HTBA SO (22)

An overview of politics in the Middle East and North Africa, with particular attention to state formation, Islam, oil, and the Arab-Israeli conflict as these influence regime type, political stability, and economic development.

***PLSC 397a/SLAV 205a^G, Language, Nationality, and Ethnic Conflict in the Balkans**

Robert Greenberg

For description see under Slavic Languages & Literatures.

***PLSC 398a^G/EP&E 244a, Property Rights, Politics, and the Economy**

Ato Kwamena Onoma

M 3:30–5:20 SO (37)

An examination of property rights, the mechanisms that guarantee them, and their impact on the economy and on politics. Effects of property rights on social justice and equality. The security, transformation, and persistence of property rights in various societies.

***PLSC 399a^G/INTS 307a, Anti-Americanism and Popular Protest** Jessica Weiss

T 1:30–3:20 SO (0)

Anti-Americanism and other varieties of antiforesh sentiment in the developing world. International and domestic sources of anti-Americanism and implications for U.S. foreign policy.

***PLSC 401b/EP&E 321b, Promoting Democracy in Developing Countries**

Harry Blair

W 3:30–5:20 SO (0)

Western efforts to promote democratization in developing countries in the past twenty years through foreign aid programs. Emphasis on “applied democracy” – putting theory into action.

***PLSC 407a/INTS 387a, The Politics of Nationalism and Ethnicity** Matthew Kocher

For description see under International Studies.

***PLSC 410b, Patronage and Clientelism in Democratic Systems** Dominika Koter

TH 9:25–11:15 SO (0)

Clientelism, patronage, and vote buying. Elections and public deliberation as they shape a society's priorities for the distribution of public resources (money, goods, public employment); the diversion of resources to individuals or groups as a quid pro quo for their political support of governments or political parties.

***PLSC 417a/AFST 360a/EP&E 365a/INTS 347a, The Political Economy of AIDS in Africa** Nicoli Nattrass and staff

For description see under International Studies.

***PLSC 419a, Forced Migration** Ato Kwamena Onoma

T 9:25–11:15 SO (0)

Themes in the study of forced migration, including the definition of the phenomenon, investigation of its causes, relations between forced migrants and host communities, and dynamics of the return home.

***PLSC 420a/EVST 424a, Rivers: Nature and Politics** James Scott

W 3:30–5:20 SO (o)

The natural history of rivers and river systems and the politics surrounding the efforts of states to manage and engineer them.

***PLSC 423b/EP&E 243b, Political Economy of Poverty Alleviation**

Ana De La O Torres

T 1:30–3:20 SO (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.

***PLSC 428a/EP&E 240a/INTS 333a^c, Comparative Welfare Policy in Developing Countries** Jeremy Seekings

For description see under International Studies.

***PLSC 430b/AFST 420b/EP&E 246b/LAST 406b, The Politics of Development Assistance** David Simon

T 1:30–3:20 SO (o)

Study of development assistance, a dominant feature of the political economies of some of the world's poorest countries. The motivations and politics of aid from donors' perspectives; the political and economic impact of aid on developing countries. Proposals to make aid a more effective instrument of development.

PLSC 433b/EAST 356b/INTS 355b, East Asian Capitalism Jun Saito

MW 2:30–3:45 SO (o)

Comparative political economy of five political systems in East Asia: China, Japan, North and South Korea, and Taiwan. Historical development of political institutions, success and failure of democratization, political determinants of economic growth, and public policy challenges such as gender equity and environmental degradation.

PLSC 435a/MMES 290a/RLST 290a, Islam Today: Jihad and Fundamentalism

Frank Griffel

For description see under Religious Studies.

***PLSC 442a/SAST 341a, Development in South Asia** Tariq Thachil

T 2:30–4:20 SO (o)

Introduction to issues surrounding political and economic development in South Asia. Successes and failures of modernization, including the influence of intellectual trends and their derivative policy prescriptions. Foundational perspectives on development and the policies they yielded; empirical treatments of the experiences of South Asian countries in the postcolonial era.

***PLSC 447a/AFST 447a, The Rwandan Genocide in Comparative Context**

David Simon

W 1:30–3:20 SO (o)

An examination of the 1994 Rwandan genocide: historical sources of the conflict, the motivations of the killers, actions and reactions of outside actors, efforts to reconstruct a post-genocide society, and continuation of the genocidal dynamic within the Great Lakes region. Consideration of other countries in similar situations, as well as other genocides in recent decades.

PLSC 449b/INTS 327b, Ethnic Conflict Steven Wilkinson

MW 1–2:15 SO (36)

Examination of ethnic conflict and discrimination. Theories of ethnic identity formation, the role of ethnicity in politics, and the economics of discrimination; historical as well as contemporary settings.

PLSC 456b, Introduction to Political Economy Alexandre Debs

TTH 2:30–3:45 SO (27)

Institutions that affect economic growth; the role of government in the economy. Classic texts applied to current-day policy making.

***PLSC 463b/EP&E 260b, Political Violence and Its Participants** Elisabeth Wood

W 3:30–5:20 SO (0)

Patterns of participation in political violence against civilians, prisoners, and combatants. Soldiers who comply with orders that violate codes of conduct compared with those who resist; individuals who join terrorist organizations compared with others who do not; conditions under which people act as bystanders or heroes in the face of violence; potential justification for killing civilians while fighting for another cause.

STATISTICAL AND MATHEMATICAL METHODS

PLSC 452a/EP&E 203a/STAT 102a^G, Introduction to Statistics: Political Science

Jonathan Reuning-Scherer, Alan Gerber

For description see under Statistics.

PLSC 453a/EP&E 209a/STAT 103a^G, Introduction to Statistics: Social Sciences

Jonathan Reuning-Scherer

For description see under Statistics.

ADVANCED COURSES

***PLSC 471a and 472b, Individual Reading for Majors** Members of the department

2 HTBA (0)

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.

***PLSC 474b, Directed Reading and Research for Junior Intensive Majors** Members of the department

HTBA (0)

For juniors preparing to write 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.

***PLSC 480a or b, One-Term Senior Essay** Members of the department

HTBA (o)

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, The Senior Colloquium** David Cameron

W 3:30–5:20 (o)

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 491b, The Senior Essay** Members of the department

HTBA (o)

Each student writing a yearlong senior essay establishes a regular consultation schedule with a department member who, working from the prospectus prepared in PLSC 490a, advises the student about preparation of the essay and changes to successive drafts. The final essay is submitted in April. Enrollment limited to Political Science majors writing a yearlong senior essay.

***PLSC 493b, Senior Essay for Intensive Majors** Members of the department

HTBA (o)

Each student writing a senior essay establishes a regular consultation schedule with a department member who, working initially from the student's previously approved prospectus, 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 in April. Enrollment limited to Political Science intensive majors.

Portuguese

Director of undergraduate studies: K. David Jackson, 82–90 Wall St., 432-1158,
k.jackson@yale.edu

Portuguese is taught at Yale as part of the Department of Spanish and Portuguese; the names of departmental faculty members teaching Portuguese courses appear in the faculty list under "Spanish."

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.

Students begin the study of Portuguese with PORT 110a or 125b, elementary courses without prerequisites. After two years of Portuguese language study, students have sufficient proficiency to take advanced courses in Luso-Brazilian literature and culture.

The standard major, for which the prerequisite is PORT 140b or the equivalent, consists of twelve term courses. Students must take at least two term courses each in the literatures of Portugal and of Brazil. 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. 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.

Senior requirement All majors must either present a senior essay or take the departmental examination. The essay is written in PORT 491a or b or 492a or b. A maximum of two credits counts toward the major. The examination is both written and oral and covers three periods of Portuguese and Brazilian literatures.

Placement 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 examination will be given on Sunday, August 29, from 2 to 4 p.m. and from 4:30 to 6:30 p.m., and in the spring term on Sunday, January 9, at 6 p.m.

REQUIREMENTS OF THE MAJOR

Prerequisite PORT 140b or equivalent

Number of courses 12 term courses beyond prereq (incl senior essay course, if elected)

Distribution of courses At least 2 courses in lit of Portugal, 2 in lit of Brazil

Substitution permitted With DUS permission, up to 4 relevant courses from other depts or from study abroad

Senior requirement Senior essay (PORT 491a or b or 492a or b) or dept exam

*PORT 001b, *Latin American Short Fiction* Paulo Moreira

TTH 9–10:15 HU Fr sem Tr (0)

Introduction to Latin American literature through one of its highest achievements: the short narrative from Brazil and Spanish America. Works of Brazilian authors (Machado de Assis, Guimarães Rosa, Graciliano Ramos, Clarice Lispector) compared with short stories from Spanish America (Quiroga, Rulfo, Carpentier, Borges) and the United States (Faulkner, Ellison, Chopin). Narrative structure and expressive qualities of the texts; literary currents; and social, psychological, and existential themes. Readings and discussion in English; texts available in the original languages. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

*PORT 010a, *Portraits of Brazil* K. David Jackson

MW 9–10:15 HU Fr sem Tr (32)

Representations of Brazil in the arts, literature, music, and other descriptive media. Focus on the portrayal of nature, society, and identity in works by travelers, visitors, religious

figures, scientists, and local artists. Readings and discussion in English. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

PORT 110a, Elementary Portuguese I Marta Almeida

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

Basic vocabulary and fundamentals of grammar through practice in speaking, reading, and writing, with stress on audiolingual proficiency. Introduces Brazilian and Portuguese culture and civilization. Credit only on completion of PORT 120b.

PORT 120b, Elementary Portuguese II Marta Almeida

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of PORT 110a. To be followed by PORT 130a. Prerequisite: PORT 110a. Qualifies students for summer study abroad.

[PORT 125b, Intensive Elementary Portuguese]

PORT 130a, Intermediate Portuguese I Marta Almeida

MTWTHF 3:30–4:20 L3 1½ Course cr (RP, 37)

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 used to build vocabulary. Exercises develop students' oral command of the language.

[PORT 140b, Intermediate Portuguese II]

***PORT 150a, Advanced Practice in Portuguese** Paulo Moreira

MWF 1:30–2:20 L5 (RP, 36)

Advanced conversation and composition, with an introduction to Luso-Brazilian literature and culture. After PORT 140b. May be repeated for credit.

PORT 246a/SPAN 245a, Latin American Film: Brazil, Mexico, and Argentina

Paulo Moreira

MW 2:30–3:45 HU (37)

An overview of the best cinema produced in Brazil, Mexico, and Argentina; survey of recent films by influential directors from these countries. Comparative discussion of cultures, using the contexts of film production and content. Conducted in English.

PORT 249b, Introduction to Brazilian Culture Paulo Moreira

TTH 11:35–12:50 L5, HU (24)

Introduction to current cultural issues in Brazil, with an overview of the country's music, art, dance, theater, literature, and cinema. Source materials include literary and nonliterary texts in Portuguese, Web pages, music, and films. Conducted in Portuguese.

***PORT 394a/LITR 294a/SPAN 385a, World Cities and Narratives** K. David Jackson

M 1:30–3:20 WR, HU Tr (o)

Study of world cities and selected narratives that describe, belong to, or represent them. Topics range from the rise of the urban novel in European capitals to the postcolonial fictional worlds of major Portuguese, Brazilian, and Spanish American cities. Conducted in English.

***PORT 471a and 472b, Directed Reading or Directed Research** K. David Jackson

HTBA (o)

Individual study for qualified students under the supervision of a faculty member selected by the student. Approval of the director of undergraduate studies required.

***PORT 491a or b and 492a or b, The Senior Essay** K. David Jackson

HTBA (o)

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

Director of undergraduate studies: Laurie Santos, 213 SSS, 432-4524, psychdus@yale.edu;
senior thesis director: Julia Kim-Cohen, 317 K, 432-7581, julia.kim-cohen@yale.edu

FACULTY OF THE DEPARTMENT OF PSYCHOLOGY

Professors Woo-kyoung Ahn, J. Truett Allison, Stephen Anderson, Amy Arnsten, John Bargh, Linda Bartoshuk, Sidney Blatt, Paul Bloom, Thomas Brown, Kelly Brownell, Joseph Chang, Marvin Chun, Margaret Clark, Ravi Dhar, John Dovidio, Carol Fowler (*Adjunct*), Donald Green, Laurence Horn, Marcia Johnson, Alan Kazdin, Frank Keil, Marianne LaFrance, James Leckman, Lawrence Marks, Gregory McCarthy, Susan Nolen-Hoeksema, Nathan Novemsky, Donald Quinlan, Peter Salovey, Brian Scholl, Fred Volkmar, Victor Vroom, Allan Wagner, Karen Wynn

Associate Professors Jeremy Gray, Jeannette Ickovics, Robert Kerns, Jr., Ami Klin, Linda Mayes, Douglas Mennin, Maria Piñango, Laurie Santos, Glenn Schafer, Mary Schwab-Stone, Jane Taylor, Teresa Treat

Assistant Professors June Gruber, Gaja Jarosz, Julia Kim-Cohen, Jelena Krivokapić, Jaime Napier, Kristina Olson

Lecturers Marc Brackett, Nancy Close, Nelson Donegan, Carla Horwitz, David Klemanski, Kristi Lockhart, Burton Saxon, Barbara Shiller, Benjamin Toll

The introduction to psychology is PSYC 110a or b, the general survey course. All other courses have PSYC 110a or b as a prerequisite, except the courses listed under “Survey Courses without Prerequisite.”

Courses in the department are organized so that they are best taken in several parallel sequences. Courses numbered from 120 to 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 to 209 focus on statistics and general methodology. Courses numbered from 210 to 299 teach data collection in various areas of psychology. Courses numbered from 300 to 399 are more advanced courses in a particular specialization. Senior seminars, whose enrollment is limited to twenty students, are numbered from 400 to 489. These seminars are best taken once a student has appropriate background. Courses numbered from 490 to 499 are special tutorial courses for which permission of the adviser and the director of undergraduate studies is required.

The standard major The major in Psychology requires twelve term courses beyond PSYC 110a or b, not including the senior requirement. No more than two term courses taken Credit/D/Fail may be applied toward the major. For the Class of 2012 and subsequent classes, no 200-level course taken Credit/D/Fail may be applied toward the major.

1. Because psychology is so diverse a subject, every student is required to take at least two courses from the social science point of view in psychology (List A) and at least two from the natural science point of view (List B). At least one course from each list must be a core course numbered from 120 to 190 and ending in zero. Students are expected to take those two core courses as early as possible in the major, normally within two terms after declaring their major.

List A: 125a, 127a, 128b, 140a, 150b, 180a, 194a, 304b, 306a, 314a, 315b, 319b, 330b, 355a, 356b

List B: 130a, 137a, 147b, 149b, 160b, 170a, 230Lb, 240a, 318b, 323a, 350a or b, 371a, 376a

2. Because statistical techniques and the mode of reasoning they employ are fundamental in psychology, a course in statistics (PSYC 200b or equivalent) is required, preferably prior to the senior year. A student may substitute an examination arranged with the instructor of PSYC 200b for this requirement. Students may take such an examination only one time.
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 and 299 fulfill this requirement. (The same course may satisfy both this and the first requirement.)
4. To encourage consideration of the relation between psychology and other disciplines, students may count toward the major as many as three term courses in other related departments, including college seminars. Appropriate courses are offered in anthropology, biology, cognitive science, computer science, philosophy, political science, and sociology. Some students may find courses in other subjects related to their major. Students should consult with the director of undergraduate studies in Psychology about selecting outside courses. In all cases, courses in other departments must have substantial psychological content or clear links to topics in psychology.
5. Students are urged to take at least one seminar especially for seniors (400–489). They are also encouraged to take at least one of several tutorials (PSYC 490a, 491b, 492a, 493b) designed as independent study courses. Students interested in research are encouraged to take a tutorial as early as the sophomore year. Students may also take PSYC 495a or b for one-half course credit per term with prior permission of the faculty adviser and the director of undergraduate studies. No more than a total of three credits from PSYC 490–495 combined may count toward the major.

Senior requirement Majors are required to earn two course credits from courses numbered PSYC 400–495. At least one of these course credits must be taken during the senior year and, for the B.S. degree, at least one must be a directed research course (PSYC 492a or 493b) taken during the senior year. Juniors may preregister for senior seminars at the end of the junior year. In order to count credits obtained from PSYC 400–495 toward the

senior requirement, a student must submit a substantial final paper (a minimum of 20 pages for a one-credit course, 10 pages for a half-credit course).

Distinction in the Major To be considered for Distinction in the Major, students must submit a senior essay to the Psychology department before the last day of classes in the final term of enrollment. The senior essay must be written during the senior year and must be a product of one or two of the 400-level courses taken to fulfill the senior requirement. Before submitting a senior essay, students must have an approved proposal and an essay adviser. Senior essays that are submitted after the deadline will be subject to grade penalties.

B.S. requirement The B.S. degree is typically awarded to students who conduct empirical research through a directed research course. B.S. candidates must fulfill the research methods and statistics requirements before starting the senior year. An empirical research project normally includes designing an experiment and collecting and analyzing the data. To be considered for a B.S. degree with Distinction, a student must submit a research proposal of one to two single-spaced pages, signed by the senior essay adviser, by the end of registration period in the fall term of the senior year. The proposal must specify a research hypothesis, a rationale for the hypothesis, and proposed methods for collecting and analyzing data.

B.A. requirement The B.A. degree is typically awarded to students who conduct a non-empirical literature review, but there are no restrictions in the research format. To be considered for a B.A. degree with Distinction, a student must submit a proposal of one to two pages, signed by the essay adviser and specifying the research topic, by the end of registration period in the fall term of the senior year.

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 under Computer Science and Psychology for more information.

Departmental advisers Schedules for all majors must be discussed with, and approved by, the director of undergraduate studies or the advisers for the neuroscience and philosophy tracks 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 the director of undergraduate studies. For questions concerning special tracks, students should consult the advisers for the neuroscience and philosophy tracks in Psychology.

Psychology and early childhood teaching For students in the Classes of 2011 and 2012, it is possible to combine a major in Psychology with a program of study in the Teacher Preparation and Education Studies program to earn a Connecticut teaching certificate in early childhood education. This combination creates opportunities to join theory with practice through field experiences at early childhood centers in New Haven. See under Teacher Preparation and Education Studies for more information.

Neuroscience track in Psychology 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). Students with such interests are encouraged to meet with the track adviser, Glenn Schafe, 204 DL, 432-3461, glenn.schafe@yale.edu.

Requirements for the neuroscience track are the same as for the standard major, with the following exceptions:

1. Two introductory courses are required for the major, MCDB 120a and E&EB 122b. Some students with advanced preparation may place out of either or both of these courses (see the “Placement” paragraph under Biology for details) at the discretion of the adviser for the neuroscience track. When the exemption is granted, the student is strongly encouraged to take an additional course in Psychology or Biology.
2. The student must take PSYC 170a or 160b, and a data-collection course, PSYC 230Lb, 240a, or 270b. PSYC 235a does not count as a data-collection course except with additional neuroscience lab experience and approval of the neuroscience track adviser. MCDB 320a may substitute for the PSYC 170a or 160b requirement, or MCDB 320a and 321La may substitute for the PSYC 230Lb, 240a, or 270b requirement, but not both. If MCDB 320a is substituted for a psychology course, it cannot also be counted as one of the three additional courses outside the department.
3. At least six courses must be in the Psychology department, including at least two from the Psychology List A. The List A courses do not need to be core courses with a number ending in zero.
4. At least three courses must be chosen from the following: Ecology and Evolutionary Biology and Molecular, Cellular, and Developmental Biology courses numbered 200 and above that deal with human and/or animal biology (recommended courses include MCDB 200b, 202a, 205b, 210b, 300a, and 320a); BENG 350a and 421b; CPSC 475b and <477a>; MB&B 300a, 301b, 420a, 421b, 425a, 435a, 443b, and 452b; MATH 222a or b, 225a or b, 230a, and 231b; and STAT 241a. In addition to these courses, others may be selected in consultation with the neuroscience track advisers. Students should note that many of these courses have prerequisites that must be taken first.
5. The senior requirement for the neuroscience track is the same as for the standard major, except that the two required course credits from PSYC 400–495 credits must have neuroscience content. For students writing a senior essay, the senior essay adviser may be a faculty member in another related department, subject to approval by the director of undergraduate studies. Independent study courses require prior permission of the faculty adviser and the adviser for the neuroscience track. Topics for the senior essay vary widely. When appropriate, all topics should include discussion of the known or potential neurobiological mechanisms underlying the psychological phenomena of interest. By the end of the junior year, students must obtain approval from the neuroscience track adviser for the proposed program for the senior year.

Philosophy track in Psychology Students with interests encompassing both philosophy and psychology may wish to elect the philosophy track. Students in this track are considered Psychology majors for whom the requirements have been modified to accommodate

their interests in philosophy. The adviser for the philosophy track is Brian Scholl, 304 SSS, 432-4629, brian.scholl@yale.edu.

Requirements for the philosophy track are the same as for the standard major in Psychology except that five of the elective courses required for the major must be taken from the Philosophy department, with the remaining eight courses (including the prerequisite) taken from the Psychology department. (This track thus precludes the possibility of counting any additional classes from other departments toward the major, as is possible in the standard major.) Students electing the philosophy track must still satisfy all other requirements of the major, including the requirements for introduction to psychology, statistics, research methods, List A and List B, and the senior project. For the senior project requirements, one of the credits from courses numbered 400–495 must be completed in the Psychology department, and the other in the Philosophy department. Senior project advisers for students in this track may be chosen from either the Psychology or Philosophy departments. In selecting courses in philosophy, students are advised to consider the following aims: (1) to obtain a background through an introductory or historical course in philosophy; (2) to obtain breadth by taking at least one course in each major area defined in the description of the Philosophy major; (3) to include courses addressing problems especially pertinent to psychology.

Students interested in psychology and philosophy are also urged to consult the description of the psychology track offered by the Philosophy department for an alternative method of satisfying these interests.

REQUIREMENTS OF THE MAJOR

STANDARD MAJOR

Prerequisite PSYC 110a or b

Number of courses 12 term courses beyond prereq (not incl senior req)

Specific course required PSYC 200b

Distribution of courses *B.A.* — 2 courses from List A, 2 courses from List B as specified; 1 Psych course numbered 210–299; *B.S.* — Same, with completion of the statistics and research methods requirement before senior year

Substitution permitted For PSYC 200b, exam arranged with instructor; up to 3 relevant courses in other depts, with DUS permission

Senior requirement *B.A.* — Two course credits from PSYC 400–495, one during senior year; *B.S.* — PSYC 492a or 493b taken during senior year; one course credit from PSYC 400–495

NEUROSCIENCE TRACK

Prerequisite PSYC 110a or b

Number of courses 12 term courses beyond prereq (not incl senior req)

Specific courses required PSYC 170a or 160b; PSYC 200b; PSYC 230Lb, 240a, or 270b; MCDB 120a; E&EB 122b

Distribution of courses *B.A.* — At least 6 courses in Psych, incl 2 from List A; at least 3 courses in biological and mathematical sciences, as specified; *B.S.* — Same, with completion of the statistics and research methods requirement before senior year

Substitution permitted MCDB 320a for PSYC 170a or 160b, or MCDB 320a and 321La for PSYC 230Lb, 240a, or 270b

Senior requirement *B.A.* — Two course credits from PSYC 400–495 with neuroscience content, one during senior year; *B.S.* — PSYC 492a or 493b with neuroscience content taken during senior year; one course credit from PSYC 400–495 with neuroscience content

PHILOSOPHY TRACK

Prerequisite PSYC 110a or b

Number of courses 12 term courses beyond prereq

Specific course required PSYC 200b

Distribution of courses 7 courses in Psych, 5 courses in Phil; 2 courses from List A, 2 courses from List B as specified; 1 Psych course numbered 210–299

Substitution permitted For PSYC 200b, exam arranged with instructor

Senior requirement Same as for standard major, except that one of the credits from courses numbered 400–495 must be from the Psychology dept, the other from the Philosophy dept, with adviser from either dept

INTRODUCTORY COURSE

PSYC 110a or b, Introduction to Psychology Paul Bloom [F], Marvin Chun [Sp]

TTH 1–2:15 [F]; MW 1–2:15 [SP] SO (o)

A survey of major psychological approaches to the biological, cognitive, and social bases of behavior.

SURVEY COURSES WITHOUT PREREQUISITE

PSYC 123b/PLSC 231b, The Psychology, Biology, and Politics of Food Kelly Brownell

TTH 1–2:15 SO (o)

A study of eating as it affects the health and well-being of every human. Taste preferences, food aversions, the regulation of hunger and satiety, food as comfort, friendship, and social ritual; the politics of food, including sustainable agriculture, organic farming, genetically modified foods, nutrition policy, and food and agriculture industries; malnutrition, eating disorders, and the global obesity epidemic; food advertising aimed at children, poverty and food, and effects of the modern environment on eating.

***PSYC 125a/CHLD 125a/TPRP 125a, Child Development** Nancy Close

For description see under Child Study Center.

***PSYC 127a/CHLD 127a/TPRP 127a, Early Childhood Methods** Carla Horwitz

For description see under Child Study Center.

***PSYC 128b/CHLD 128b/TPRP 128b, Language, Literacy, and Play** Nancy Close,

Carla Horwitz

For description see under Child Study Center.

***PSYC 129a/STAT 129a, Statistics as a Way of Knowing** Nelson Donegan

MF 11:35–12:50 QR (34)

An introduction to basic concepts of statistics and probability that allow us to describe, evaluate, and understand aspects of the world and make informed choices. Exploration of relationships among statistical reasoning, cognitive psychology, and philosophical theories of knowledge. Enrollment limited to freshmen and sophomores.

PSYC 130a/CGSC 110a, Introduction to Cognitive Science Staff

For description see under Cognitive Science.

PSYC 137a/LING 117a^C, Language and Mind Maria Piñango

For description see under Linguistics.

PSYC 147b, Animal Models of Clinical Disorders Nelson Donegan

MWF 11:35–12:25 SC, SO (34)

An interdisciplinary approach to understanding and treating psychiatric disorders. Focus on how research with animal models, developed to simulate human disorders such as drug addiction, depression, Parkinson's disease, and schizophrenia, can advance our understanding of these disorders and generate more effective treatments for patients.

***PSYC 194a/TPRP 194a, Educational Psychology** Burton Saxon

For description see under Teacher Preparation & Education Studies.

SURVEY COURSES WITH PREREQUISITE

PSYC 110a or b is a prerequisite for the courses in this group.

PSYC 140a, Developmental Psychology Frank Keil

TTH 9–10:15 (22)

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.

PSYC 150b, Social Psychology Marianne LaFrance

TTH 11:35–12:50 SO (0)

Study of social cognition, attitudes and persuasion, group processes, intergroup processes, prosocial behavior, aggression, and conformity. Theories, methodology, and applications of social psychology.

PSYC 160b, Human Neuroscience Jeremy Gray

TTH 9–10:15 SC (22)

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.

PSYC 170a, Fundamentals of Neuroscience Thomas Brown

MW 2:30–3:45 SC, SO (37)

Examination of the way the nervous system controls behavior. Biological insights about neural cell function are applied to processes such as learning, emotion, and perception.

PSYC 180a, Abnormal Psychology Susan Nolen-Hoeksema

MW 11:35–12:50 SO (34)

The major forms of psychopathology that appear in childhood and adult life. Topics include the symptomatology of mental disorders; their etiology from psychological, biological, and sociocultural perspectives; and issues pertaining to diagnosis and treatment.

STATISTICS AND GENERAL METHODOLOGY

PSYC 200b, Statistics Jaime Napier

MWF 9:25–10:15 QR (32)

Measures of central tendency, variability, association, and the application of probability concepts in determining the significance of research findings.

DATA COLLECTION

PSYC 230Lb, Research Methods in Human Neuroscience Gregory McCarthy

F 12–4 SC (0)

Methods of human neuroscience research. Focus on functional magnetic resonance imaging, electroencephalography, and evoked potentials. Students design experiments, acquire data, and perform analyses. Extensive use of MATLAB. Prerequisites: PSYC 160b or 170a and a course in statistics, or permission of instructor.

PSYC 235a, Research Methods in Psychology Woo-kyoung Ahn

MF 9:25–10:15, 1 HTBA WR, SO (32)

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. No prerequisites.

***PSYC 240a, Research Methods in Conditioning and Learning** Allan Wagner

TTH 1–2:15 SC (26)

Laboratory examination of the basic procedures used in the investigation of animal learning. Topics include habituation, classical conditioning, and instrumental learning.

***PSYC 270b, Research Methods in Behavioral Neuroscience** Staff

HTBA SC (0)

Laboratory course in which students design and conduct research to study brain function and behavior. Emphasis on hands-on participation in surgical, behavioral, and other neuroscience techniques. Prerequisites: PSYC 170a and a course in statistics.

ADVANCED COURSES

PSYC 304b/CGSC 304b, The Mental Lives of Babies and Animals Karen Wynn

MW 2:30–3:45 SO (37)

Interdisciplinary exploration of the cognitive, social, and emotional capacities of creatures lacking language and culture. The extent to which our complex psychology is unique to mature humans; the relative richness of a mental life without language or culture. Some attention to particular human populations such as children with autism and adults with language disorders.

***PSYC 306a, Nature, Nurture, and Human Behavior** Julia Kim-Cohen

MW 2:30–3:45 SO (0)

Study of genetic and nongenetic contributions to individual differences in human behavior and development. Topics include cognitive abilities, personality, violence, homosexuality, and psychopathology. Research methods for identifying genetic and environmental

influences and for investigating gene-environment interaction. Some discussion of the bioethical implications of behavior genetics.

[PSYC 314a, Political Psychology]

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

TTH 11:35–12:50 SO (o)

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.

PSYC 318a/LING 120a^G, General Phonetics Jelena Krivokapić

For description see under Linguistics.

PSYC 319b/HLTH 215b, Health Psychology Benjamin Toll

For description see under Global Health Studies.

PSYC 322a/LING 130a^G, Evolution of Language Stephen Anderson

For description see under Linguistics.

***PSYC 323a^G, Food and the Brain** Ivan de Araujo, Kristin Rudenga

TTH 4–5:15 SC (o)

Brain responses to the ingestion of food, and brain circuits that control appetite and body weight. Basic neurobiology of chemosensation (taste, smell, and flavor perception); neural circuits responsible for energy metabolism and body weight. Neurochemistry of food reward and nutrient preference; altered physiological states associated with food intake, including food craving, the effects of stress on eating, and obesity. Prerequisite: PSYC 160b, 170a, or permission of instructor.

***PSYC 327a/LING 141a^G, Language and Computation** Gaja Jarosz

For description see under Linguistics.

PSYC 330b, Psychology and the Law Kristi Lockhart

TTH 1–2:15 SO (26)

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.

PSYC 331b/LING 231b^G, Neurolinguistics Maria Piñango

For description see under Linguistics.

***PSYC 350a or b/CHLD 350a or b, Autism and Related Disorders** Ami Klin,
Fred Volkmar

For description see under Child Study Center.

***PSYC 355a and 356b, Clinical Psychology in the Community** Kristi Lockhart

W 9:25–11:15 Cr/year only (o)

Mental disorders as they are treated within a community setting. Students participate in a fieldwork placement, working either one-on-one or in groups with the psychiatrically

disabled. Seminar meetings focus on such topics as the nature of severe mental disorders, the effects of deinstitutionalization, counseling skills, and social policy issues related to mental health. Prerequisite: PSYC 180a.

***PSYC 360a/LING 260a^G, Topics in Syntax: The Mental Lexicon** Maria Piñango
For description see under Linguistics.

***PSYC 371a, Laboratory in Animal Cognition** Laurie Santos
T 7–8:50 p.m. (o)

An introduction to current issues, laboratory techniques, and field methods in animal cognition. Students help develop and pilot research projects on nonhuman primates. Topics include number, theory of mind, and causality.

***PSYC 372a/LING 490a^G, Research Methods in Linguistics** Claire Bowerin
For description see under Linguistics.

PSYC 376a, Basics of Learning and Memory Thomas Brown
TTH 2:30–3:45 SC, SO (o)

The basic facts, general principles, and theories that describe how higher animals, from mice to humans, are changed by their experiences. The historically separate fields of learning and memory research desegregated under a neuroscientific perspective that recognizes the evolutionary continuity among higher animals. Prerequisites: introductory courses in biology and psychology, or permission of instructor.

SENIOR SEMINARS

The seminars below may be used to fulfill the senior requirement.

***PSYC 407b/CGSC 407b, Cognitive Science of Causality** Frank Keil
M 1:30–3:20 SO (o)

Examination of how people and animals track causal patterns in the world around them. Topics include the perception of causality; mechanistic, teleological, and psychological causation; variations in causal thinking across domains; the role of counterfactuals; biases and heuristics in causal thought; and the development of causal thinking.

***PSYC 418a^G, The Social Brain** Gregory McCarthy
F 1:30–3:20 SO (o)

Selected topics in social neuroscience, including animacy and the attribution of intention from motion, thinking about the self and others, and moral judgments. Prerequisite: PSYC 160b, 170a, or permission of instructor.

***PSYC 419a^G, Food Policy and Science** Kelly Brownell
M 1:30–3:20 SO (o)

The science on food and nutrition is connected with pressing policy issues. Topics include hunger, obesity, and the impact of food production and consumption on the environment.

***PSYC 423b^G/CGSC 423b, Cognitive Science of Good and Evil** Paul Bloom
T 2:30–4:20 SO (o)

Interdisciplinary exploration of issues such as our sense of right and wrong, the interaction of emotion and reason, the relationship between moral thought and moral action, and what the study of moral psychology can tell us about how best to live our lives.

***PSYC 425b^G/CGSC 425b, Social Perception** Brian Scholl

TH 1:30–3:20 SO (o)

Connections between visual perception, among the earliest and most basic of our 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.

***PSYC 454b^G, Sensory Information Processing** Lawrence Marks

T 9:25–11:15 SC, SO (o)

A functional examination of the ways that sensory systems transduce stimulus energies and information. Topics include sensory anatomy and physiology, psychophysical analysis of the qualitative dimensions of sensory experience, selective attention, and interactions among sensory, perceptual, and cognitive mechanisms.

***PSYC 461b/TPRP 195b, Issues in Special Education** Barbara Shiller

For description see under Teacher Preparation & Education Studies.

***PSYC 475b^G, Brain and Behavior** Thomas Brown

TTH 1–2:15 SC (o)

Overview of modern concepts and theories of brain function, emphasizing evolution, behavior, and cognition. Topics include the organization of the nervous system, effects of drugs, mechanisms of learning and thinking, various brain dysfunctions, and contemporary methods of analysis. Prerequisite: PSYC 160b, 170a, or permission of instructor.

***PSYC 489b, Principles of Cognitive and Behavior Therapy** Alan Kazdin

W 2:30–4:20 SO (o)

An examination of the diverse theories, principles, and treatments in behavior therapy, including operant and classical conditioning, cognitive behavioral approaches, and social learning. Enrollment limited to senior Psychology majors.

TUTORIALS***PSYC 490a and 491b, Directed Reading** Laurie Santos

HTBA (o)

Individual study for qualified students, primarily seniors, who wish to investigate an area of psychology not covered by regular departmental offerings. A student must be sponsored by a faculty member, who sets requirements and meets regularly with the student. To register, the student must submit a written plan of study approved by the adviser to the director of undergraduate studies. The normal minimum requirement is a term paper, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms.

***PSYC 492a and 493b, Directed Research** Laurie Santos

HTBA (o)

Empirical research projects for qualified students, primarily seniors. A student must be sponsored by a faculty member, who sets the requirements and supervises research. To register, the student must submit a written plan of study approved by the adviser to the director of undergraduate studies. The normal minimum requirement is a written report

of the completed research, but individual faculty members may set alternative equivalent requirements. May be elected for one or two terms.

***PSYC 495a or b, Research Topics** Laurie Santos

M 1:30–3:20 ½ Course cr (o)

Discussion of current and advanced topics and/or ongoing research projects. Specific areas of research correspond to 700-level courses. Students sign up for sections at www.yale.edu/oci, using the last two digits of the corresponding 700-level course number. Enrollment forms, which must be signed by the instructor of the section, are available at the office of undergraduate studies. May be repeated for credit.

COURSES OF INTEREST IN OTHER DEPARTMENTS

***ART 111a or b, Visual Thinking** Anna Betbeze and staff

***BENG 485b⁶, Fundamentals of Neuroimaging** Fahmeed Hyder, Douglas Rothman

Psychology and Computer Science

(See under Computer Science and Psychology.)

Psychology and Philosophy

(See under Philosophy or under Psychology.)

Public Health

For information about Yale College course offerings related to health, see under Global Health Studies.

B.A.–B.S./M.P.H. degree program The Select Program in Public Health gives 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 in a five-year joint program. During four years of Yale College enrollment, students complete a standard Yale College major and six course credits applicable toward the M.P.H. degree. Students are placed in a public health internship between the fourth and fifth years of the program and study at the School of Public Health (YSPH) full time in the fifth year, when they complete the master's thesis and the remaining ten courses for the master's degree.

Students apply to YSPH for the joint program in the fall term of their junior year. Candidates must present evidence of a commitment to public health, as well as a record of one year of college-level mathematics and either biology, chemistry, or physics. Applicants must complete YSPH application forms and submit transcripts, SAT scores, three letters of recommendation, and a personal statement. Financial aid, if provided during the fifth year, comes from YSPH.

Further information about this program may be obtained from the YSPH Office of Student Affairs, 60 College Street, P.O. Box 208034, New Haven, CT 06520-8034, 785-6260, or on the Web at <http://publichealth.yale.edu>.

Religious Studies

Director of undergraduate studies: Stephen Davis, 451 College St., 432-0828, stephen.davis@yale.edu

FACULTY OF THE DEPARTMENT OF RELIGIOUS STUDIES

Professors Gerhard Böwering, Jon Butler, John Darnell, Stephen Davis, Carlos Eire, Steven Fraade, Philip Gorski, Phyllis Granoff, Frank Griffel, Christine Hayes, Paula Hyman, Bentley Layton, Ivan Marcus, Dale Martin, Vered Noam (*Visiting*), Gene Outka, Harry Stout (*Chair*), Denys Turner, Miroslav Volf, Robert Wilson

Associate Professors Shannon Craigo-Snell, Ludger Viefhues-Bailey

Assistant Professors Kathryn Lofton, Andrew March, Andrew Quintman, Eliyahu Stern

Senior Lecturers Koichi Shinohara, David Smith

Lecturers Adel Allouche, Hugh Flick, Jr., John Grim, Jonathan Kaplan, Margaret Olin, Hizky Shoham, Mary Evelyn Tucker, Sandra Valabregue-Perry

The study of religion investigates religious traditions, institutions, cultural practices, texts, and ideas in many different ways. Courses in the Religious Studies department concentrate on the history of religious traditions (Western and Eastern, ancient and modern) and the role of religion in shaping past human cultures and current events; on textual traditions and religious literatures of various kinds; and on ethical and philosophical issues central to religious reflection, such as the nature of the divine or the problem of evil and suffering. Because religious studies is an interdisciplinary field, it makes use of a wide variety of methods and academic disciplines. Students who want a broad introduction to the study of religions can choose courses listed under Groups A or B below, 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 and other members of the faculty.

Religious Studies course offerings, other than freshman seminars, are arranged in four categories. Group A features general, comparative, and thematic courses that engage more than one religious tradition. 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. Normally, courses in Groups A to C have no prerequisites while courses in Group D have a specific prerequisite or require the permission of the instructor.

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 courses and a two-term senior essay.

Core requirement A core of six term courses in Religious Studies is required of all majors. One core course examines world religions; qualifying courses include RLST 100b or others

with permission of the director of undergraduate studies. Three core courses are in the historical or textual study of a specific religion, most commonly from Group B; each of the three courses must be on a different religion, and at least one must be focused on Judaism, Christianity, or Islam and one on Buddhism or Hinduism. One core course, selected in consultation with the director of undergraduate studies, focuses on systematic thought (ethics, philosophy of religion, or theology). The final core course is RLST 490b, the junior seminar on approaches to the study of religion. Before the end of the junior year, students must also 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 investigate religious phenomena or literature and are integral to the student's area of concentration may count toward the major with permission of the director of undergraduate studies. 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 director of undergraduate studies, 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 unit. Through them students can develop expertise in a single 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. 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 director of undergraduate studies. Students who think they may elect this program should consult the director of undergraduate studies 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 topic 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 director of undergraduate studies. The Senior Essay (RLST 491a, 492b) 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 director of undergraduate studies by the last day of classes of the first term in order to receive a grade of “satisfactory” for that term.

Students in Yale College are eligible to take certain courses in the Divinity School; those interested should consult its bulletin. Some Divinity School courses may count toward the major, with permission of the director of undergraduate studies.

Students majoring in Religious Studies who plan to do graduate work in the subject are strongly encouraged to study languages of which a reading knowledge will be needed for their graduate program.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses *Program I*—12 term courses (incl two-term senior essay); *Program II*—8 term courses in Rel St (incl two-term senior essay), and 4 nonintro courses in another subject linked with senior essay, chosen in consultation with DUS

Specific course required *Both programs*—RLST 490b

Distribution of courses *Both programs*—1 course in world religions; 3 courses in historical or textual study of a specific religion, as specified; 1 course in systematic thought, as specified; 1 sem other than junior sem, as specified

Substitution permitted *Program I*—related courses in other depts, incl 2 courses in related ancient lang, with DUS permission; *Both programs*—Divinity School courses, with DUS permission; related courses for world religions req, with DUS permission

Senior requirement *Both programs*—senior essay (RLST 491a, 492b)

FRESHMAN SEMINAR

***RLST 012a/HUMS 092a, Divine Law in Historical Perspective** Christine Hayes
For description see under Humanities.

GENERAL, COMPARATIVE, AND THEMATIC COURSES (GROUP A)

[RLST 100b, Introduction to World Religions]

***RLST 110b^c, Apocalyptic Religion in Cross-Cultural Perspective** Robert Wilson
TH 1:30–3:20 HU (o)

An examination of millennial and “end-time” beliefs in a variety of cultures around the world. Attention given to Jewish and Christian texts as well as Native American traditions, African and Asian movements, and modern manifestations such as Jonestown and Heaven’s Gate.

RLST 111a/AMST 111a/HIST 129a/WGSS 111a, Sexuality and Religion

Kathryn Lofton

TTH 11:35–12:25, 1 HTBA HU (o)

The sexuality of American religion. Case studies and theoretical works illuminate connections between ideas about sex and religion, as well as the interrelation of sexual and religious practices. Focus on mapping the relationship between sexuality and the texts, rituals, regulations, and communities of American religious cultures.

RLST 112b, Defining Religion Kathryn Lofton

MW 10:30–11:20, 1 HTBA HU (o)

Major problems in the contemporary study of religion explored through theoretical readings and case studies. Historical and current names used for the academic study of religion, such as comparative religion, history of religion, and science of religion. Ways in which these names and the methodologies associated with them have influenced how scholars define the term “religion.”

SURVEYS OF RELIGIOUS TRADITIONS (GROUP B)

RLST 126a/SAST 262a, Tibetan Buddhism Andrew Quintman

MW 11:35–12:50 HU (o)

Introduction to major themes in Tibetan Buddhist thought and practice, including Buddhist ethics, systems of monastic and ascetic life, ritual applications, sacred geography and pilgrimage, and lay religion. The status of Buddhism in Chinese-occupied Tibet and in the West.

***RLST 127b^G, Biography in Asian Religions** Andrew Quintman

TH 1:30–3:20 HU (o)

The significance of life writing in the religious traditions of Asia. Readings both from primary texts and from theoretical works on biography and autobiography.

RLST 130a/HUMS 418a/SAST 367a, Traditional Literature of India, China, and Japan
Koichi Shinohara, Phyllis Granoff

For description see under Humanities.

***RLST 140a^G, Gnostic Religion and Literature** Bentley Layton

T 3:30–5:20 HU (o)

The early Christian heresy known as Gnosticism explored through its scriptures and the words of its ancient opponents. Gnostic myth and dualism; Satan and demons as creators of the world; theories of salvation; Gnostic versions of the Bible; Gnostic Christianity and ancient philosophy.

RLST 145a, Introduction to the Old Testament (Hebrew Bible) Christine Hayes

MW 1–2:15 HU (36)

The Old Testament (Hebrew Bible) as an expression of the religious life and thought of ancient Israel. Emphasis on the texts’ cultural and historical setting in the ancient Near East. Introduction to a wide range of critical and literary approaches to biblical studies. Students view course lectures on line; class time focuses on close reading and discussion of biblical texts and their subsequent interpretation.

[RLST 146b/JDST 202b, Judaism: Continuity and Change]

RLST 148a^G/HIST 219a^G/JDST 200a^G, History of the Jews to the Reformation

Ivan Marcus

For description see under History.

RLST 149b^G/HIST 220b^G/JDST 201b^G, History of Jewish Culture, 1500 to the Present

Paula Hyman

TTH 11:35–12:50 HU (24)

A broad introduction to the history of Jewish culture from the late Middle Ages until the present. Emphasis on the changing interaction of Jews with the larger society as well as the transformation of Judaism in its encounter with modernity.

RLST 158b^G/HIST 226b^G/HUMS 422b/NELC 326b, Jesus to Muhammad: Ancient Christianity to the Rise of Islam

Stephen Davis

MW 10:30–11:20, 1 HTBA HU (33)

The history of Christianity and the development of Western culture from Jesus to the early Middle Ages. The creation of orthodoxy and heresy; Christian religious practice; philosophy and theology; politics and society; gender; Christian literature in its various forms, up to and including the early Islamic period.

RLST 161a/HIST 200a, History of Catholicism: The First Millennium

Carlos Eire

MW 2:30–3:20, 1 HTBA HU (37)

A survey of the development of Catholic Christianity from its beginnings to the twelfth century, tracing its rise from a small persecuted sect to its apogee in the age of cathedrals and crusades. Topics include social, intellectual, and cultural history; institutions and doctrines; and symbols, rituals, and ethics.

RLST 162b/HIST 201b, History of Catholicism: The Second Millennium

Carlos Eire

MW 2:30–3:20, 1 HTBA HU (37)

A survey of the development of Catholic Christianity from the Middle Ages to the present, tracing its evolution from a position of dominance in twelfth-century Europe to its current role as a global religion in a largely irreligious world. Topics include social, intellectual, and cultural history; institutions and doctrines; and symbols, rituals, and ethics.

RLST 163a^G/HUMS 316a, Reason, Faith, and Feeling: Early Modern Christian Thought

Shannon Craigo-Snell

TTH 11:35–12:25, 1 HTBA HU (0)

A survey of major developments in religious thought in the West from Descartes to Schleiermacher, focusing on the struggles to defend, discredit, or distance religious belief in relation to reason. Connections between theology, philosophy, and social history. No background in religious studies assumed.

RLST 164b^G/HUMS 317b, History, Hope, and the Self: Modern Christian Thought

Shannon Craigo-Snell

TTH 11:35–12:25, 1 HTBA HU (0)

An overview of important developments in Western religious thought during the nineteenth and twentieth centuries. Connections between philosophy, theology, and social history. Authors include Hegel, Barth, Tillich, Rahner, and Gutiérrez. No background in religious studies assumed.

RLST 170b/MMES 192b, The Religion of Islam Gerhard Böwering

TTH 2:30–3:45 HU (27)

The rise of Islam in Arabia; Muhammad and the Qur'an; Muslim tradition and religious law; crucial issues of Islamic philosophy and theology; basic beliefs and practices of the Muslim community; religious institutions and modern trends.

TOPICS IN RELIGIOUS STUDIES (GROUP C)

RLST 175a^C/PLSC 285a, Bioethics: Freedom, Justice, and Religion David Smith

For description see under Political Science.

***RLST 180a/SAST 312a, Rituals of Buddhist Tantra** Andrew Quintman

TH 1:30–3:20 HU (o)

The ritual traditions of tantric Buddhism in India and Tibet. Topics include the practice of deity yoga, tantric physiology, the use of mantras and the creation of mandalas, monastic protocol, social and state-sponsored practices, pilgrimage, and death practices. A prior course in Buddhism helpful but not required.

***RLST 182b/SAST 459b, Buddhist Traditions of Mind and Meditation**

Andrew Quintman

T 1:30–3:20 HU (o)

Buddhist meditation practices examined in the context of traditional theories of mind, perception, and cognition. Readings both from Buddhist canonical works and from secondary scholarship on cognitive science and ritual practice.

***RLST 183a, The Bhagavad Gita** Hugh Flick, Jr.

W 1:30–3:20 HU Tr (o)

An examination of the Bhagavad Gita in its historical and religious context. Exploration of the major interpretations of this important religious text. All readings in translation.

***RLST 192a^C/HIST 165Ja^C/JDST 297a^C, Religion, Ethnicity, and Identity in American Jewish History** Paula Hyman

M 1:30–3:20 HU (o)

An exploration of how Jews in America negotiated, and renegotiated, religion and ethnicity to forge a hyphenated American identity. Topics include the impact of Protestant domination, immigrant experiences and legacies, the role of discrimination, and self-presentation and representation by others.

***RLST 197b^C/PLSC 329b^C, Islamic Law and Ethics** Andrew March

For description see under Political Science.

***RLST 201a/HIST 232Ja/HUMS 443a/JDST 270a/MMES 342a, Medieval Jews, Christians, and Muslims Imagining Each Other** Ivan Marcus

For description see under Humanities.

RLST 202b^C/HIST 345b^C/JDST 265b^C, Jews in Muslim Lands from the Seventh to the Sixteenth Centuries Ivan Marcus

For description see under History.

RLST 214a^G/HIST 248a/JDST 293a^G, Introduction to Modern Jewish Thought

Eliyahu Stern

For description see under Judaic Studies.

***RLST 217b^G/HIST 221Jb^G/JDST 390b^G, Memory, Memoirs, and Modern Jewish History** Paula Hyman

For description see under History.

***RLST 224a^G/JDST 277a^G, Major Trends in Kabbalah** Sandra Valabregue-Perry

For description see under Judaic Studies.

RLST 230a^G/HIST 269a^G/JDST 286a^G, Holocaust in Historical Perspective

Paula Hyman

For description see under History.

***RLST 234b/JDST 275b, Kabbalah and Philosophy in the Jewish Middle Ages**

Sandra Valabregue-Perry

For description see under Judaic Studies.

***RLST 235b^G/HIST 219Jb^G, Secular and Traditional Worldviews in Modern Western Thought** Eliyahu Stern

For description see under History.

RLST 237b^G/HIST 240b/JDST 294b^G, The Jewish Enlightenment Eliyahu Stern

For description see under Judaic Studies.

***RLST 240a, The Historical Jesus** Dale Martin

TTH 2:30–3:45 WR, HU (o)

Introduction to the study of Jesus in canonical and noncanonical sources. History of the quest for the historical Jesus, methods for reconstructing a historical account of Jesus, and versions of Jesus as offered by the early Gospels. No background in New Testament assumed.

RLST 273a^G/PLSC 281a^G, Moral, Religious, and Social Issues in Bioethics

David Smith

For description see under Political Science.

***RLST 278b, Christian Understandings of Evil and the Power of God**

Shannon Craigo-Snell

M 1:30–3:20 HU (o)

Examination of various ways that Christian theologians have described evil in relationship to God's power. Use of traditional and contemporary texts.

RLST 290a/MMES 290a/PLSC 435a, Islam Today: Jihad and Fundamentalism

Frank Griffel

MW 10:30–11:20, 1 HTBA HU (33)

Introduction to modern Islam, including some historical background. Case studies of important countries in the contemporary Muslim world, such as Egypt, Iran, Pakistan, and Saudi Arabia. Islam as a reactive force to Western colonialism; the ideals of Shari'a and jihad; violence and self-sacrifice; and Islam as a political ideology.

***RLST 295a^G/JDST 272a^G, Al-Ghazali and Maimonides** Frank Griffel

M 1:30–3:20 HU (o)

The lives and thought of the philosopher theologians Al-Ghazali and Maimonides. Comparison of their lives and writings, focusing on their integration of Aristotelian philosophy into the theology of Islam and Judaism.

***RLST 311a^G/AMST 392a, Religion and Popular Culture** Kathryn Lofton

TTH 2:30–3:45 HU (o)

The religious dimensions of consumer culture. The marketing of goods by religious institutions and religious imagery in purportedly secular goods. Popular arts and media that portray religion and religious ideas and that serve the “religious” purpose of conveying meaning in the values they represent.

ADVANCED TOPICS IN RELIGIOUS STUDIES (GROUP D)

***RLST 408b^G/JDST 400b, Midrash Seminar: Exodus 32 and Its Midrashic Development** Christine Hayes

TTH 1–2:15 HU (o)

A study of the midrashic career of the Golden Calf story. Examination of the rich and polyphonic tradition of interpretation found in the Bible itself, in ancient translations, and in classical rabbinic sources. Prerequisite: reading proficiency in Hebrew.

***RLST 415a^G/JDST 411a^G, The Scroll of Fasting and Collective Memory** Vered Noam

For description see under Judaic Studies.

***RLST 420b^G/HIST 211Jb/NELC 380b^G, The Making of Monasticism** Bentley Layton

T 3:30–5:20 HU (o)

The social and intellectual history of Christian monasteries, hermits, ascetics, and monastic institutions and values in late antiquity and the early Middle Ages, as seen in classic texts of monastic literature and in monastic archaeology. Readings in translation.

OTHER COURSES

***RLST 488a and 489b, Individual Tutorial** Stephen Davis

HTBA (o)

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, Seminar on Approaches to the Study of Religion**

Ludger Viefhues-Bailey

W 3:30–5:20 (o)

Introduction to the study of religion in anthropology, sociology, phenomenology, philosophy, psychology, and history. Focus on current debates about how religion should be approached and on issues crucial to the investigation of religion in an academic setting. Required for all junior majors; open to others with permission of the instructor.

***RLST 491a and 492b, The Senior Essay** Stephen Davis

w 7–8:50 p.m. Cr/year only (o)

Students writing their senior essay meet periodically in the fall and weekly in the spring for the 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.

ADDITIONAL COURSES RELEVANT TO THE MAJOR

***CLCV 414a⁶/HIST 213Ja, Religions of the Roman Empire** Veronika Grimm

For description see under Classics.

***CLCV 423b/HIST 209Jb, The Origins of Byzantium** John Matthews

For description see under Classics.

NELC 402a/HIST 360a/MMES 171a, The Islamic Near East from Muhammad to the Mongol Invasion Adel Allouche

For description see under Near Eastern Languages & Civilizations.

Russian

(See under Slavic Languages and Literatures.)

Russian and East European Studies

Director of undergraduate studies: Molly Brunson, 2699B HGS, 432-7023,
molly.brunson@yale.edu

FACULTY ASSOCIATED WITH THE MAJOR

Professors Vladimir Alexandrov (*Slavic Languages & Literatures*), Paul Bushkovitch (*History*), Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Laura Engelstein (*History*), John Gaddis (*History*), Harvey Goldblatt (*Slavic Languages & Literatures*), Robert Greenberg (*Adjunct*) (*Slavic Languages & Literatures*), Benjamin Harshav (*Comparative Literature*), John MacKay (*Slavic Languages & Literatures*), Timothy Snyder (*History*), Tomas Venclova (*Slavic Languages & Literatures*)

Associate Professor Keith Darden (*Political Science*)

Assistant Professors Molly Brunson (*Slavic Languages & Literatures*), Bella Grigoryan (*Slavic Languages & Literatures*)

Lecturer Hilary Fink

Senior Lecturer II Irina Dolgova

Senior Lectors Krystyna Illakowicz, Rita Lipson, Constantine Muravnik, Julia Titus, Karen von Kunes

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.

Languages A full understanding of the area demands a 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 160a, 161b); (2) passing a written examination to demonstrate equivalent ability; or (3) completing a literature course taught in Russian and approved by the director of undergraduate studies. 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 or Polish; students interested in studying other East European languages should contact the director of undergraduate studies); or (2) by passing a language examination demonstrating equivalent ability. Students are encouraged to learn more than one language.

Course requirements 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. 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 director of undergraduate studies 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 director of undergraduate studies. Qualified students may elect pertinent courses in the Graduate School with the permission of the instructor, the director of graduate studies, and the director of undergraduate studies.

Senior requirement Every major must write a senior essay in RSEE 490a, 491b. At the beginning of the senior year, students enroll in RSEE 490a 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. The student provides the adviser with a form that the adviser signs to notify the director of undergraduate studies that the first-term requirements for the senior essay have been met. Failure to meet these requirements results in loss of credit for RSEE 490a. 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 15, 2011. A member of the faculty other than the adviser grades the essay.

Study and travel Students should be aware of opportunities for study and travel in Russia and eastern Europe. The director of undergraduate studies 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 director of undergraduate studies by October 1.

M.A. program The European and Russian Studies program does not offer the simultaneous award of the B.A. and M.A. degrees. 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.

REQUIREMENTS OF THE MAJOR

Prerequisite or corequisite Demonstrated proficiency in Russian or intermediate-level ability in an East European lang

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

Distribution of courses 1 course in Russian or East European hist approved by DUS; at least 1 course in social sciences

Senior requirement Senior essay (RSEE 490a, 491b)

*RSEE 223a/PLSC 175a, *After Communism: The Politics of the Post-Soviet States*

Robert Person

For description see under Political Science.

RSEE 255b/LITR 206b/RUSS 255b, *Studies in the Novel: Tolstoy*

Vladimir Alexandrov

For description see under Slavic Languages & Literatures.

RSEE 256a/LITR 208a/RUSS 256a, *Studies in the Novel: Dostoevsky*

Molly Brunson

For description see under Slavic Languages & Literatures.

*RSEE 300b/CZEC 301b/LITR 220b, *Milan Kundera: The Czech Novelist and French Thinker*

Karen von Kunes

For description see under Slavic Languages & Literatures.

*RSEE 490a and 491b, *The Senior Essay* Molly Brunson

HTBA Cr/year only (o)

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.

COURSES IN ANOTHER DEPARTMENT THAT COUNT TOWARD THE MAJOR

CZEC 110a, Elementary Czech I Karen von Kunes
For description see under Slavic Languages & Literatures.

CZEC 120b, Elementary Czech II Karen von Kunes
For description see under Slavic Languages & Literatures.

CZEC 130a, Intermediate Czech Karen von Kunes
For description see under Slavic Languages & Literatures.

CZEC 140b, Advanced Czech Karen von Kunes
For description see under Slavic Languages & Literatures.

PLSH 110a, Elementary Polish I Krystyna Illakowicz
For description see under Slavic Languages & Literatures.

PLSH 120b, Elementary Polish II Krystyna Illakowicz
For description see under Slavic Languages & Literatures.

PLSH 130a, Intermediate Polish I Krystyna Illakowicz
For description see under Slavic Languages & Literatures.

PLSH 140b, Intermediate Polish II Krystyna Illakowicz
For description see under Slavic Languages & Literatures.

Sanskrit

(See under Linguistics and under South Asian Studies.)

Science

Yale College offers two special interdepartmental courses for freshmen with strong preparation in the sciences. SCIE 030a and 031b, Current Topics in Science, is a freshman seminar designed for incoming students who have strong preparation in mathematics and science but who do not intend to major in the sciences. SCIE 198a and 199b, Perspectives on Science and Engineering, is a lecture and discussion course that supplements the standard academic program of a selected group of freshmen who have unusually strong preparation in mathematics and science. It presents a broader range of topics than standard science courses and highlights the interdependence of the scientific disciplines.

Students may apply to one or the other of these programs during the summer before their freshman year. Application information is available on the Web at yalecollege.yale.edu/content/freshman-seminar-program-0 (SCIE 030a, 031b) and yalecollege.yale.edu/content/perspectives-science-and-engineering-pse (SCIE 198a, 199b).

***SCIE 030a and 031b, Current Topics in Science** Charles Bailyn, Douglas Kankel

Lect. and disc. F 1:30–3 SC Fr sem ½ Course cr per term Cr/year only (o)

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. One course credit is awarded for successful completion of the year's work. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***SCIE 198a and 199b, Perspectives on Science and Engineering** William Segraves

Lect. and disc. F 1:30–3 ½ Course cr per term Cr/year only (o)

A series of lectures—one every other week—by science and engineering faculty guest lecturers. In alternate weeks, groups of students and faculty participants meet to discuss the lecture topics more fully. Students are expected to be enrolled in other science courses, usually with laboratory. One course credit is awarded for successful completion of the year's work. Enrollment limited to freshmen.

Slavic Languages and Literatures

Director of undergraduate studies: Molly Brunson, 2699B HGS, 432-7023, molly.brunson@yale.edu; language coordinator: Irina Dolgova, 2704A HGS, 432-1307, irina.dolgova@yale.edu

FACULTY OF THE DEPARTMENT OF SLAVIC LANGUAGES AND LITERATURES

Professors Vladimir Alexandrov, Katerina Clark, Laura Engelstein, Harvey Goldblatt, Robert Greenberg (*Adjunct*), Benjamin Harshav, John MacKay, Tomas Venclova

Assistant Professors Molly Brunson, Bella Grigoryan

Lecturer Hilary Fink

Senior Lector II Irina Dolgova

Senior Lectors Krystyna Illakowicz, Rita Lipson, Constantine Muravnik, Julia Titus, Karen von Kunes

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. Students interested in specializing in Russian or Slavic linguistics may arrange a special concentration in linguistics with the director of undergraduate studies.

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

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

1. Two terms of Russian literature in translation: RUSS 250a and 253b.
2. Fourth-year Russian: RUSS 160a and 161b.
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 490a or b. 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 director of undergraduate studies; three additional term courses in the Department of Slavic Languages and Literatures above RUSS 151b. 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 director of undergraduate studies.

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 director of undergraduate studies. 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 director of undergraduate studies well before their junior year.

Senior requirement All majors write a senior essay (RUSS 490a or b), 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 15, 2011.

Placement examination A departmental placement examination will be given on Sunday, August 29, at 2 p.m. Students who have studied Russian elsewhere must take the placement examination before enrolling in any Russian language course at Yale. For further information consult Irina Dolgova, language coordinator, 432-1307.

REQUIREMENTS OF THE MAJOR

Prerequisite RUSS 151b

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

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

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

Senior requirement Senior essay (RUSS 490a or b)

GROUP A COURSES

Unless otherwise noted, all Group A courses are conducted in Russian.

RUSS 110a, First-Year Russian I Julia Titus

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

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. Credit only on completion of RUSS 120b.

RUSS 120b, First-Year Russian II Julia Titus

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

Continuation of RUSS 110a. After RUSS 110a or equivalent.

RUSS 122a, Russian for Bilingual Students I Julia Titus

MWF 11:35–12:25 L1–L2 (34)

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.

RUSS 125a, Intensive Elementary Russian Constantine Muravnik, Julia Titus

MTWTHF 10:30–11:20, MWF 9:25–10:15 L1–L2 2 Course cr (RP, 33)

An intensive course that covers in one term the material taught in RUSS 110a and 120b. 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.

RUSS 130a, Second-Year Russian I Irina Dolgova

MTWTHF 10:30–11:20 L3 1½ Course cr (RP, 33)

A course to improve functional competence in all four language skills (speaking, writing, reading, and listening). 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 120b or equivalent.

RUSS 140b, Second-Year Russian II Irina Dolgova

MTWTHF 10:30–11:20 L4 1½ Course cr (RP, 33)

Continuation of RUSS 130a. After RUSS 130a or equivalent.

***RUSS 142b, Russian for Bilingual Students II** Julia Titus

MWF 11:35–12:25 L3–L4 (34)

Continuation of RUSS 122a. Further development of reading and writing skills. Expansion of vocabulary. After RUSS 122a or equivalent.

RUSS 145b, Intensive Intermediate Russian Constantine Muravnik

MTWTHF 10:30–11:20, MWF 9:25–10:15 L3–L4 2 Course cr (RP, 33)

A continuation of RUSS 125a that covers in one term the material taught in RUSS 130a and 140b. For students of superior linguistic ability. Prerequisite: RUSS 125a.

RUSS 150a, Third-Year Russian I Constantine Muravnik

MWF 11:35–12:50 L5 1½ Course cr (RP, 34)

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 140b or 145b or equivalent.

RUSS 151b, Third-Year Russian II Constantine Muravnik

MWF 11:35–12:50 L5 1½ Course cr (RP, 34)

Continuation of RUSS 150a. After RUSS 150a or equivalent.

***RUSS 154a, Russian for Literary and Cultural Interpretation**

Constantine Muravnik

MW 1–2:15 L5, HU (36)

Close reading, interpretation, and discussion of Russian fiction, poetry, and discursive prose in history and philosophy. Special attention to cultural significance, stylistics, and aesthetics, as well as to grammatical structures and syntax. Use of translation as a method for interpretation. Grammar review and extensive vocabulary building. Readings include works by Babel, Nabokov, Bulgakov, Mandelshtam, Tsvetaeva, Karamzin, Chaadaev, and Victor Erofeev. Conducted in Russian and English. Prerequisite: RUSS 140b or 145b or permission of instructor.

RUSS 160a, Fourth-Year Russian I Irina Dolgova

MWF 11:35–12:25 L5 (34)

Development of advanced skills in speaking, listening, reading, and writing Russian. Classwork centers on discussion and analysis of videotapes, literary texts, newspaper articles, and readings about Russian intellectual life and culture. Weekly compositions or translations, oral reports, intensive review, and refinement of syntactical and lexical topics. After RUSS 151b or equivalent.

RUSS 161b, Fourth-Year Russian II Irina Dolgova

MWF 11:35–12:25 L5 (34)

Continuation of RUSS 160a. After RUSS 160a or equivalent.

***RUSS 180a, Chekhov's Stories and Plays** John MacKay, Margarita Safarants

M 3:30–5:20 L5, HU (o)

Close reading of short stories and one play by Anton Chekhov. Focus on the forms and themes of Chekhov's works, as well as their historical context. Readings and discussion in Russian.

***RUSS 181b, The Fantastic in Russian Artistic Culture** Molly Brunson

TTH 11:35–12:50 L5, HU (o)

The supernatural and the fantastic in nineteenth- and twentieth-century Russian literature. Readings in Pushkin, Gogol, Turgenev, Zamiatin, Bulgakov, and Pelevin. Madness and delusion; vampires and the undead; artistic sorcery; Soviet and post-Soviet fantasy and unreality; and the appearance of these themes in contemporaneous painting and film. Special attention to the development of vocabulary pertaining to literary and cultural studies. Prerequisite: RUSS 151b or equivalent. Readings and discussion in Russian.

RUSS 191b, The Russian Table in Literature, Film, and Art Rita Lipson

TTH 1–2:15 L5, HU (o)

The Russian custom of the food feast (*zastol'e*) as a social and cultural institution with respect to ritual, communication, and identity. Ways in which literature, film, and visual art portray this specifically Russian mode of celebration, bonding, and interpersonal enjoyment. Development of advanced Russian language proficiency with a focus on describing in detail, supporting opinions, stating hypotheses, and using extended discourse. Eight classes conducted around a traditional Russian table offering authentic cuisine. Prerequisite: RUSS 160a or equivalent.

GROUP B COURSES

These courses, conducted in English, are open to all Yale College students.

***RUSS 023a, Storytelling and the Russian Tradition** Bella Grigoryan

MW 1–2:15 HU Fr sem Tr (o)

The relationship between oral storytelling and literary production, with the Russian literary tradition as a case study. The oral transmission of narrative and the origins of Western literary culture; the aesthetic and ideological uses of storytelling in Russian prose fiction. Readings include the *Odyssey*, the *Decameron*, and short prose works of Russian literature by Gogol, Tolstoy, Leskov, Chekhov, Babel, Zoshchenko, Shalamov, and Petrushevskaya. Readings and discussion in English. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***SLAV 205a^c/PLSC 397a, Language, Nationality, and Ethnic Conflict in the Balkans**

Robert Greenberg

M 7–8:50 p.m. SO (o)

The role of linguistic controversies in the polarization of ethnic relations within the former Yugoslavia. Language and nationalism; the integration and disintegration of Yugoslavia; and the Balkans in the context of other charged ethnolinguistic controversies, from the United States to India.

***SLAV 207b^c/PLSC 365b, Languages and Politics** Robert Greenberg

M 7–8:50 p.m. SO (o)

Political controversies surrounding issues of language planning and language policy. How social and political actors differentiate languages and dialects, and how nationalist ideology has shaped language choices. Topics include English-only movements in the United States, official bilingualism in Canada, and language policies in Europe, with emphasis on Slavic countries.

RUSS 250a, Masterpieces of Russian Literature I Bella Grigoryan

TTH 2:30–3:45 HU Tr (o)

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.

[RUSS 253b, Literature and Revolution in Russia, 1892 to the Present]

RUSS 255b/LITR 206b/RSEE 255b, Studies in the Novel: Tolstoy

Vladimir Alexandrov

MW 2:30–3:20, 1 HTBA HU Tr (37)

A survey of Leo Tolstoy's legacy. Readings include early stories, *War and Peace* and *Anna Karenina*, and short later works. Close textual analyses, with primary attention to the interrelation of theme, form, and literary and cultural contexts. Readings and discussion in English.

RUSS 256a/LITR 208a/RSEE 256a, Studies in the Novel: Dostoevsky Molly Brunson

TTH 1:30–2:20, 1 HTBA HU Tr (26)

The literary and intellectual legacy of Fyodor Dostoevsky. Focus on *Crime and Punishment* and *The Brothers Karamazov*; consideration of several short stories and novellas. Special attention to Dostoevsky's concept of modernity. Close textual analysis is accompanied by discussion of the historical, biographical, literary, and philosophical contexts of Dostoevsky's novels. Readings and discussion in English.

GROUP C COURSES

***RUSS 480a and 481b, Directed Reading in Russian Literature** Molly Brunson

HTBA (o)

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.

***SLAV 485b, Directed Reading or Individual Research in Slavic Languages and Literatures** Molly Brunson

HTBA (o)

Individual study under the supervision of a faculty member selected by the student. Applicants must submit a prospectus approved by the adviser to the director of undergraduate studies by the end of the first week of classes in the term in which the course is taken. The student meets with the adviser at least one hour each week, and takes a final examination

or writes a term paper. No credit granted without prior approval of the director of undergraduate studies.

***RUSS 490a or b, The Senior Essay** Molly Brunson

HTBA (o)

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.

CZEC 110a, Elementary Czech I Karen von Kunes

MTWTHF 10:30–11:20 L1 1½ Course cr (RP, 33)

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. Newspaper articles, annotated excerpts from Čapek's *R.U.R.*, Hašek's *Svejk*, Kundera's *Joke* and *Unbearable Lightness of Being*, and Havel's *Private View*. Audio- and videotapes. Credit only on completion of CZEC 120b.

CZEC 120b, Elementary Czech II Karen von Kunes

MTWTHF 10:30–11:20 L2 1½ Course cr (RP, 33)

Continuation of CZEC 110a. After CZEC 110a or equivalent.

CZEC 130a, Intermediate Czech Karen von Kunes

MTWTHF 11:35–12:25 L3 1½ Course cr (RP, 34)

Continuation of CZEC 120b. Grammar and usage, with emphasis on idiomatic expressions, syntax, and stylistics. Readings in modern Czech history, prose, and poetry; discussions of economic, political, and social issues. After CZEC 120b or equivalent.

CZEC 140b, Advanced Czech Karen von Kunes

MTWTHF 11:35–12:25 L4 1½ Course cr (RP, 34)

Continuation of CZEC 130a. Emphasis on writing skills and spoken literary Czech. After CZEC 130a or equivalent.

***CZEC 301b/LITR 220b/RSEE 300b, Milan Kundera: The Czech Novelist and French Thinker** Karen von Kunes

TH 1:30–3:20 HU Tr (26)

Close reading of Kundera's novels, with analysis of his aesthetics and artistic development. Relationships to French, German, and Spanish literatures and to history, philosophy, music, and art. Topics include paradoxes of public and private life, the irrational in erotic behavior, the duality of body and soul, the interplay of imagination and reality, the function of literary metaphor, and the art of composition. Readings and discussion in English.

PLSH 110a, Elementary Polish I Krystyna Illakowicz

MTWTHF 10:30–11:20 L1 1½ Course cr (RP, 33)

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. Credit only on completion of PLSH 120b.

PLSH 120b, Elementary Polish II Krystyna Illakowicz

MTWTHF 10:30–11:20 L2 1½ Course cr (RP, 33)

Continuation of PLSH 110a. After PLSH 110a or equivalent.

PLSH 130a, Intermediate Polish I Krystyna Illakowicz

MTWTHF 11:35–12:25 L3 1½ Course cr (RP, 34)

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 120b or equivalent.

PLSH 140b, Intermediate Polish II Krystyna Illakowicz

MTWTHF 11:35–12:25 L4 1½ Course cr (RP, 34)

Continuation of PLSH 130a. After PLSH 130a or equivalent.

PLSH 246b, Polish Communism and Postcommunism in Film Krystyna Illakowicz

MW 1–2:15 HU (0)

The basic social and ethical dilemmas of communist and postcommunist Poland. Intersections between national ethos and issues of identity, censorship, and religion. Reevaluations of Polish-Jewish and Polish-German relations. Films by Wajda, Munk, Polanski, Kieslowski, and Holland, as well as selected documentaries. Texts by Milosz, Konwicki, Rozewicz, and Maslowska. Readings and discussion in English.

GRADUATE COURSES

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 director of undergraduate studies.

Sociology

Director of undergraduate studies: Philip Smith, 204 Prospect St., 436-3773,
philip.smith@yale.edu

FACULTY OF THE DEPARTMENT OF SOCIOLOGY

Professors Julia Adams, Jeffrey Alexander, Elijah Anderson, †James Baron, Scott Boorman, Richard Breen, Hannah Brueckner, †Paul Cleary, Deborah Davis, Ron Eyerman, Philip Gorski, †Vicki Schultz, †Olav Sorensen

Associate Professor Philip Smith

Assistant Professors Rene Almeling, Emily Erikson, †Sigrun Kahl, Vida Maralani, Peter Stamatov, Christopher Wildeman, Jonathan Wyrzten

Lecturer Jasmina Beširević-Regan

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

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, or sociology. Others work in finance, consulting, publishing, marketing, city planning, teaching, research, and advocacy.

The Sociology department offers two undergraduate programs leading to the B.A. degree. The standard program focuses on sociological concepts, theories, and methods. The combined program provides students with the option to combine sociology with a concentration in another field. For example, students interested in business careers can combine sociology with economics. Students interested in the major are encouraged to contact the director of undergraduate studies early in their academic careers to discuss potential options.

Admission to the major Students interested in the Sociology major should complete either a freshman seminar or at least one introductory course (numbered 110–149) by the end of the sophomore year. This course may be applied toward the requirements of the major. The director of undergraduate studies can waive the introductory course requirement for students who demonstrate adequate preparation for advanced course work in sociology. All students interested in the Sociology major should meet with the director of undergraduate studies no later than the beginning of the junior year to elect a program of study.

Division of courses Courses in Sociology are divided by level, with introductory courses numbered from 110 to 149, courses in sociological theory from 150 to 159, courses in sociological methods from 160 to 169, intermediate courses from 170 to 299, advanced courses in the 300s, and individual study and research courses in the 400s. Freshman seminars are numbered below 100 and count as introductory or intermediate courses. In addition, qualified students may elect to enroll in graduate courses, with permission of the instructor and of the director of graduate studies. A list of graduate courses and descriptions is available from the director of undergraduate studies.

PROGRAM I. THE STANDARD PROGRAM

The requirements for the standard program are:

1. Thirteen term courses in sociology (including the 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 director of undergraduate studies, but no more than two introductory courses may count toward this total. For the Class of 2012 and subsequent classes, a maximum of two courses taken Credit/D/Fail may count toward the requirements of the major.

2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151a, Foundations of Modern Social Theory, and 152b, Topics in Contemporary Theory, are the required courses for theory. SOCY 160a, Methods of Inquiry, and one additional Sociology course numbered between 161 and 169 are required for methods. 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 director of undergraduate studies before finalizing their plans.
3. One advanced seminar in Sociology (SOCY 300–399).
4. For students in the intensive major, a two-term senior essay and colloquium, SOCY 493a, 494b. This yearlong biweekly colloquium provides students in the intensive major with an opportunity to share their research experiences. Students in the nonintensive major take one additional 300-level seminar in Sociology and write a one-term senior essay in SOCY 491a or 492b.

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. The requirements are:

1. Thirteen term courses (including the 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 director of undergraduate studies, but no more than two introductory courses in any department or program may count toward this total. The courses outside Sociology must constitute a coherent unit alone and form a logical whole when combined with the Sociology courses. For the Class of 2013 and subsequent classes, a maximum of two courses taken Credit/D/Fail may count toward the requirements of the major.
2. Two courses in sociological theory and two in sociological methods, normally completed by the end of the junior year. SOCY 151a, Foundations of Modern Social Theory, and 152b, Topics in Contemporary Theory, are the required courses for theory. SOCY 160a, Methods of Inquiry, and one additional Sociology course numbered between 161 and 169 are required for methods. 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 director of undergraduate studies before finalizing their plans.
3. One advanced seminar in Sociology (SOCY 300–399).
4. A one- or two-term senior essay in which the student integrates sociology and the other subject chosen. Students in the intensive major write a two-term senior essay and attend a yearlong biweekly colloquium (SOCY 493a, 494b). The colloquium provides students with an opportunity to share their research experiences. Students in the nonintensive major take one additional 300-level seminar in Sociology and write a one-term senior essay in SOCY 491a or 492b.

The combined program allows students to design a program to satisfy their own substantive interests and future career plans. By the beginning of the junior year, participants in

the combined program are expected to consult with the director of undergraduate studies in order to obtain approval for their course of study.

Senior requirement 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 491a or 492b). The senior essay for nonintensive majors is intended to be an in-depth scholarly review and critical analysis based on secondary sources. Students select a controversial 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 491a or 492b 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 director of undergraduate studies 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.

Senior requirement 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, conducting 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 493a, 494b, Senior Essay and Colloquium for Intensive Majors, 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 chapter I) and submit a senior essay written in SOCY 493a, 494b.

Admission to the intensive major Students should apply to the director of undergraduate studies by the last day of classes in the spring term of their junior year. 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 director of undergraduate studies and the senior essay adviser serve as advisers to candidates for the intensive major.

REQUIREMENTS OF THE MAJOR

Prerequisite 1 freshman sem or intro course (SOCY 110–149) or equivalent

Number of courses 13 term courses (incl prereq and senior essay)

Specific courses required SOCY 151a, 152b, 160a, 1 addtl Sociology course numbered 161–169

Distribution of courses *Program I*—at least 11 term courses in Sociology at intermediate and advanced levels, 1 Sociology sem at 300 level; *Program II*—9 or 10 term courses in Sociology; at least 1 Sociology sem at 300 level; no more than 2 intro courses in any dept or program

Senior requirement *Nonintensive major*—1 addtl 300-level Sociology sem and senior essay (SOCY 491a or 492b); *Intensive major*—senior essay (SOCY 493a, 494b)

FRESHMAN SEMINARS

***SOCY 021b, Causes and Consequences of Mass Imprisonment**

Christopher Wildeman

WF 4–5:15 SO Fr sem (o)

Consideration of reasons why the United States imprisons a larger share of its population than any other wealthy democracy. Consequences of the high imprisonment rate for American society, especially for former and current prisoners. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***SOCY 035b/WGSS 035b, Reproductive and Genetic Technologies** Rene Almeling

WF 2:30–3:45 Fr sem (o)

Reproductive and genetic technologies in relation to individual bodies, family formation, and social institutions such as the medical profession, the law, and the marketplace. Conceptive technologies such as surrogacy, egg and sperm donation, and pre-implantation genetic diagnosis; contraceptive technologies such as birth control, abortion, and sterilization. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

INTRODUCTORY COURSES

***SOCY 121b, The Sociological Imagination** Julia Adams, Elizabeth Breese

T 2:30–4:20 SO (27)

Introduction to the study of modernity and sociology. Topics include the dramatic rise of capitalism and colonialism, new forms of social inequality, the advent of democracy and bureaucracy, and the contested role of religion in modernity. Readings from contemporary writings on postmodern social life that are informed by, and react against, the classical sociological tradition. Preference to freshmen and sophomores.

SOCY 133a, Computers, Networks, and Society Scott Boorman

TTH 1–2:15 SO (RP, 26)

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.

SOCY 134a/WGSS 110a, Sex and Gender in Society Rene Almeling

WF 9:25–10:15, 1 HTBA SO (o)

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.

SOCY 136a/EAST 186a, Contemporary Chinese Society Deborah Davis

TTH 2:30–3:45 SO (27)

The social, cultural, and political consequences of China's recent retreat from socialism and its rapid integration into the global economy. Intended for students with no previous formal study of modern China.

SOCY 141b, Sociology of Crime and Deviance Philip Smith

TTH 1:30–2:20, 1 HTBA SO (26)

An introduction to sociological approaches to crime and deviance. Review of the patterns of criminal and deviant activity within society; exploration of major theoretical accounts. Topics include drug use, violence, and white-collar crime.

[SOCY 147b, Introduction to Social Policy Analysis]

SOCY 149a/ARCH 385a/EP&E 285a/HIST 152a/PLSC 279a, New Haven and the American City Alan Plattus, Elihu Rubin

For description see under Political Science.

COURSES IN SOCIOLOGICAL THEORY

Open to all students without prerequisite.

SOCY 151a/HUMS 302a/PLSC 290a, Foundations of Modern Social Theory

Emily Erikson

TTH 9:25–10:15, 1 HTBA SO (0)

Major works of social thought from the beginning of the modern era through the 1920s. Attention to social and intellectual contexts, conceptual frameworks and methods, and contributions to contemporary social analysis. Writers include Hobbes, Locke, Rousseau, Montesquieu, Adam Smith, Marx, Freud, Nietzsche, Weber, and Durkheim.

***SOCY 152b, Topics in Contemporary Theory** Peter Stamatov

W 9:25–11:15 WR, SO (0)

Overview of developments in social theory since the 1950s. Theories considered include structural functionalism, hermeneutical approaches, interactionist and phenomenological perspectives, rational choice, network theory, the new institutionalism, and theories of globalization.

COURSES IN SOCIOLOGICAL METHODS

***SOCY 160a, Methods of Inquiry** Julia Adams

TTH 9–10:15 SO (22)

The theory, philosophy, and practice of research design in the social sciences. Modes of observation that social scientists employ; measuring and sampling techniques; debates over how to “do” social science; ethical quandaries involved in social research. No background in social research assumed.

***SOCY 161b, Survey Methods** Hannah Brueckner

TTH 2:30–3:45 SO (0)

Theory and practice of survey design, including conceptualization, measurement issues, sample design, questionnaire construction, interviewing, data analysis, publication of results, and limitations and ethical aspects of survey research.

INTERMEDIATE COURSES

The prerequisite for intermediate courses is one introductory Sociology course or permission of the instructor.

***SOCY 191b/AFST 323b/ANTH 239b/WGSS 323b, HIV and AIDS in Africa**

Graeme Reid

For description see under Women's, Gender, & Sexuality Studies.

***SOCY 216a/EP&E 267a/WGSS 314a, Social Movements** Ron Eyerman

M 1:30–3:20 SO (36)

An introduction to sociological perspectives on social movements and collective action, exploring civil rights, student movements, global justice, nationalism, and radical fundamentalism.

***SOCY 221b/WGSS 221b, Sex and Romance in Adolescence** Hannah Brueckner

F 9:25–11:15 SO (0)

Sexuality—making decisions about when and with whom to have sex, understanding of risk, and measures taken to reduce risk—analyzed as a fundamentally social aspect of human development. Themes include cultural, socioeconomic, institutional, and relational determinants of adolescent sexual development and behavior; courtship processes; relationship formation and dissolution; sociological versus biological perspectives on sexual orientation; review and evaluation of interventions to promote sexual health. Enrollment limited to sophomores except with permission of instructor.

***SOCY 231b, Mass Incarceration and the Urban Family** Christopher Wildeman

F 9:25–11:15 SO (0)

Examination of the huge increases in imprisonment in urban areas over the past thirty-five years, including the consequences for urban families existing on the margins of society.

***SOCY 246a, Sociology of Religion** Philip Gorski

MW 2:30–3:45 SO (0)

Introduction to the main theoretical traditions and research problems in the sociology of religion. Focus on the role of religion in political conflict.

ADVANCED COURSES

Courses in this category are open to students who have completed one intermediate course and any other specified requirement, or by permission of the instructor. Preference is given to Sociology majors in their junior and senior years.

***SOCY 306a/EP&E 337a, Empires and Imperialism** Peter Stamatov, Samuel Nelson

W 9:25–11:15 WR, SO (0)

Empire as a territorial organization of political power. Comparison of empires in historical periods from antiquity to European overseas expansion in the fifteenth through twentieth centuries, and in different geographic contexts in Africa, Asia, and Europe. Economic, political, and cultural theories of imperialism, colonialism, and decolonization.

***SOCY 309b^c/EP&E 266b, Religious Nationalism** Philip Gorski

TH 1:30–3:20 SO (26)

Religious nationalism past and present, East and West; the normative issues the phenomenon raises. Religious roots of Western nationalism; nationalistic propensities of different religious traditions; conditions under which religious nationalism turns violent; and whether religion, nationalism, pluralism, and democracy are compatible.

***SOCY 310b/EAST 410b/INTS 443b, Civic Life in Modern China I**

Deborah Davis

For description see under International Studies.

***SOCY 311a^G, Gender, Race, and Genetic Testing** Rene Almeling

TH 1:30–3:20 SO (o)

Overview of sociological approaches to genetics, including gene/environment interactions and the history of genetic medicine. A focus on genetic testing in Huntington's disease, pregnancy, cancer, and psychological disorders to explore how genetic information is provided to patients, and how patients experience genetic risk. Discussion of commercial firms offering direct-to-consumer genetic testing.

***SOCY 313b^G, Sociology of the Arts and Popular Culture** Ron Eyerman

M 9:25–11:15 SO (o)

An advanced introduction to sociological perspectives on the arts and popular culture. Emphasis on the conceptualization of culture within social theory, with the aim of interpreting cultural expressions and artifacts: artworks, music, television, film, and literature.

***SOCY 314a, Inequality in America** Vida Maralani

T 1:30–3:20 SO (o)

Empirical, theoretical, and methodological issues involved in the study of inequalities in occupation, income, wealth, education, health, and neighborhoods. Intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. Questions include whether the United States is a land of opportunity and how different social groups fare and why.

[SOCY 325a, Topics in Contemporary Chinese Society]

***SOCY 330a^G/EP&E 303a, Civil Society and Democracy** Jeffrey Alexander

T 9:25–11:15 HU, SO (22)

Normative and sociological theories of civil society and empirical studies of its culture. Attention to organizations such as polls, mass media, law, and office, which provide ways of partially institutionalizing civil society. The civil rights movement and multiculturalism as illustrations of struggles inside the civil sphere. Discussion of whether a global civil society is possible.

***SOCY 334a^G, Punishment and Inequality** Christopher Wildeman

TH 9:25–11:15 SO (o)

Massive increases in the American imprisonment rate since the mid-1970s that have rendered contact with the criminal justice system a common event for marginalized Americans. Consideration of effects on inequality in the labor market, family life, politics, and health.

***SOCY 338b^G, Building Social Theory for Empirical Analysis** Richard Breen

TH 9:25–11:15 SO (o)

Approaches to developing explanatory theories aimed at addressing specific empirical questions in contemporary sociology. Rational choice, game theory, and social (or endogenous) interaction models. The use of agent-based models and other simulation techniques in building models of social phenomena. Testing of explanatory models against empirical data.

***SOCY 352b⁶, Material Culture** Jeffrey Alexander

HTBA HU, SO (50)

Exploration of how and why modern and postmodern societies have continued to sustain material symbolism and iconic consciousness. Theoretical approaches to debates about icons and symbols in philosophy, sociology, linguistics, psychoanalysis, and semiotics. Use of case studies to analyze modern iconography in advertisements and branding, food and bodies, nature, fashion, celebrities, popular culture, art, and politics.

***SOCY 363a/EP&E 269a/ER&M 362a/INTS 384a, Genocide and Ethnic Conflict**

Jasmina Beširević-Regan

W 1:30–3:20 SO (0)

Exploration of the explosion of genocide and violent ethnic conflict in the past sixty years, including contributory historical and political elements. Consideration of ways to prevent or resolve such conflicts. Focus on questions of identity, religion, class, and nationhood as related to violence and conflict. An analytical framework developed from four case studies: the Holocaust, Cambodia, the former Yugoslavia, and Rwanda.

***SOCY 367b, Citizenship and Civic Engagement** Peter Stamatov

T 1:30–3:20 SO (0)

Citizenship as a complex phenomenon: an instrument of social closure, a determinant of social policies, a normative ideal in political philosophy, and a model for political participation. Meaning and forms of citizenship and civic engagement in historical and theoretical perspective. Debates on the decline of civic participation and on the emergence of global civil society.

***SOCY 395a/EAST 408a/EP&E 308a, Wealth and Poverty in Modern China**

Deborah Davis

W 1:30–3:20 SO (0)

The underlying causes and consequences of the changing distribution of income, material assets, and political power in contemporary China. Substantive focus on inequality and stratification. Instruction in the use of online Chinese resources relevant to research. Optional weekly Chinese language discussions. Prerequisite: a previous course on China since 1949.

INDIVIDUAL STUDY AND RESEARCH COURSES***SOCY 471a and 472b, Individual Study** Philip Smith

HTBA (0)

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.

***SOCY 491a and 492b, Senior Essay and Colloquium for Nonintensive Majors**

Rene Almeling

Alt. T 3:30–5:20 (0)

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 on Tuesday, September 7, in the fall term and Tuesday, January 11, in the spring term.

***SOCY 493a and 494b, Senior Essay and Colloquium for Intensive Majors**

Philip Smith

Alt. T 3:30–5:20 (o)

Independent research under faculty direction, involving empirical research and resulting in a substantial paper. Workshop meets biweekly to discuss various stages of the research process and to share experiences in gathering and analyzing data. The first meeting is on Tuesday, September 14, in the fall term and Tuesday, January 18, in the spring term.

South Asian Studies

Director of undergraduate studies: Harry Blair, 115 Prospect St., 432-3399,
harry.blair@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF SOUTH ASIAN STUDIES

Professors Akhil Amar (*Law School*), Tim Barringer (*History of Art*), Nihal de Lanerolle (*School of Medicine*), Michael Dove (*Forestry & Environmental Studies, Anthropology*), Sara Suleri Goodyear (*English*), Phyllis Granoff (*Religious Studies*), Inderpal Grewal (*Women's, Gender, & Sexuality Studies*), Stanley Insler (*Linguistics*), Kalyanakrishnan Sivaramakrishnan (*Anthropology*), T. N. Srinivasan (*Economics*), Shyam Sunder (*School of Management*), Steven Wilkinson (*Political Science*)

Associate Professors Bernard Bate (*Anthropology*), Sarah Weiss (*Music*)

Assistant Professors Ashwini Deo (*Linguistics*), Mayur Desai (*Public Health*), Zareena Grewal (*Ethnicity, Race, & Migration*), Karuna Mantena (*Political Science*), Shital Pravinchandra (*English*), Andrew Quintman (*Religious Studies*), Kishwar Rizvi (*History of Art*), Tamara Sears (*History of Art*), Tariq Thachil (*Political Science*)

Senior Lecturers Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Koichi Shinohara (*Religious Studies*)

Lecturers Harry Blair (*Political Science*), Carol Carpenter (*Forestry & Environmental Studies, Anthropology*), Ian Desai, Hugh Flick, Jr. (*Religious Studies*), Gijs Kruijtzter, Mrinalini Rajagopalan

Senior Lector Seema Khurana

Lectors David Brick, Swapna Sharma, Blake Wentworth

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.

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 director of undergraduate studies. Students should also identify an adviser from the South Asian Studies faculty in their area of specialization as early as possible.

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.

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 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. For the Class of 2012 and subsequent classes, a maximum of one course taken Credit/D/Fail may count toward the major.

Language requirement One South Asian language must be studied at the advanced level (courses designated L5). Courses to fulfill this requirement must be taken while the student is enrolled at Yale. Students who matriculate with advanced proficiency in Hindi or Tamil, as demonstrated through testing, are encouraged to study Sanskrit, or to study a second modern language (Bengali, Urdu, Nepali, Telugu, Kannada, Marathi) through 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.

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 491a, 492b. 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 7 term courses (not incl senior req or lang req)

Specific courses required None

Distribution of courses 7 term courses in South Asian Studies numbered 200 or above, 2 in premodern; 2 sems

Substitution permitted One relevant course in another dept, 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 491a, 492b

LANGUAGE AND LITERATURE COURSES

HNDI 110a^c, Elementary Hindi I Seema Khurana, Swapna Sharma5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (o)

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. Credit only on completion of HNDI 120b.

HNDI 120b^c, Elementary Hindi II Seema Khurana, Swapna Sharma5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (o)

Continuation of HNDI 110a. After HNDI 110a or equivalent.

HNDI 130a^c, Intermediate Hindi I Seema Khurana, Swapna Sharma5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (o)

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 120b or equivalent.

HNDI 140b^c, Intermediate Hindi II Seema Khurana, Swapna Sharma5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (o)

Continuation of HNDI 130a. After HNDI 130a or equivalent.

HNDI 150a^c, Advanced Hindi Seema Khurana, Swapna Sharma

TTH 4–5:15 L5 (o)

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 140b or permission of instructor.

***HNDI 158b^c, Writing in Independence and Post-Independence** Seema Khurana

TTH 4–5:15, 1 HTBA L5 (o)

Development of language skills through selected readings in Hindi literature and the study of popular culture of the twentieth and twenty-first centuries. Focus on the works of Munshi Premchand, Mannoo Bhandhari, Mohan Rakesh, and Amrita Pritam. Debates on political, social, and cultural topics.

***HNDI 198a^c or b^c, Advanced Tutorial** Seema Khurana, Swapna Sharma

HTBA (o)

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 150a or equivalent.

SKRT 110a/LING 115a⁶, Introductory Sanskrit I David Brick

MTWTHF 9:25–10:15 L1 1½ Course cr (32)

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. Credit only on completion of SKRT 120b.

SKRT 120b/LING 125b⁶, Introductory Sanskrit II David Brick

MTWTHF 9:25–10:15 L2 1½ Course cr (32)

Continuation of SKRT 110a. Focus on the basics of Sanskrit grammar; readings from classical Sanskrit texts written in Devanagari script. After SKRT 110a.

SKRT 130a/LING 138a, Intermediate Sanskrit I David Brick

MTWTHF 10:30–11:20 L3 1½ Course cr (33)

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 120b or equivalent.

SKRT 140b/LING 148b, Intermediate Sanskrit II David Brick

MTWTHF 10:30–11:20 L4 1½ Course cr (33)

Continuation of SKRT 130a, 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 130a or equivalent.

TAML 110a⁶, Introductory Tamil I Blake Wentworth

MTWTHF 10:30–11:20 L1 1½ Course cr (33)

An in-depth introduction to modern Tamil, focusing on comprehension, speaking, reading, and writing skills as well as on cultural understanding. Course work includes graded texts, written assignments, audiovisual material, and computer-based exercises. No prior background in Tamil assumed. Credit only on completion of TAML 120b.

TAML 120b⁶, Introductory Tamil II Blake Wentworth

MTWTHF 10:30–11:20 L2 1½ Course cr (33)

Continuation of TAML 110a. After TAML 110a.

TAML 130a⁶, Intermediate Tamil I Blake Wentworth

MTWTHF 11:35–12:25 L3 1½ Course cr (RP, 34)

The first half of a two-term sequence designed to develop proficiency in comprehension, speaking, reading, and writing through the use of visual media, newspapers and magazines, modern fiction and poetry, and public communications such as pamphlets, advertisements, and government announcements. Prerequisite: TAML 120b or equivalent.

TAML 140b⁶, Intermediate Tamil II Blake Wentworth

MTWTHF 11:35–12:25 L4 1½ Course cr (RP, 34)

Continuation of TAML 130a, focusing on further development of proficiency in the four language skills. Prepares students to conduct fieldwork in Tamil. Prerequisite: TAML 130a or equivalent.

GENERAL COURSES IN SOUTH ASIAN STUDIES

SAST 238b, Islam in South Asia: 1000 to the Present Gijs Kruijtzer

TTH 2:30–3:20, 1 HTBA HU (27)

Introductory overview of the development of South Asian Islam and the history of Muslims in South Asia from around 1000 C.E. to the present. Focus on Islam as a religion and on being Muslim as an identity.

SAST 239a, Modern Indian History Ian Desai

MW 1–2:15 HU (0)

The making of modern India from the early eighteenth through the twentieth century. The British presence in India, the Raj, the relationship between imperial rulers and their subjects, the national movement and resistance to colonialism, Mahatma Gandhi's program of civil disobedience, independence, Partition, early statehood, and challenges for democracy.

***SAST 243a/PLSC 351a, Democracy in South Asia** Tariq Thachil

For description see under Political Science.

SAST 256a/HSAR 383a, Art of India, 300 B.C.–A.D. 1650 Tamara Sears

For description see under History of Art.

SAST 258b/HSAR 385b, Temple Towns of South Asia Tamara Sears

For description see under History of Art.

SAST 259b/MUSI 357b, Indian Music Theory and Practice Stan Scott

MF 11:35–12:50 HU (34)

Introduction to the basic concepts of Indian classical music traditions from Vedic times to the present, with a focus on Hindustani music. Discussion of history and theory combined with practical instruction. Topics include improvisation, modern trends, gender, Bollywood, musical fusions, and interactions between Indian and Western music cultures. No previous experience in Indian classical music required.

SAST 262a/RLST 126a, Tibetan Buddhism Andrew Quintman

For description see under Religious Studies.

SAST 277a, South Asian Urbanisms Mrinalini Rajagopalan

MW 3:30–4:20, 1 HTBA HU (0)

The rise of urbanization in South Asia as a product of colonial intervention and dominance. Deep and lasting ramifications of colonization on the social, political, and cultural fabric of South Asian peoples. Cities as representatives of complex notions of sovereignty, modernity, and development.

***SAST 300a/ANTH 419a^c, Language and the Public Sphere** Bernard Bate

For description see under Anthropology.

***SAST 312a/RLST 180a, Rituals of Buddhist Tantra** Andrew Quintman

For description see under Religious Studies.

***SAST 339b, Gandhi** Ian Desai

TH 2:30–4:30 HU (0)

The life, work, and global legacy of Mohandas K. Gandhi. Examination of writings by Gandhi, his closest associates, and some of the historical figures he influenced. How Gandhi became known as the Mahatma and became a leader in Indian and world affairs. Gandhi's relevance for today's world and the future.

***SAST 341a/PLSC 442a, Development in South Asia** Tariq Thachil

For description see under Political Science.

SAST 367a/HUMS 418a/RLST 130a, Traditional Literature of India, China, and Japan

Koichi Shinohara, Phyllis Granoff

For description see under Humanities.

***SAST 370a/HSAR 487a, Visualizing Stories in India** Tamara Sears

For description see under History of Art.

***SAST 377b, Visual Media and Development in India** Mrinalini Rajagopalan

M 3:30–5:30 HU (0)

Visual technologies used to represent development in India from the 1930s to the present. Analysis of how visual schema such as architecture, film, popular advertising, art, and clothing uphold mythologies as well as praxes of development. Questions of nationalism, globalization, gender politics, and urban modernity.

***SAST 438a, Visions of South Asia, 1500–1800** Gijs Kruijtzter

TH 2:30–4:30 HU (0)

Portuguese, Dutch, English, Danish, and French involvement with South Asia between 1500 and 1800. The extent to which European involvement can be called “modern.” Comparison of visions of South Asia created by Europeans on the one hand and non-Europeans on the other, as well as visions of Europeans created by South Asians.

***SAST 458b/ER&M 328b/WGSS 328b, Popular Culture and Postcolonial India**

Geetanjali Singh Chanda

For description see under Women's, Gender, & Sexuality Studies.

***SAST 459b/RLST 182b, Buddhist Traditions of Mind and Meditation**

Andrew Quintman

For description see under Religious Studies.

SENIOR ESSAY COURSE

***SAST 491a and 492b, Senior Essay** Harry Blair

HTBA ½ Course cr per term Cr/year only (0)

A yearlong research project completed under faculty supervision and resulting in a substantial paper.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in South Asian Studies are open to qualified undergraduates. Course descriptions appear in the online Graduate School bulletin and are available in the South Asian Studies program office. Permission of the instructor and of the director of graduate studies is required.

Southeast Asia Studies

Language studies coordinator: Amity Doolittle, Southeast Asia Studies Council,
311 LUCE, 432-3431, seas@yale.edu, www.yale.edu/seas

FACULTY ASSOCIATED WITH THE COUNCIL ON SOUTHEAST ASIA STUDIES

Professors William Burch (*Emeritus*) (*Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies*), J. Joseph Errington (*Anthropology*), William Kelly (*Anthropology*), Benedict Kiernan (*Chair*) (*History*), James Scott (*Political Science*), Mimi Yiengpruksawan (*History of Art*)

Associate Professor Sarah Weiss (*Music*)

Assistant Professor Erik Harms (*Anthropology*)

Lecturers Carol Carpenter (*Forestry & Environmental Studies, Anthropology*), Amity Doolittle (*Acting Chair*) (*Forestry & Environmental Studies*)

Senior Lector II Quang Phu Van

Senior Lector Indriyo Sukmono

The Council on Southeast Asia Studies oversees an interdisciplinary program that brings together faculty and students sharing an interest in Southeast Asia and supplements the undergraduate curriculum with an annual seminar series, periodic conferences, and special lectures. Yale does not offer a degree in Southeast Asia studies. 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 planning to undertake field research or language study in Southeast Asia may apply to the Council for summer fellowship support.

Courses featuring Southeast Asian content are offered within a variety of departments each year, including Anthropology, Economics, History, Music, and Political Science. A list of courses for the current year can be obtained through the Council office or Web site. Yale maintains extensive library and research collections on Southeast Asia.

Language instruction is offered in two Southeast Asian languages, Indonesian and Vietnamese. The Council on Southeast Asia Studies supports language tables and tutoring in other Southeast Asian languages by special arrangement.

INDN 110a^C, Elementary Indonesian I Indriyo Sukmono

5 HTBA L1 1½ Course cr (61)

An introductory course in standard Indonesian with emphasis on developing communicative skills through a systematic survey of grammar and graded exercises. Credit only on completion of INDN 120b.

INDN 120b^C, Elementary Indonesian II Indriyo Sukmono

5 HTBA L2 1½ Course cr (61)

Continuation of INDN 110a. Introduction to reading, leading to mastery of language patterns, essential vocabulary, and basic cultural competence. After INDN 110a or equivalent.

***INDN 130a^G, Intermediate Indonesian I** Indriyo Sukmono

3 HTBA L3 (61)

Continued practice in colloquial Indonesian conversation and reading and discussion of texts. After INDN 120b or equivalent.

***INDN 140b^G, Intermediate Indonesian II** Indriyo Sukmono

3 HTBA L4 (61)

Continuation of INDN 130a. After INDN 130a or equivalent.

***INDN 470a and 471b, Independent Tutorial** Indriyo Sukmono

HTBA (o)

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. Permission to enroll requires submission of a detailed project proposal and its approval by the language studies coordinator.

VIET 110a^G, Elementary Vietnamese I Quang Phu Van

MTWTHF 10:30–11:20 L1 1½ Course cr (RP, 33)

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. Credit only on completion of VIET 120b. No previous knowledge of Vietnamese assumed.

VIET 120b^G, Elementary Vietnamese II Quang Phu Van

MTWTHF 10:30–11:20 L2 1½ Course cr (RP, 33)

Continuation of VIET 110a. After VIET 110a or equivalent.

***VIET 130a^G, Intermediate Vietnamese I** Quang Phu Van

MTWTHF 11:35–12:25 L3 1½ Course cr (RP, 34)

An integrated approach to language learning aimed at strengthening students' listening, speaking, reading, and writing skills in Vietnamese. Communicative activities such as conversations, performance simulation, drills, role plays, and games. Discussion of aspects of Vietnamese society and culture. After VIET 120b or equivalent.

***VIET 140b^G, Intermediate Vietnamese II** Quang Phu Van

MTWTHF 11:35–12:25 L4 1½ Course cr (RP, 34)

Continuation of VIET 130a. After VIET 130a or equivalent.

VIET 220b^G, Introduction to Vietnamese Culture, Values, and Literature

Quang Phu Van

TTH 1–2:15 HU Tr (o)

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. Readings in translation. No previous knowledge of Vietnamese required.

***VIET 470a and 471b, Independent Tutorial** Quang Phu Van

HTBA (o)

For students with advanced Vietnamese language skills who wish to engage in concentrated reading and research on material not otherwise offered in courses. The work must be supervised by an adviser and must terminate in a term paper or its equivalent. Permission to enroll requires submission of a detailed project proposal and its approval by the language studies coordinator.

Spanish

Director of undergraduate studies: Kevin Poole, Rm. 207, 82–90 Wall St., 432-1157, kevin.poole@yale.edu; language director: Sonia Valle, Rm. 210, 82–90 Wall St., 432-1159, sonia.valle@yale.edu

FACULTY OF THE DEPARTMENT OF SPANISH AND PORTUGUESE

Professors Rolena Adorno (*Chair*), Aníbal González, Roberto González Echevarría, K. David Jackson, María Rosa Menocal, Noël Valis

Assistant Professors Susan Byrne, Ernesto Estrella, Paulo Moreira, Kevin Poole

Senior Lectors Sybil Alexandrov, Marta Almeida, Teresa Carballal, Mercedes Carreras, Sebastián Díaz, Oscar González Barreto, María Jordán, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé-Colom, Terry Seymour, Margherita Tórtora, Sonia Valle

Lectors Pilar Asensio, Yovanna Cifuentes, Ame Cividanes, Maripaz García, Rosamaría León, Tania Martuscelli, Bárbara Safille

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 in the list above.

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 and Latin America. 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 provides students with the opportunity to acquire thorough linguistic proficiency as well as in-depth knowledge of both cultural and literary topics.

Students majoring in history, international studies, Latin American studies, anthropology, environmental studies, humanities, political science, literature, and economics, as well as those considering a career in medicine or law, are encouraged to consider completing the Spanish major as one of two majors.

Among the Spanish offerings, Group A includes beginning and intermediate language courses designed to help students develop fluency in understanding, speaking, reading, and writing Spanish. Group B courses seek to provide students with a broad but solid introduction to the fields of Hispanic literatures and cultures, and to strengthen their linguistic competence through courses in advanced grammar and composition. Group C allows students to perfect their linguistic and critical skills with courses organized around 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.

Beginning students ordinarily enroll in SPAN 110a or 125a or b. Students who take SPAN 110a must continue with 120b in the following term, and no credit is awarded for 110a until 120b has been successfully completed.

Freshmen offering Spanish for admission are placed according to their scores on the Advanced Placement tests in Spanish Language and/or Literature or on the Yale Spanish departmental placement examination, given at the beginning of the fall term. Students with a score of 5 on either of the Spanish Advanced Placement tests, or an appropriate score on the departmental placement examination, may enroll in any Group B or C course or in SPAN 150a or 151b.

Students wishing to take intensive beginning Spanish may, with the instructor's permission, enroll in SPAN 125a or b, which covers the same material as SPAN 110a and 120a or b, but in one term. Students wishing to take intensive intermediate Spanish may, with the instructor's permission, enroll in SPAN 145a or b, which covers the same material as SPAN 130a or b and 140a or b, also in one term. SPAN 132a and 142b are designed for heritage speakers and are available only to them; interested students should contact the instructor.

Regardless of previous Spanish study, students without a score of 5 on either of the Advanced Placement tests must take the departmental placement examination in order to enroll in any course above SPAN 110a or 125a or b.

The standard major, for which the prerequisite is SPAN 140a or b or the equivalent, consists of twelve term courses from Groups B and C, including the senior requirement. Students are required to take SPAN 243a or b, 244a or b, two courses chosen from SPAN 261a, 262b, 266a, or 267b, and at least five courses from Group C. With prior permission of the director of undergraduate studies, two relevant courses from other departments may be applied toward the major. Successful completion of a special examination given at the beginning of each term may exempt Spanish majors from SPAN 243a or b; details about the examination may be obtained from the course instructor.

Juniors and seniors majoring in Spanish may, with the 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 director of undergraduate studies.

Senior requirement Seniors write the senior essay in SPAN 491b 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 491a in the fall of their senior year. Seniors in SPAN 491b or 491a are expected to submit their completed essay to the director of undergraduate studies at 82–90 Wall Street by 4 p.m. on April 15 in the spring term, or by 4 p.m. on December 3 in the fall 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. Students in the intensive major both present the essay and take the departmental examination.

Study abroad Students are encouraged to apply to the eight-week summer language courses offered by Yale Summer Session in New Haven and Bilbao, Spain, and Quito, Ecuador.

A five-week Spanish course at the L5 level is also offered in Buenos Aires, Argentina. More information about Yale Summer Session is available on the Web at www.yale.edu/summer. For information about the Year or Term Abroad program, refer to chapter II of this bulletin.

Departmental placement examination The placement examination will be given on Sunday, August 29, from 9 to 11 a.m. and from 11 a.m. to 1 p.m. in LC 101 and 102. Students should arrive by 8:30 a.m. to sign up for the first exam, and by 10:45 a.m. for the second. No other preregistration is required. Two makeup examinations will be given, one on Monday, August 30, from 11 a.m. to 1 p.m. (arrive by 10:45 a.m.) in LC 101, and another on Friday, September 3, from 3:30 to 5:30 p.m. (arrive by 3 p.m.). All students, including native speakers, who wish to enroll in a Spanish course above SPAN 110a or 125a or b and who have not earned a score of 5 on either of the Spanish Advanced Placement tests must take the placement examination. Students who have already taken one year or more of Spanish instruction before coming to Yale are required to take the placement examination before enrolling in a Spanish course. The results of the placement examination are valid for one year from the date on which it was taken.

REQUIREMENTS OF THE MAJOR

Prerequisite SPAN 140a or b, 142b, 145a or b, or equivalent

Number of courses 12 term courses from Groups B and C (incl senior req)

Specific courses required SPAN 243a or b, 244a or b; 2 from SPAN 261a, 262b, 266a, 267b

Distribution of courses At least 5 courses in Group C

Substitution permitted Up to 2 relevant courses in other depts, with DUS permission

Senior requirement Senior essay (SPAN 491a or b)

Intensive major Senior req and dept exam

COURSES FOR FRESHMEN

***SPAN 060b, Freshman Colloquium: Literary Studies in Spanish** Ernesto Estrella

TTH 11:35–12:50 L5, HU Fr sem (0)

Introduction to the study of literature in general and to some of the most important texts in Hispanic literature. Selected texts in Spanish include narratives (Borges, García Márquez, Fuentes, Unamuno), essays (Paz, Fuentes, Sor Juana), lyric (Neruda, Paz, Valle-Inclán), and theater (Lope de Vega, García Lorca). Conducted in Spanish. Counts toward the requirements for the Spanish major. Enrollment limited to freshmen. Preregistration required; see under Freshman Seminar Program.

***SPAN 070b/HUMS 075b, The Cultures of Medieval Spain** María Rosa Menocal

For description see under Humanities.

GROUP A COURSES

SPAN 110a, Elementary Spanish I Maripaz García and staff

5 HTBA For sections see www.yale.edu/oci L1 1½ Course cr (RP, 61)

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 120b. Credit only on completion of SPAN 120b.

SPAN 120a or b, Elementary Spanish II Juliana Ramos-Ruano and staff

5 HTBA For sections see www.yale.edu/oci L2 1½ Course cr (RP, 61)

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 110a or in accordance with placement results. Admits to SPAN 130a or b or 145a or b.

***SPAN 125a or b, Intensive Elementary Spanish** Maripaz García and staff

MTWTHF 2 HTBA L1–L2 2 Course cr (RP, 61)

An intensive beginning course in spoken and written Spanish that covers the material of SPAN 110a and 120a or b in one term. Conducted in Spanish. Admits to SPAN 130a or b or 145a or b. Not open to students who have completed SPAN 110a or 120a or b.

SPAN 130a or b, Intermediate Spanish I Lissette Reymundi and staff

5 HTBA For sections see www.yale.edu/oci L3 1½ Course cr (RP, 61)

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. Conducted in Spanish. Admits to SPAN 140a or b.

***SPAN 132a, Spanish for Heritage Speakers I** Sybil Alexandrov

MWF 10:30–11:20 L2–L3 (33)

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. Admission in accordance with placement results.

SPAN 140a or b, Intermediate Spanish II Ame Cividanes and staff

5 HTBA For sections see www.yale.edu/oci L4 1½ Course cr (RP, 61)

Continuation of SPAN 130a or b. 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.

***SPAN 142b, Spanish for Heritage Speakers II** Sybil Alexandrov

MWF 10:30–11:20 L4 (33)

Continuation of SPAN 132a. Examination of complex grammar structures; consideration of problems particular to heritage speakers through the reading of both literary and journalistic texts. Practice in all communicative skills (comprehension, speaking, reading, writing). After SPAN 132a or in accordance with placement results.

***SPAN 145a or b, Intensive Intermediate Spanish** Pilar Asensio and staff

MTWTHF 2 HTBA L3–L4 2 Course cr (RP, 61)

An intensive intermediate course in spoken and written Spanish that covers the material of SPAN 130a or b and 140a or b in one term. Conducted in Spanish. Admits to L5 courses. Not open to students who have completed SPAN 130a or b or 140a or b.

SPAN 150a and 151b, Advanced Conversational Spanish Teresa Carballal, Pilar Asensio, and staff

3 HTBA For sections see www.yale.edu/oci L5 (RP, O)

Intended to improve active command of the language through readings, discussions, and reports. Conversational skills are stressed. Reading selections include commentaries on political and social problems as well as cultural topics. Prepares students for practical situations and for literature courses. Conducted in Spanish. After SPAN 140a or b or 145a or b, or in accordance with placement results. Not open to students who have completed SPAN 132a, 142b, or 235b. May be taken for credit by students who have completed courses with higher numbers. Admits to Group B and C courses. Does not count toward the major.

GROUP B COURSES

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.

***SPAN 220a, Theater and Poetry Workshop** Sonia Valle

MW 1–2:15 L5 (O)

The dynamics of figurative language, advanced linguistic structures, and aural comprehension through close reading of original Latin American and Spanish dramatic and poetic texts reflecting on time, memory, identity, and love. Students participate in performance and creation of short dramatic and poetic texts.

***SPAN 222a or b, Legal Spanish** Mercedes Carreras

TTH 9–10:15 [F]; MW 11:35–12:50 [SP] L5 (O)

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.

***SPAN 223b, Spanish in Film: An Introduction to the New Latin American Cinema**

Margherita Tórtora

MW 1–2:15 (O)

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.

***SPAN 224a or b, Spanish in Politics, International Relations, and the Media**

Teresa Carballal

MW 1–2:15 [F]; TTH 1–2:15 [SP] L5 (O)

Issues of domestic and international politics are integrated with advanced usage of the Spanish language. A cross-cultural approach is used to analyze Spanish (vocabulary, style, content, and objectives) in political discourse, diplomatic relations, and the media.

SPAN 225b, Spanish for the Medical Professions Mercedes Carreras

MW 9–10:15 L5 (32)

Topics in health and welfare. Conversation, reading, and writing about medical issues for advanced Spanish-language students, including those considering careers in medical professions.

SPAN 226b, The Unity and Diversity of Spanish Lissette Reymundi

TTH 11:35–12:50 L5 (RP, 0)

A sociolinguistic survey of the Spanish-speaking world (Africa, the Americas, Asia, and Europe). Exploration of the unity and diversity of the Spanish language and Spanish-speaking people through the study of such topics as types of language variation, language and identity, language and society, and multilingualism (including Spanish in the United States).

***SPAN 227a, Creative Writing** María Jordán and staff

TTH 1–2:15 L5 (0)

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.

***SPAN 235b, Advanced Spanish for Heritage Speakers** Sonia Valle

MW 1–2:15 L5 (0)

Intended for heritage speakers with some previous training in Spanish grammar and writing. Development and refinement of reading, writing, and oral skills in standard Spanish to native-level fluency. Through literature, film, newspapers, and the Internet, an examination of different aspects of the Hispanic world. May be taken alone or as a continuation of SPAN 132a or 142b.

SPAN 243a or b, Advanced Spanish Grammar Terry SeymourHTBA For sections see www.yale.edu/oci L5 (61)

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.

SPAN 244a or b, Writing in Spanish Margherita Tórtora, Pilar AsensioHTBA For sections see www.yale.edu/oci L5 (61)

Intensive instruction and practice in writing as a means of developing critical thinking. Recommended for students considering courses in literature. Analysis of fiction and non-fiction forms, techniques, and styles. Classes conducted in a workshop format.

SPAN 245a/PORT 246a, Latin American Film: Brazil, Mexico, and Argentina

Paulo Moreira

For description see under Portuguese.

SPAN 246a, Introduction to the Cultures of Spain Ernesto Estrella

MW 4–5:15 L5, HU (37)

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. Conducted in Spanish.

SPAN 247b, Introduction to the Cultures of Latin America

Roberto González Echevarría

TTH 2:30–3:45 L5, HU (0)

A chronological study of Latin American cultures through their expressions in literature and the arts, beginning in the pre-Columbian period and focusing on the period from the nineteenth century to the present. Emphasis on crucial historical moments and on distinctive rituals such as fiestas. Conducted in Spanish.

SPAN 261a, Studies in Spanish Literature I Kevin Poole

MW 11:35–12:50 L5, HU (34)

An introduction to Spanish prose, drama, and lyric poetry from their medieval multicultural origins through the Golden Age in the seventeenth century. Readings include *El Cid*, *La Celestina*, *Conde Lucanor*, *Don Quijote*, and *La vida es sueño*. Conducted in Spanish.

SPAN 262b, Studies in Spanish Literature II Noël Valis

MW 11:35–12:50 L5, HU (34)

An introduction to Spanish prose, drama, and lyric poetry from the eighteenth century to the present, centered on the conflict between modernity and tradition and the quest for national identity. Texts by Bécquer, Unamuno, Lorca, Sender, Machado, Cernuda, and others. Conducted in Spanish.

SPAN 266a, Studies in Latin American Literature I Aníbal González

TTH 9–10:15 L5, HU (22)

An introduction to Spanish American literature from the Conquest to the nineteenth century. Writings of adventurers, poets, and patriots who won the New World in the sixteenth century, forged new cultural identities in the seventeenth and eighteenth centuries, and fought for independence in the nineteenth century. Conducted in Spanish.

SPAN 267b, Studies in Latin American Literature II Ernesto Estrella

TTH 1–2:15 L5, HU (26)

An introduction to Latin American literature from the nineteenth century to the present. Works by Borges, García Márquez, Paz, Neruda, Cortázar, and others. Conducted in Spanish.

GROUP C COURSES

Open to students who have placed into L5 courses. Unless otherwise noted, all courses in Group C are conducted in Spanish.

***SPAN 307a, Hispanic Poetry off the Page** Ernesto Estrella

MW 2:30–3:45 L5, HU (0)

Hispanic poetry by movements and authors who started their creative search with the visual, sound, and performative nature of the poem, i.e., “off the page.” Beginnings in the avant-garde period, the 1970s rebirth of experimental poetry in the Hispanic world, and recent manifestations of poetry off the page. Writers and movements include Juan José Tablada, Vicente Huidobro, Brazilian concretists, Mexican No-grupo, and Argentinian Diagonal Cero. Conducted in Spanish.

***SPAN 343a, Humor in Contemporary Spanish American Narrative**

Aníbal González

TTH 1–2:15 L5, HU (o)

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.

***SPAN 344b, Narrative and Music in Hispanic Caribbean Culture** Aníbal González

MW 9–10:15 L5, HU (32)

The development of the narrative genre in Cuba, the Dominican Republic, and Puerto Rico from its origins in the nineteenth century to the present. Focus on how music is represented and incorporated into the discourse of Hispanic Caribbean novels and stories. Authors include Villaverde, Carpentier, Cabrera Infante, Nicolás Guillén, Ana Lydia Vega, and Luis Palés Matos. Conducted in Spanish.

***SPAN 367a/HIST 227a, The Spanish Civil War: Words and Images** Noël Valis

MW 1–2:15 L5, HU (36)

An introduction to the history and impact of the Spanish Civil War (1936–39) through historical analyses, literature, art, and film. Authors and artists include George Orwell, Hemingway, Sender, and Picasso. Conducted in Spanish.

SPAN 368b, The Pilgrimage Road to Santiago Kevin Poole

MW 4–5:15 L5 (37)

A study of the medieval pilgrimage road to Santiago as it exemplified the cultural meanings and material conditions of religious journeys in the late Middle Ages. Examination of literary texts, architecture, art, and music. Conducted in Spanish.

***SPAN 385a/LITR 294a/PORT 394a, World Cities and Narratives** K. David Jackson

For description see under Portuguese.

***SPAN 393a/LITR 420a, The Jungle Books** Roberto González Echevarría

For description see under Literature.

***SPAN 478a and 479b, Directed Readings and/or Individual Research**

Kevin Poole

HTBA (o)

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** Kevin Poole

HTBA (o)

A research project completed under faculty supervision and resulting in a paper of considerable length, in Spanish.

GRADUATE COURSES OF INTEREST TO UNDERGRADUATES

Graduate courses in Spanish are open to qualified undergraduates. Descriptions of courses are listed in the online Graduate School bulletin. Permission of the instructor and of the director of graduate studies is required.

Special Divisional Majors

Director of undergraduate studies: Jasmina Beširević-Regan, Dean's Office TC, 432-0722, jasmina.besirevic@yale.edu

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 two patterns prevail. Some majors combine two disciplines (e.g., music and English, religious studies and anthropology), while others 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 www.yale.edu/renstudies/undergrad.html. 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 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.

Application Students considering a Special Divisional Major are invited to talk with directors of undergraduate studies 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 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 Trumbull 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 Trumbull 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 directors of undergraduate studies and other faculty members to judge whether or not this is the case.

Requirements of the major 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.

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. For the Class of 2012 and subsequent classes, courses taken Credit/D/Fail may not be counted toward the major. No distinction is made in the Special Divisional Major between standard and intensive majors.

The director of undergraduate studies 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 director of undergraduate studies. 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.

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 491a, 492b, 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.

Advisers Candidates must arrange for faculty advisers before applying. Directors of undergraduate studies 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.

REQUIREMENTS OF THE MAJOR

Prerequisite Approval of 2 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 491a and/or 492b), or, with DUS permission, written or oral exam, or grad course, or tutorial

***SPEC 491a and 492b, The Senior Project** Jasmina Beširević-Regan

HTBA (o)

An essay or project, prepared during one or two terms by senior Special Divisional Majors. Conducted under the supervision of the student's primary adviser and with the approval of the Committee on Honors and Academic Standing in connection with an approved Special Divisional Major. Spring-term essays are due no later than two weeks before the last day of classes.

Statistics

Director of undergraduate studies: David Pollard, 24 Hillhouse Ave., 432-0641, david.pollard@yale.edu

FACULTY OF THE DEPARTMENT OF STATISTICS

Professors †Donald Andrews, Andrew Barron, Joseph Chang, †Donald Green, John Hartigan (*Emeritus*), †Peter Phillips, David Pollard, †Heping Zhang, †Hongyu Zhao, Harrison Zhou

Associate Professors John Emerson, †Sekhar Tatikonda, †Edmund Yeh

Assistant Professors Lisha Chen, Mokshay Madiman, Jing Zhang

Lecturers Balaji Raman, Jonathan Reuning-Scherer, David Salsburg

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

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.

The Statistics program at Yale is a blend of the mathematical theory of probability and statistical inference, the philosophy of inference under uncertainty, computational techniques, the practice of data analysis, and statistical analysis applied to economics, biology, medicine, engineering, and other areas. Statistical methods are widely used in the sciences, medicine, industry, business, and government; graduates can work in these areas or go on to graduate study.

The curriculum for the Statistics major is a synthesis of theory, methods, and applications. The requirements are designed to achieve some balance and depth in each of the three directions of probability, statistics, and data analysis. Statistics can be taken either as a primary major or as one of two majors, in consultation with the director of undergraduate studies. Appropriate majors to combine with Statistics include programs in the social sciences, natural sciences, engineering, computer science, or mathematics. A Statistics concentration is also available within the Applied Mathematics major.

Prerequisites Multivariable calculus and linear algebra are required and should be taken before or during the sophomore year. This requirement may be satisfied by MATH 120a or b and MATH 222a or b or 225a or b, or equivalents.

Requirements of the major for the B.A. degree program The program requires ten term courses beyond the prerequisites, including the senior project. Majors take two courses in the theory and applications of probability (STAT 241a and 251b), two courses emphasizing the theory of statistical inference (STAT 242b and 312a), and two courses in the methods and practice of data analysis, chosen from STAT 230b, 361a, and 363b. STAT 238a may be substituted for STAT 241a with the permission of the director of undergraduate studies. All majors are also required to take a course in computing (ENAS 130b or CPSC 112a or b).

The two remaining courses are electives chosen from Statistics courses numbered above 200. Appropriate courses in other departments or in the graduate school may count toward the major with permission of the director of undergraduate studies.

Requirements of the major for the B.S. degree program The program requires twelve term courses beyond the prerequisites. In addition to the courses indicated for the B.A. major, the B.S. degree requires a course in mathematical analysis (MATH 260b, 300b, or 301a) and an additional Statistics elective numbered above 200.

Senior requirement In the senior year, majors in both degree programs complete a research project in STAT 490b. Students enrolled in this course work on a research project under the supervision of a faculty member, present and share their progress with each other during the seminar meetings, and write a final report.

REQUIREMENTS OF THE MAJOR

Prerequisites *Both degrees*—MATH 120a or b and MATH 222a or b or 225a or b, or equivalents

Number of courses *B.A.*—10 term courses beyond prereqs (incl senior project); *B.S.*—12 term courses beyond prereqs (incl senior project)

Specific courses required *B.A.*—STAT 241a, 242b, 251b, 312a; 2 from STAT 230b, 361a, 363b; ENAS 130b or CPSC 112a or b; *B.S.*—same, plus MATH 260b, 300b, or 301a

Distribution of courses *B.A.*—2 Stat electives numbered above 200, as specified; *B.S.*—3 Stat electives numbered above 200, as specified

Substitution permitted STAT 238a for STAT 241a, with DUS permission; courses in other depts or grad courses, with DUS permission

Senior requirement *Both degrees*—Senior project (STAT 490b)

STAT 100b, Introductory Statistics Staff

MWF 10:30–11:20 QR (33)

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.

STAT 101–106, Introduction to Statistics

A basic introduction to statistics, including numerical and graphical summaries of data, probability, hypothesis testing, confidence intervals, and regression. Each course focuses on applications to a particular field of study and is taught jointly by two instructors, one specializing in statistics and the other in the relevant area of application. The first seven weeks of classes are attended by all students in STAT 101–106 together, as general concepts and methods of statistics are developed. The remaining weeks are divided into field-specific sections that develop the concepts with examples and applications. Computers are used for data analysis. These courses are alternatives; they do not form a sequence and only one may be taken for credit. No prerequisites beyond high school algebra. May not be taken after STAT 100b.

STAT 101a^G, Introduction to Statistics: Life Sciences Jonathan Reuning-Scherer,
Günter Wagner

TTH 1–2:15 QR (26)

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.

STAT 102a^G/EP&E 203a/PLSC 452a, Introduction to Statistics: Political Science
Jonathan Reuning-Scherer, Alan Gerber

TTH 1–2:15 QR (26)

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.

STAT 103a^G/EP&E 209a/PLSC 453a, Introduction to Statistics: Social Sciences
Jonathan Reuning-Scherer

TTH 1–2:15 QR (26)

Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research.

STAT 105a, Introduction to Statistics: Medicine Jonathan Reuning-Scherer,
David Salsburg

TTH 1–2:15 QR (26)

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.

[STAT 106a^G, Introduction to Statistics: Data Analysis]

***STAT 129a/PSYC 129a, Statistics as a Way of Knowing** Nelson Donegan
For description see under Psychology.

STAT 230b^G, Introductory Data Analysis John Emerson

MW 2:30–3:45 QR (0)

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.

STAT 238a^G, Probability and Statistics Joseph Chang

MWF 2:30–3:20 QR (37)

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 MATH 118a or b or 120a or b. Some acquaintance with matrix algebra and computing assumed.

STAT 241a^G/MATH 241a, Probability Theory Balaji Raman

MWF 9:25–10:15 QR (32)

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 120a or b or equivalent.

STAT 242b^G/MATH 242b, Theory of Statistics Lisha Chen

MWF 9:25–10:15 QR (32)

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 STAT 241a and concurrently with or after MATH 222a or b or 225a or b, or equivalents.

STAT 251b^G/MATH 251b, Stochastic Processes Joseph Chang

MW 1–2:15 QR (0)

Introduction to the study of random processes, including Markov chains, Markov random fields, martingales, random walks, Brownian motion, and diffusions. Techniques in probability, such as coupling and large deviations. Applications to image reconstruction, Bayesian statistics, finance, probabilistic analysis of algorithms, and genetics and evolution. After STAT 241a or equivalent.

STAT 312a^G, Linear Models David Pollard and staff

TTH 1–2:15 QR (26)

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). Linear algebra and some acquaintance with statistics assumed. After STAT 242b and MATH 222a or b or 225a or b.

STAT 330b^G/MATH 330b, Advanced Probability David Pollard

TTH 2:30–3:45 QR (0)

Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis assumed.

STAT 361a^G/AMTH 361a^G, Data Analysis Jing Zhang

MW 2:30–3:45 QR (0)

Through analysis of data sets using the R statistical computing language, study of a selection of statistical topics such as linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Weekly sessions in the Statistical Computing laboratory. After STAT 242b and MATH 222a or b or 225a or b, or equivalents.

STAT 363b^G, Multivariate Statistics for Social Sciences Jonathan Reuning-Scherer

TTH 1–2:15 QR (0)

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.

STAT 364b^G/AMTH 364b^G/EENG 454b^G, Information Theory Andrew Barron

TTH 9–10:15 QR (22)

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 241a.

STAT 365b^G, Data Mining and Machine Learning Staff

MW 11:35–12:50 QR (0)

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 STAT 242b.

***STAT 490b, Senior Seminar and Project** David Pollard

HTBA (0)

Under the supervision of a member of the faculty, each student works on an independent project. Students participate in seminar meetings at which they speak on the progress of their projects.

GRADUATE COURSES OF PARTICULAR INTEREST TO UNDERGRADUATES

Courses in the Graduate School are open to qualified undergraduates. Descriptions of graduate courses in Statistics are available on the departmental Web site at www.stat.yale.edu. Permission of the instructor and of the director of graduate studies is required.

Study of the City

STCY 176b, Introduction to the Study of the City Alexander Garvin

T 6:45–9:15 p.m. SO (27)

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.

Swahili

(See under African Studies.)

Syriac

(See under Near Eastern Languages and Civilizations.)

Tamil

(See under *South Asian Studies*.)

Teacher Preparation and Education Studies

Director: Jonathon Gillette, 35 Broadway, 432-4631, jonathon.gillette@yale.edu, www.yale.edu/tprep

COMMITTEE OF THE TEACHER PREPARATION PROGRAM

Jill Campbell (*English*), Gordon Geballe (*Forestry & Environmental Studies*), Jonathon Gillette (*Sociology*), Joseph Gordon (*Yale College Dean's Office*), Judith Hackman (*Yale College Dean's Office*), Roger Howe (*Mathematics*), Matthew Jacobson (*History*), Frank Keil (*Psychology, Linguistics*), Michael Morand (*Office of New Haven & State Affairs*), Robert Wyman (*Molecular, Cellular, & Developmental Biology*)

The Teacher Preparation and Education Studies program offers a variety of courses on educational issues including school reform, policy, pedagogy, and instructional design. Courses are organized around two different tracks, education studies and teacher preparation.

Education studies Courses in the education studies track are designed to examine the system of education as a civic institution. The goal is to introduce ways of challenging and disciplining thinking about educational issues from a historical or sociological perspective. Courses are open to all students.

Teacher preparation The program also offers a course of study for those interested in teaching. Completion of the full course of study, begun in the sophomore year, fulfills the requirements for a license to teach in any American public school either in an early childhood setting (birth through kindergarten, open only to the Classes of 2011 and 2012) or in a secondary school setting (grades seven through twelve). Those who complete part of the program have a strong basis for teaching in a private or alternative setting such as Teach for America. For students considering elementary education, the program offers a flexible noncertified course of study called Elementary Explorations for either private school teaching or preparation for graduate school certification programs.

The teacher preparation course of study emphasizes the ability to think about teaching and the creation of learning environments for a wide range of students. Experiences in local schools and classrooms provide opportunities to explore students' individual styles of teaching. Most graduates of the program, especially in the early education area, move into positions of leadership at either the school or the policy level. Courses are offered on a space-available basis to students not enrolled in the program.

Undergraduates interested in the program should consult the director during the freshman year or early in the sophomore year in order to plan a schedule that includes both the required courses and sufficient time for student teaching. Applications close in early April of each year; students are informed by the Admissions Committee of its decisions by mid-April.

To be eligible for certification, participants must complete the following program: secondary school teachers—a major in an academic field, sufficient course work in a subject

taught in middle and high schools (English, history, modern languages, Latin, science, mathematics), and certain required professional courses; early childhood teachers (Classes of 2011 and 2012) – a major in an academic field, a designated series of courses for early childhood preparation, and certain required professional courses. The usual secondary school sequence is:

Junior Year

TPRP 190a

TPRP 194a

TPRP 195b

TPRP 199b

Senior Year

TPRP 290a–294a

TPRP 299a or b

The usual early childhood sequence is:

Junior Year

TPRP 125a

TPRP 128b

TPRP 190a

TPRP 191b

TPRP 192a

TPRP 195b

Electives in Psychology

Senior Year

TPRP 127a

TPRP 299a or b

Changes in a student's schedule must be approved by the director. All courses in the program must be taken for a letter grade. Students are encouraged to elect courses that complement their work in teacher preparation and provide links with their academic major.

EDUCATION STUDIES

TPRP 150b, Examining Education Jonathon Gillette

HTBA SO (o)

Introduction of a number of ways to challenge and discipline thinking about educational issues. Topics are presented through a series of disciplinary lenses beginning with a historical perspective and moving to psychology, political science, and sociology. Examination of one particular topic – the role of race in education – from two different disciplinary vantage points, psychology and anthropology. A comparison between China and the United States illuminates the American system. Issues of school reform are presented using a variety of interdisciplinary approaches.

TEACHER PREPARATION

***TPRP 125a/CHLD 125a/PSYC 125a, Child Development** Nancy Close

For description see under Child Study Center.

***TPRP 127a/CHLD 127a/PSYC 127a, Early Childhood Methods** Carla Horwitz

For description see under Child Study Center.

***TPRP 128b/CHLD 128b/PSYC 128b, Language, Literacy, and Play** Nancy Close, Carla Horwitz

For description see under Child Study Center.

***TPRP 190a^C, Schools, Communities, and the Teacher** Jonathon Gillette

HTBA For sections see www.yale.edu/oci SO (RP, O)

An introduction to the study of schooling in America. The cultural and historical context of schools, and major philosophies of education, discussed along with consideration of contemporary developments in schooling.

***TPRP 191b/CHLD 126b, Clinical Child Development and Assessment of Young Children** Nancy Close

2 HTBA SO ½ Course cr (O)

Clinical observation and conceptual material on the complexity of assessing young children and their families.

***TPRP 192a and 193b, Observation** Jonathon Gillette

4 HTBA ½ Course cr per term (RP, O)

Supervised and directed observation in a middle or high school associated with the program or in an appropriate preschool or kindergarten setting.

***TPRP 194a/PSYC 194a, Educational Psychology** Burton Saxon

W 2:30–4:20 SO (O)

Theories of learning and child and adolescent development and their applications to teaching and learning contexts. Topics include cognitive development; personal, gender, social, and moral development; individual and group differences; and motivation and assessment. Designed for, but not limited to, students in the Teacher Preparation and Education Studies program.

***TPRP 195b/PSYC 461b, Issues in Special Education** Barbara Shiller

W 2:30–4:20 SO (RP, O)

An examination of contemporary issues in the field of special education from systemic and developmental perspectives. Review of policy, assessment and classification, and instruction and intervention.

***TPRP 199b, Teaching and Learning in Secondary Schools** Linda Cole-Taylor

T 1:30–3:20 SO (RP, O)

A philosophical and practical forum in which prospective educators enact and evaluate their philosophy of education from the “classroom out.” Expansion of a number of topics arising in TPRP 190a; exploration of specific challenges that face educators and students today. Prospective teachers work together in a Collaborative Teaching Lab to develop and teach formal lessons at a local high school. Recommended preparation: TPRP 190a.

TPRP 290–294, The Methods of Teaching

Readings, discussions, and case studies focusing on all aspects of instruction – objectives, motivation, evaluation, short- and long-term planning, management, and curriculum. Specialists from public school systems assist in particular subject instruction.

***TPRP 290a^C, The Teaching of English** Jonathon Gillette

M 2:30–4:20 (RP, O)

***TPRP 291a^G, The Teaching of History** Linda Cole-Taylor

M 2:30–4:20 (RP, O)

[TPRP 292a^G, The Teaching of Languages]

***TPRP 293a^G, The Teaching of Mathematics** Nicholas Fiori

M 2:30–4:20 (RP, O)

***TPRP 294a^G, The Teaching of Science** Katherine Morosky and staff

M 2:30–4:20 (RP, O)

***TPRP 299a^G or b^G, Student Teaching** Staff

HTBA 3 Course cr (RP, O)

Teaching for a ten-week period, full time, in a local middle or high school or in an early childhood program, under the direction of a master teacher and the Yale supervisor.

***TPRP 471a or b, Independent Study** Staff

2 HTBA (RP, O)

Readings in educational topics, history, policy, or methodology; weekly tutorial and a substantial term essay.

Theater Studies

Director of undergraduate studies: Toni Dorfman, 220 York St., 432-1310,
toni.dorfman@yale.edu, <http://theaterstudies.yale.edu>

FACULTY ASSOCIATED WITH THE PROGRAM OF THEATER STUDIES

Professors Richard Lalli (*Adjunct*) (*Music, Theater Studies*), *Lawrence Manley (*English*), Donald Margulies (*Adjunct*) (*Theater Studies, English*), J. D. McClatchy (*Adjunct*) (*Theater Studies, English*), *Charles Musser (*Film Studies, American Studies, Theater Studies*), *Joseph Roach (*English, African American Studies, Theater Studies*), *Marc Robinson (*School of Drama, Theater Studies, English*), *Robert Stepto (*African American Studies, English, American Studies*)

Associate Professors *Murray Biggs (*Adjunct*) (*Theater Studies, English*), *Toni Dorfman (*Adjunct*) (*Theater Studies*), Joan MacIntosh (*Adjunct*) (*Theater Studies, School of Drama*), *Deb Margolin (*Adjunct*) (*Theater Studies*)

Assistant Professor Paige McGinley (*Theater Studies, American Studies*)

Senior Lecturer Bettyann Kevles

Lecturers Emily Coates, Lacina Coulibaly, Daniel Egan, Grant Herreid, Annette Jolles, Polina Klimovitskaya, Michael Korie, Kathryn Krier, Daniel Larlham, Paul McKinley, Dean Moss, Timothy Robinson, Rachel Sheinkin

Senior Lector Krystyna Illakowicz

*Member of the Executive Committee for the program.

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 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 physical approaches to explore diverse cultural forms, historical traditions, and contemporary life.

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 the production seminars (THST 211a or b, 224a, 226b, 230b, 300a, 315a, 318a, 320a, 321a, 322b, 324b, 327b, 335a, 341b, 386a, 387b, 392b, 412b, 414a, 416b, 418a, 451b) and guided independent study projects (THST 471a, 472b, and 491a or b). Each production seminar concentrates on study, through practice, of one aspect of work in the theater; examples are approaches to acting, directing, writing, dance, or design. Each seminar involves numerous projects that grow out of the term's work. For example, the project may be production of a play or several plays, adaptation or translation of existing works, or creation of original plays, performance pieces, or set design. Independent study projects give the student freedom to pursue individual and group-generated projects under the guidance of a Theater Studies faculty member. All production seminars require permission of the instructor (by application or audition). Independent study project courses are open only to majors.

Although students need not formally declare an intention to major in Theater Studies until the second term of the sophomore year, the requirements of the major may be difficult to complete in two years. Students intending to apply for admission to the major must have completed THST 110a and 111b before applying, which they must do by the end of the sophomore year. Information about the application process and advice about the program can be sought at any time from the director of undergraduate studies. Interested students are urged to consult the director of undergraduate studies early in their academic careers.

The major The major consists of ten term courses beyond the introductory prerequisites (THST 110a, 111b), one of which must be THST 210a. Students are encouraged to enroll in a balanced combination of courses involving studio work and courses with literature, history, and theory content. Of the ten required term courses, four must be chosen from four periods of dramatic literature or theater history or from four cultures. A suggested scheme might be one course in each of four of the following categories: Shakespeare, African American theater, Greek drama, melodrama, British drama, modern American drama, contemporary American drama, German drama, or other courses in dramatic literature and theater history. 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.

Students are encouraged to choose additional courses to develop the perspectives achieved in the production and literature courses. These courses may be selected (1) as a study of material that has influenced or provided sources for a playwright or theater; (2) as a study of the

historical, political, or religious context of a particular playwright, theater, or literature; (3) as a study of forms of expression contemporary with a particular theater or author, for example, courses in music, art history, architecture, or film; or (4) as a study of theoretical aspects of the theater through courses in such areas as linguistics, aesthetics, psychology, or the history of criticism.

Senior requirement Majors satisfy the senior requirement in one of two ways. They may undertake a one-term senior project (THST 491a or b), or, with the approval of the director of undergraduate studies, they may take one of the courses listed in the dramatic literature and theater history section as a senior seminar. Senior projects may take the form of directing, designing, or writing a play, performing a role, choreographing a dance piece, or writing a critical essay. Performance-oriented projects are in addition to a senior essay, which is an integral requirement of THST 491a or b. Students wishing to undertake a senior project must submit a proposal before the deadline announced by the director of undergraduate studies. Each proposal is submitted to a faculty committee for approval.

Students interested in mounting a production as part of their senior project are encouraged to develop collaborative proposals among actors, writers, directors, designers, dancers, or dramaturgs. Students proposing a collaborative production project have priority for rehearsal time and production slots in the Whitney Theater Space, 53 Wall Street. For the Class of 2012 and subsequent classes, proposals for senior project productions will normally be approved only for students who have previously served as producers of curricular theater projects.

REQUIREMENTS OF THE MAJOR

Prerequisites THST 110a, 111b

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

Specific course required THST 210a

Distribution of courses 4 courses in dramatic lit or theater hist, each from a different period or culture as specified (1 with reading in lit other than English)

Senior requirement Senior sem or senior project (THST 491a or b)

CORE CURRICULUM IN THEATER STUDIES

NOTE: All performance-oriented classes that hold auditions during the first week of the term are marked with a dagger (†). Yearlong courses hold auditions once only at the beginning of the fall term. Other starred (*) courses, limited in enrollment, are seminars intended primarily for juniors and seniors in the Theater Studies major. When openings are available, sophomores and nonmajors may be admitted with the permission of the instructor. All students interested in taking starred courses must preregister during the reading period of the preceding term. Cross-listed courses in dramatic literature and theater history or those double-titled with another department may require earlier preregistration.

Preregistration and audition information is available at the office of the director of undergraduate studies, 220 York St.

THST 110a and 111b, Survey of Theater and Drama Joseph Roach

TTH 2:30–3:20, 1 HTBA HU (27)

An introduction to theater history, plays, aesthetic theories, and performance techniques. From antiquity to Elizabethan Renaissance in the fall and continuing through to the present in the spring.

***THST 210a, Introduction to Performance Concepts** Daniel Larlham, Deb MargolinHTBA For sections see www.yale.edu/oci (RP, o)

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 110a, 111b.

PRODUCTION SEMINARS

Production seminars concentrate on study through practice of a single aspect of work in the theater, for example, acting, directing, designing, dancing, or writing for the stage. Unless otherwise indicated, production seminars are open to junior and senior majors, and to nonmajors with permission of the instructor. Application procedures are given in the course descriptions. Note the information above on both performance-oriented (†) and limited-enrollment (*) courses. Additional information is available at the office of the director of undergraduate studies.

***THST 211a or b, Intermediate Acting** Joan MacIntosh [F],

Polina Klimovitskaya [Sp]

WF 2:30–4:20 [F]; TTH 1:30–3:20 [SP] HU (RP, o)

Continued study of acting as an art, building on performance concepts introduced in THST 210a. 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 210a.

***THST 224a/MUSI 228a, Musical Theater Performance I** Annette Jolles

For description see under Music.

***THST 226b/MUSI 229b, Musical Theater Performance II** Annette Jolles

For description see under Music.

***THST 230b, Advanced Acting and Scene Study** Deb Margolin

MW 1:30–3:20 (RP, o)

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 211b.

[THST 235b, Dance Theater]**[THST 237a and 238b, Design for the Theater]*****THST 300a, The Director and the Text I** Toni Dorfman

MW 1:30–3:20 HU (RP, o)

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. Prerequisite: THST 210a.

***THST 315a, Shakespeare Acted** Murray Biggs

TTH 4:30–6:15 HU (RP, o)

An attempt to realize some of Shakespeare's texts through performance. Emphasis on problems of language: how to give language meaning, clarity, and form, while making it suggestive and natural, in alliance with other acting considerations. Close work with sonnets and monologues, with duologues, and finally with scenes. †Admission by September audition only; preference to seniors and juniors; open to nonmajors.

***THST 318a/MUSI 322a, Analyzing, Directing, and Performing Early Opera**

Grant Herreid, Toni Dorfman

For description see under Music.

***THST 320a/ENGL 453a, Playwriting** Donald Margulies

For description see under English Language & Literature.

***THST 321a, Production Seminar: Playwriting** Deb Margolin

MW 3:30–5:20 (RP, o)

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 322b, Advanced Playwriting** Deb Margolin

MW 3:30–5:20 (RP, o)

A seminar and workshop in advanced playwriting that furthers the development of an individual voice. Study of contemporary and classical plays to understand new and traditional forms. Students write two drafts of an original one-act play or adaptation for critique in workshop sessions. Familiarity with basic playwriting tools is assumed. Open to juniors and seniors, nonmajors as well as majors, on the basis of their work; priority to Theater Studies majors. Writing samples should be submitted to the instructor before the first class meeting. Prerequisite: THST 320a or 321a, or a college seminar in playwriting, or equivalent experience.

***THST 324b, Playwright-Director Laboratory** Toni Dorfman

M 9:25–11:15, 1 HTBA (RP, o)

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 210a; for directors: THST 300a; for playwrights: THST 320a, 321a; or with permission of instructor.

***THST 327b/ENGL 468b, Advanced Playwriting Workshop** Donald Margulies

For description see under English Language & Literature.

***THST 335a/AFST 435a, West African Dance: Traditional to Contemporary**

Lacina Coulibaly

TTH 1:30–3:20 HU (RP, o)

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.

***THST 341b, Comedy in Performance** Daniel Larlham

MW 1:30–3:20 (o)

Comic performance explored through discussion, exercises, and collaborative projects, with an emphasis on improvisation, playfulness, and physical engagement. Use of circus, commedia dell'arte, clowning, and other body-based techniques to extend physical and imaginative capabilities and expressiveness. Experimentation with the language of comedic storytelling through devised performance projects.

***THST 386a, Advanced Dance Repertory** Emily Coates

MW 1:30–3:20 HU (RP, o)

A studio exploration of American concert dance through the repertory of two key choreographers: Yvonne Rainer and Twyla Tharp. Emphasis on each artist's historical context, evolving aesthetic, and performance philosophy. The course culminates in a final performance. †Admission by audition during the first class meeting.

***THST 387b, Advanced Dance Composition** Emily Coates

MW 3:30–5:20 HU (RP, o)

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.

***THST 392b, American Avant-Garde Theater of the 1960s and 1970s**

Joan MacIntosh

M 1:30–3:20 (o)

American avant-garde theater and its significance, with an introduction to the historical, aesthetic, and political events that evoked and shaped it. Readings from the works of Gertrude Stein, Allen Ginsberg, the Living Theater, the Open Theater, the Performance Group, Richard Foreman, Charles Ludlam, and Mabou Mines. Includes films, guest artists, and class presentation of students' re-creations and reinterpretations of works.

***THST 412b, Libretto Writing for Musical Theater** Rachel Sheinkin

M 11:30–1:20 (RP, o)

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. May not be repeated for credit.

***THST 414a, Lyric Writing for Musical Theater** Michael Korie

M 1:30–3:20 HU (RP, o)

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. May not be repeated for credit.

***THST 416b, The Actor and the Text: Bertolt Brecht** Daniel Larlham

MW 3:30–5:20 HU (RP, o)

The drama, theory, and practice of the German playwright and theatrical reformer Bertolt Brecht explored through readings, discussion, written assignments, practical exercises, and performance projects. Brechtian dramaturgical methods, staging devices, and acting techniques. The course culminates in a fully staged production of *The Caucasian Chalk Circle*. Prerequisite: THST 210a or permission of instructor.

***THST 418a, Actors and the Art of Acting** Daniel Larlham

TTH 1:30–3:20 (RP, o)

Investigation of the actor's various modes of concentration, imaginative projection, and physical awareness. A laboratory environment combines rigorous conceptual analysis and practical experiment. Intellectual and physical engagement with texts and techniques of acting theory from Quintilian and Zeami to Boal and Anne Bogart. †Admission by audition only. Preference to Theater Studies majors. Prerequisites: THST 210a, 211b, and 230a or b, or with permission of instructor.

***THST 451b, Transcultural Collaboration in Performance** Dean Moss

M 3:30–5:20 HU (o)

Aesthetic, social, and ethical aspects of what it means for performing and visual artists from different cultures to collaborate with one another. Problems of translation across languages and disciplines; the cultural specificity of theatrical formats and the implications for audience involvement; the incorporation of visual art constructs into theatrical performance projects. Students create three original performance pieces.

DRAMATIC LITERATURE AND THEATER HISTORY***THST 218b/CLCV 218b, Drama and Demos** Timothy Robinson

For description see under Classics.

THST 223b/ENGL 360b/HUMS 243b/LITR 223b, The Foundations of Modern Drama Murray Biggs

MW 9:25–10:15, 1 HTBA HU (32)

Three representative plays by each of the seven principals of early modern Western drama: Ibsen, Strindberg, Chekhov, Shaw, O'Neill, Pirandello, Brecht.

***THST 236b/MUSI 246b, American Musical Theater History** Daniel Egan

For description see under Music.

***THST 288b/ENGL 362b, From Celebrity to Stardom** Joseph Roach

For description see under English Language & Literature.

***THST 329b/ENGL 361b, Theater Now** Marc Robinson

T 1:30–3:20 HU (o)

Study of the drama, performance, and dance theater created in the last five years, with special attention to work produced in 2010–2011. Readings from both published and unpublished American and European plays, contemporary criticism and theory, interviews, and essays by the artists themselves. Video of works created by companies such as Elevator Repair Service, Radiohole, and the Nature Theater of Oklahoma. May include attendance of productions at performance spaces in and around New York City.

***THST 345b, Dramatic Theory and Criticism** Paul McKinley

F 1:30–3:20 HU (RP, 36)

Examination of theater and dramatic criticism in connection with Greek tragedy, the Italian Renaissance, French neoclassicism, the German Enlightenment, comedy, naturalism, expressionism, realism, absurdism, feminism, and performance theory. Texts include works by Plato, Aristotle, Diderot, Lessing, Hegel, Zola, and Brecht.

THST 357a/FILM 407a, The Cinema of War Murray Biggs

For description see under Film Studies.

***THST 380b/AMST 370b, The History of Dance** Emily Coates

W 3:30–5:20 HU (o)

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. Exercises are used to illuminate analysis of the body in motion.

***THST 394b/HIST 141Jb/HSBM 462b, Science and Drama** Bettyann Kevles

For description see under History.

***THST 440b/ENGL 440b, Modern Irish Drama** Murray Biggs

TTH 4–5:15 WR, HU (o)

A study of Irish drama from the Abbey Theatre to Field Day and beyond: Yeats, Lady Gregory, Synge, O'Casey, Behan, Friel, and recent playwrights from both sides of the border.

OTHER COURSES PERTINENT TO THE THEATER STUDIES MAJOR

ENGL 200b, Shakespeare: Comedies and Romances Lawrence Manley**ENGL 201a, Shakespeare: Histories and Tragedies** David Scott Kastan***ENGL 210b/HUMS 296b, Reading and Writing in Renaissance England**

David Scott Kastan

For description see under English Language & Literature.

ENGL 409a, Shakespeare's Poems** Lawrence ManleyENGL 410b, Shakespeare and His Dramatic Contemporaries** Brian Walsh***GMAN 172b, Introduction to German Theater** Paul North***GMAN 335a^e/GMST 335a/LITR 219a, Brecht, Artaud, Müller, and the Modern Theater** Rainer Nägele

For description see under Germanic Languages & Literatures.

***GMAN 356a/GMST 356a/HUMS 294a, Dream and Interpretation** Paul North

For description see under Germanic Languages & Literatures.

HSAR 243b/ARCG 243b/CLCV 160b, Greek Art and Architecture Milette Gaifman

For description see under History of Art.

***HSAR 431b, Bosch and Bruegel** Christopher Wood

***HUMS 218a, Shakespearian Character: Falstaff, Hamlet, Iago, Cleopatra**

Harold Bloom

HUMS 219b, Shakespeare: *King Lear*, *Macbeth*, *The Winter's Tale*, *The Tempest

Harold Bloom

***HUMS 442b/CLCV 312b/NELC 315b, Translating the Hero** Kathryn Slanski

For description see under Humanities.

ITAL 153b, Theater Practicum: Pirandello** Monica Georgeo**LITR 122b, World Poetry and Performance** David Gabriel and staffLITR 357a/ENGL 321a/HUMS 246a, Visual Culture in Literature, Drama, and Film**

Edward Barnaby

For description see under Literature.

LITR 469a, The World as Theater** Jan HagensLITR 470b, Faust** Jan Hagens**NELC 121a/HUMS 441a, The Hero in the Ancient Near East** Kathryn Slanski

For description see under Near Eastern Languages & Civilizations.

***RUSS 180a, Chekhov's Stories and Plays** John MacKay, Margarita Safariants

For description see under Slavic Languages & Literatures.

SPAN 220a, Theater and Poetry Workshop** Sonia Valle**SPECIAL PROJECTS**THST 471a and 472b, Directed Independent Study** Toni Dorfman

HTBA (o)

An independent study should generally conform to the standards and procedures of the senior project, THST 491a or b, 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 15 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 10 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 20 pages. A playwriting project normally requires 20 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 210a and one seminar.

THST 473a and 474b/ENGL 438a and 439b, Directed Independent Study:*Eugene O'Neill** Murray Biggs

HTBA (o)

Individual or small-group study focused on the works of Eugene O'Neill. The course of study is planned by the student under faculty supervision; work may include one or more performances and/or written projects.

***THST 491a or b, Senior Project in Theater Studies** Toni Dorfman, Kathryn Krier

W 9:25–10:15 (o)

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.

COURSES IN THE SCHOOL OF DRAMA

Undergraduate enrollment in School of Drama courses requires the consent of the instructor and of the associate dean of the School of Drama. For a description of these courses, see the director of undergraduate studies. Meeting times and places are posted in the Green Room, UT, on the first day of the term. *Undergraduates may not enroll in acting or directing courses offered by the School of Drama.* Majors in Theater Studies, however, are encouraged to consider taking selected courses in design, dramaturgy, and theater management.

Students enrolling in School of Drama courses should note that only four term courses given in the professional schools may be offered toward the bachelor's degree. Permission to count any School of Drama course toward the major in Theater Studies must be obtained from the director of undergraduate studies at the beginning of the term in which the course is taken. 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.

Unless otherwise specified in individual course descriptions, courses in the School of Drama are not open to the Credit/D/Fail option.

Turkish

(See under *Near Eastern Languages and Civilizations*.)

Urban Studies**FACULTY ASSOCIATED WITH URBAN STUDIES**

Professors Katerina Clark (*Comparative Literature, Slavic Languages & Literatures*), Kathryn Dudley (*Anthropology, American Studies*), Dolores Hayden (*School of Architecture, American Studies*), Matthew Jacobson (*History, American Studies*), Jennifer Klein (*History*), Alan Plattus (*School of Architecture*), Douglas Rae (*School of Management, Political Science*), Helen Siu (*Anthropology*), Robert Solomon (*Law School*), Jay Winter (*History*)

Associate Professors Keller Easterling (*School of Architecture*), Michael Rowe (*School of Medicine*)

Assistant Professor Khalilah Brown-Dean (*African American Studies, Political Science*)

Lecturers Ellen Brennan-Galvin (*Forestry & Environmental Studies*), Karla Britton (*Architecture*), Gordon Geballe (*Forestry & Environmental Studies*), Jonathon Gillette (*Teacher Preparation*), Jay Gitlin (*History*), Cynthia Horan (*Political Science*), Virginia Jewiss (*Humanities*)

Courses related to urban studies may be found in a number of different departments and programs, particularly African American Studies; American Studies; Anthropology; Architecture; Environmental Studies; Ethics, Politics, and Economics; History; Humanities; Political Science; and Sociology. The course Introduction to the Study of the City is offered each year; details may be found under the heading "Study of the City" in this bulletin.

Urban studies can be incorporated into a number of major programs. The Architecture major includes an urban studies track. American Studies and Ethics, Politics, and Economics majors are required to select an area of concentration, and urban studies meets this requirement. Political Science majors who select the optional interdisciplinary concentration may focus on urban studies. The Political Science department offers the seminar Poverty, Politics, and Policy in the American City (PLSC 280b) for qualified students.

Students interested in pursuing a concentration in urban studies within a particular major are encouraged to contact their director of undergraduate studies. Faculty members listed above are available to help students identify appropriate sequences and combinations of courses and may also be willing to meet with students who are writing senior essays on interdisciplinary urban topics.

Vietnamese

(See under *Southeast Asia Studies*.)

Women's, Gender, and Sexuality Studies

Director of undergraduate studies: Melanie Boyd, 316 WLH, 432-0847, melanie.boyd@yale.edu

FACULTY ASSOCIATED WITH THE PROGRAM OF WOMEN'S, GENDER, AND SEXUALITY STUDIES

Professors Julia Adams (*Sociology*), Elizabeth Alexander (*African American Studies*), Carol Armstrong (*History of Art*), Hannah Brueckner (*Sociology*), Alicia Schmidt Camacho (*American Studies*), Jill Campbell (*English*), Hazel Carby (*African American Studies, American Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), George Chauncey (*History*), Kamari Clarke (*African American Studies, Anthropology*), Deborah Davis (*Sociology, East Asian Studies*), Ronald Eyerman (*Sociology*), Glenda Gilmore (*History*), Inderpal Grewal (*American Studies, Anthropology, Women's, Gender, & Sexuality Studies*), Dolores Hayden (*School of Architecture, American Studies*), Margaret Homans (*English, Women's, Gender, & Sexuality Studies*), Paula Hyman (*History, Religious Studies*),

Professors (*cont.*)

Marcia Inhorn (*Anthropology, Global Affairs*), Jennifer Klein (*History*), Marianne LaFrance (*Psychology, Women's, Gender, & Sexuality Studies*), Mary Lui (*American Studies, History*), Joanne Meyerowitz (*American Studies, History*), Sally Promey (*American Studies, Institute of Sacred Music, Religious Studies*), Frances Rosenbluth (*Political Science*), Cynthia Russett (*History*), William Summers (*Molecular Biophysics & Biochemistry*), Emilie Townes (*African American Studies, Religious Studies*), Michael Warner (*English*), Laura Wexler (*American Studies, Women's, Gender, & Sexuality Studies*)

Associate Professors Bernard Bate (*Anthropology*), Shannon Craigo-Snell (*Religious Studies*), Moira Fradinger (*Comparative Literature*), Terri Francis (*Film Studies, African American Studies*), Janet Henrich (*School of Medicine*), Deb Margolin (*Adjunct*) (*Theater Studies*), Barry McCrea (*Comparative Literature, English*), Naomi Rogers (*History of Science, History of Medicine*), Sarah Weiss (*Music*)

Assistant Professors Jafari Allen (*African American Studies, Anthropology*), Rene Almeling (*Sociology*), Kathryn Lofton (*American Studies, Religious Studies*), Alyssa Mt. Pleasant (*American Studies, History*), Karen Nakamura (*Anthropology*), Hala Khamis Nassar (*Near Eastern Languages & Civilizations*), Naomi Pabst (*African American Studies*), Sam See (*English*)

Senior Lecturers Geetanjali Singh Chanda (*Women's, Gender, & Sexuality Studies*), Ron Gregg (*Film Studies*), Maria Trumpler (*Women's, Gender, & Sexuality Studies*)

Lecturers Melanie Boyd (*Women's, Gender, & Sexuality Studies*), Kathleen Cleaver (*African American Studies*), Graeme Reid (*Anthropology, Women's, Gender, & Sexuality Studies*), Timothy Stewart-Winter (*History, Women's, Gender, & Sexuality Studies*), Rebecca Tannenbaum (*History*)

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. The 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 two-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 Women's, Gender, and Sexuality Studies may be taken either as a primary major or as one of two majors. The major requires twelve term courses,

including one gateway course, one intermediate course, one transnational perspectives course, one methodology course, the junior sequence, and the senior sequence. The area of concentration consists of at least five courses, the majority of which should be drawn from program offerings. Substitutions to these requirements may be made only with the written permission of the director of undergraduate studies.

Gateway course The gateway courses (WGSS 110a, 111a, 115b, 120a, 200a, and 201b) offer broad introductions to the fields of women's, gender, and sexuality studies. Potential majors should aim to take a gateway course during the freshman or sophomore year.

Intermediate course There are two intermediate courses: Globalizing Gender (WGSS 295b) and Introduction to LGBT Studies (WGSS 296a). Majors are encouraged to take both but need take only one, preferably after the gateway course and prior to the junior sequence.

Transnational perspectives course Ideally, each student's course work engages a broad diversity of cultural contexts, ethnicities, and global locations. Such study illuminates the links among nations, states, cultures, regions, and global locations. Most students take several classes that focus on genders and sexualities outside the U.S. context; majors are required to take at least one. (WGSS 295b cannot fulfill both the transnational perspectives and the intermediate requirements.)

Methodology course 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 one methodology relevant to his or her own concentration and planned senior essay. In preparation for the senior essay, students are advised to complete the methods requirement in the junior year.

Junior sequence The two-term junior sequence consists of History of Feminist and Queer Thought (WGSS 340a) and the Junior Seminar: Theory and Method (WGSS 398b). All students must take both courses. (Individualized alternatives are found for students who study abroad during the junior year and for students in the Class of 2012.)

Senior sequence and senior essay The two-term senior sequence consists of the Senior Colloquium (WGSS 490a or b), in which students begin researching and writing a senior essay, followed by the Senior Essay (WGSS 491a or b), 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.

REQUIREMENTS OF THE MAJOR

Prerequisites None

Number of courses 12 term courses (incl senior req)

Specific courses required WGSS 340a, 398b

Distribution of courses 1 gateway course; 1 intermediate course; 1 transnational perspectives course; 1 methodology course; 5 electives in area of concentration

Senior requirement Senior colloq and senior essay (WGSS 490a or b, 491a or b)

GATEWAY COURSES

WGSS 110a/SOCY 134a, Sex and Gender in Society Rene Almeling

For description see under Sociology.

WGSS 111a/AMST 111a/HIST 129a/RLST 111a, Sexuality and Religion

Kathryn Lofton

For description see under Religious Studies.

WGSS 115b/AMST 115b/ANTH 115b, Gender in a Transnational World

Inderpal Grewal

MW 1:30–2:20, 1 HTBA SO (36)

Gender and sex as constituted in modern nation-states through the divisions between domestic and foreign spheres. Ways in which the interactions between international and national issues shape gender and sexuality in everyday life. Topics include science, race, and empire; nation and identity formation; media, representation, and art practices; and migration, displacement, and globalization.

WGSS 120a, Women, Food, and Culture Maria Trumpler

TTH 1:30–2:20, 1 HTBA SO (o)

Interdisciplinary exploration of the gendering of food production, preparation, and consumption in cross-cultural perspective. Topics include agricultural practices, cooking, pasteurization, kitchen technology, food storage, home economics, hunger, anorexia, breast-feeding, meals, and ethnic identity.

WGSS 200a/AMST 135a/HIST 127a, U.S. Lesbian and Gay History

George Chauncey

For description see under History.

WGSS 201b/AMST 271b/HIST 171b, Women in America: The Twentieth Century

Joanne Meyerowitz

For description see under History.

INTERMEDIATE COURSES

***WGSS 295b, Globalizing Gender** Geetanjali Singh Chanda

TTH 11:35–12:50 WR, HU (o)

The use of gender as an analytical tool to understand a wide range of contemporary issues. Themes include nature versus culture, daily life, economic globalization, war, and fundamentalism; emphasis on connections between women's experiences across national borders. Authors include Woolf, Enloe, Kincaid, Freedman, Mernissi, and Heilbrun.

***WGSS 296a, Introduction to LGBT Studies** Graeme Reid, Timothy Stewart-Winter

MW 11:35–12:50 HU (o)

Study of works that have as their theme gay and lesbian experience and identity since the late nineteenth century. Works include fiction and autobiographical texts, historical and sociological materials, texts on queer theory, and films. Focus on modes of representing sexuality and on the intersections between sexuality and race, ethnicity, class, gender, and nationality.

JUNIOR SEMINARS

[WGSS 340a/AMST 482a, History of Feminist Thought]

***WGSS 398b, Junior Seminar: Theory and Method** Melanie Boyd

T 7–8:50 p.m. WR, HU, SO (o)

An interdisciplinary approach to studying gender and sexuality. Exploration of a range of theoretical frameworks and methodologies relevant to contemporary feminism. Prepares students for the senior essay.

SENIOR COURSES

***WGSS 490a or b, The Senior Colloquium** Maria Trumpler

W 7–8:50 p.m. [F]; T 3:30–5:20 [SP] (o)

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** Melanie Boyd

HTBA (o)

Independent research on, and writing of, the senior essay.

ELECTIVES

***WGSS 032b, History of Sexuality** Maria Trumpler

TTH 1–2:15 WR, HU Fr sem (o)

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 freshmen. Preregistration required; see under Freshman Seminar Program.

***WGSS 035b/SOCY 035b, Reproductive and Genetic Technologies** Rene Almeling

For description see under Sociology.

WGSS 167b/AFAM 167b/AMST 317b, African American Women's History

Crystal Feimster

For description see under African American Studies.

***WGSS 215b/ENGL 243b/HUMS 428b/LITR 207b/MGRK 214b, Modern Literature and the Eastern Mediterranean** Langdon Hammer, George Syrimis

For description see under Hellenic Studies.

***WGSS 221b/SOCY 221b, Sex and Romance in Adolescence** Hannah Brueckner

For description see under Sociology.

***WGSS 234b/ANTH 234b, Disability and Culture** Karen Nakamura

For description see under Anthropology.

***WGSS 261a/FILM 421a/HUMS 414a/INTS 380a/MGRK 213a, Cinema of Migration**

George Syrimis

For description see under Hellenic Studies.

WGSS 292b/AFAM 296b/AMST 296b/ENGL 296b, African American Literature

III: 1970 to the Present Elizabeth Alexander

For description see under African American Studies.

***WGSS 298a/ANTH 298a/ER&M 298a, The Anthropology of Oratory and Rhetoric**

Bernard Bate

For description see under Anthropology.

***WGSS 304a, Men, Manhood, and Masculinity** Graeme Reid

W 3:30–5:20 SO (o)

Cultural and historic constructions of masculinity explored through an investigation of male bodies, sexualities, and social interactions. Multiple masculinities; the relationship between hegemonic, nonhegemonic, and subordinate masculinities.

***WGSS 308b/ANTH 308b^G, Queer Ethnographies** Karen Nakamura

For description see under Anthropology.

***WGSS 309b/AFAM 304b/AMST 309b, Toni Morrison** Naomi Pabst

For description see under African American Studies.

***WGSS 314a/EP&E 267a/SOCY 216a, Social Movements** Ron Eyerman

For description see under Sociology.

***WGSS 323b/AFST 323b/ANTH 239b/SOCY 191b, HIV and AIDS in Africa**

Graeme Reid

MW 11:35–12:50, 1 HTBA SO (o)

The social and cultural context in which the AIDS epidemic emerged and spread in southern Africa. How people and organizations experience, conceptualize, and respond to AIDS, and how AIDS is constructed through discourse and representation.

***WGSS 327a/MMES 311a, Constructing the Self: From Autobiography to Facebook**

Geetanjali Singh Chanda

T 1:30–3:20 WR, HU (o)

Autobiography in its evolving form as literary genre, historical archive, and individual and community narrative in a changing geographical context. Women's life stories from Afghanistan, China, Cambodia, Indonesia, India, Iran, Egypt, Jordan, and Vietnam illustrate the dialectic relationship between the global and the local. What the reading and writing of autobiographies reveal about oneself and one's place in society; how autobiography can be considered a horizontal community formation.

***WGSS 328b/ER&M 328b/SAST 458b, Popular Culture and Postcolonial India**

Geetanjali Singh Chanda

HTBA (o)

A study of films and literature of South Asians living, working, and directing in Canada, the United Kingdom, and the United States. Questions of commercial populism, authenticity, and postcolonial identity.

***WGSS 339b/ENGL 385b, Feminist Fictions** Margaret Homans

For description see under English Language & Literature.

***WGSS 342a/AFAM 279a/AMST 273a, Black Women's Literature** Naomi Pabst

For description see under African American Studies.

***WGSS 360b/ENGL 386b, Queer Theory** Michael Warner

T 9:25–11:15 HU (o)

Traditions of queer critical reflection on sexuality and the social order, from the theoretical statements of the gay liberation movement to the present. Readings in Michel Foucault, Eve Sedgwick, Judith Butler, and Leo Bersani. Present-day trans theory; debates over gay marriage, globalization, rights, and secularism.

***WGSS 363b/AFST 363b/ANTH 358b, Beauty, Fashion, and Self-Styling**

Graeme Reid

W 3:30–5:20 SO (o)

Beauty, fashion, and style as aspects of self-identification and embodiment in everyday life. The relationship between the individual and society in different cultural and historical contexts, as interpreted by social science scholarship about the human body and its adornment.

***WGSS 370a, Theorizing Sexual Violence** Melanie Boyd

TTH 1–2:15 WR (o)

Examination of key feminist theories of violence against women, considering the ways in which they have both illuminated and altered broader cultural narratives of sexual violence. Ways in which these theories are themselves shaped by cultural presumptions, particularly those grounded in race, class, and sexual orientation.

***WGSS 380a/AMST 404a/ANTH 302a, Gender and Sexuality in Media and Popular Culture** Laura Wexler, Inderpal Grewal

T 3:30–5:20 HU (o)

Investigation of visual media and popular culture in the United States and transnationally. Gender, race, class, and sexuality in relation to the production, circulation, consumption, and reception of media culture. Focus on theories of media and the visual. Significant lab component in which students use media technologies to make and illustrate theoretical arguments.

***WGSS 389b/AFAM 389b/ENGL 371b, Sexuality in African American Literature and Popular Culture** GerShun Avilez

For description see under African American Studies.

WGSS 405b/CHNS 201b^c, Women and Literature in Traditional China

Kang-i Sun Chang

For description see under East Asian Languages & Literatures.

***WGSS 408b/ENGL 342b/HUMS 288b, Queer Mythologies** Sam See

For description see under English Language & Literature.

***WGSS 410b/AFAM 410b, Interdisciplinary Approaches to African American Studies**

Deborah Thomas

For description see under African American Studies.

***WGSS 412a/AFST 412a/FREN 412a/LITR 265a/MMES 162a, Postcolonial Theory and Literature** Edwige Tamalet-Talbayev

For description see under French.

***WGSS 427a/HIST 127Ja, Witchcraft in Colonial America** Rebecca Tannenbaum

For description see under History.

***WGSS 453b/HIST 142Jb/HSHM 445b, Women and Medicine in America from the Colonial Era to the Present** Naomi Rogers

For description see under History of Science, History of Medicine.

***WGSS 471a or b, Independent Directed Study** Melanie Boyd

HTBA (o)

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 including a bibliography of the work proposed and a letter of support from the adviser.

***WGSS 493b/MMES 493b/NELC 491b^c, Introduction to Modern Middle Eastern Studies** Hala Khamis Nassar

For description see under Near Eastern Languages & Civilizations.

Yorùbá

(See under African Studies.)

Zulu

(See under African Studies.)

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School of Medicine 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. Combined programs with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.) and to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Master of Medical Science (M.M.Sc.) from the Physician Associate Program. 203 785-2643

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School of Forestry & Environmental Studies 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

School of Public Health 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

School of Architecture Courses for college graduates. 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

School of Nursing Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate. Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 785-2389

School of Drama Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-Year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.). 203 432-1507

School of Management Courses for college graduates. Master of Business Administration (M.B.A.). Doctor of Philosophy (Ph.D.) awarded by the Graduate School of Arts and Sciences. 203 432-5635

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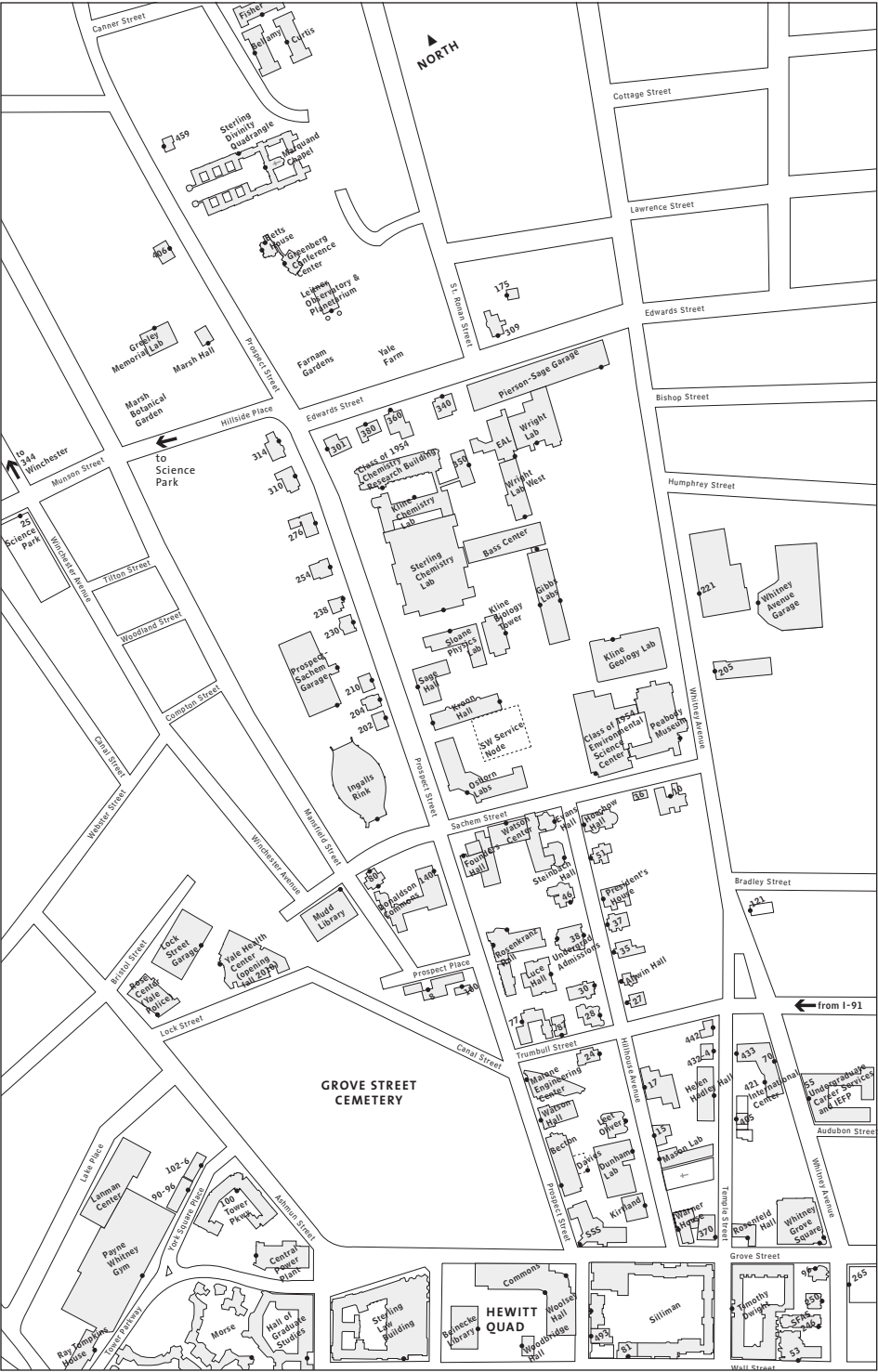
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