

Graduate School of Arts and Sciences

Programs and Policies

2009–2010



BULLETIN OF YALE UNIVERSITY

Series 105 Number 10 August 10, 2009

BULLETIN OF YALE UNIVERSITY *Series 105 Number 10 August 10, 2009* (USPS 078-500) is published seventeen times a year (one time in May, June, and November; three times in September; four times in July; seven times in August) by Yale University, 175 Whitney Avenue, New Haven CT 06511. Periodicals postage paid at New Haven, Connecticut.

Postmaster: Send address changes to Bulletin of Yale University,
PO Box 208227, New Haven CT 06520-8227

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PO Box 208230, New Haven CT 06520-8230


The closing date for material in this bulletin was June 30, 2009.
The University reserves the right to withdraw or modify the courses of instruction or to change the instructors at any time.

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 The Graduate School of Arts and Sciences Bulletin is primarily a digital publication, available in both html and pdf versions at www.yale.edu/bulletin. A limited number of copies were printed on 30% postconsumer recycled paper for the permanent archive of the Bulletin of Yale University. Individual copies may also be purchased on a print-on-demand basis; please contact Joseph Cinquino at Yale Printing and Publishing Services, 203.432.6560 or joseph.cinquino@yale.edu.

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Contents

The President and Fellows of Yale University	7
The Officers of Yale University	8
The Administration of the Graduate School	9
Schedule of Academic Dates and Deadlines	10
A Message from the Dean	14
The Graduate School of Arts and Sciences	15
Yale and the World	15
The Dean	17
Associate and Assistant Deans for Academic Affairs	17
Assistant Dean for Administration	18
Directors of Graduate Studies	18
Diversity and Equal Opportunity	18
McDougal Graduate Student Center	18
Admissions	20
Finance and Administration	21
Financial Aid	21
Registrar's Office	21
Teaching Fellow Program	21
Committees	22
Graduate Student Assembly (GSA)	22
Graduate-Professional Student Senate (GPSS)	23
Degree-Granting Departments and Programs	24
African American Studies	25
African Studies	33
American Studies	41
Anthropology	52
Applied Mathematics	63
Applied Physics	66
Archaeological Studies	67
Architecture	71
Astronomy	74
Biomedical Engineering	78
Cell Biology	79
Cellular and Molecular Physiology	83
Chemical Engineering	88
Chemistry	89
Classics	94
Comparative Literature	103
Computational Biology and Bioinformatics	113
Computer Science	116
East Asian Languages and Literatures	122
East Asian Studies	127
Ecology and Evolutionary Biology	129

Economics	135
Electrical Engineering	145
Engineering and Applied Science	146
English Language and Literature	165
Environmental Engineering	172
Epidemiology and Public Health	173
European and Russian Studies	198
Experimental Pathology	201
Film Studies	206
Forestry & Environmental Studies	211
French	217
Genetics	222
Geology and Geophysics	227
Germanic Languages and Literatures	234
History	239
History of Art	257
History of Science and Medicine	267
Immunobiology	274
International and Development Economics	280
International Relations	282
Investigative Medicine	294
Italian Language and Literature	298
Linguistics	302
Management	311
Mathematics	316
Mechanical Engineering	318
Medieval Studies	319
Microbiology	322
Molecular Biophysics and Biochemistry	325
Molecular, Cellular, and Developmental Biology	332
Music	339
Near Eastern Languages and Civilizations	344
Neurobiology	354
Neuroscience	362
Nursing	368
Pharmacology	373
Philosophy	376
Physics	383
Political Science	388
Psychology	404
Religious Studies	415
Renaissance Studies	424
Slavic Languages and Literatures	427

Sociology	432
Spanish and Portuguese	439
Statistics	443
Urban Education Studies Program	450
Non-Degree-Granting Programs, Councils, and Research Institutes	453
Atmospheric Science	453
Biological and Biomedical Sciences, Combined Program in the	454
The Cowles Foundation	457
The Economic Growth Center	458
Institution for Social and Policy Studies	459
International Security Studies	460
Judaic Studies	461
The MacMillan Center	466
African Studies, Council on	471
East Asian Studies, Council on	473
European Studies, Council on	475
International Affairs Council	477
Latin American and Iberian Studies, Council on	480
Middle East Studies, Council on	483
South Asian Studies, Council on	486
Southeast Asia Studies, Council on	490
Organismal and Integrative Biology	492
Women's, Gender, and Sexuality Studies	493
Yale Center for the Study of Globalization	499
Policies and Regulations	501
Admissions	501
Programs of Study	502
Full-Time Degree Candidacy	
Part-Time Study	
Nondegree Study	
Interdisciplinary Study	
Combined and Joint-Degree Programs	
Exchange Scholar Program	
International Graduate Student Exchange Agreements	
Summer Study	
Degree Requirements	506
Requirements for the Degree of Doctor of Philosophy	
Requirements for the Degree of Master of Philosophy	
Requirements for the Degree of Master of Arts or Master of Science	
Requirements for Joint-Degree Programs	
Petitioning for Degrees	
Dissertation Submission	
Commencement	

Academic Regulations	517
Registration	
Course Enrollment	
Grades	
Registration Status and Leaves of Absence	
Personal Conduct	
Grievance Procedures	
Freedom of Expression	
Financing Graduate School	533
Tuition and Fees, 2009–2010	533
Student Accounts and Bills	533
Transcripts	534
Financial Aid	535
University Fellowships	
Dissertation Fellowships	
Teaching Fellowships	
Traineeships and Assistantships in Research	
Research Appointments	
External Fellowships and Combined Award Policy	539
Eligibility for Fellowships	540
Other Means of Financing Graduate Education	540
Part-Time Employment	
Loans and Work-Study	
Two Federal Regulations Governing Title IV Financial Aid Programs	541
Satisfactory Academic Progress	
Department of Education Refund Policy	
University Services and Facilities	542
Living Accommodations	542
Graduate Housing—On Campus	
Off-Campus Listing Service	
University Properties	
Health Services	543
Computing and Telecommunications	546
Office of International Students and Scholars	548
International Center for Yale Students and Scholars	549
International Student Life	549
Resource Office on Disabilities	550
The Work of Yale University	551
Index	553
Campus Map	560

The President and Fellows of Yale University

President

Richard Charles Levin, B.A., B.Litt., Ph.D.

Fellows

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His Honor the Lieutenant Governor of Connecticut, *ex officio*

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The Officers of Yale University

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The Administration of the Graduate School

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Pamela Schirmeister, Ph.D., Associate Dean of the Graduate School

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Edward Barnaby, Ph.D., Assistant Dean of the Graduate School

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Lisa Furino, Assistant Director of Admissions

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Stephen Goot, M.A., Deputy Registrar, Faculty of Arts and Sciences

Judith Dozier Hackman, Ph.D., Director, Teaching Fellow Program

Howard el-Yasin, B.A., Assistant Director, Teaching Fellow Program

Schedule of Academic Dates and Deadlines

FALL TERM 2009

Aug. 24	M	New student orientation week begins
Aug. 26	W	English Language Proficiency Examination for new international students
Aug. 27	TH	Matriculation ceremony
Aug. 28	F	Fall-term Online Course Selection (OCS) begins Orientation in departments for all new students begins
Sept. 1	T	Registration for returning students begins Orientation for all new Teaching Fellows
Sept. 2	W	Fall-term classes begin, 8:20 a.m.
Sept. 4	F	Final day to pick up registration materials from academic departments
Sept. 7	M	Labor Day. Administrative offices closed
Sept. 11	F	Final day to apply for a fall-term personal leave of absence The entire fall-term tuition charge or continuous registration fee (CRF) will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a leave of absence effective on or before this date
Sep. 16	W	Fall-term Online Course Selection (OCS) ends. Final day for registration. <i>A fee of \$25 is assessed for course schedules accepted after this date</i>
Sep. 25	F	One-half of the fall-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a medical leave of absence effective on or before this date. <i>The CRF is not prorated</i>
Oct. 1	TH	Final date for the faculty to submit grades to replace grades of Temporary Incomplete (TI) awarded during the previous academic year Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in December Final day to file petitions for degrees to be awarded in December

Oct. 23	F	Midterm One-quarter of the fall-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a medical leave of absence effective on or before this date. <i>The CRF is not prorated</i> Teaching appointments will not appear on the transcripts of students who withdraw from the assignment on or before this date
Oct. 30	F	Final day to change enrollment in a fall-term course from Credit to Audit or from Audit to Credit Final day to withdraw from a fall-term course
Nov. 2	M	Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in December
Nov. 6	F	Departmental recommendations are due for candidates for December degrees Final day to withdraw a degree petition for degrees to be awarded in December
Nov. 12	TH	English Language Proficiency Examination for international students
Nov. 20	F	Fall recess begins, 5:20 p.m.
Nov. 30	M	Classes resume, 8:20 a.m.
Dec. 11	F	Classes end, 5:20 p.m.
Dec. 19	SA	Fall term ends; winter recess begins

SPRING TERM 2010

Jan. 6	W	Final grades for fall-term courses due
Jan. 7	TH	English Language Proficiency Examination for new international students
Jan. 11	M	Registration and spring ID validation begins Spring-term classes begin, 8:20 a.m.
Jan. 15	F	Friday classes do not meet. Monday classes meet instead
Jan. 18	M	Martin Luther King, Jr. Day. Administrative offices closed. Classes do not meet

Jan. 20	W	<p>Final day to apply for a spring-term personal leave of absence</p> <p>The entire spring-term tuition charge or CRF will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a leave of absence effective on or before this date</p>
Jan. 22	F	<p>Registration and spring ID validation end. Spring-term Online Course Selection (OCS) ends. Final day for registration. <i>A fee of \$25 is assessed for forms accepted after this date</i></p>
Feb. 5	F	<p>One-half of the spring-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a medical leave of absence effective on or before this date. <i>The CRF is not prorated</i></p>
Mar. 5	F	<p>Midterm</p> <p>Spring recess begins, 5:20 p.m.</p> <p>One-quarter of the spring-term full-tuition charge will be canceled for students who withdraw from the Graduate School on or before this date or who are granted a medical leave of absence effective on or before this date. <i>The CRF is not prorated</i></p> <p>Teaching appointments will not appear on the transcripts of students who withdraw from the assignment on or before this date</p>
Mar. 15	M	<p>Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in May</p> <p>Final day to file petitions for degrees to be awarded in May</p>
Mar. 22	M	<p>Classes resume, 8:20 a.m.</p>
Mar. 29	M	<p>Final day to change enrollment in a spring-term course from Credit to Audit or from Audit to Credit</p> <p>Final day to withdraw from a spring-term course</p>
Apr. 2	F	<p>Good Friday. Administrative offices closed</p>
Apr. 12	M	<p>Readers' Reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in May</p>
Apr. 15	TH	<p>English Language Proficiency Examination for international students</p>
Apr. 21	W	<p>Departmental recommendations are due for candidates for May degrees</p>

Apr. 23	F	Final day to withdraw a degree petition for degrees to be awarded in May
Apr. 26	M	Monday classes do not meet. Friday classes meet instead
Apr. 30	F	Final day to submit Dissertation Progress Reports and petitions for extended registration
May 3	M	Classes end, 5:20 p.m.
May 11	T	Spring term ends
May 14	F	Final grades for spring-term courses are due for candidates for terminal M.A. and M.S. degrees to be awarded at Commencement
May 23	SU	Graduate School Convocation
May 24	M	University Commencement
Jun. 1	T	Final grades for spring-term courses and full-year courses are due

A Message from the Dean

Welcome to the Graduate School of Arts and Sciences at Yale University, the first of its kind in North America. The Graduate School stands at the very heart of Yale's mission as a university, and this publication, *Programs and Policies*, reveals the extraordinary breadth of opportunities for graduate study at Yale. As you peruse it, you likely will discover the intriguing ways in which graduate study differs from the undergraduate experience and the fulfillment brought by this intellectual progression. You have undertaken to explore a field in depth, master an area of inquiry, and learn to disseminate knowledge through classroom teaching. Graduate education culminates in a creative and original contribution in one's field of study representing the ability to participate in the advancement of human knowledge.

Yale's departments and programs constitute the center for most graduate student intellectual and social life at Yale and elsewhere. They comprise vital communities of scholars who share a common interest in advancing a particular discipline, and graduate students and faculty alike gain immeasurably from their intellectual and disciplinary collaborations. Yale's excellent laboratory facilities, unique museum collections, and tremendous library holdings all enrich the experience of a Yale University graduate education.

The Graduate School of Arts and Sciences has worked to extend and enrich the community life found within these disciplines. Through interdisciplinary programs and institutes, as well as the McDougal Graduate Student Center's seminars on teaching, writing, and career education that help graduate students prepare for their professional lives, the Graduate School enables students to connect with skilled experts with a shared commitment to careers in teaching, research, and an array of potential leadership opportunities.

Use *Programs and Policies* as a guide throughout your graduate study at Yale. It includes practical information about registration, financial aid, teaching experiences, University resources available to you, and the full range of assistance provided by the Graduate School. All of us in the Graduate School wish you good fortune as you pursue your advanced degree, and we want you to contact us if we can help you along the way. Graduate study is exhilarating and life-changing. For well over a century Yale has prepared men and women for truly extraordinary careers across many old, new, and evolving disciplines.

Jon Butler
Dean, Graduate School of Arts and Sciences
Howard R. Lamar Professor of American Studies,
History, and Religious Studies

The Graduate School of Arts and Sciences

The Yale Graduate School of Arts and Sciences is one of fourteen schools composing Yale University and the only one that awards the degrees of Doctor of Philosophy, Master of Philosophy, Master of Arts, Master of Science, and Master of Engineering. The work of the Graduate School is carried on in the divisions of the Humanities, Social Sciences, and Biological and Physical Sciences. Fifty-four departments and programs offer courses of study leading to the Ph.D. degree. There are twenty-four programs that terminate with the master's degree.

Yale began to offer graduate education in 1847, and in 1861 it conferred the first Ph.D. degrees in North America. In 1876 Yale became the first American university to award the Ph.D. to an African American. The Graduate School of Arts and Sciences was formally established in 1892, when the first dean was appointed. It was in that same year that women were first admitted as candidates for the doctorate.

The Graduate School community has grown vigorously since the early twentieth century; today it comprises 2,500 graduate students and a faculty of 900 who are among the world's most distinguished teachers and scholars. Admission to the Graduate School is highly competitive; currently each entering class is made up of about 550 students.

The Graduate School's purpose is to educate students in research, scholarship, and teaching in the arts and sciences. Under the guidance of the faculty, graduate students engage in advanced study of a discipline and then proceed to generate new knowledge and ideas through research. They learn to disseminate this knowledge in scholarly publications and teaching. Yale's graduate students have built careers in colleges and universities, research laboratories, government, the nonprofit sector, and private industry. Their education equips them for leadership roles in all these callings.

Yale's standing as a great international research university is based on the strength and attractiveness of its graduate programs. The pursuit of advanced learning and new knowledge takes place in the departments and programs of the Graduate School. Thus it is the Graduate School that makes Yale a university. Furthermore, graduate students as scholars in training and apprentice teachers engage with undergraduates and the faculty. A shared sense of common purpose makes Yale a community of scholars, and a place for an unusually intimate exchange of ideas.

YALE AND THE WORLD

The Yale Graduate School has always comprised an international community, but it recognizes as well that now, more than ever, advanced scholarship must occur on transnational grounds. It is increasingly important that we prepare our students to participate in a global economy of research and knowledge and that we create institutional channels through which such participation can flourish. In addition to formal student exchanges that enable graduate students to perform research and fieldwork abroad, individual faculty members, departments, and the School participate in collaborative efforts with international partners.

Approximately one-third of full-time graduate students at Yale come from outside the United States. In addition, many international students come to the Graduate School

as non-degree students in the Division of Special Registration (DSR). DSR students may undertake course work and/or research for periods of one term or one year. When appropriate the period may extend for a second year. These students are subject to the usual admissions procedure, are admitted to a department, and often work with a specific faculty member. See International Student Life for additional information regarding international student life at Yale.

A Global University

In a speech entitled “The Global University,” Yale President Richard C. Levin declared that as Yale enters its fourth century, its goal is to become a truly global university—educating leaders and advancing the frontiers of knowledge not simply for the United States, but for the entire world:

“The globalization of the University is in part an evolutionary development. Yale has drawn students from outside the United States for nearly two centuries, and international issues have been represented in its curriculum for the past hundred years and more. But creating the global university is also a revolutionary development—signaling distinct changes in the substance of teaching and research, the demographic characteristics of students, the scope and breadth of external collaborations, and the engagement of the University with new audiences.”

Yale University’s goals and strategies for internationalization are described in a report entitled “The Internationalization of Yale: The Emerging Framework,” which is available online at www.world.yale.edu/pdf/Internationalization_of_Yale.pdf.

International activity is coordinated by several University-wide organizations in addition to the efforts within the individual schools and programs.

Launched in 2003–2004, the Office of International Affairs supports the international activities of all schools, departments, offices, centers, and organizations at Yale; promotes Yale and its faculty to international audiences; and works to increase the visibility of Yale’s international activities around the globe. (www.yale.edu/oia)

The Office of International Students and Scholars is a resource on immigration matters and hosts orientation programs and social activities for the University’s international community. See description in this bulletin and www.oiss.yale.edu.

The Whitney and Betty MacMillan Center for International and Area Studies is the University’s principal agency for encouraging and coordinating teaching and research on international affairs, societies, and cultures. See description in this bulletin and www.yale.edu/macmillan.

The Yale Center for the Study of Globalization draws on the intellectual resources of the Yale community, scholars from other universities, and experts from around the world to support teaching and research on the many facets of globalization, and to enrich debate through workshops, conferences, and public programs. See description in this bulletin and www.ycsg.yale.edu.

The Yale World Fellows Program hosts eighteen emerging leaders from outside the United States each year for an intensive semester of individualized research, weekly seminars, leadership training, and regular interactions with the Yale community. (www.yale.edu/worldfellows)

For additional information, the “Yale and the World” Web site offers a compilation of resources for international students, scholars, and other Yale affiliates interested in the University’s global initiatives. (www.world.yale.edu)

THE DEAN

Jon Butler, 112 HGS, 432.2733, grad.dean@yale.edu

The dean of the Graduate School is appointed by the president of the University and is responsible for the educational mission of the Graduate School, its faculty, the quality of its programs, and the welfare of graduate students.

ASSOCIATE AND ASSISTANT DEANS FOR ACADEMIC AFFAIRS

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Robert Harper-Mangels, Assistant Dean, 133 HGS, 432.1884,
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The academic deans of the Graduate School are responsible for the administration of graduate programs, normally in consultation with the directors of graduate studies, and for the academic and personal well-being of students. They participate in decisions regarding admissions, financial aid, academic performance, and the application of the regulations and policies of the Graduate School.

Dean Schirmeister and Dean Barnaby oversee Ph.D. and terminal master’s programs in African American Studies; African Studies; American Studies; Archaeological Studies; Architecture; Classics; Comparative Literature; East Asian Languages and Literatures; East Asian Studies; Economics; English Language and Literature; European and Russian Studies; Film Studies; French; Germanic Languages and Literatures; History; History of Art; History of Medicine and Science; International and Development Economics; International Relations; Italian Language and Literature; Management; Medieval Studies; Music; Near Eastern Languages and Civilizations; Philosophy; Political Science; Religious Studies; Renaissance Studies; Slavic Languages and Literatures; Sociology; Spanish and Portuguese; and Urban Education Studies.

Dean Sleight and Dean Harper-Mangels oversee Ph.D. and terminal master’s programs in Anthropology; Applied Mathematics; Astronomy; Biological and Biomedical Sciences; Cell Biology; Cellular and Molecular Physiology; Chemistry; Computational Biology and Bioinformatics; Computer Science; Ecology and Evolutionary Biology; Engineering and Applied Science (Applied Physics, Biomedical Engineering, Chemical Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering); Epidemiology and Public Health; Experimental Pathology; Forestry & Environmental Studies; Genetics; Geology and Geophysics; Immunobiology; Investigative Medicine; Linguistics; Mathematics; M.D./Ph.D. Program; Microbiology; Molecular

Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Neurobiology; Neuroscience; Nursing; Pharmacology; Physics; Psychology; and Statistics.

DIRECTORS OF GRADUATE STUDIES (DGS)

A senior faculty member, appointed by the dean, serves as director of graduate studies (DGS) for each department or program. The directors of graduate studies are responsible for the satisfactory administration of the programs of graduate study and function as advisers and guides to all graduate students in their respective department and programs. They help graduate students to plan an appropriate course of study and research, and advise on and approve course schedules. The DGS acts as the liaison between each student in the department or program and the Office of the Dean.

DIVERSITY AND EQUAL OPPORTUNITY

Michelle Nearon, Assistant Dean, Director, 127 HGS, 432.0763
www.yale.edu/graduateschool/diversity

The Office for Diversity and Equal Opportunity's mission is to expand the diversity of the student body and to enhance the intellectual experience of the entire scholarly community. The office coordinates efforts to recruit and retain students of color, women, and other diverse groups at Yale Graduate School. The assistant dean works collaboratively with departments and programs to support the needs of these students as they pursue graduate study. The assistant dean advises prospective and current minority graduate students, directs the Summer Undergraduate Research Fellowship (SURF) Program, oversees Diversity Recruitment Days, writes and administers grants, and provides reports on the Graduate School's progress in recruiting and retaining diverse students. Graduate Diversity Fellows within the office are also appointed annually to assist the office in the development and implementation of a wide array of programs, such as application seminars, mentoring programs, discussions and lectures presented by diverse scholars, and social and cultural events. An Advisory Committee, appointed by the dean, meets regularly to discuss and review the office's programmatic efforts.

MCDUGAL GRADUATE STUDENT CENTER

Hall of Graduate Studies, 432.BLUE (2583)
www.yale.edu/graduateschool/mcdougal

A generous gift from Mr. Alfred McDougal '53, a Yale alumnus, and his wife, Ms. Nancy Lauter, enabled Yale to create the McDougal Graduate Student Center in 1997. The McDougal Center provides space and programs for building intellectual, cultural, and social community, as well as facilitating professional development activities across the departments of the Graduate School.

Graduate Career Services

Victoria A. Blodgett, Assistant Dean and Director, Graduate Career Services,
 122 HGS, 432.7375, mcdougal.careers@yale.edu
www.yale.edu/mcdougal/careers

Graduate Career Services (GCS) is a comprehensive career center for students and alumni/ae of the Graduate School. Through individual advising, a full schedule of programs each term, on-campus recruiting, interview practice, and a library of print resources as well as career-related Web links, the office assists with career education, decision making, and job search planning. The GCS director consults with directors of graduate studies to develop programs that supplement the department's role in the professional development of students pursuing an academic career. For graduate students considering careers beyond the professoriate, the director initiates programs and develops links with employers who seek graduate students' skills. Students and alumni place requests through Interfolio to transmit their dossiers to employers, agencies, and schools considering them for permanent or short-term positions, and for grants and fellowships. Students are encouraged to begin using the services of the office early in their graduate careers in order to increase their opportunities upon the completion of their degree. Students interested in the activities planned by the GCS should visit the Web site to view the calendar of events and subscribe to the weekly GCS newsletter.

Graduate Student Life

Lisa Brandes, Assistant Dean for Student Affairs and Director, Graduate Student Life,
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Jennifer Mendelsohn, Associate Director, Graduate Student Life,
124 HGS, 432.2583, mcdougal.center@yale.edu
www.yale.edu/mcdougal/studentlife

The Office of Graduate Student Life is responsible for student life programs in the McDougal Center and student services in the Graduate School. McDougal Graduate Fellows and staff produce a wide array of student life programs, including concerts, arts, literary, music, sports and cultural events, health and wellness sessions, outings, family activities and resources, international student events, public service opportunities, monthly happy hours, dances, and events for various student groups. Graduate Student Life provides advice and support to graduate student organizations, which may sponsor events at the center. Activities are announced in the weekly e-mail McDougal Life Notes (www.yale.edu/graduateschool/studentLife), through specialized e-mail lists, and on the McDougal Center Student Life Web calendar at the site listed above. This office also oversees the facilities and general services of the McDougal Center, including meeting rooms and room requests, ticket sales, and lockers.

The assistant dean for student affairs coordinates general campus services for graduate students, serving as the student advocate and departmental liaison for graduate housing, dining services, health services, athletics, security, chaplains, parking and transit. The assistant dean and staff are available to answer questions or help with any problems that students may have, including speaking individually about issues concerning their life at Yale and other personal matters and concerns. The Graduate Student Life office also organizes recruitment activities, new student orientation, and other events for the Graduate School community, including the Graduate School's participation in the University's Commencement exercises.

The McDougal Graduate Teaching Center

William C. Rando, Assistant Dean and Director, Graduate Teaching Center,
120B HGS, 432.2583, william.rando@yale.edu, mcdougal.teaching@yale.edu
Jennifer Frederick, Associate Director, Science Education, Graduate Teaching Center,
120A HGS, 432.2583, jennifer.frederick@yale.edu, mcdougal.teaching@yale.edu
www.yale.edu/mcdougal/teaching

The Graduate Teaching Center offers a full range of training, consultation, and development services to teachers and teaching fellows at Yale. The director and staff of fifteen graduate teaching consultants are available throughout the year and in a variety of capacities, providing assistance and training for brand-new teachers as well as experienced members of the faculty. Each year the center offers a comprehensive program of teaching workshops, dealing with topics such as effective discussion leading, classroom management, lecturing, and course design. The center also organizes four- to six-week courses in the fundamentals of teaching in each of four areas: humanities, social sciences, sciences, and foreign languages. Through its Spring Teaching Forum and lecture series, the GTC also provides a venue for members of the Yale community to discuss issues in undergraduate education and to explore the latest in teaching innovation. Anyone teaching at Yale can contact the center for an individual consultation at any time. Classroom visitations and videotaping are also available. The GTC works closely with academic departments to design discipline-specific training for teaching fellows and new faculty. The GTC publishes *Becoming Teachers: The Graduate Student Guide to Teaching at Yale* as well as *Tales from the Classroom*, which presents teaching cases from Yale as short, illustrated comics. Graduate students interested in the activities organized by the GTC should visit the Web site and sign up for the GTC listserv, TeachingNotes.

Resource Library

McDougal Center, 120 HGS

The Resource Library is a collection of books, other documentation, and Web resources for graduate students and postdoctoral appointees regarding careers (both academic and nonacademic), teaching, writing and research, graduate student life and diversity, and funding opportunities. Materials may be checked out for use in the center or be copied in the ITS computer cluster.

ADMISSIONS

Robert Colonna, Director, 117B HGS, 203.432.2771, graduate.admissions@yale.edu
Lisa Furino, Assistant Director, 117A HGS, 203.432.2771,
graduate.admissions@yale.edu
www.yale.edu/graduateschool/admissions/

The Office of Graduate Admissions coordinates and oversees all aspects of application to the Graduate School for individuals seeking master's and doctoral degrees, as well as for nondegree study. The Office of Graduate Admissions also works with the associate deans and academic departments to provide relevant information and decisions to applicants.

FINANCE AND ADMINISTRATION

Alice Oliver, Director, 131 HGS, 432.2739, alice.oliver@yale.edu

The Office of Finance and Administration is responsible for all financial transactions in the Graduate School, overseeing both financial aid and operating activities. Working with the dean and others, the office develops and monitors all Graduate School budgets and expenditures, maintaining compliance with internal and external policies and regulations. The office provides support to the dean and Graduate School supervisory staff in hiring, training, and related human resources activities of the School. The office is a resource to Graduate School, University, and external organizations seeking interpretation of policies and regulations and providing guidance about procedures, reporting, and interactive systems.

FINANCIAL AID

Jennifer Brinley, Associate Director, 130 HGS, 432.7980, jennifer.brinley@yale.edu
www.yale.edu/graduateschool/financial

The Office of Financial Aid is a resource to graduate students, departments, and non-Yale organizations needing guidance or assistance regarding financial aid policies and the administration of fellowships and student loan programs. The office oversees and maintains financial and data management systems and disburses all graduate student financial aid.

REGISTRAR'S OFFICE

Stephen Goot, Deputy Registrar, 114 HGS, 432.2743, stephen.goot@yale.edu

The Registrar's Office maintains the academic records of all students in the Graduate School. In addition, the Registrar's Office develops course and classroom schedules and oversees registration, tuition charges, academic holds, dissertation submission, final clearance at graduation, and release of diplomas for Commencement. Students should consult this office to report changes in name or Social Security number, to request transcripts, or to certify their enrollment in the Graduate School. Students can change their address listing at www.yale.edu/sis.

TEACHING FELLOW PROGRAM

Judith Dozier Hackman, Director, 139 HGS, 432.2757, judith.hackman@yale.edu
Howard el-Yasin, Assistant Director, 139 HGS, 432.2757, howard.el-yasin@yale.edu

The Teaching Fellow Program is the principal framework at Yale in which graduate students learn to become effective teachers. Learning to teach and to evaluate student work is fundamental to the education of graduate students. The Teaching Fellow Program provides opportunities for graduate students to develop teaching skills, under faculty guidance, through active participation in the teaching of Yale undergraduates. Teaching fellows who encounter problems or difficulties related to their teaching roles are encouraged to meet with the director of the Teaching Fellow Program or their associate dean.

COMMITTEES

Currently five standing committees are concerned with the policies and procedures of the Graduate School; as with all standing committees, their deliberations are confidential. Student members of these committees are selected by the Graduate Student Assembly.

The Executive Committee A committee of faculty members and graduate students, chaired by the dean, advises the dean on broad matters of policy and procedure and makes recommendations to the faculty of the Graduate School.

The Degree Committees There are three degree committees, serving the divisions of Humanities, Social Sciences, and Biological and Physical Sciences. The degree committees, composed of members of the division's faculty and chaired by the dean, meet twice a year and are responsible to the faculty of the Graduate School for maintaining standards of graduate education in the School and for recommending candidates for degrees. They review special academic problems of individual students and, when appropriate, the educational programs of the departments.

Dean's Advisory Committee on Student Grievances Composed of three students, three faculty members, normally one from each division, and one administrator of the Graduate School, the committee reviews complaints brought by graduate students against a member of the faculty or administration of the Graduate School (see Grievance Procedures, under Policies and Regulations).

The Grievance Board for Student Complaints of Sexual Harassment Composed of two faculty members, two graduate student members, an administrator of the Graduate School, and a person with counseling experience, the board exists to support an atmosphere of mutual tolerance and respect in the Graduate School. It is responsible for addressing complaints of sexual harassment brought by graduate students against administrators, faculty of the Graduate School of Arts and Sciences, other instructors of graduate students, postdoctoral appointees, or other graduate students (see Grievance Procedures, under Policies and Regulations).

The Committee on Regulations and Discipline Composed of three graduate students, three faculty members, normally one from each division, and an associate dean, the committee reviews violations of the regulations governing academic and personal conduct (see Personal Conduct, under Policies and Regulations).

GRADUATE STUDENT ASSEMBLY (GSA)

B43 HGS, 432.8893, graduate.student.assembly@yale.edu
www.yale.edu/gsa

Students in the Graduate School are represented collectively by the Graduate Student Assembly, which provides a forum for students to address issues across the Graduate School and University. It consults with the dean and other administrators on proposed changes in Graduate School policy, raises concerns expressed by the student body, nominates the student members of all Graduate School standing committees, and administers a conference travel fund for graduate students. Representatives to the assembly are

elected by students in individual departments and degree programs. Each department or program has at least one student representative, with additional representatives allotted proportionally by size of the student population.

GRADUATE-PROFESSIONAL STUDENT SENATE (GPSS)

gpss@yale.edu

www.yale.edu/gpss/

Founded in 1971, the Graduate-Professional Student Senate (GPSS) fosters discussion and the exchange of ideas among the graduate and professional student population. All graduate and professional students are eligible to become senators. Senators are chosen each year by their respective schools. The GPSS meets every two weeks throughout the academic year, and meetings are open to the graduate and professional school community. Members serve on and make appointments to University committees, meet with University officials and Yale Corporation members, sponsor informational workshops and conferences, organize lectures and social events, and assist in community service events. Additionally, the GPSS oversees operation of the Graduate-Professional Student Center at Yale (GPSCY), at 203 York Street, which includes office and meeting spaces for graduate-professional student organizations, and the Gryphon's Pub.

Degree-Granting Departments and Programs

This section provides information on all degree-granting departments and programs of the Graduate School of Arts and Sciences. Each listing provides a roster of faculty, special admissions and degree requirements, and course offerings for that department or program. The requirements appearing in the *Graduate School of Arts and Sciences Programs and Policies* take precedence over any statements published separately by individual departments and programs.

The degree requirements of the Graduate School itself appear later in this publication, under Policies and Regulations. These apply to all students in the Graduate School, although there are variations in the pattern of their fulfillment in individual departments and programs. The requirements of the Graduate School may change from time to time. If a requirement changes within the period normally required for completion of a student's course of study, the student will normally be given the choice of completing either the new or the old requirement.

The requirements of individual departments also may change from time to time, with the approval of the Graduate School. After such approval has officially been given, students in that department or program will receive written notification. All changes in departmental degree requirements occurring after the publication closing date of the *Graduate School of Arts and Sciences Programs and Policies* are posted in the Faculty of Arts and Sciences Registrar's Office, 246 Church Street, third floor.

The course listings and instructors that follow reflect information received by the registrar as of the publication date and are subject to change without notice. Students are advised to consult www.yale.edu/courseinfo/ for the most recent information.

Fall-term courses are indicated by the letter "a," spring-term courses by the letter "b." Yearlong courses have no letter designation or list both "a" and "b." Course numbers followed by a superscript "u" are also open to undergraduates in Yale College. Courses in brackets are not offered during the current academic year.

AFRICAN AMERICAN STUDIES

81 Wall St., 432.1170
www.yale.edu/afamstudies/
 M.A., M.Phil., Ph.D.

Chair

Elizabeth Alexander

Director of Graduate Studies

Glenda Gilmore (81 Wall St., glenda.gilmore@yale.edu)

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

Associate Professors Kamari Clarke, Alondra Nelson

Assistant Professors Jafari Allen, Khalilah Brown-Dean, Terri Francis, Paige McGinley, Naomi Pabst, Edward Rugemer

Lecturers Kathleen Cleaver, Flemming Norcott, Deborah Thomas

Fields of Study

African American Studies offers a combined Ph.D. in conjunction with several other departments and programs. Departments and programs which currently offer a combined Ph.D. with African American Studies are: American Studies, Anthropology, English, Film Studies, French, History, History of Art, Political Science, Psychology, Religious Studies, Sociology, and Spanish and Portuguese. Within the field of study, the student will select an area of concentration in consultation with the directors of graduate studies of African American Studies and the joint department or program. An area of concentration in African American Studies may take the form of a single area study or a comparative area study: e.g., Caribbean or African American literature, a comparison of African American literature in a combined degree with the Department of English; an investigation of the significance of the presence of African cultures in the New World, either in the Caribbean or in Latin and/or South America in a combined degree with the Spanish and Portuguese department. An area of concentration may also follow the fields of study already established within a single discipline: e.g., race/minority/ethnic studies in a combined degree with Sociology. An area of concentration must either be a field of study offered by a department or fall within the rubric of such a field. Please refer to the description of fields of study of the prospective joint department or program.

Special Admissions Requirements

Strong undergraduate preparation in a discipline related to African American studies; writing sample; description of the fields of interest to be pursued in a combined degree. This is a combined degree program. To be considered for admission to this program you must indicate both African American Studies and one of the participating departments/

programs listed above. Additionally, please indicate both departments on all supporting documents (personal statement, letters of recommendation, transcripts, etc.).

Special Requirements for the Ph.D. Degree

Students will be subject to the combined Ph.D. supervision of the African American Studies department and the relevant participating department or program. The student's academic program will be decided in consultation with an adviser, the director of graduate studies of African American Studies, and the director of graduate studies of the participating department or program and must be approved by all three. Students are required to take four designated core courses in African American Studies. Core courses are (1) Theorizing Racial Formations (AFAM 505a/AMST 643a), which is a required course for all first-year graduate students in the combined program; (2) American Legal History: Citizenship and Race (AFAM 829b/WGSS 715b) and/or Race, Racism, and Social Theory (AFAM 719b/AMST 680b/SOCY 654b/WGSS 719b), which is a required course for all first-year graduate students in the combined-program spring term; (3) Race and Ethnicity (AFAM 814a/PLSC 823a), which is a required course for all second-year graduate students in the combined-program fall term; (4) Dissertation Prospectus Workshop (AFAM 895), which is a yearlong requirement of all third-year graduate students in the combined program after completion of course work. This workshop is intended to support preparation of the dissertation proposal. Each student will be expected to present his or her dissertation prospectus during that year. The workshop will also feature seminars in which students present chapters of their dissertations-in-progress. The expectation is that this workshop will be voluntarily attended by students even during terms when they are not required to register for it. The workshop will be an important part of each graduate student's professionalization and will serve as a vital stimulus to intellectual activity.

Qualifying examinations and the dissertation proposal will be administered jointly by the program and participating department and must be passed within the time required by the participating department. The total number of courses required will adhere to the requirements of the participating department or program. Each student must complete the minimum number of courses required by the participating department or program; African American Studies core courses (excepting the dissertation prospectus workshop) count toward the participating department's or program's total. For details of these requirements, see the special requirements of the combined Ph.D. for the particular department printed in this publication. Students will be required to meet the foreign language requirements of the participating department (see Policies and Regulations: Degree Requirements). Students will not be admitted to candidacy until all requirements, including the dissertation prospectus, have been met and approved by the Graduate Studies Executive Committee of the African American Studies department and the participating department. If a student intends to apply for this combined Ph.D. in African American Studies and another department, he or she should contact the prospective department and request a description of all Ph.D. requirements and courses.

The faculty in African American Studies consider teaching to be an essential component of graduate education, and students therefore will teach in their third and fourth years.

Master's Degrees

M.Phil. See Graduate School requirements.

M.A. (en route to the joint Ph.D.) Students will be awarded a combined M.A. degree in African American Studies and the relevant participating department or program upon successful completion of all course work except the Research Workshop, which is taken in the student's third year of study. See also Graduate School requirements.

Program materials are available upon request to the Director of Graduate Studies, African American Studies, Yale University, PO Box 203388, New Haven CT 06520-3388.

Courses

AFAM 505a/AMST 643a, Theorizing Racial Formations Jonathan Holloway

A required course for all first-year students in the joint Ph.D. in African American Studies; also open to students in American Studies. This interdisciplinary reading seminar focuses on new work that is challenging the temporal, theoretical, and spatial boundaries of the field. TH 9:25–11:15

[AFAM 525b^U, Psychosocial Study of Black Autobiography]

AFAM 563a^U/AMST 651a^U, Ralph Ellison in Context Robert Stepto

This seminar pursues close readings of Ralph Ellison's essays, short fiction, and novels *Invisible Man* and *Juneteenth*. The "in context" component of the seminar involves working from the Benston and Sundquist volumes on Ellison to discern a portrait of the modernist African America Ellison investigated, with at least Richard Wright, James Baldwin, and Romare Bearden also in view. The texts include Ellison, *The Collected Essays, Flying Home and Other Stories, Invisible Man*, and *Juneteenth*; K. Benston, *Speaking for You*; E. Sundquist, *Cultural Contexts for Ralph Ellison's Invisible Man*; A. Nadel, *Invisible Criticism: Ralph Ellison and the American Canon*. M 1:30–3:20

[AFAM 573a/ANTH 595a, Transnationalism, Globalization, and New Diasporic Formations]

AFAM 588b^U/AMST 710b^U/ENGL 948b^U, Autobiography in America Robert Stepto

At least a dozen North American autobiographies are studied, mostly from the "American Renaissance" to the present. Discussion of various autobiographical forms and strategies as well as of various experiences of American selfhood and citizenship. Slave narratives, spiritual autobiographies, immigrant narratives, autobiographies of childhood or adolescence, relations between autobiography and class, region, or occupation. M 1:30–3:20

AFAM 596a^U/AMST 641a, African American Poets of the Modern Era

Robert Stepto

The African American practice of poetry between 1900 and 1960, especially of sonnets, ballads, sermonic, and blues poems. Poets studied include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. The classes include sessions at Beinecke Library for the inspection and discussion of original editions, manuscripts, letters, and other archival materials. W 1:30–3:20

[AFAM 693b/AMST 730b/HIST 709b, **The Black Intellectual since 1941**]

[AFAM 697a/HIST 713a, **Research in Slavery and Abolition**]

AFAM 706b/AMST 714b/HIST 735b, Readings in Twentieth-Century U.S. History
Glenda Gilmore

Recent trends in American political history from the 1800s, with an emphasis on the social analysis of mass politics and reform. TH 3:30–5:20

AFAM 709a/AMST 709a/HIST 736a/WGSS 736a, Research in Twentieth-Century U.S. Political and Social History Glenda Gilmore

Projects chosen from the post-Civil War period, with emphasis on twentieth-century social and political history, broadly defined. Research seminar. TH 3:30–5:20

[AFAM 719b^U/AMST 680b/SOCY 654b^U/WGSS 719b, **Race, Racism, and Social Theory**]

AFAM 723a/AMST 645a, Caribbean Diasporic Intellectuals

Hazel Carby

This course examines work by writers of Caribbean descent from different regions of the transatlantic world. In response to contemporary interest in issues of globalization, the premise of the course is that in the world maps of these black intellectuals we can see the intertwined and interdependent histories and relations of the Americas, Europe, and Africa. Thinking globally is not a new experience for black peoples, and we need to understand the ways in which what we have come to understand and represent as “Caribbeanness” is a condition of movement. Literature is most frequently taught within the boundaries of a particular nation, but this course focuses on the work of writers who shape the Caribbean identities of their characters as traveling black subjects and refuse to restrain their fiction within the limits of any one national identity. We practice a new and global type of cognitive mapping as we read and explore the meanings of terms like black trans-nationalism, migrancy, globalization, and empire. Diasporic writing embraces and represents the geopolitical realities of the modern, modernizing, and postmodern worlds in which multiple racialized histories are inscribed on modern bodies. M 2:30–4:20

AFAM 728b^U/AFST 778b^U/HSAR 778b^U, From West Africa to the Black Americas:

The Black Atlantic Visual Tradition Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yoruba, Ejagham, Kongon—and their impact on the rise of New World art and music, especially rock, blues, North American black painting of the past ten years, and black artists of Cuba, Haiti, and Brazil. TTH 11:35–12:50

AFAM 729a^U/HSAR 779a^U, New York Mambo: Microcosm of Black Creativity

Robert Thompson

Rise, development, and philosophic achievement of the world of New York mambo and salsa. Emphasis on Palmieri, Cortijo, Roena, Harlow, and Colon. Examination of parallel traditions, e.g., New York Haitian art, Dominican merengue, reggae and rastas of Jamaican Brooklyn, and the New York school of Brazilian capoeira. TTH 11:35–12:50

AFAM 731b^U/WGSS 705b^U, Theories of Black Women and Film

Terri Francis

Study of films and videos made by women of African descent during the twentieth and twenty-first centuries. Focus on filmmaking as a critical practice and an art form, particularly how it engages cinematic perceptions of black womanhood. Films placed in a matrix of African American film history, feminist film theory, and legacies of black feminist writing and image making. Topics include film language, authorship, performance, and the question of audience. T 1:30–3:20, screening M 9 P.M.

AFAM 735b/AMST 807b, Performance Historiography Paige McGinley

This course examines methodological issues and research strategies employed by scholars doing historical research on performance. What is the relationship among history, memory, and performance? Where does performance “live” in the archive? How can one study the embodied events of the past? How can we make scholarly claims about performances that seem to disappear? This course looks at the work of scholars who have wrestled with these questions, paying specific attention to studies of African American performance in the nineteenth and twentieth centuries. Students also work with Beinecke Library collections in areas of their own interest. Scholars to be examined may include Hartman, Roach, Brooks, Young, and Brody. T 7–8:50

AFAM 739a/AFST 781a/HSAR 781a, Problem and Theory in Afro-Atlantic**Architecture I: Africa** Robert Thompson

The seminar addresses a new frontier—rebuilding the inner cities. This refers to Latino and mainland black cities within the cities of America. Accordingly, the course focuses on major roots of Latino and black traditional architecture. Topics include the architecture of Djenné, Berber art and architecture, Mauritanian sites, the monumental stone architecture of Zimbabwe, the sacred architecture of Ethiopia, and Muslim-influenced architecture from Rabat to Zanzibar. Then comes a case-by-case examination of some of the sites of African influence on the architecture of the Americas—the Puerto Rican *casita*; the southern verandah; the round-houses of New York, Virginia, North Carolina, Mexico, Panama, and Colombia; Ganvie, the Venice of West Africa, and its mirror image among the tidal stilt architectures of blacks of the Choco area in Pacific Colombia. TH 3:30–5:20

AFAM 739b/AFST 781b/HSAR 781b, Problem and Theory in Afro-Atlantic**Architecture II: The Black Americas** Robert Thompson

A continuation of AFAM 739a. TH 3:30–5:20

[AFAM 748a^U, Rethinking the African American Literary Canon]**AFAM 749b/AMST 648b/WGSS 735b, Transnational Imaginaries** Hazel Carby

We traverse the boundaries of conceptual, disciplinary, historical, and theoretical imaginings of the transnational. How the transnational has been imagined is posed as a series of questions rather than as a fixed definition: for example, what constitutes the transnational; how do we think the transnational; why should we think in terms of the transnational; and what is the relation or difference among the transnational, the cosmopolitan, and globalization? We consider creative responses to the consequences of the

unquenchable, demonic thirst of European and American powers for the control of trade, land, and resources, attempts to render visible what Amitav Ghosh refers to as “the results of the five hundred years of pure, undistilled violence and terror unleashed in the name of modernity.” We analyze the spatial, temporal, and historical dimensions of the creation of literary and visual narratives which seek to represent the displacement of peoples, the formation of diasporas, the invention and reinvention of subjects and subjectivities, and the politics of knowledge and power. Final paper. M 2:30–4:20

AFAM 757b/AMST 722b/HIST 722b, Research Seminar in Nineteenth-Century American History David Blight

Some class sessions focus on matters of craft: research techniques, styles of writing, narrative and analysis; judging scholarly work; and philosophical dimensions of doing history in the early twenty-first century. Primary focus of course is for each student to complete his/her own major research paper. Students in any field of American history are welcome. W 3:30–5:20

[AFAM 764b/AMST 715b/HIST 715b, Readings in Nineteenth-Century American History, 1820–1877]

AFAM 773a/SOCY 630a, Workshop in Urban Ethnography Elijah Anderson

The ethnographic interpretation of urban life and culture. Conceptual and methodological issues are discussed. Ongoing projects of participants are presented in a “workshop” format, thus providing participants with critical feedback as well as the opportunity to learn from and contribute to ethnographic work in progress. Selected ethnographic works are read and assessed. T 11:30–1:20

AFAM 773b/SOCY 630b, Workshop in Urban Ethnography Elijah Anderson

For description see AFAM 773a/SOCY 630a.

AFAM 779a/REL 830a/RLST 845a, Metaphors of Evil Emilie Townes

This course is an examination of the ways in which metaphors and symbols function at the intersection of various forms of oppression that coalesce into lifestyles of misery to produce social patterns of domination and subordination. We consider how conversations between Christian ethics and theology as well as other disciplines help frame possible trajectories of justice and justice making. M 1:30–3:20

AFAM 805a/AFST 949a/CPLT 987a/FREN 949a, Novel, Film, and History in French Africa Christopher L. Miller

African history as represented in historiography, novels, and films. Limited to French and Francophone Africa. Themes include empire and epic; orality and literacy; the slave trade; contact, conquest, and resistance; the Congo Free State; the role of colonial intermediaries; the two world wars; decolonization and neocolonialism; and the 1994 genocide in Rwanda. Reading knowledge of French required. TH 1:30–3:20

AFAM 814a^U/PLSC 823a, Race and Ethnicity Khalilah Brown-Dean

This course is an introduction to research on race and ethnicity in American politics. Topics include 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. We discuss and debate the empirical contributions of this literature, as well as questions of theory, methodology, and research design. T 1:30–3:20

[AFAM 821a/REL 742a, *Warrior Chants and Unquiet Spirits*]

[AFAM 827b, *Interdisciplinary Analysis in Race, Class, Gender*]

AFAM 829b/WGSS 715b, American Legal History: Citizenship and Race

Kathleen Cleaver

The seminar examines the evolution of U.S. citizenship as defined and interpreted by courts during the nineteenth and twentieth centuries, with particular attention to the way historical events that defined race have affected citizenship. Topics of study include the Thirteenth, Fourteenth, and Fifteenth Amendments to the U.S. Constitution, the 1866 Civil Rights Act, Reconstruction legislation, immigration restrictions imposed on Asians, legislation impacting the racial classification of Mexicans, statutes governing the citizenship of indigenous native peoples, racially based prohibitions against voting, education, and employment, and efforts to reduce them by civil rights legislation culminating with the 1964 Civil Rights Act. Each seminar participant has to research several topics and make a presentation to the class on at least one topic. Engagement in seminar discussion and the drafting of research papers are the basis for grading. This seminar is open to seniors. TH 2:30–4:20

[AFAM 833b/REL 746b/RLST 846b, *Vexations: Religion and Politics in the Black Community*]

AFAM 835b/AMST 822b/CPLT 697b/ENGL 929b, The Big Easy: Literary New Orleans Joseph Roach

An exploration of the sources of creative inspiration that writers find in NOLA, including its cultural mystique, its colonial history, its troubled assimilation into Anglo-North America, its tortured racial politics, its natural and built environment, its spirit-world practices, its raucous festive life, its eccentric characters, its food, its music, its predisposition to catastrophe, and its capacity for reinvention and survival. T 1:30–3:20

AFAM 838b^U/ENGL 988b^U/WGSS 773b^U, Contemporary African American Poetry

Elizabeth Alexander

In this course we study African American poetry of the contemporary era, from 1960 to the present. We also cover predominant theoretical approaches to African American poetry and poetics. Authors include late Gwendolyn Brooks and Robert Hayden, Amiri Baraka, Lucille Clifton, Audre Lorde, Yusef Komunyakaa, Rita Dove, Michael Harper, and poets of the new generation. W 1:30–3:20

AFAM 845b/REL 828b/RLST 850b, What's in a Text?: Samuel Huntington's *Clash of Civilizations* Emilie Townes

A detailed examination of one formative text for moral discourse to explore a thinker's ideas and how he or she states a theme, develops an argument, and is able to argue his or her case in a persuasive manner. Attention to consistency, reasoning, style, and

rhetoric are also a part of the course. Finally, we consider the book in relation to the renewal of the church, its implication for ministry, and its place in enriching scholarly debate and thought. Students may repeat the course as different texts are studied. The text we consider this time is the classic text, Samuel Huntington's *Clash of Civilizations*. TH 3:30–5:20

[AFAM 847b/AFST 847b/CPLT 947b/FREN 947b, African-Caribbean Connections in French]

AFAM 851b/CPLT 989b/FREN 943b, Creole Identities and Fictions

Christopher L. Miller

Focusing on the French and English Caribbean, this course analyzes the quintessential but ambiguous American condition: that of the “Creole.” Encompassing all non-native cultures, this term is inseparable from issues of race and slavery. Readings of historical and literary texts: Moreau de Saint-Méry, Bernardin de Saint-Pierre, Madame de Staël, Charlotte Brontë (and reinventions of *Wuthering Heights* by Jean Rhys and Maryse Condé), the Créolistes of Martinique. Attention to Louisiana and to the Haitian Revolution. TH 1:30–3:20

[AFAM 857b/FILM 781b, Blackspace and Cinema]

AFAM 880a or b, Directed Reading

By arrangement with faculty.

AFAM 895, Dissertation Prospectus Workshop Glenda Gilmore

A noncredit, yearlong course required of all third-year students. Fall term consists of biweekly work-in-progress talks by Yale faculty, advanced graduate students, and outside speakers. Spring term has biweekly workshops that focus on the dissertation prospectus.

For course offerings in African languages, see African Studies.

AFRICAN STUDIES

Council on African Studies
The MacMillan Center
142 Luce Hall, 34 Hillhouse, 432.3436
www.yale.edu/macmillan/african/
M.A.

Chair

Kamari Clarke (Anthropology)

Director of Graduate Studies

Ann Biersteker [F] (432.9902, ann.biersteker@yale.edu)
Michael McGovern [Sp] (432.3686, mike.mcgovern@yale.edu)

Director of Program in African Languages

Kiarie Wa’Njogu (432.0110, john.wanjogu@yale.edu)

Professors David Apter (*Emeritus, Political Science; Sociology*), Lea Brilmayer (*Law*), John Darnell (*Near Eastern Languages & Civilizations*), Owen Fiss (*Law*), William Foltz (*Emeritus, Political Science*), Robert Harms (*History*), Andrew Hill (*Anthropology*), Roderick McIntosh (*Anthropology*), Christopher L. Miller (*French; African American Studies*), Lamin Sanneh (*History; Divinity*), Ian Shapiro (*Political Science*), Robert Thompson (*History of Art*), Christopher Udry (*Economics*), Michael Veal (*Music*), David Watts (*Anthropology*)

Associate Professors Ann Biersteker (*Adjunct; Linguistics*), Kamari Clarke (*Anthropology*), Michael Mahoney (*History*)

Lecturers Anne-Marie Foltz (*Epidemiology & Public Health*), David Simon (*Political Science*)

Senior Lectors II Sandra Sanneh (*African Languages*), Kiarie Wa’Njogu (*African Languages*)

Senior Lecturer Matuku Ngame (*French*)

Lecturer Oluseye Adesola (*African Languages*)

Fields of Study

African Studies considers the arts, history, cultures, languages, literatures, politics, religions, and societies of Africa as well as issues concerning development, health, and the environment. Considerable flexibility and choice of areas of concentration are offered because students entering the program may have differing academic backgrounds and career plans. Enrollment in the M.A. program in African Studies provides students with the opportunity to register for the many African studies courses offered in the various departments of the Graduate School of Arts and Sciences and the professional schools.

The Program in African Studies also offers two interdisciplinary seminars to create dialogue and to integrate approaches across disciplines. In addition to the M.A. degree program, the Council on African Studies offers students in the University’s doctoral and

other professional degree programs the chance to obtain a Graduate Certificate of Concentration in African Studies by fulfilling a supplementary curriculum (see the section on the African Studies Council, under Non-Degree Granting Programs, Councils, and Research Institutes). Joint degrees are possible with the approval of the M.A. in African Studies and the relevant officials in the schools of Forestry & Environmental Studies, Public Health, Law, and Management.

The African collections of the Yale libraries together represent one of the largest holdings on Africa found in North America. The University now possesses more than 220,000 volumes including, but not limited to, government documents, art catalogues, photographs, manuscripts, correspondence, and theses, many published in Africa.

Special Admissions Requirement

The GRE General Test is required.

Special Requirements for the M.A. Degree

The Yale University Master of Arts degree program in African Studies was instituted in 1986. The two-year interdisciplinary, graduate-level curriculum is intended for students who will later continue in a Ph.D. program or a professional school, or for those who will enter business, government service, or another career in which a sound knowledge of Africa is essential or valuable. A student may choose one of the following areas of concentration: history; anthropology; political science; sociology; arts and literatures; languages and linguistics; religion; environmental and development studies.

The program requires sixteen courses: two compulsory introductory interdisciplinary seminars, Research Methods in African Studies (AFST 501) and Africa and the Disciplines (AFST 764), four courses of instruction in an African language, four courses in one of the foregoing areas of concentration, four other approved courses offered in the Graduate School or professional schools, and two terms of directed reading and research (AFST 900a or b) during which students will complete the required thesis. A student who is able to demonstrate advanced proficiency in an African language may have the language requirement waived and substitute four other approved courses. The choice of courses must be approved by the director of graduate studies, Ann Biersteker, and students should consult with her as soon as possible in the first term.

The Master's Thesis

The master's thesis is based on research on a topic approved by the director of graduate studies and advised by a faculty member with expertise or specialized competence in the chosen topic.

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). Language-related courses and language courses for professionals are also offered. African language courses emphasize communicative competence, and instructors use 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 the African Language program encourages students to spend one summer or term in Africa during their language study.

Noncredited 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.

Program materials are available upon request from the Director of Graduate Studies, Council on African Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; e-mail, african.studies@yale.edu.

Courses

AFST 501a^U, Research Methods in African Studies Ann Biersteker

This course considers disciplinary and interdisciplinary research methodologies in African studies. The focus of the course is on field methods and archival research in the social sciences and humanities. Topics include use of African studies and disciplinary sources (including bibliographical databases and African studies archives), research design, interviewing, survey methods, analysis of sources, and the development of databases and research collections. W 1:30–3:20

AFST 541b^U, Comparative Perspectives on African Literatures Ann Biersteker

Introduction to a wide range of topics in African literature through an examination of 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, between composition and transmission. W 1:30–3:20

AFST 574a/ANTH 574a, New Directions in Political and Legal Anthropology

Kamari Clarke

This course explores changes in the field of political and legal anthropology. The course begins with an exploration of some of the key texts in the field and moves to explore the conceptual, theoretical, and methodological shifts over the late twentieth and early twenty-first centuries. TH 2:30–4:20

AFST 598a^U, Introduction to an African Language I Kiarie Wa’Njogu and staff

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. Students may also study an African language through the noncredit Directed Independent Language Study program. Permission of instructor required. MTWTHF 9:25–10:15

AFST 599b^U, Introduction to an African Language II Kiarie Wa’Njogu and staff

Continuing 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. After AFST 598a. Students may also study an African language through the noncredit Directed Independent Language Study program. Permission of instructor required. 5 HTBA

AFST 618b^U, Communication and Healing Sandra Sanneh

This course deals with practical issues of communication about health and healing in South Africa. It focuses on the Nguni language environment (Zulu/Xhosa/Swati/Ndebele) but also addresses some issues relating to other South African languages. The course offers an introduction to Zulu language in the context of health, and to social and cultural issues surrounding the origins of suffering, the articulation of symptoms, and the role of the family, traditional healers, and Western medical practitioners. Particular attention is given to HIV/AIDS in the community and to the status and attitudes of young people. HTBA

AFST 630b^U, Language Planning in Sub-Saharan Africa Kiarie Wa’Njogu

Examination of language policies in selected sub-Saharan African countries. Analysis of language use in different contexts; assessment of the impact of globalization on African languages. W 1:30–3:20

AFST 650, Second Year in an African Language

By arrangement with faculty. After AFST 599.

AFST 660, Third Year in an African Language

By arrangement with faculty. After AFST 650.

AFST 670, Fourth Year in an African Language

By arrangement with faculty. After AFST 660.

AFST 680b^U, Nigeria and Its Diaspora Oluseye Adesola

Nigerians in the modern diaspora, both those who endured forced migration and those who migrated voluntarily. Specific reference to the Igbos and the Yorubas. 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 764b^U/ANTH 622b^U/PLSC 784b^U, Africa and the Disciplines M. Kamari Clarke

A broad survey of Africa’s relation to academic discourse, as seen in a variety of disciplines. This course examines how Africa is represented and discussed in different fields; how disciplinary formations, language, popular conceptions, and related intellectual practices of the various disciplines have affected academic approaches to studies of Africa; and how these approaches have reinvented particular African geographies (e.g., sub-Saharan vs. North African, francophone vs. anglophone, South Africa vs. the rest of Africa, and contemporary diasporic articulations). Attention to questions surrounding the management of the “New World Order.” After a general context is established over the first four weeks of the term, scholars representing various fields in the humanities, social and political sciences, and the professional schools visit the seminar to discuss their work in relation to the ways that their respective discipline(s) have explored related themes. Throughout the term, attention is given to issues of interdisciplinarity. W 1:30–3:20

AFST 778b^U/AFAM 728b^U/HSAR 778b^U, From West Africa to the Black Americas:**The Black Atlantic Visual Tradition** Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yoruba, Ejagham, Kongon—and their impact on the rise of New World art and music. TTH 11:35–12:50

AFST 781a/AFAM 739a/HSAR 781a, Problem and Theory in Afro-Atlantic**Architecture I: Africa** Robert Thompson

The seminar addresses a new frontier—rebuilding the inner cities. This refers to Latino and mainland black cities within the cities of America. Accordingly, the course focuses on major roots of Latino and black traditional architecture. Topics include the architecture of Djenné, Berber art and architecture, Mauritanian sites, the monumental stone architecture of Zimbabwe, the sacred architecture of Ethiopia, and Muslim-influenced architecture from Rabat to Zanzibar. Then comes a case-by-case examination of some of the sites of African influence on the architecture of the Americas—the Puerto Rican *casita*; the southern verandah; the round-houses of New York, Virginia, North Carolina, Mexico, Panama, and Columbia; Ganvie, the Venice of West Africa, and its mirror image among the tidal stilt architectures of blacks of the Choco area in Pacific Columbia. TH 3:30–5:20

AFST 781b/AFAM 739b/HSAR 781b, Problem and Theory in Afro-Atlantic**Architecture II: The Black Americas** Robert Thompson

A continuation of AFST 781a. TH 3:30–5:20

AFST 814a/REL 814a, Christian-Muslim Dialogue Lamin Sanneh

An introductory survey of Islam: its origin, history, law, theology, and religious tradition. An examination of the encounter of the medieval Muslim world with the West, and an assessment of intercultural influences between the two civilizations. The course explores interfaith issues in terms of convergence as well as contrast. HTBA

AFST 816b/REL 816b, World Christianity Lamin Sanneh

The course explores the worldwide Christian movement from the perspective of the current post-Western resurgence and the accompanying shift of the religion's center of gravity from the north Atlantic world to the south Atlantic and Pacific world. Employing primary historical sources and critical secondary literature, the course examines the characteristic features and patterns of Christianity as a world religion now surging in diverse cultures and societies.

AFST 819b/REL 819b, African Religions Lamin Sanneh

Based primarily on Evans-Pritchard's classic text *Nuer Religion*, the course is an introduction to phenomenology of religion with particular reference to the role and meaning of sacrifice in non-Western religious traditions. Looking at a diverse range of sources and examples, the course explores the phenomenon of religion in terms of ideas of God and the central rituals of gifts, offerings, and sacrifice as representations of the human response to the transcendent.

AFST 849a/HIST 849a, Agrarian History of Africa Robert Harms

This course examines changes in African rural life from precolonial times to the present. Issues to be examined include land use systems, rural modes of production, gender roles, markets and trade, the impact of colonialism, cash cropping, rural-urban migration, and development schemes. T 9:25–11:15

AFST 900a or b, Master's Thesis Ann Biersteker and faculty

Directed reading and research on a topic approved by the director of graduate studies and advised by a faculty member (by arrangement) with expertise or specialized

competence in the chosen field. Readings and research are done in preparation for the required master's thesis.

AFST 947a/HIST 847a/WGSS 739a, Women and Gender in African History

Michael Mahoney

Examination of both the particularities of the historical experiences of African women and the ways that gender has been defined in an African context. Context covers pre-colonial, colonial, and postcolonial periods. Topics include masculinity, sexuality, and the representation of African women. T 1:30–3:20

AFST 949a/AFAM 805a/CPLT 987a/FREN 949a, Novel, Film, and History in French Africa Christopher L. Miller

African history as represented in historiography, novels, and films. Limited to French and Francophone Africa. Themes include empire and epic; orality and literacy; the slave trade; contact, conquest, and resistance; the Congo Free State; the role of colonial intermediaries; the two world wars; decolonization and neocolonialism; and the 1994 genocide in Rwanda. Reading knowledge of French required. TH 1:30–3:20

AFST 951a or b, Directed Reading and Research Ann Biersteker and faculty

By arrangement with faculty.

SWAH 610a^U, Elementary Kiswahili I Kiarie Wa'Njogu

A beginning course with intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken language and conversation. Credit only on completion of SWAH 620b. MTWTHF 9:25–10:15

SWAH 620b^U, Elementary Kiswahili II Kiarie Wa'Njogu

Continuation of SWAH 610a. Texts provide an introduction to the basic structure of Kiswahili and to the culture of the speakers of the language. Prerequisite: SWAH 610a. MTWTHF 9:25–10:15

SWAH 630a^U, Intermediate Kiswahili I Kiarie Wa'Njogu

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 620b. MTWTHF 11:35–12:25

SWAH 640b^U, Intermediate Kiswahili II Kiarie Wa'Njogu

Continuation of SWAH 630a. MTWTHF 11:35–12:25

SWAH 650a^U, Advanced Kiswahili I Ann Biersteker

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 640b. TTH 11:35–12:50

SWAH 660b^U, Advanced Kiswahili II Ann Biersteker

Continuation of SWAH 650a. TTH 11:35–12:50

SWAH 670a^U or b^U, Topics in Kiswahili Literature Ann Biersteker

Advanced readings and discussion with emphasis on literary and historical texts. Reading assignments include materials on Kiswahili poetry, Kiswahili dialects, and the history of Kiswahili. After SWAH 660b. TTH 11:35–12:50

YORU 610a^U, Elementary Yorùbá I Oluseye Adesola

Training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken aspect, with special attention to unfamiliar consonantal sounds, nasal vowels, and tone, using isolated phrases, set conversational pieces, and simple dialogues. Multimedia materials provide audio practice and cultural information. Credit only on completion of YORU 620b. MTWTHF 10:30–11:20

YORU 620b^U, Elementary Yorùbá II Oluseye Adesola

Continuing practice in using and recognizing tone through dialogues. More emphasis is placed on simple cultural texts and role playing. Prerequisite: YORU 610a. MTWTHF 10:30–11:20

YORU 630a^U, Intermediate Yorùbá I Oluseye Adesola

Refinement of students' speaking, listening, reading, and writing skills. More natural texts are provided to prepare students for work in literary, language, and cultural studies as well as for a functional use of Yorùbá. After YORU 620b. MTWTHF 11:35–12:25

YORU 640b^U, Intermediate Yorùbá II Oluseye Adesola

Students are exposed to more idiomatic use of the language in a variety of interactions, including occupational, social, religious, and educational. Cultural documents include literary and nonliterary texts. After YORU 630a. MTWTHF 11:35–12:25

YORU 650a^U, Advanced Yorùbá I Oluseye Adesola

An advanced course intended to improve the students' aural and reading comprehension as well as speaking and writing skills. Emphasis is 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 video movies and recorded poems (*ewi*); and music. After YORU 640b. 3 HTBA

YORU 660b^U, Advanced Yorùbá II Oluseye Adesola

Continuing development of students' aural and reading comprehension, and speaking and writing skills, with emphasis on idiomatic usage and stylistic nuance. Study materials are selected to reflect research interests of the students. After YORU 650a. 3 HTBA

YORU 670a^U or b^U, Topics in Yorùbá Literature and Culture Oluseye Adesola

This course provides students with the opportunity to acquire Yorùbá up to the superior level. It is designed to give an in-depth discussion on advanced readings on Yorùbá literature and culture. It focuses on Yorùbá history, poetry, novels, dramas, and oral folklore. It also seeks to uncover the basics of the Yorùbá culture in communities where Yorùbá is spoken across the globe, with particular emphasis on Nigeria. It examines movies, texts, and written literature to gain insight into the Yorùbá philosophy and ways of life.

TTH 4–5:15

ZULU 610a^U, Elementary isiZulu I Sandra Sanneh

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 620b. MTWTHF 11:35–12:25

ZULU 620b^U, Elementary isiZulu II Sandra Sanneh

Development of communication skills through dialogues and role play. Texts and songs are drawn from traditional and popular literature and songs. Students research daily life in selected areas of South Africa. Prerequisite: ZULU 610a. MTWTHF 11:35–12:25

ZULU 630a^U, Intermediate isiZulu I Sandra Sanneh

Development of basic fluency in speaking, listening, reading, and writing isiZulu, 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 620b. MTWTHF 9:25–10:15

ZULU 640b^U, Intermediate isiZulu II Sandra Sanneh

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 630a. MTWTHF 9:25–10:15

ZULU 650a^U, Advanced isiZulu I Sandra Sanneh

Development of fluency in using idioms, speaking about abstract concepts, and voicing preferences and opinions. Excerpts are drawn from oral genres, short stories, and dramas made for television. Introduction to other South African languages and to issues of standardization, dialect, and language attitude. After ZULU 640b. 3 HTBA

ZULU 660b^U, Advanced isiZulu II Sandra Sanneh

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 650a.

AMERICAN STUDIES

230 Hall of Graduate Studies, 432.1186
www.yale.edu/amstud/
 M.A., M.Phil., Ph.D.

Chair

Jean-Christophe Agnew (230 HGS, 432.1186)

Director of Graduate Studies

Joanne Meyerowitz (230 HGS, 432.1186)

Professors Jean-Christophe Agnew, Elizabeth Alexander, Ned Blackhawk, David Blight, Jon Butler, Hazel Carby, George Chauncey, Edward Cooke, Jr., John Demos [F], Michael Denning, Wai Chee Dimock, Kathryn Dudley (*on leave* [F]), John Mack Faragher, Glenda Gilmore, Langdon Hammer, Dolores Hayden, Jonathan Holloway, Amy Hungerford, Matthew Jacobson (*on leave*), Daniel Kevles, Joanne Meyerowitz, Charles Musser, Alexander Nemerov, Patricia Pessar (*Adjunct*), Stephen Pitti, Sally Promey, Joseph Roach, Marc Robinson, Michael Roemer (*Adjunct*), Stephen Skowronek (*on leave* [F]), Robert Stepto, Harry Stout, Michael Veal, John Harley Warner, Michael Warner, Laura Wexler

Associate Professors Mary Lui, Alondra Nelson, Alicia Schmidt Camacho

Assistant Professors Birgit Brander Rassmussen, Kathryn Lofton, Paige McGinley, Alyssa Mt. Pleasant (*on leave*), Caleb Smith, Kariann Yokota

Lecturers James Berger, Ronald Gregg, David Musto

Fields of Study

Fields include American literature, history, the arts and material culture, philosophy, cultural theory, and the social sciences.

Special Admissions Requirement

A twenty-page writing sample is required with the application.

Special Requirements for the Ph.D. Degree

During the first two years of study students are required to take twelve term courses; at least two of these each year must be in American Studies. The student's program will be decided in consultation with the adviser and the director of graduate studies. In each of the two years, the student should take at least one seminar devoted to research or requiring a substantial original paper, and must achieve two grades of Honors, with an average overall of High Pass. Students will be required to show proficiency in a language other than English by conducting research in that language as a component of one of the courses taken during the first two years. Upon completion of course work, students in their third year of study are required to participate in a yearlong prospectus workshop (AMST 902a and b). Open to all students in the program, the workshop serves as a forum for the discussion of selecting a dissertation topic, refining a project's scope, organizing

research materials, and evaluating work in progress. Intended to complement the work of the prospectus committee, the workshop is designed as a professionalization experience that culminates in students' presentation of the dissertation prospectus at their prospectus colloquium. The workshop meets once a month.

Students should schedule the oral qualifying examinations in four fields, in the fifth term of study. Preparation, submission, and approval of the dissertation prospectus should be completed by the end of the sixth term, with a final deadline at the end of the seventh term with permission from the DGS. Students are admitted to candidacy for the Ph.D. upon completion of all predissertation requirements, including the prospectus. The faculty in American Studies considers training in teaching to be an important part of the program. Students in American Studies normally teach in years three and four.

Combined Ph.D. Programs

AMERICAN STUDIES AND AFRICAN AMERICAN STUDIES

The Department of American Studies also offers, in conjunction with the Department of African American Studies, a combined Ph.D. in American Studies and African American Studies. This combined degree is most appropriate for students who intend to concentrate in and write a dissertation on any aspect of African American history, literature, or culture in the United States and other parts of the Americas. Applicants to the joint program must indicate on their application that they are applying both to American Studies and to African American Studies. All documentation within the application should include this information.

AMERICAN STUDIES AND FILM STUDIES

The Department of American Studies also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in American Studies and Film Studies. For further details, see Film Studies. Applicants to the joint program must indicate on their application that they are applying both to Film Studies and to American Studies. All documentation within the application should include this information.

Master's Degrees

M.Phil. See Degree Requirements.

M.A. (en route to the Ph.D.) The M.A. is granted upon the completion of six term courses (two grades must be Honors and the other four grades must average High Pass), and the successful completion of the language requirement. It can be petitioned for in the term following completion of the requirements. Candidates in combined programs will be awarded the master's degree only when the master's requirements for both programs have been met.

Public Humanities Concentration The M.A. in Public Humanities is granted upon the completion of all requirements for the en route M.A. Of the six term courses required, students must take four Public Humanities courses, including AMST 903, 904, 905.

Terminal Master's Degree Program The basic requirements for this terminal degree are six term courses, including a special writing project, and the successful completion of the language examination. The project involves the submission of substantial written

work either in conjunction with one course or as a tutorial that substitutes for one course. Students must earn a grade of Honors in two of their courses and an average grade of High Pass in the others.

For further information, see the American Studies Web site: www.yale.edu/amstud/.

Courses

AMST 600a, American Scholars Jean-Christophe Agnew

“What would we really know the meaning of? The meal in the firkin; the milk in the pan; the ballad in the street; the news of the boat; the glance of the eye; the form and the gait of the body. The literature of the poor, the feelings of the child, the philosophy of the street, the meaning of household life, are the topics of the time.”

—Ralph Waldo Emerson, *The American Scholar*, 1837

A half-century ago American studies was a movement; now it is an institution. But it remains an anomaly in the academy, with neither method nor discipline: a modest program, not a department, that immodestly claims the space between disciplines, beyond disciplines, and perhaps encompassing disciplines.

In the early days, American studies was imagined as a home for Emerson’s American scholar; these days Emerson’s scholar is apt to be eyed more skeptically. Nevertheless the philosophy of the street and the meaning of household life continue to be the topics of the time, and American studies remains an oddly Emersonian place for nurturing intellectuals.

To explore the various kinds of American scholars and American studies, the American Scholars colloquium meets weekly. Each week, we ask a member of the American Studies faculty: What are the key works that shape your intellectual project? What works pose the crucial issues? What works engage what you would really know the meaning of? Each speaks briefly and leads a discussion of the works chosen. There is no writing assignment, and students receive a credit for participating. This course is mandatory for first-year American Studies graduate students. W 9:25–11:15

AMST 622a and 623b, Working Group on Globalization and Culture

Michael Denning

A continuing collective research project, a cultural studies “laboratory,” that has been running since the fall of 2003. The group is made up of graduate students and faculty from several disciplines. The working group meets regularly to discuss common readings, to develop collective and individual research projects, and to present that research publicly. The general theme for the working group is globalization and culture, with three principal aspects: (1) the globalization of cultural industries and goods, and its consequences for patterns of everyday life as well as for forms of fiction, film, broadcasting, and music; (2) the trajectories of social movements and their relation to patterns of migration, the rise of global cities, the transformation of labor processes, and forms of ethnic, class, and gender conflict; (3) the emergence of and debates within transnational social and cultural theory. The specific focus, projects, and directions of the working group are determined by the interests, expertise, and ambitions of the members of the group, and change as its members change. There are a small number of openings for second-year graduate students. Students interested in participating should contact michael.denning@yale.edu.

M 1:30–3:20

AMST 641a/AFAM 596a^u, African American Poets of the Modern Era

Robert Stepto

The African American practice of poetry between 1900 and the present, especially of sonnets, ballads, sermonic and blues poems. Poets studied include Paul Laurence Dunbar, Langston Hughes, Sterling Brown, Gwendolyn Brooks, Margaret Walker, and Robert Hayden. W 1:30–3:20

AMST 643a/AFAM 505a, Theorizing Racial Formations Jonathan Holloway

A designated core course for students in the joint Ph.D. program; also open to students in American Studies and History. This interdisciplinary reading seminar focuses on new work that is challenging the temporal, theoretical, and spatial boundaries of the field. TH 9:25–11:15

AMST 644a, Race and Memory Alicia Schmidt Camacho

A seminar in critical theory and methods for studying social movements and popular, vernacular cultures. The seminar addresses issues of modernity and “development,” racialization, class formation, sexual and gender difference in the Americas through readings in subaltern studies, postcolonial theory, and ethnic studies. The course pairs primary texts with secondary, critical texts. We address the evocations of collective, popular memory by communities to recall or contest the condition of subaltern status. The course focuses on the Americas and U.S. imperial projects dating from the nineteenth century up to the current moment. T 9:25–11:15

AMST 645a/AFAM 723a, Caribbean Diasporic Intellectuals Hazel Carby

This course examines work by writers of Caribbean descent from different regions of the transatlantic world. In response to contemporary interest in issues of globalization, the premise of the course is that in the world maps of these black intellectuals we can see the intertwined and interdependent histories and relations of the Americas, Europe, and Africa. Thinking globally is not a new experience for black peoples, and we need to understand the ways in which what we have come to understand and represent as “Caribbeanness” is a condition of movement. Literature is most frequently taught within the boundaries of a particular nation, but this course focuses on the work of writers who shape the Caribbean identities of their characters as traveling black subjects and refuse to restrain their fiction within the limits of any one national identity. We practice a new and global type of cognitive mapping as we read and explore the meanings of terms like black transnationalism, migrancy, globalization, and empire. Diasporic writing embraces and represents the geopolitical realities of the modern, modernizing, and postmodern worlds in which multiple racialized histories are inscribed on modern bodies. M 2:30–4:20

AMST 648b/AFAM 749b/WGSS 735b, Transnational Imaginaries Hazel Carby

We traverse the boundaries of conceptual, disciplinary, historical, and theoretical imaginings of the transnational. How the transnational has been imagined is posed as a series of questions rather than as a fixed definition: for example, what constitutes the transnational; how do we think the transnational; why should we think in terms of the transnational; and what is the relation or difference among the transnational, the cosmopolitan, and globalization? We consider creative responses to the consequences of the unquenchable, demonic thirst of European and American powers for the control of trade, land,

and resources, attempts to render visible what Amitav Ghosh refers to as “the results of the five hundred years of pure, undistilled violence and terror unleashed in the name of modernity.” We analyze the spatial, temporal, and historical dimensions of the creation of literary and visual narratives which seek to represent the displacement of peoples, the formation of diasporas, the invention and reinvention of subjects and subjectivities, and the politics of knowledge and power. Final paper. M 2:30–4:20

AMST 649b/HIST 763b, Readings in Latina/o History Stephen Pitti

A reading of the historical works that focus on Latino communities in the United States. We focus particular attention on Mexican American, Puerto Rican, and Cuban American communities, and we look at topics such as racial identity, border conflict, 1960s activism, patterns of residency and migration, transnationality and citizenship, labor struggles and class formation, and gender and sexuality. Readings bring together scholarship from several disciplines and emphasize both the critical importance of this developing field and its contemporary challenges. M 7–8:50

AMST 651a^U/AFAM 563a^U, Ralph Ellison in Context Robert Stepto

This seminar pursues close readings of Ralph Ellison’s essays, short fiction, and novels *Invisible Man* and *Juneteenth*. The “in context” component of the seminar involves working from the Benston and Sundquist volumes on Ellison to discern a portrait of the modernist African America Ellison investigated, with at least Richard Wright, James Baldwin, and Romare Bearden also in view. The texts include Ellison, *The Collected Essays, Flying Home and Other Stories, Invisible Man*, and *Juneteenth*; K. Benston, *Speaking for You*; E. Sundquist, *Cultural Contexts for Ralph Ellison’s Invisible Man*; A. Nadel, *Invisible Criticism: Ralph Ellison and the American Canon*. M 1:30–3:20

AMST 653b, Recording Vernacular Music Michael Denning

An introduction to the cultural study of vernacular musics in the era of sound recording. Topics include the rise of the music industry from sheet music to MP3s; the critical debates over vernacular musics associated with figures like Theodor Adorno, Charles Seeger, Alejo Carpentier, and Amiri Baraka; the rise of ethnographic field recording and the twentieth-century revivals of folk musics; the popular urban music cultures of ports and industrial cities; and the global circulation of commercial vernacular musics from jazz, tango, and hula to salsa and hip hop. TTH 1–2:15

AMST 700a/HIST 700a, Introduction to the Historiography of the United States

Stephen Pitti

Readings and discussion of a scholarly work on U.S. history from the settlement era to the present. Members of the department faculty visit the class on a rotating basis. MW 9–10:15

AMST 705b/HIST 720b/RLST 705b, Readings in Religion and Society, 1600–2000

Harry Stout, Kathryn Lofton

This introductory graduate readings course assesses interrelations between religion and American society from 1600 to 1990. Concentration on religion’s successes and failures in shaping American society from the Puritans to modern neoconservative fundamentalism. Readings in primary and secondary sources; development of bibliographical skills. M 1:30–3:20

AMST 709a/AFAM 709a/HIST 736a/WGSS 736a, Research in Twentieth-Century U.S. Political and Social History Glenda Gilmore

Projects chosen from the post-Civil War period, with emphasis on twentieth-century social and political history, broadly defined. Research seminar. TH 3:30–5:20

AMST 710b^U/AFAM 588b^U/ENGL 948b, Autobiography in America Robert Stepto
At least a dozen North American autobiographies are studied, mostly from the “American Renaissance” to the present. Discussion of various autobiographical forms and strategies as well as of various experiences of American selfhood and citizenship. Slave narratives, spiritual autobiographies, immigrant narratives, autobiographies of childhood or adolescence, relations between autobiography and class, region, or occupation. M 1:30–3:20

AMST 714b/AFAM 706b/HIST 735b, Readings in Twentieth-Century U.S. History
Glenda Gilmore

Recent trends in American political history from the 1890s, with an emphasis on the social analysis of mass politics and reform. TH 3:30–5:20

AMST 719b/RLST 703b, Interrogating the Crisis of Islam: Seminar

Zareena Grewal

In official and unofficial discourses in the U.S., diagnoses of Islam’s various “crises” are ubiquitous, and Muslim “hearts and minds” are viewed as the “other” front in the War on Terror. Since 9/11, the U.S. State Department has made the reform of Islam an explicit national interest, pouring billions of dollars into USAID projects in Muslim-majority countries, initiating curriculum development programs for madrasas in South Asia, and establishing the Arabic Radio Sawa and the satellite TV station Al-Hurra to propagate the U.S. administration’s political views as well as what it terms a “liberal” strain of Islam. Muslim Americans are also consumed by debates about the “crisis” of Islam, a crisis of religious authority in which the nature and rapidity of change in the measures of authority are felt to be too difficult to assimilate. This course maps out the various and deeply politically charged contemporary debates about the “crisis of Islam” and the question of Islamic reform through an examination of official U.S. policy, transnational pulp Islamic literature, fatwas and essays authored by internationally renowned Muslim jurists and scholars, and historical and ethnographic works that take up the category of crisis as an interpretive device. M 1:30–3:20

AMST 722b/AFAM 757b/HIST 722b, Research Seminar in Nineteenth-Century American History David Blight

Some class sessions focus on matters of craft: research techniques, styles of writing narrative and analysis; judging scholarly work; and philosophical dimensions of doing history in the early twenty-first century. Primary focus of the course is for each student to complete his/her own major research paper. Students in any field of American history are welcome. W 3:30–5:20

AMST 724a/HSAR 733a, Abstract Expressionism Alexander Nemerov

The study of Abstract Expressionism is not what it once was. Previously considered a centerpiece of modernist art history, the work of Jackson Pollock, Willem de Kooning, Helen Frankenthaler, Franz Kline, and other painters has been somewhat subordinated in the last ten years to the study of more recent art. Abstract Expressionism and Post-Painterly

Abstraction are now arguably two of the many mid-twentieth-century cultural forms that require almost an archaeological approach to excavate. In this seminar we review critical approaches to this art—starting with Clement Greenberg and Harold Rosenberg and moving on to recent scholars such as T. J. Clark, Tom Crow, Serge Guilbaut, Caroline Jones, and Michael Leja—before trying to determine (or, better, develop) new models for understanding these works from ca. 1935 to 1965. T 1:30–3:20

AMST 733b, America in the Transpacific World Kariann Yokota

This seminar explores the politics of material and cultural exchange in the transpacific world by examining the most significant commodities that drew the U.S. into the region. Readings take a global perspective on the circulation of people, objects, and ideas in the region. The class analyzes how expansion from the mid-eighteenth to the mid-nineteenth century influenced the transpacific world and, conversely, how this involvement shaped the development of American culture. Students study objects that were preserved in cabinets of curiosity, universities, and museums in diverse locations such as Honolulu, London, and Salem.

AMST 735a/ARCG 725a/HSAR 725a, An Introduction to American Material Culture

Edward Cooke

The field of material culture has drawn from a number of different disciplines and scholarly traditions. Through readings and applications of methodologies ranging from structuralism and semiotics to Marxist criticism and cultural studies, this seminar provides a solid foundation for the interpretation of artifacts. W 1:30–3:20

AMST 738b/HIST 733b, Readings in Western and Frontier History

John Mack Faragher

An introduction to recent work on the history of North American frontiers and the shifting region of the American West. Critical consideration of readings, participation in discussion, and completion of short weekly writing assignments and a term project. W 9:25–11:15

AMST 741b/HIST 752b, Indians and Empires Ned Blackhawk

This course explores recent scholarship on Indian-imperial relations throughout North American colonial spheres from roughly 1500 to 1900. It examines indigenous responses to Spanish, Dutch, French, English, and lastly American and Canadian colonialisms and interrogates commonplace periodization, geographic, and conceptual approaches to historiography. It concludes with an examination of American Indian political history, contextualizing it within larger assessments of Indian-imperial and Indian-state relations. M 9:25–11:15

AMST 746b/ANTH 543b, Writing Ethnography: Representations and Relevant

Publics Kathryn Dudley

What kind of literary project is ethnography? How do ethnographers conceptualize the relationship between their readers and their subjects—and themselves as authors and subjects of their own texts? This seminar moves beyond the “crisis of representation” in anthropology to take stock of what experimental approaches to writing ethnography have contributed to our understanding of the ethnographic encounter and its place in the production of knowledge. In addition to genre-bending examples of recent ethnography,

we read works of literary criticism, social theory, and cultural analysis that problematize classic representational conventions. We also consider the unique challenges of writing ethnographically for a public audience. M 1:30–3:20

AMST 767b/HIST 724b, Research Seminar in U.S. Urban History Mary Lui

Students conduct archival research to write an original article-length essay on any aspect of U.S. urban history in any century. The first half of the seminar consists of weekly readings discussions, while the latter half consists of article workshop meetings focused on student writing. T 9:25–11:15

AMST 770b/HIST 770b/WGSS 750b, Research in Gender and Sexuality

George Chauncey

Students conduct research in primary sources and write original monographic essays on the history of gender and sexuality. Readings include key theoretical works as well as journal articles that might serve as models for student research projects. T 1:30–3:20

AMST 775a/HIST 757a, Culture in U.S. International and Transnational Histories

Seth Fein

Reading seminar that crosses disciplinary, national, and historiographical borders to explore the history of the United States outside the United States and the history of other nations within the United States (mainly since 1900). Work focuses on comparing methods, using theory, doing research, writing history. Themes include empire, imperialism, and postcolonialism; Americanization, globalization, and mass culture; nationalism, nationality, and transnationalism. M 7–8:50

AMST 777b/HIST 758b, Research Seminar in U.S. International and Transnational Histories Seth Fein

Emphasizes interdisciplinary methods and cultural analysis for research and writing about the history of the United States outside the United States and the history of other nations within the United States. Term project is a publishable, article-length essay. M 7–8:50

AMST 786a/HIST 744a/WGSS 744a, Readings in the History of Gender

Joanne Meyerowitz

Selected topics in women's and gender history with emphasis on U.S. history. Themes include changing conceptions of sex, gender, womanhood, manhood, femininity, and masculinity; the language of gender as a constitutive part of various social hierarchies; class, racial/ethnic, regional, and national differences; and gendered participation in religion, labor, politics, war, and social reform movements. Readings, writing assignments, and classroom discussions address recent historical methodological approaches. W 2:30–4:20

AMST 798b/HIST 726b, The Culture of the Gilded Age Cynthia Russett

This course uses fiction and nonfiction to look at some of the major concerns of late nineteenth-century America, including political corruption, wealth and poverty, social reform, and the situation of women and minorities. Authors include Edward Bellamy, William Graham Sumner, Jane Addams, W.E.B. DuBois, and Charlotte Perkins Gilman. W 2:30–4:20

AMST 799b/HIST 799b, The American Century, 1941–1961

Jean-Christophe Agnew

This seminar looks at recent work in the intellectual and cultural history of WWII and Cold War America—the years between the New Deal and the New Frontier. Secondary readings highlight current directions in historiography as well as the range of research opportunities available, while class assignments and discussions focus for the most part on the different ways one can teach the period and its documentary sources, including literature, film, music, and painting. The seminar aims to suggest the richness and coherence of this period as a subject for intellectual and cultural historians—especially for those wishing to pursue a research topic in this area—and as an occasion to explore the possibilities for interdisciplinary teaching. T 1:30–3:20

AMST 803a/HIST 703a, Research in Early National America Joanne Freeman

A research seminar focused on the early national period of American history, broadly defined. Early weeks familiarize students with sources from the period and discuss research and writing strategies. Students produce a publishable article founded on primary materials. T 1:30–3:20

AMST 807b/AFAM 735b, Performance Historiography Paige McGinley

This course examines methodological issues and research strategies employed by scholars doing historical research on performance. What is the relationship among history, memory, and performance? Where does performance “live” in the archive? How can one study the embodied events of the past? How can we make scholarly claims about performances that seem to disappear? This course looks at the work of scholars who have wrestled with these questions, paying specific attention to studies of African American performance in the nineteenth and twentieth centuries. Students also work with Beinecke Library collections in areas of their own interest. Scholars to be examined may include Hartman, Roach, Brooks, Young, and Brody. T 7–8:50

AMST 813a^U/FILM 736a^U, Contemporary Documentary Film and Video

Charles Musser

Examination of documentary and related nonfiction forms in the last three decades. Issues include film truth, performance, ethics, race and gender, and the filmmaker as participant-observer. Filmmakers include Frederick Wiseman, William Greaves, Chris Choy, Errol Morris, Lourdes Portillo, Trin T. Minh-Ha, Sue Friedrich, and Marlon Riggs. M 6:30–10:30

AMST 822b/AFAM 835b/CPLT 697b/ENGL 929b, The Big Easy: Literary New Orleans Joseph Roach

An exploration of the sources of creative inspiration that writers find in NOLA, including its cultural mystique, its colonial history, its troubled assimilation into Anglo-North America, its tortured racial politics, its natural and built environment, its spirit-world practices, its raucous festive life, its eccentric characters, its food, its music, its predisposition to catastrophe, and its capacity for reinvention and survival. T 1:30–3:20

AMST 823b, Visual Controversies: Religion and the Politics of Vision

Sally Promey

This interdisciplinary graduate seminar explores the destruction, censorship, and suppression of pictures and objects, as these acts have been motivated by religious convictions

and practices, in the United States from colonization to the present. In such episodes, religion does not operate in a vacuum but draws attention to various other cultural pressure points concerning, for instance, race, ethnicity, gender, and sexuality. The course treats iconoclasm as a fundamental constituent in the American myth of national origins. The course focuses most specifically on variations of Protestant Christianity, but also explores case studies within multiple American religious traditions and elsewhere in the world. By permission of instructor. TH 9:25–11:15

AMST 861b/ARCH 914b, Built Environments and the Politics of Place

Dolores Hayden

Call it the built environment, the vernacular, everyday architecture, or the cultural landscape, the material world of built and natural places is intricately bound up with social and political life. This seminar introduces research methods involving the built environment. It includes readings from urban and suburban history, geography, anthropology, and architecture as well as readings on narrative and graphic strategies for representing spaces and places. Participants present papers; chapters from longer projects are welcome. Limited enrollment. M 9:25–11:15

AMST 879a^U/HIST 914a^U/HSHM 634a^U, Media and Medicine in Modern America

John Harley Warner, Gretchen Berland

An exploration of the relationships among medicine, health, and the media in the United States from 1870 through the present. Focus on newspapers, magazines, professional journals, advertising, exhibitions, radio, film, television, and the Internet; and on interactions among researchers, health professions, medical and public health institutions, journalists, advocacy organizations, the state, industry, and the public. Topics include 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. TTH 10:30–11:20

AMST 882b^U/HIST 939b^U/HSHM 677b^U, Genetics, Reproduction, and Society

Daniel Kevles

A history of modern biology, especially evolution, genetics, and molecular biology, within its social, economic, legal, and cultural context. Topics include eugenics and sterilization, the Scopes trial, contraception and abortion, new reproductive technologies, medical genetics, the Human Genome Project, and human cloning. MW 11:35–12:25

AMST 886b/ENGL 851b, American Literature: Fields, Genealogies, Webs

Wai Chee Dimock

A survey of genres and methods, with special attention to these broad areas of inquiry: multiple diasporas; cross-mappings of poetry and prose; movement across words, image, music; memories, adaptations, and rewritings from the nineteenth century to the twenty-first; morphologies of the human, the subhuman, and the nonhuman; and the fate of close reading in a global world. We read Hawthorne in conjunction with Maryse Condé; Poe with Ishmael Reed; Whitman with Allen Ginsberg and Sherman Alexie; Faulkner with Suzan-Lori Parks; Olaudah Equiano with Dave Eggers; Emily Dickinson with Richard Powers. W 1:30–3:20

AMST 900, Independent Research**AMST 901, Directed Reading****AMST 902a and b, Prospectus Workshop** Joanne Meyerowitz

Upon completion of course work, students are required to participate in at least one term of the prospectus workshop, ideally the semester before the prospectus colloquium is held. Open to all students in the program and joint departments, the workshop serves as a forum for discussing the selection of a dissertation topic, refining a project's scope, organizing research materials, and evaluating work in progress. The workshop meets once a month. M 12–1:30

AMST 903a, Public Humanities Laura Wexler

What is the relationship between knowledge produced in the university and the circulation of ideas among a broader public, between academic expertise on the one hand and non-professionalized ways of knowing and thinking on the other? What is possible? This seminar provides an introduction to various institutional relations and to the modes of inquiry, interpretation, and presentation by which practitioners in the humanities seek to invigorate the flow of information and ideas among a public more broadly conceived than the academy, its classrooms, and its exclusive readership of specialists. Topics may include public history, museum studies, oral and community history, public art, documentary film and photography, public writing and educational outreach, and the socially conscious performing arts. In addition to core readings and discussions, the seminar includes presentations by several practitioners who are currently engaged in different aspects of the Public Humanities. A highly flexible term project—including possibilities for an internship with a regional museum, archive, gallery, or media outlet—allows students to explore the substantive and logistical challenges of public intellectual work in the genre or form that most interests them. Participants also collaborate in developing and beginning to organize a Public Humanities program of installations and events to be held during the following academic year. Required for the Master's Degree in Public Humanities. T 3:30–5:20

AMST 904, Practicum in Public Humanities**AMST 905, Master's Project in Public Humanities**

ANTHROPOLOGY

10 Sachem, 432.3670
www.yale.edu/anthropology/
 M.A., M.Phil., Ph.D.

Chair

William Kelly

Director of Graduate Studies

M. Kamari Clarke

Professors Richard Bribiescas, Richard Burger, Michael Dove (*Forestry & Environmental Studies*), Kathryn Dudley (*American Studies*), J. Joseph Errington, Andrew Hill, Marcia Inhorn (*Middle East Studies*), William Kelly, Enrique Mayer, Roderick McIntosh, Patricia Pessar (*Adjunct; American Studies*), Eric Sargis, James Scott (*Political Science*), Helen Siu, Kalyanakrishnan Sivaramakrishnan, David Watts, Harvey Weiss (*Near Eastern Languages & Civilizations*)

Associate Professors J. Bernard Bate, M. Kamari Clarke, Nora Groce (*Adjunct; Epidemiology & Public Health*)

Assistant Professors Jafari Allen (*African American Studies*), Brenda Bradley, Sean Brotherton, Narges Erami (*Middle East Studies*), Erik Harms (*Southeast Asia Studies*), Karen Hébert (*Forestry & Environmental Studies*), William Honeychurch, Michael McGovern, Karen Nakamura, Douglas Rogers

Lecturers Osmund Bopéarachchi (*South Asian Studies*), Carol Carpenter (*Forestry & Environmental Studies*), Ashish Chadha (*Film Studies*), John Hale, Graeme Reid (*Women's, Gender & Sexuality Studies*)

Fields of Study

The department covers three subfields: archaeology; sociocultural and linguistic anthropology; and physical anthropology. Archaeology focuses on ritual complexes and writing, ceramic analysis, warfare, ancient civilizations, origins of agriculture, and museum studies. Sociocultural anthropology provides a range of courses: classics in ethnography and social theory, religion, myth and ritual, kinship and descent, historical anthropology, culture and political economy, agrarian studies, ecology, environment and social change, medical anthropology, emotions, public health, sexual meanings and gender, postcolonial development, ethnicity, identity politics and diaspora, urban anthropology, global mass culture, and alternate modernity. Linguistic anthropology includes language, nationalism, and ideology, structuralism and semiotics, feminist discourse. Physical anthropology focuses on paleoanthropology, evolutionary theory, human functional anatomy, race and human biological diversity, primate ecology. There is strong geographical coverage in Africa, the Caribbean, East Asia (China and Japan), Latin America and South America, Southeast Asia (Indonesia), South Asia and the Indian Ocean, the Near East, Europe, and the United States.

Special Requirements for the Ph.D. Degree

Although there are a few required courses or seminars for each subfield, more than three-fourths of a student's program consists of electives, including course work in other departments. Admission to candidacy requires (1) completion of two years of course work (sixteen term courses); (2) independent study and research; (3) satisfactory performance on qualifying examinations; and (4) a dissertation research proposal submitted and approved before the end of the third year. Qualifying examinations, normally taken at the end of the second year, consist of eight hours written (four hours on one of the subfields, four hours on the student's special interest), and two hours oral. Dissertations are normally based on field or laboratory research.

Combined Ph.D. Programs

The Anthropology department also offers a combined Ph.D. in Anthropology and Forestry & Environmental Studies in conjunction with the School of Forestry & Environmental Studies, and a combined Ph.D. in Anthropology and African American Studies in conjunction with the Department of African American Studies. These combined programs are ideal for students who intend to concentrate in, and to write dissertations on, thematic and theoretical issues centrally concerned with anthropology and one of these other areas of study. Students in the combined degree programs will be subject to the combined supervision of faculty members in the Anthropology department and in the respective department or school.

Admission into the combined degree program in Anthropology and African American Studies is based on mutual agreement between these two departments. Individual students will develop courses of study in consultation with their academic advisers and with the directors of graduate study for both departments. Students in the program must take core courses in Anthropology and in African American Studies, plus related courses in both departments approved by their advisory committees. In addition, they must successfully complete the African American Studies third-year Research Workshop. Oral and written qualifying examinations must include two topics in the field of African American Studies and two topics in Anthropology. The examination committee must include at least one faculty member from each department. The dissertation prospectus must be submitted to the directors of graduate study of both departments and approved by the faculty of both. The thesis readers committee must also include at least one faculty member from each department, and the faculties of both departments must approve its composition.

Master's Degrees

M.Phil. See Degree Requirements.

M.A. Applications for a terminal master's degree are not accepted. This degree is granted to students not continuing in the Ph.D. program. The student must complete eight graduate-level term courses approved for credit in the Anthropology department and maintain an average grade of High Pass.

Contact information: Director of Graduate Studies, Department of Anthropology, Yale University, PO Box 208277, New Haven CT 06520-8277; 203.432.3670; e-mail, anthropology@yale.edu; Web site, www.yale.edu/anthro/.

Courses

ANTH 500a, The Development of the Discipline: Historical Trajectories

William Kelly

This seminar emphasizes the characteristics of anthropology as a discipline and as a profession, and the historical trajectory of sociocultural anthropology from the late nineteenth century to the 1970s. The seminar is reserved for first-year doctoral students in Anthropology. M 9–12

ANTH 500b, The Development of the Discipline: Contemporary Themes

Kalyanakrishnan Sivaramakrishnan

The major theoretical orientations in social and cultural anthropology (especially in the United States and Europe), their historical development and importance, their relation to one another and to other disciplines. The seminar is reserved for first-year doctoral students in Anthropology, and students are presumed to have taken ANTH 500 in the fall term. M 9:25–11:15

ANTH 501a, Anthropology and Classical Social Theory Erik Harms

Readings of primary texts in classical social theory, especially the writings of Marx, Weber, and Durkheim. Particular emphasis is placed on the role of these theorists in the early development of anthropology and social science more broadly. This course is reserved for first-year graduate students in Anthropology. TH 1:30–3:20

ANTH 501b, Anthropology and Contemporary Social Theory Sean Brotherton

An overview of central themes and debates in contemporary social theory, with a focus on the integration of theory and research, rather than a hermeneutical analysis of particular theoretical texts. Concentrating on questions of power, inequality, the self, and community, assessment of the relevance of sociological theory to advancing an understanding of the complexities of late twentieth-century Western society. Critical theory, feminist theories, postmodernism, and the contributions of individual theorists reviewed and critiqued. M 1:30–3:20

ANTH 502a, Research in Sociocultural Anthropology: Design and Methods

Helen Siu

The course offers critical evaluation of the nature of ethnographic research. Research design includes the rethinking of site, voice, and ethnographic authority. M 1:30–3:20

ANTH 503a, Research in Sociocultural Anthropology: Ethnographic Writing and Representation Karen Nakamura

This course examines the representational practices that inform the doing and making of ethnography, broadly construed as the depiction of social life in the past and present. We consider classic and contemporary approaches to ethnography as a literary form as well as explore precedents and possibilities in the visual and performing arts. W 1:30–3:20

ANTH 513b^U, Language, Culture, and Ideology J. Joseph Errington

Influential anthropological theories of culture are reviewed with critical reference to theories of language that inspired or informed them. Topics include American and European structuralism, cognitivist and interpretivist approaches to cultural description, work of Bakhtin, Bourdieu, and various “critical theorists.” W 9:25–11:15

ANTH 533b^U, Bilingualism in Social Context J. Joseph Errington

The linguistic phenomenon of bilingualism is presented through broad issues in social description inseparably linked to it: growth and change in bilingual communities, bilingual usage, social identity, and allegiance, interactional significances of bilingual speech repertoire use. T 1:30–3:20

ANTH 537a, Politics/Aesthetics Michael McGovern

This course explores the complex relations between expressive culture and the exercise of power. Starting with the works of the Frankfurt School and such authors as Lukács, Debord, Raymond Williams, and Rancière, the course proceeds through a series of thematic steps, examining case studies. We look at Zairean popular music and painting as political critique; the politics of museum and other exhibitionary displays; the question of visibility both as it relates to talk about transparency and conspiracy and as it relates to urban planning. The course ends with several full-length monographs on the performance of secularism in contemporary Turkey, the attribution of agency to architecture in Jerusalem, and the “theater state” in Bali. The course attempts to analyze the politics of artistic creation and the aesthetic elements of political rhetoric and practice as two moments in a dialectical – indeed, dialogical – relation. T 9:25–11:15

ANTH 541a/F&ES 80054a/HIST 965a/PLSC 779a, Agrarian Societies: Culture, Society, History, and Development Kalyanakrishnan Sivaramakrishnan, Peter Perdue, James Scott

An interdisciplinary examination of agrarian societies, contemporary and historical, Western and non-Western. Major analytical perspectives from anthropology, economics, history, political science, and environmental studies are used to develop a meaning-centered and historically grounded account of the transformations of rural society. Team-taught. TH 1:30–5:20

ANTH 542a^U, Cultures and Markets: Asia Connected through Time and Space Helen Siu

The course focuses on historical and contemporary movements of people, goods, cultural meanings, and imaginaries that have connected an “Asian” region. It builds on the scholarship of Fernand Braudel, K. N. Chaudhuri, and Takeshi Hamashita and uses an ocean-based perspective to highlight the interconnected, multi-ethnic commercial nodes. It captures the energies of agents of trading empires, religious traditions, colonial encounters, and cultural fusion as transregional institutions and local societies intersected. The contemporary global perspective highlights the time-space compression of volatile finance flows that connect East Asia and the Indian Ocean to the Middle East and Africa, and examines the cultures of capital and market in the neoliberal and post-socialist world. T 1.30–3.20

ANTH 543b/AMST 746b, Writing Ethnography: Representations and Relevant**Publics** Kathryn Dudley

What kind of literary project is ethnography? How do ethnographers conceptualize the relationship between their readers and their subjects—and themselves as authors and subjects of their own texts? This seminar moves beyond the “crisis of representation” in anthropology to take stock of what experimental approaches to writing ethnography have contributed to our understanding of the ethnographic encounter and its place in the production of knowledge. In addition to genre-bending examples of recent ethnography, we read works of literary criticism, social theory, and cultural analysis that problematize classic representational conventions. We also consider the unique challenges of writing ethnographically for a public audience. (Formerly “Ethnographic Writing and Representation.”) M 1:30–3:20

ANTH 557a^U, Culture, Power, and Identity in the Caribbean Sean Brotherton

Drawing on a wide and interdisciplinary range of texts, both classic and more recent, this course examines the theoretical debates of the body as a subject of anthropological, historical, psychological, medical, and literary inquiry. We explore specific themes, for example, the persistence of the mind/body dualism; experiences of embodiment/alienation; phenomenology of the body; Foucauldian notions of bio-politics, bio-power, and the ethic of the self; the medicalized body; and the gendered body, among other salient themes. T 1:30–3:20

ANTH 560b^U, Representing Iran Narges Erami

This course introduces students to major themes in Iranian history and culture, as well as building a critical framework for understanding some of the challenges that face modern Iran today. In reading modern fiction, ethnography, historical narratives, primary sources, and theoretical texts covering local and oral history, revolutions, Islam and secularism, democracy and theocracy and the role of cinema, students examine the “Western” production of knowledge about Iran and rethink what we know about such categories as history, culture, and gender. M 1:30–3:20

ANTH 561a/F&ES 80061a, Anthropology of the Global Economy for Development and Conservation Carol Carpenter

This seminar explores topics in the anthropology of the global economy that are relevant to development and conservation policy and practice. Anthropologists are often assumed to focus on micro- or local-level research, and thus to have limited usefulness in the contemporary, global world of development and conservation policy. In fact, however, they have been examining global topics since at least the 1980s, and very little current anthropological research is limited to the village level. More importantly, the anthropological perspective on the global economy is unique and important. TH 11:30–2:20

ANTH 569b^U, Economic Anthropology Enrique Mayer

An introduction to understanding economic systems in other cultures and societies. How work and leisure are organized, who gets what and how, and how economic concerns tie into other aspects of social life. Major debates and controversies are examined, and examples from different parts of the world are presented. No prior training in economics or anthropology necessary. TH 1:30–3:20

ANTH 572b/F&ES 80176b, Disaster, Degradation, Dystopia: Social Science

Approaches to Environmental Perturbation and Change Michael Dove

This is an advanced seminar on the long tradition of social science scholarship on environmental perturbation and natural disasters, the relevance of which has been heightened by the current global attention to climate change. Topics covered include the academic literature on the social dimension of natural disasters, illustrated with a case study of volcanic hazard; the discursive dimensions of environmental degradation, focusing on deforestation and other case studies; climate change, including discursive dimensions at the global level and close-grained studies of adaptation at the local level; the current debate about the relationship between resource wealth and political conflict, focusing on the “green war” thesis, and the case of tropical forest commodities; and alternative perspectives on sustainable environmental relations, based on interdisciplinary work and work in the humanities. Prerequisite: F&ES 83056a/ANTH 597a, or F&ES 83050a/ANTH 581a, or F&ES 83073b/ANTH 582b. Three-hour lecture/seminar. Enrollment limited to twenty. 3 credits. TH 2:30–5:20

ANTH 574a/AFST 574a, New Directions in Political and Legal Anthropology

M. Kamari Clarke

This course explores changes in the field of political and legal anthropology. The course begins with an exploration of some of the key texts in the field and moves to explore the conceptual, theoretical, and methodological shifts over the late twentieth and early twenty-first centuries. TH 2:30–4:20

ANTH 581b/F&ES 83050b, Society and Environment: Introduction to Theory and Method Michael Dove

This is an introductory graduate core course on the scope of social scientific contributions to environmental and natural resource issues. It is designed to be the first course for students who will be specializing in social science approaches as well as the last/only course for students who take only one course in this area. The approach taken in the course is inductive, problem-oriented, and case-study-based. Section I presents an overview of the field and course. Section II deals with the way that environmental problems are initially framed. Case studies focus on placing problems in their wider political context, new approaches to uncertainty and failure, and the importance of how the analytical boundaries to resource systems are drawn. Section III focuses on questions of method, including the dynamics of working within development projects, and the art of rapid appraisal and short-term consultancies. Section IV is concerned with local peoples and the environment, with case studies addressing the myth of slash-and-burn cultivation, livestock and the development discourse, and indigenous knowledge and its transformation. Section V presents lessons learned. No prerequisites. The course is a prerequisite for advanced seminars in social ecology in F&ES. Three-hour lecture/seminar. Enrollment limited to thirty. 3 credits. TH 2:30–5:20

ANTH 582b/F&ES 83073b, Households, Communities, Gender (for Development and Conservation) Carol Carpenter

The implementation of development and conservation projects involving people requires an understanding of households, communities, and gender; unfortunately, policy is laden with mistaken assumptions about these social units. This course examines both

the anthropology of households, communities, and gender, and common assumptions about them in development and conservation. Economic and political aspects of relations within these units are intimately linked, and are examined together. The course explores important global variations in the structure of households, communities, and gender. The structure of households, communities, and gender in any particular locality influences the economic and political relation with its region, nation, and the world system—with essential implications for development and conservation. The course aims to study local social units in order to understand their importance for regional, national, and global development and conservation. The goal is to encourage future policy makers and implementers to examine their assumptions about society, and to think more critically about the implications of these social units (and their variations around the world) for development and conservation. No prerequisites. Three hours lecture/seminar. T 10:30–1:20

ANTH 597a/F&ES 83056a, Social Science of Development and Conservation

Carol Carpenter

This course provides a fundamental understanding of the social aspects involved in implementing sustainable development and conservation projects. Social science has two things to contribute to the practice of development and conservation. First, it provides ways of thinking about, researching, and working with social groupings—including rural households and communities, but also development and conservation institutions, states, and NGOs. Second, social science tackles the analysis of the knowledge systems that implicitly shape development and conservation policy and impinge on practice. The goal of the course is to stimulate students to apply informed and critical thinking to whatever roles they play in sustainable development and conservation, in order to move toward more environmentally and socially sustainable projects and policies. A prerequisite for F&ES 80153a and F&ES 80157a. Three hours lecture/seminar. T 10:30–1:20

ANTH 598b/F&ES 80157b, Social Science of Development and Conservation:

Advanced Readings Carol Carpenter, Michael Dove

This course is an advanced seminar on the social science theory of sustainable development and conservation, intended for students interested in research design and policy planning in this field. It traces the conceptual history of the ideas of progress and development from the colonial period through the present and examines how these ideas are used by the parties who fund, design, and manage development projects. Topics discussed vary from year to year in response to current debates and events, but in the past have included the idea of poverty, the politics of mapping, microcredit and the entrepreneurial subject, the politics of indigeneity, new directions in political ecology, the tsunami in Indonesia, the WorldWatch debate on conservation and indigenous people, and the idea of community in the natural and social sciences. Students are expected to use the course to develop, and present in class, their own research and writing. Prerequisite: F&ES 83050a or F&ES 83056a. Three-hour lecture/seminar. Enrollment limited to twelve. Taught alternate years. TH 11:30–2:20

ANTH 619a^U/WGSS 685a^U, Language and the Public Sphere J. Bernard Bate

Explores the relationship between language and the public sphere through consideration of theoretical perspectives of Jürgen Habermas and Benedict Anderson along with

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 century. T 1:30–3:20

ANTH 622b^U/AFST 764b^U/PLSC 784b^U, Africa and the Disciplines

M. Kamari Clarke

A broad survey of Africa's relation to academic discourse, as seen in a variety of disciplines. This course examines how Africa is represented and discussed in different fields; how disciplinary formations, language, popular conceptions, and related intellectual practices of the various disciplines have affected academic approaches to studies of Africa; and how these approaches have reinvented particular African geographies (e.g., sub-Saharan vs. North African, francophone vs. anglophone, South Africa vs. the rest of Africa, and contemporary diasporic articulations). Attention to questions surrounding the management of "The New World Order." After a general context is established over the first four weeks of the term, scholars representing various fields in the humanities, social and political sciences, and the professional schools visit the seminar to discuss their work in relation to the ways that their respective discipline(s) have explored related themes. Throughout the term, attention is given to issues of interdisciplinarity. W 1:30–3:20

ANTH 623b^U, Poetics and Performance Bernard Bate

Examines the historical and social structuring effects of poetic and performative elements of communication. Readings drawn from philosophy, linguistics, anthropology, history, and critical theory demonstrate how poetics and performance provide critical insights into world-building processes within political practice, the performance of gender identity, and the structuring of large-scale social organization and imagination. T 1:30–3:20

ANTH 632a^U, Politics of Language J. Joseph Errington

This course centers on aspects of language difference and inequality as often neglected but crucial shapers of the political dynamics and social change in plural societies. The first part of the course involves broad comparative and theoretical approaches to the politics of sociolinguistic difference. The second part is devoted to case studies which foreground specific issues: "problems" of substandard languages, bilingual identities, globalization and language shift, language death, and others. TH 1:30–3:20

ANTH 651a^U/WGSS 651a^U, Intersectionality and Women's Health Marcia Inhorn

This interdisciplinary seminar is designed to explore how the intersections of race, class, gender, and other axes of "difference" (age, sexual orientation, disability status, nation, religion) affect women's health, primarily in the contemporary United States. Recent feminist approaches to intersectionality and multiplicity of oppressions theory are introduced. In addition, the course demonstrates how anthropologists studying women's health issues have contributed to social and feminist theory at the intersections of race/class/gender. W 2:30–4:20

ANTH 674b^U, Anthropologies of Insurgency Michael McGovern

This course explores the interlinked categories of rebel, bandit, and freedom fighter to understand insurgency from an anthropological viewpoint. Privileging sociological and micropolitical analysis, the course approaches specific instances of illegal use of force in their sociocultural and historic settings, and builds toward a consideration of insurgency from "the actors' points of view." T 9:25–11:15

ANTH 684b^U/WGSS 660b^U, Men, Manhood, and Masculinity Graeme Reid

Cultural and historic constructions of masculinity through an investigation of male bodies, sexualities, and social interactions. Examination of multiple masculinities and exploration of the relationship among hegemonic, non-hegemonic, and subordinate masculinities.

ANTH 705Lb^U/ARCG 705Lb^U, Archaeology Laboratory II Roderick McIntosh

Practical experience in preparation, analysis, and interpretation of artifacts and nonartificial archaeological data. Students undertake term projects. W 2–5

ANTH 720a^U/ARCG 720a^U, Mesopotamian Origins Harvey Weiss

Analysis of the archeological and paleoenvironmental data for rain-fed and irrigation agriculture settlement, subsistence, and politico-economic innovation from the earliest sedentary agriculture villages, to the earliest cities and states, to the earliest empire. What combinations of dynamic social and environmental forces drove these developments in these regions during this ten thousand year span? TH 2:30–4:20

ANTH 732a^U and 733La^U/ARCG 732a^U and 733La^U, Archaeological Field Techniques and Archaeology Lab I John Hale

An introduction to the practice and techniques of modern archaeology, including methods of excavation, recording, mapping, dating, and ecological analysis. The lab offers instruction in the field at an archaeological site in Connecticut in stratigraphy, mapping, artifact recovery, and excavation strategy. The courses must be taken concurrently and are counted together as 1 credit. MW 4–5:15, lab SA 8:30–5

ANTH 748^U/ARCG 748^U, Contemporary Archaeological Theory Richard Burger

This seminar explores contemporary theory in all of its diversity. The course examines multiple critiques of New Archaeology and its remaining legacy; the diversity of competing approaches, sometimes called post-processualist, currently employed in the U.S. and the United Kingdom, including critical archaeology, the archaeology of gender, structuralist approaches, various Marxist and neo-Marxist formulations of archaeological theory, and applications of evolutionary theory; and the differing trajectory of approaches outside the English-speaking world. M 1:30–3:20

ANTH 763b^U/ARCG 763b^U/NELC 589b^U, Archaeologies of Empire Harvey Weiss

Comparative study of origins, structures, efficiencies, and limitations of imperialism, ancient and modern, in the Old and New World, from Akkad to “Indochine,” and from Wari to Aztec. The contrast between ancient and modern imperialisms examined from the perspectives of nineteenth- and twentieth-century archaeology and political economy. TH 2:30–4:20

ANTH 773a^U/ARCG 773a^U/NELC 588a^U, Civilizations and Collapse Harvey Weiss

Collapse documented in the archaeological and early historical records of the Old and New Worlds, including Mesopotamia, Mesoamerica, the Andes, and Europe. Analysis of politico-economic vulnerabilities, resiliencies, and adaptations in the face of abrupt climate change, anthropogenic environmental degradation, resource depletion, “barbarian” incursions, or class conflict. TH 9:25–11:15

ANTH 774a^U/ARCG 774a^U, Origins of Peruvian Civilization Richard Burger

This seminar offers an overview of the diversity of early Andean complex societies and their transformations during the first two millennia B.C. Emphasis is on the most recent research and on explanatory models that have been used to explain the emergence of complexity in Prehispanic Peru. T 1:30–3:20

ANTH 783a^U/ARCG 783a^U, Archaeology of Sacred Sites John Hale

A global and interdisciplinary survey of ancient religious sites, from tombs and temples to entire sacred landscapes, with a focus on reconstructing the ancient beliefs encoded within the archaeological record. M 3:30–5:20

ANTH 793a^U/ARCG 793a^U, Underwater Archaeology John Hale

Overview of major underwater archaeological discoveries, from shipwrecks to sunken cities, and of the technology and methods used to find, survey, excavate, and interpret submerged sites. MW 9–10:15

ANTH 811b, Behavioral Endocrinology Richard Bribiescas

This seminar examines the role of hormones in the evolution and expression of human and nonhuman primate behavior. Emphasis is placed on behaviors that are associated with aggression, stress, mating, and parenting. Advanced undergraduates are welcome with instructor's permission. T 1:30–3:20

ANTH 849b, Primate Models in Human Evolution David Watts

This course considers ways in which comparative research on nonhuman primates can properly serve to increase understanding of issues in human evolution and aspects of modern human behavior. Among the topics covered are the conceptual basis for using extant species as models for extinct ones; dietary evolution; the importance of hunting, food sharing, and intergroup aggression in human evolution; the evolution of mating strategies; whether nonhumans have culture; and primate cognitive evolution. TH 2:30–4:20

ANTH 851a, Topics and Issues in Evolutionary Theory Andrew Hill, Eric Sargis

Focus on current literature in theoretical evolutionary biology, intended to give new graduate students intensive training in critical analysis of theoretical models and in scientific writing. TH 1:30–3:20

ANTH 856a/ARCG 856a^U, Reconstructing Human Evolution: An Ecological

Approach Andrew Hill

If human evolutionary change has been determined or affected by ecological factors, such as changes in climate, competition with other animals, and availability and kinds of food supply, then it is important to determine ecological and environmental information about the regions and time period in which human evolution has occurred. Examination of methods for obtaining data relevant to such information, and for evaluating the techniques and results of such other fields as geology, paleobotany, and paleozoology. Ethnographic, primatological, and other biological models of early human behavior. W 1:30–3:20

ANTH 894a^U, Methods and Research in Molecular Anthropology I Brenda Bradley

The first of a two-part practical introduction to molecular analyses of anthropological

questions. Students learn a range of basic tools for laboratory-based genetic analyses and bioinformatics. M 9:25–11:15

ANTH 895b^U, Methods and Research in Anthropological Genetics II

Brenda Bradley

The second of a two-part practical introduction to molecular analyses of anthropological questions. Students design and carry out independent laboratory projects that were developed in the first term (ANTH 894a^U). W 9:25–11:15

ANTH 896b^U, Primate Comparative Anatomy Eric Sargis

Examination of the major organ and musculoskeletal systems of nonhuman primates. Focus is on functional similarities and differences among several primate groups. MW 2:30–3:45

ANTH 897b^U, Laboratory for Primate Comparative Anatomy Eric Sargis

Laboratory for ANTH 896b^U. T 2:30–5:30

ANTH 941a and b, Research Seminar in Japan Anthropology Karen Nakamura

This seminar offers professional preparation for doctoral students in Japan anthropology through systematic readings and analysis of the anthropological literature, in English and in Japanese. Permission of the instructor required. HTBA

ANTH 942a and b, Research Seminar in South Asia Anthropology

Kalyanakrishnan Sivaramakrishnan

This seminar is for students preparing to become scholars of South Asia. It consists of systematic reading, analysis, discussion, and writing about the anthropological literature in English. It deals with a selection of key ethnographic monographs that cover important topics and debates in the anthropology of South Asia and India including caste, class, community, gender, language, development, environment, politics, and popular culture. Students actively prepare and lead discussions, and write either a proposal or research paper at the end of term. The seminar is designed for doctoral students working on South Asia. Others with appropriate background and interests may be admitted by permission of the instructor. T 9:25–11:15

ANTH 951a and b, Directed Research in Ethnology and Social Anthropology

By arrangement with faculty.

ANTH 952a and b, Directed Research in Linguistics

By arrangement with faculty.

ANTH 953a and b, Directed Research in Archaeology and Prehistory

By arrangement with faculty.

ANTH 954a and b, Directed Research in Biological Anthropology

By arrangement with faculty.

Course of Interest

NELC 872b^U, Magic in Ancient Egypt Hans-Werner Fischer-Elfert

APPLIED MATHEMATICS

A. K. Watson Hall, 432.1278
www.cs.yale.edu/appliedmath2/
 M.S., M.Phil., Ph.D.

Chair and Director of Graduate Studies

Steven Zucker (AKW 107A, 432.1278, zucker@cs.yale.edu)

Professors Andrew Barron (*Statistics*), Donald Brown (*Economics*), Joseph Chang (*Statistics*), Ronald Coifman (*Mathematics; Computer Science*), Gustave Davis (*Pathology*), Eric Denardo (*Operations Research*), Stanley Eisenstat (*Computer Science*), Michael Fischer (*Computer Science*), Roger Howe (*Mathematics*), Peter Jones (*Mathematics*), Steven Orszag (*Mathematics*), David Pollard (*Statistics*), Nicholas Read (*Physics; Applied Physics*), Vladimir Rokhlin (*Computer Science; Mathematics; Physics*), Herbert Scarf (*Economics*), Martin Schultz (*Computer Science*), Mitchell Smooke (*Mechanical Engineering; Applied Physics*), Daniel Spielman (*Computer Science*), Günter Wagner (*Ecology & Evolutionary Biology*), John Wettlaufer (*Geology & Geophysics; Physics*), Steven Zucker (*Computer Science; Biomedical Engineering*)

Associate Professors Josephine Hoh (*Epidemiology & Public Health; Ophthalmology*), Sekhar Tatikonda (*Electrical Engineering; Statistics*)

Assistant Professors Lisha Chen (*Statistics*), John Emerson (*Statistics*), Thierry Emonet (*Molecular, Cellular & Developmental Biology; Physics*), Dan Kushnir, Triet Le (*Mathematics*), Adam Marcus, Mokshay Madiman (*Statistics*), Andrew Wells, Huibin Zhou (*Statistics*)

Fields of Study

The graduate Program in Applied Mathematics comprises the study and application of mathematics to problems motivated by a wide range of application domains. Areas of concentration include the analysis of data in very high-dimensional spaces, the geometry of information, computational biology, and randomized algorithms. Topics covered by the program include classical and modern applied harmonic analysis, linear and nonlinear partial differential equations, numerical analysis, scientific computing and applications, discrete algorithms, combinatorics and combinatorial optimization, graph algorithms, geometric algorithms, discrete mathematics and applications, statistical theory and applications, probability theory and applications, information theory, econometrics, financial mathematics, statistical computing, and applications of mathematical and computational techniques to fluid mechanics, combustion, and other scientific and engineering problems.

Requirements for the Ph.D. in Applied Mathematics

All students are required to: (1) complete twelve term courses (including reading courses) at the graduate level, at least two with Honors grades; (2) pass a qualifying examination on their general applied mathematical knowledge (in algebra, analysis, and probability and statistics) by the end of their second year; (3) submit a dissertation prospectus;

(4) participate in the instruction of undergraduates; (5) be in residence for at least three years; and (6) complete a dissertation that clearly advances understanding of the subject it considers. The normal time for completion of the Ph.D. program is four years.

Requirement (1) normally includes four core courses in each of the methods of applied analysis, numerical computation, algorithms, and probability; these should be taken during the first year. The qualifying examination is normally taken by the end of the third term and will test knowledge of the core courses as well as more specialized topics. The thesis is expected to be independent work, done under the guidance of an adviser. This adviser should be contacted not long after the student passes the qualifying examinations. A student is admitted to candidacy after completing requirements (1)–(5) and obtaining an adviser.

Master's Degrees

M. Phil. See Degree Requirements.

M.S. (en route to the Ph.D.) The M.S. degree is a terminal degree and is not awarded en route to the Ph.D.

Master's Degree Program Students may also be admitted to a terminal master's degree program directly. This program is normally completed in one year, but a part-time program may be spread over as many as four years. To qualify for the M.S., the student must pass eight graduate-level courses. Courses taken as part of the M.S. program must be pre-approved by the director of graduate studies to ensure that a suitable distribution of topics is covered.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study.

Program materials and additional information concerning degrees offered and admissions requirements are available upon request to the Graduate School of Arts and Sciences, Yale University, PO Box 208323, New Haven CT 06520-8323.

Courses

AMTH 561a, Spectral Graph Theory Daniel Spielman

An applied approach to spectral graph theory. The combinatorial meaning of the eigenvalues and eigenvectors of matrices associated with graphs. Applications to optimization, numerical linear algebra, error-correcting codes, and testing graph isomorphism.

AMTH 605a/ENAS 503a/STAT 667a, Probabilistic Networks, Algorithms, and Applications Sekhar Tatikonda

This course examines probabilistic and computational methods for the statistical modeling of complex data. The emphasis is on the unifying framework provided by graph models: Markov random fields, Bayesian networks, and factor graphs. Algorithms: filtering, smoothing, belief-propagation, sum-product, and junction tree. Variational techniques: mean-field and convex relaxations. Markov processes on graphs: MCMC,

factored HMMs, and Glauber dynamics. Some statistical physics techniques: cavity and replica methods. Applications to error-correcting codes, computer vision, bio-informatics, and combinatorial optimization.

AMTH 664a^U, Topics in Computational Biology Steven Zucker

An overview of basic topics in computational biology, spanning scales from molecules to cells to networks. How cells process information (cell biology); how neurons sense the world and make decisions (neurobiology); and how genes control form (evolutionary biology). Prerequisite: MATH 120a or b or equivalent.

[AMTH 665b^U/MCDB 561b^U/PHYS 529b, Systems Modeling in Biology]

AMTH 666a/ASTR 666a /G&G 666a, Statistical Thermodynamics for Astrophysics and Geophysics John Wettlaufer

Classical thermodynamics is derived from statistical thermodynamics. We then develop kinetics, transport theory, and reciprocity from the linear thermodynamics of irreversible processes. Emphasis is placed on phase transitions, including novel states of matter, nucleation theory, and the thermodynamics of atmospheres. We explore phenomena that are of direct relevance to problems in astrophysical settings, atmospheres, oceans, and the Earth's interior. No quantum mechanics is necessary as a prerequisite. TTH 2:30–3:45

APPLIED PHYSICS

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Chair

A. Douglas Stone

Director of Graduate Studies

Robert Grober

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*), Karyn Le Hur, Marshall Long, Tso-Ping Ma, Daniel Prober, Nicholas Read, Mark Reed, Robert Schoelkopf, Ramamurti Shankar, Mitchell Smooke, A. Douglas Stone, John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

Associate Professor Sohrab Ismail-Beigi

FIELDS OF STUDY

Fields include areas of theoretical and experimental condensed-matter and materials physics, optical and laser physics, quantum engineering, and nanoscale science. Specific programs include surface and interface science, first principles electronic structure methods, photonic materials and devices, complex oxides, magnetic and superconducting artificially engineered systems, quantum computing and superconducting device research, quantum transport and nanotube physics, quantum optics, and random lasers.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

ARCHAEOLOGICAL STUDIES

10 Sachem, 432.3670
www.yale.edu/archaeology/
 M.A.

Chair and Director of Graduate Studies

Richard Burger (*Anthropology*)

Professors Richard Burger (*Anthropology*), Edward Cooke, Jr. (*History of Art*), John Darnell (*Near Eastern Languages & Civilizations*), Eckart Frahm (*Near Eastern Languages & Civilizations*), Andrew Hill (*Anthropology*), Diana Kleiner (*Classics; History of Art*), Roderick McIntosh (*Anthropology*), Mary Miller (*History of Art*), Eric Sargis (*Anthropology*), Ronald Smith (*Geology & Geophysics*), Karl Turekian (*Geology & Geophysics*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

Assistant Professors Milette Gaifman (*History of Art; Classics*), William Honeychurch (*Anthropology*), Colleen Manassa (*Near Eastern Languages & Civilizations*), Tamara Sears (*History of Art*), Lillian Tseng (*History of Art*)

Lecturers Hans-Werner Fischer-Elfert (*Near Eastern Languages & Civilizations*), Karen Foster (*Near Eastern Languages & Civilizations*), John Hale (*Anthropology*), Barbara Mundy (*History of Art*)

The aims of the program are to give students the academic background needed for careers in the conservation of archaeological resources, to prepare students to teach in community colleges and secondary schools, and to provide the opportunity for teachers, curators, and administrators to refresh themselves on recent developments in archaeology. The program is administered by Yale's Council on Archaeological Studies, with faculty from the departments of Anthropology, Classics, Geology & Geophysics, History of Art, and Near Eastern Languages & Civilizations.

Special Admissions Requirements

The GRE General Test; applicants need not have an archaeology background, but a strong grounding in the social sciences or history is recommended.

Special Requirements for the M.A. Degree

Courses are drawn from the graduate programs of the participating departments and from those undergraduate courses that are also open to graduate students. Eight courses are required. Unless previously taken for credit, these will include Field Techniques; at least one laboratory course; a course related to archaeology in each of the following three groups: (1) Anthropology; (2) Classics, History of Art, or Near Eastern Languages & Civilizations; (3) Ecology & Evolutionary Biology, Forestry & Environmental Studies, or Geology & Geophysics; and three electives. In addition, each student will write a master's thesis. Degree candidates are required to pay a minimum of one year of full tuition. Full-time students can complete the course requirements in one academic year, and all students are expected to complete the program within a maximum period of three academic years.

For further information, visit the Archaeological Studies Web site, www.yale.edu/archaeology/. Inquiries may be directed to Director of Graduate Studies, c/o Registrar, Archaeological Studies, Department of Anthropology, Yale University, PO Box 208277, New Haven CT 06520-8277, or via e-mail, archaeology@yale.edu.

Courses

ARCG 705Lb^U/ANTH 705Lb^U, Archaeology Laboratory II Roderick McIntosh

Practical experience in preparation, analysis, and interpretation of artifacts and nonartificial archaeological data. Students undertake term projects. W 2–5

ARCG 720a^U/ANTH 720a^U, Mesopotamian Origins Harvey Weiss

Analysis of the archaeological and paleoenvironmental data for rain-fed and irrigation agriculture settlement, subsistence, and politico-economic innovation from the earliest sedentary agriculture villages, to the earliest cities and states, to the earliest empire. What combinations of dynamic social and environmental forces drove these developments in these regions during this 10,000-year span? TH 2:30–4:20

ARCG 725a/AMST 735a/HSAR 725a, An Introduction to American Material Culture

Edward Cooke

The field of material culture has drawn from a number of different disciplines and scholarly traditions. Through readings and applications of methodologies ranging from structuralism and semiotics to Marxist criticism and cultural studies, this seminar provides a solid foundation for the interpretation of artifacts. W 1:30–3:20

ARCG 732a^U and 733La^U/ANTH 732a^U and 733La^U, Archaeological Field Techniques and Archaeology Lab John Hale

An introduction to the practice and techniques of modern archaeology, including methods of excavation, recording, mapping, dating, and ecological analysis. The lab offers instruction in the field at an archaeological site in Connecticut in stratigraphy, mapping, artifact recovery, and excavation strategy. The courses must be taken concurrently and are counted together as one credit. MW 4–5:15, lab SA 8:30–5

ARCG 748^U/ANTH 748^U, Contemporary Archaeological Theory Richard Burger

This seminar explores contemporary theory in all of its diversity. The course examines multiple critiques of New Archaeology and its remaining legacy; the diversity of competing approaches, sometimes called post-processualist, currently employed in the U.S. and the United Kingdom, including critical archaeology, the archaeology of gender, structuralist approaches, various Marxist and neo-Marxist formulations of archaeological theory, and applications of evolutionary theory; as well as the differing trajectory of approaches outside the English-speaking world. M 1:30–3:20

ARCG 749a/CLSS 846a/HSAR 570a, Becoming Hadrian: Autobiography and Art in the Second Century A.D. Diana Kleiner

Marguerite Yourcenar's famed fictional *Memoirs of Hadrian* serves as the starting point for an exploration of Hadrian and the art he commissioned in Rome and abroad. Hadrian's passion for life, quest after peace, romantic wanderlust, veneration of Greek culture, and craving for love, along with his acceptance of death's inexorableness led him

to commission some of Rome's greatest monuments. The emperor's flair for leadership and talent as an amateur architect inform student projects on the sculpture, mosaics, and buildings of the age, among them the portraiture of Hadrian's lover Antinous, the Pantheon, and Hadrian's Wall in Britain. Special attention is paid to Hadrian's Villa at Tivoli, an empire unto itself where Hadrian's autobiography was fully realized. T 1:30–3:20

ARCG 762a^U/EMD 548a/F&ES 77001a/G&G 562a^U, Remote Sensing: Observing the Earth from Space Ronald Smith and staff

Topics include the spectrum of electromagnetic radiation; satellite-borne radiometers; data transmission and storage; computer image analysis; and GIS analysis of satellite imagery with applications to weather and climate, oceanography, surficial geology, snow and ice, forestry, agriculture, and watershed management. TTH 9–10:15

ARCG 763b^U/ANTH 763b^U/NELC 589b^U, Archaeologies of Empire Harvey Weiss
Comparative study of origins, structures, efficiencies, and limitations of imperialism, ancient and modern, in the Old and New World, from Akkad to "Indochine," and from Wari to Aztec. The contrast between ancient and modern imperialisms examined from the perspectives of nineteenth- and twentieth-century archaeology and political economy. TH 2:30–4:20

ARCG 773a^U/ANTH 773a^U/NELC 588a^U, Civilizations and Collapse Harvey Weiss
Collapse documented in the archaeological and early historical records of the Old and New Worlds, including Mesopotamia, Mesoamerica, the Andes, and Europe. Analysis of politico-economic vulnerabilities, resiliencies, and adaptations in the face of abrupt climate change, anthropogenic environmental degradation, resource depletion, "barbarian" incursions, or class conflict. TH 9:25–11:15

ARCG 774a^U/ANTH 774a^U, Origins of Peruvian Civilization Richard Burger
This seminar offers an overview of the diversity of early Andean complex societies and their transformations during the first two millennia B.C. Emphasis is on the most recent research and on explanatory models that have been used to explain the emergence of complexity in Prehispanic Peru. T 1:30–3:20

ARCG 783a^U/ANTH 783a^U, Archaeology of Sacred Sites John Hale
A global and interdisciplinary survey of ancient religious sites, from tombs and temples to entire sacred landscapes, with a focus on reconstructing the ancient beliefs encoded within the archaeological record. M 3:30–5:20

ARCG 793a^U/ANTH 793a^U, Underwater Archaeology John Hale
Overview of major underwater archaeological discoveries, from shipwrecks to sunken cities, and of the technology and methods used to find, survey, excavate, and interpret submerged sites. MW 9–10:15

ARCG 856a^U/ANTH 856a, Reconstructing Human Evolution: An Ecological Approach Andrew Hill

If human evolutionary change has been determined or affected by ecological factors, such as changes in climate, competition with other animals, and availability and kinds of food supply, then it is important to determine ecological and environmental information

about the regions and time period in which human evolution has occurred. Examination of methods for obtaining data relevant to such information, and for evaluating the techniques and results of such other fields as geology, paleobotany, and paleozoology. Ethnographic, primatological, and other biological models of early human behavior.
W 1:30–3:20

ARCG 953a or b, Directed Research in Archaeology and Prehistory

By arrangement with faculty.

Related Courses

ARCG 100b/ANTH 150b/HUMS 376b/NELC 100b, Genesis and Collapse of Old World Civilizations Harvey Weiss

ARCG 172b/ANTH 172b, Great Hoaxes and Fantasies in Archaeology Harvey Weiss

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

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

ARCG 235b/HUMS 245b/NELC 502b^U/HSAR 245b, Worlds of Homer Karen Foster

ARCG 236a/HSAR 236a/NELC 103a, The Art of Ancient Palaces Karen Foster

ARCG 240a/CLCV 182a/HSAR 240a/RLST 179a, Myth, Blood, and Festival
Milette Gaifman

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

ARCG 245a/HSAR 245a, The Art of the Greek God Dionysos Milette Gaifman

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

ARCG 272b/ANTH 272b, African Prehistory Roderick McIntosh

NELC 872b^U, Magic in Ancient Egypt Hans-Werner Fischer-Elfert

ARCHITECTURE

180 York Street, 432.2288
 www.architecture.yale.edu
 M.Arch., M.E.D., Ph.D.

Dean

Robert A. M. Stern

Director of Doctoral Studies

Kurt W. Forster (316 Rudolph, 432.0692, kurt.forster@yale.edu)

Professors Peggy Deamer, Peter Eisenman (*Visiting*), Kurt W. Foster (*Visiting*), Dolores Hayden, Alan Plattus, Robert A. M. Stern

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

Assistant Professors Ljiljana Blagojević (*Visiting*), Alexander Felson, Mark Foster Gage, Kyoung Sun Moon, Emmanuel Petit, Hilary Sample

Adjunct Faculty Thomas Beeby, Deborah Berke, Kent Bloomer, Turner Brooks, Alexander Garvin, Anne Gilbert, Steven Harris, John Jacobson, Fred Koetter, Edward Mitchell, Joel Sanders

Fields of Study

The five-year doctoral program prepares candidates for careers in university teaching, cultural advocacy and administration, museum curatorship, and publishing. It aims chiefly, however, to educate teachers capable of effectively instructing future architects in the history of their own field and its manifold connections with the culture at large. The program forges a unique combination of professional knowledge with a historical and analytical grasp of key phases in the history of architecture, especially those that have a demonstrable share in the field's current state and its critical issues.

The program secures sound training in historical study and historiography, imparting technical knowledge and awareness of intellectual trends that inform the reception and role of architecture around the world. The history of science and technology (as well as its reception in popular culture and the arts), the history of media, and an understanding of architectural practice are as important as the fine arts and literature.

Admission Requirements

Applicants shall have appropriate academic credentials (a master's degree or equivalent in Architecture, Engineering, Environmental Design, or, exceptionally, in a related field) and at least two years of work experience in an appropriate professional setting. The Graduate Record Examination (GRE) General Test taken no more than five years prior to application is required. All applicants whose native language is not English are required to take the Internet-based Test of English as a Foreign Language (TOEFL iBT), a test that includes a section on spoken English. In addition to meeting qualifying criteria, candidates are required as part of the application to submit a portfolio of their own

architectural work, a writing sample in the form of a research paper or publication, and an explanation of their motivation for engaging in this course of study. Qualified applicants may be invited to interview with a member of the doctoral faculty.

Special Requirements for the Ph.D. Degree

Entering students with sound professional preparation engage in a concerted course of study that leads directly to dissertation research and a doctoral degree.

All students must spend their first two years in residence at Yale enrolled as full-time students in the School of Architecture. During the first two years of study, students will normally take at least eight courses, consisting of graduate seminars. During each of the four terms in residence, a student must take a Ph.D. seminar taught by a member of the Ph.D. committee, which will introduce the student to various methodologies and areas of study. Some seminars will encourage primary research on a narrow topic or focus on producing a collective body of work, such as an exhibition. Others offer a broader survey of historiographies. Another will focus on the close reading of a body of texts. These four required seminars form the methodological core of the program.

Students will be encouraged to take courses outside the School of Architecture but related to their specific areas of interest. For example, a student working on Italian modernism would be encouraged to take a course in Italian history or literature. Typically, at least two of the four elective seminars would be in related fields. Students can also opt to do independent readings with individual faculty members on their specific areas of interest.

Students will also be expected to demonstrate competence in at least one foreign language relevant to their field of study, not later than the end of their second year. Language competence is more than a formality and requires some acquaintance with the literature in the chosen language. Competency may be determined by either a grade of B or better in a yearlong intermediate-level language course or through examination.

Ideally, the student's field of interest will be defined after the first year. At this point, the student will be assigned an adviser by the director of doctoral studies. At the end of the second year the student will be assigned an additional three faculty members, who will constitute his or her dissertation committee. One of these additional faculty members should be from outside the School of Architecture, with selection based on the student's area of interest, and in consultation with the Ph.D. adviser and the director of doctoral studies.

Upon completion of all course requirements and the language requirement, normally during the fall of the third year, students will take a qualifying exam, which requires an approximately 8,000-word research paper and an oral examination during which members of his/her dissertation committee will question the candidate in three fields of study. During the spring term of the third year, candidates will present and defend a preliminary proposal for a dissertation topic, consisting of a topic statement, program of research and study, and annotated bibliography.

By the end of the third year, students will begin a period of dissertation research and writing. A student is asked to submit a draft of the dissertation half a year before the final defense. After successful completion of the defense, students are given three months to complete the final submission.

Graduate Research Assistant and Teaching Fellow Experience

The program in Architecture considers teaching to be an important part of graduate training. Students in the Ph.D. program in Architecture, therefore, are expected to teach for four terms, normally in their third and fourth years. Between these four terms, it is typically expected that a Ph.D. student will teach in two history and theory survey courses in the student's area of study at the School of Architecture or elsewhere in the University and teach in two design studios at the School of Architecture. Each teaching assignment shall be under the direct supervision of senior faculty.

Master's Degree

M.Phil. (en route to the Ph.D.) This degree will be granted to Ph.D. students who successfully complete two years of course work. To be awarded the M.Phil. degree, students need to complete all core courses, four cognates (may include independent study with faculty), and two years of Graduate Research Assistant experience, and must pass the Preliminary Examination.

Courses

For courses and their descriptions, see the School of Architecture bulletin (www.yale.edu/bulletin/pdf/architecture.pdf).

ASTRONOMY

J.W. Gibbs Laboratories, 432.3000

www.astro.yale.edu/

M.S., M.Phil., Ph.D.

Chair

Jeffrey Kenney

Director of Graduate Studies

Robert Zinn (436.3017, robert.zinn@yale.edu)

Professors Charles Bailyn, Charles Baltay (*Physics*), Sarbani Basu, Paolo Coppi, Pierre Demarque (*Emeritus*), Jeffrey Kenney, Richard Larson, Peter Parker (*Physics*), Sabatino Sofia (*Emeritus*), C. Megan Urry (*Physics*), William van Altena (*Emeritus*), Pieter van Dokkum, Robert Zinn

Associate Professor Priyamvada Natarajan

Assistant Professors Hector Arce, Richard Easther (*Physics*), Marla Geha

Fields of Study

Fields include observational and theoretical galactic astronomy, solar and stellar astrophysics, astrometry, extragalactic astronomy, radio astronomy, high-energy astrophysics, and cosmology.

Special Admissions Requirements

Applicants are expected to have a strong undergraduate preparation in physics and mathematics. Although some formal training in astronomy is useful, it is by no means a prerequisite for admission. Applicants are required to take the General GRE as well as the subject test in Physics.

Special Requirements for the Ph.D. Degree

A typical program of study includes twelve courses taken during the first four terms, and must include the core courses listed below:

Computational Methods in Astrophysics and Geophysics (ASTR 520), Observational Techniques (ASTR 555), Interstellar Matter and Star Formation (ASTR 560), either Stellar Populations (ASTR 510) or Stellar Astrophysics (ASTR 550), and either Galaxies (ASTR 530) or The Evolving Universe (ASTR 565).

Students require the permission of the instructor and the DGS to skip a core class if they think that they have sufficient knowledge of the field. Students will be required to demonstrate their knowledge of the field before they are allowed to skip any core class.

Two of the twelve courses must be research credits, each earned by working in close collaboration with a faculty member. Of the two research credits, one must be earned doing a theoretical project and one doing an observational research project. The students need to present the results of the project as a written report and will be given an evaluation of their performance.

The choice of the five remaining courses depends on the candidate's interest and background and must be decided in consultation with the DGS and/or the prospective thesis adviser. Advisers may require students to take particular classes and obtain a specified minimum grade in order for a student to work with them for their thesis. Students must take any additional course that their supervisors require even after their fourth term. In addition, all students, regardless of their term of study, have to attend Professional Seminar (ASTR 710) every term. Note that ASTR 710 may not be used to fulfill the twelve-course requirement.

Students are encouraged to take graduate courses in physics or related subjects. On an irregular basis, special topic courses and seminars are offered, which provide the opportunity to study some fields in greater depth than is possible in standard courses. To achieve both breadth and depth in their education, students are encouraged to take a few courses beyond their second year of study.

There is no foreign language requirement. A written comprehensive examination, normally taken at the end of the fourth term of graduate work, tests the student's familiarity with the entire field of astronomy and related branches of physics and mathematics. Particular attention will be paid to the student's performance in the field in which the student plans to do research. An oral examination, held a few weeks after the written examination, is based on the student's chosen field of research. Satisfactory performance in these examinations, an acceptable record in course and research work, and an approved dissertation prospectus are required for admission to candidacy for the Ph.D. degree. The dissertation should present the results of an original and thorough investigation, worthy of publication. Most importantly, it should reflect the candidate's capacity for independent research. An oral dissertation defense is required.

Teaching experience is an integral part of graduate education in astronomy. All students will serve as teaching fellows and complete a total of nine TF units. Both the level of teaching assignments and the scheduling of teaching are flexible and determined by the needs of the department. By the end of the third term, however, most students will have completed six TF units. The additional three TF units will normally be carried out after the fourth term of study.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study.

Master's Degrees

M.Phil. See Degree Requirements.

M.S. (en route to the Ph.D.) Upon application, the department will recommend for the award of the M.S. degree any student who has satisfactorily completed the first year of the program leading to the Ph.D. degree. Satisfactory is defined as having taken at least four courses (not including ASTR 710) and one research project. The student should have a grade average of HP in the courses taken and a grade of HP or above in the research project.

Program materials are available upon request to the Director of Graduate Studies, Department of Astronomy, Yale University, PO Box 208101, New Haven CT 06520-8101.

Courses

[ASTR 510b^U, Stellar Populations]

ASTR 518b, Stellar Dynamics Marla Geha

The dynamics and evolution of star clusters; structure and dynamics of our galaxy; theories of spiral structure; dynamical evolution of galaxies.

ASTR 520a/G&G 538a, Computational Methods in Astrophysics and Geophysics

Paolo Coppi

The analytic and numerical/computational tools necessary for effective research in astronomy, geophysics, and related disciplines. Topics include numerical solutions to differential equations, spectral methods, and Monte Carlo simulations. Applications are made to common astrophysical and geophysical problems including fluids and N-body simulations.

[ASTR 530b^U, Galaxies]

[ASTR 540a^U, Radiative Processes in Astrophysics and Geophysics]

[ASTR 550b^U, Stellar Astrophysics]

ASTR 555a^U, Observational Techniques Robert Zinn

The design and use of optical telescopes, cameras, spectrographs, and detectors to make astronomical observations. The reduction and analysis of photometric and spectroscopic observations.

ASTR 560b, Interstellar Matter and Star Formation Hector Arce

Observations of interstellar matter at optical, infrared, radio, and X-ray wavelengths. Dynamics and evolution of the interstellar medium, including interactions between stars and interstellar matter. Molecular clouds and processes of star formation.

ASTR 565b, The Evolving Universe Pieter van Dokkum

The emergence of structure in the universe: stars, galaxies, and clusters of galaxies. Emphasis on the interplay of theory and observations in this rapidly evolving field.

ASTR 570a/PHYS 570a, High-Energy Astrophysics Eilat Glikman

A survey of current topics in high-energy astrophysics, including accreting black hole and neutron star systems in our galaxy, pulsars, active galactic nuclei and relativistic jets, gamma-ray bursts, and ultra-high-energy cosmic rays. The basic physical processes underlying the observed high-energy phenomena are also covered. HTBA

ASTR 580a or b, Research

By arrangement with faculty.

[ASTR 585a, Radio Astronomy]

ASTR 590b^U, Solar Physics Sarbani Basu

This course presents a detailed description of the structure of the Sun and its atmosphere and is aimed to give students a good understanding of the underlying physical processes. Topics to be covered include a discussion of the standard solar model, solar atmospheres, solar oscillations, solar magnetic fields, chromosphere and corona, as well as solar winds and eruptions. Particular attention is paid to the solar magnetic cycle since it can affect us on Earth.

ASTR 600a^U/PHYS 600a, Cosmology Priyamvada Natarajan

A comprehensive introduction to cosmology at the graduate level. The standard paradigm for the formation, growth, and evolution of structure in the Universe is covered in detail. The course does not assume prior knowledge of general relativity. HTBA

ASTR 666a/AMTH 666a/G&G 666a, Statistical Thermodynamics for Astrophysics and Geophysics John Wettlaufer

Classical thermodynamics is derived from statistical thermodynamics. We then develop kinetics, transport theory, and reciprocity from the linear thermodynamics of irreversible processes. Emphasis is placed on phase transitions, including novel states of matter, nucleation theory, and the thermodynamics of atmospheres. We explore phenomena that are of direct relevance to problems in astrophysical settings, atmospheres, oceans, and the Earth's interior. No quantum mechanics is necessary as a prerequisite. TTH 2:30–3:45

[ASTR 705, Research Seminar in Stellar Populations]**ASTR 710a and b, Professional Seminar** Richard Larson

A weekly seminar covering science and professional issues in astronomy.

BIOMEDICAL ENGINEERING

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Chair

Mark Saltzman

Director of Graduate Studies

Richard Carson

Professors Richard Carson, James Duncan, Douglas Rothman, Mark Saltzman, Fred Sigworth, Steven Zucker (*Computer Science*)

Associate Professors Todd Constable, Fahmeed Hyder, Erin Lavik, Laura Niklason, Lawrence Staib, Hemant Tagare

Assistant Professors Robin de Graaf, Tarek Fahmy, Themis Kyriakides, Mark Laubach, Michael Levene, Xenios Papademetris, Erik Shapiro

FIELDS OF STUDY

Fields include the physics of image formation (MRI, ultrasound, nuclear medicine, and X-ray), NMR spectroscopy, PET and modeling, digital image analysis and processing, computer vision, biological signals and sensors, biomechanics, physiology and human factors engineering, drug delivery, biotechnology, biomechanics of the spine, and tissue engineering.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

CELL BIOLOGY

C-207 Sterling Hall of Medicine, 737.5603

www.cellbiology.yale.edu/

M.S., M.Phil., Ph.D.

Chair

James Rothman

Director of Graduate Studies

Carl Hashimoto (C-223 SHM, 737.2746, carl.hashimoto@yale.edu)

Professors Michael Caplan (*Cellular & Molecular Physiology*), Lynn Cooley (*Genetics*), Peter Cresswell (*Immunobiology*), Pietro De Camilli, Jorge Galán (*Microbial Pathogenesis*), Fred Gorelick (*Internal Medicine/Digestive Diseases*), Carl Hashimoto, James Jamieson, Diane Krause (*Laboratory Medicine*), Thomas Lentz (*Emeritus*), Haifan Lin, Vincent Marchesi (*Pathology*), Mark Mooseker (*Molecular, Cellular & Developmental Biology*), Michael Nathanson (*Internal Medicine/Digestive Diseases*), Thomas Pollard (*Molecular, Cellular & Developmental Biology*), James Rothman, Michael Simons (*Internal Medicine/Cardiovascular Medicine*), Elisabetta Ullu (*Internal Medicine/Infectious Diseases*), Sandra Wolin

Associate Professors Karin Reinisch, Elke Stein (*Molecular, Cellular & Developmental Biology*), Derek Toomre, Agnes Vignery (*Orthopaedics*)

Assistant Professors Joerg Bewersdorf, Jonathan Bogan (*Internal Medicine/Endocrinology*), Daniel Colón-Ramos, Eric Dufresne (*Mechanical Engineering*), Megan King, Patrick Lusk, Thomas Melia, Peter Takizawa, Yongli Zhang

Fields of Study

Fields include membrane traffic and protein sorting, organelle biogenesis, epithelial cell polarity, membrane function in the nervous system (synapse formation and function), axon guidance, neural circuit development, cell biology of protozoan parasites and of pathogen/host interactions, cell biology of the immune response, mRNA biogenesis and localization, RNA folding, non-coding RNAs, stem cells, cell biology of the cytoskeleton and of the nucleus, cellular signaling and motility, cytokinesis. Approaches to these topics include biochemistry, molecular biology, and crystallography; bacterial, yeast, *Drosophila*, *C. elegans*, and mouse genetics; immunocytochemistry and electron microscopy; live cell and super-resolution imaging.

Special Admissions Requirements

An undergraduate major in the biological sciences is recommended. GRE General Test is required; GRE Subject Test recommended (in Biology or in Biochemistry, Cell and Molecular Biology).

To enter the Ph.D. program, students apply to an interest-based track, usually the Molecular Cell Biology, Genetics, and Development track, in the combined program in Biological and Biomedical Sciences (BBS), <http://info.med.yale.edu/bbs>.

Special Requirements for the Ph.D. Degree

Students are required to take at least five graduate-level courses. No specific curriculum of courses is required, but CBIO 602 (Molecular Cell Biology) is recommended for all students to attain a solid foundation in molecular cell biology. Also recommended is a seminar course, such as CBIO 603 (Seminar in Molecular Cell Biology), in which students can develop the skill for critical analysis of research papers. Students design their own curriculum of courses to meet individual interests and needs, in consultation with the director of graduate studies. During the first year, students participate in three laboratory rotations. In the second year, a committee of faculty members determines whether each student is qualified to continue in the Ph.D. program. There is an oral qualifying examination by the end of the third term. In order to be admitted to candidacy, students must have met the Graduate School Honors requirement, maintained a High Pass average in course work, passed the qualifying examination, submitted an approved prospectus, and received a positive evaluation of their laboratory work from the thesis committee. All students are required to present a talk at the departmental progress report series each year after passing the qualifying exam. The remaining degree requirements include completion of the dissertation project and the writing of the dissertation and its oral defense, the formal submission of copies of the written dissertation to the Graduate School, and the deposit of an additional copy with the department. Laboratory rotations and thesis research may be conducted outside of the department.

An important aspect of graduate training in cell biology is the acquisition of teaching skills through participation in courses appropriate for the student's scientific interests. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school levels. Ph.D. students are required to participate in two terms (or the equivalent) of teaching. Students are not expected to teach during their first year.

M.D./Ph.D. Students

M.D./Ph.D. students are required to take a total of five graduate-level courses for a grade, including Molecules to Systems (CBIO 502), Molecular and Cellular Basis of Human Disease (CBIO 601), and a seminar course that involves the reading and class discussion of research papers. The two remaining courses can be in areas such as Genetics, Neurobiology, Immunology, Microbiology, Pharmacology, and Physiology. Students must meet the Graduate School requirement of a grade of Honors in two courses, if necessary taking additional courses beyond the five required in the department to fulfill this requirement. Students must also maintain an average grade of High Pass in all courses. One term of teaching is required.

Master's Degrees

M.Phil. Requirements for the M.Phil. degree are the same as for admission to candidacy (see above).

M.S. This degree is normally granted only to students who are withdrawing from the Ph.D. program. To be eligible for the degree, a student must pass at least five graduate-

level term courses at Yale, including CBIO 602, Molecular Cell Biology, and a seminar course as recommended above, with at least one grade of Honors or three of High Pass.

Prospective applicants are encouraged to visit the BBS Web site (<http://info.med.yale.edu/bbs>), MCGD Track. Program materials are available upon request to the Director of Graduate Studies, Department of Cell Biology, Yale University, PO Box 208002, New Haven CT 06520-8002.

Courses

CBIO 502a/b, Molecules to Systems James Jamieson, Peter Takizawa, Thomas Lentz, Fred Gorelick, and staff

This full-year course is designed to provide medical students with a current and comprehensive review of biologic structure and function at the cellular, tissue, and organ system levels. Areas covered in the first semester include replication and transcription of the genome; regulation of the cell cycle and mitosis; protein biosynthesis and membrane targeting; cell motility and the cytoskeleton; signal transduction; nerve and muscle function. The second semester of the course covers cell and tissue organization of organ systems including respiratory, renal, gastrointestinal, endocrine, and reproductive systems. Clinical correlation sessions, which illustrate the contributions of cell biology to specific medical problems, are interspersed in the lecture schedule. Histophysiology laboratories provide practical experience with an understanding of exploring cell and tissue structure. This course is offered only to M.D. and M.D./Ph.D. students. This course runs from September to mid-May and is equivalent to three graduate credits.

CBIO 601a/b, Molecular and Cellular Basis of Human Disease Fred Gorelick, James Jamieson, and staff

This course emphasizes the connections between diseases and basic science using a lecture and seminar format. It is designed for students who are committed to a career in medical research, those who are considering such a career, or students who wish to explore scientific topics in depth. The first half of the course is organized in four- to five-week blocks that topically parallel CBIO 502a/b. Examples of blocks from past years include "Diseases of protein folding" and "Diseases of ion channels." Each topic is introduced with a lecture given by the faculty. The lecture is followed by sessions in which students review relevant manuscripts under the supervision of a faculty mentor. The second half of the course focuses on the relationship of basic science to disease processes while emphasizing translational and clinical research. In addition, sessions are devoted to academic careers and cover subjects such as obtaining an academic position, promotions, and grant writing. The course is open to M.D. and M.D./Ph.D. students who are taking or have taken CBIO 502a/b. Student evaluations are based on attendance, participation in group discussions, formal presentations, and a written review of an NIH proposal. This course runs from September to mid-May and is equivalent to three graduate credits. M 4–5:30

CBIO 602a/MB&B 602a/MCDB 602a, Molecular Cell Biology Sandra Wolin, Thomas Melia, Thomas Pollard, Craig Crews, and faculty

A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. MW 1:45–3

CBIO 603a/MCDB 603a, Seminar in Molecular Cell Biology Sandra Wolin,

Thomas Melia, Thomas Pollard, and faculty

A graduate-level seminar course in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the CBIO 602a lecture schedule. Thus, concurrent or previous enrollment in CBIO 602a is required. TH 9–11

CBIO 604b, Systems Cell Biology Carl Hashimoto, Daniel Colón-Ramos, and

faculty

Introduction to the organization and function of cells within complex multicellular systems as encountered in the human body. Covers major tissues and organs as well as the cardiovascular, immune, and nervous systems, with special emphasis on the molecular and cellular bases of developmental processes and human diseases. Lectures supplemented by electronic-based tutorials on the histology of tissues and organs. T 9:30–10:30, TH 9:30–11

CBIO 606b, Advanced Topics in Cell Biology Derek Toomre, Karin Reinisch, and

faculty

This seminar course, which meets once weekly, covers advanced topics in cell biology. Each topic is spread over two or three sessions, which start with an introductory overview and are followed by a discussion of key papers led by an expert in the field. Special emphasis is given to application of state-of-the-art imaging techniques to topical areas covering a wide range of contemporary cell biology. T 4–6

CBIO 701b, Illuminating Cellular Function Derek Toomre and faculty

Introduction to the principles and practical methods of live cell imaging. Covers principles of fluorescent microscopy (including genetically encoded probes and physiological indicators), image formation, image detection, and image analysis. Includes hands-on demonstrations of state-of-the-art instrumentation, such as video-rate confocal and multi-photon microscopes.

CBIO 900a and 901b/GENE 900a and 901b/MCDB 900a and 901b, First-Year**Introduction to Research** Carl Hashimoto, Charles Radding, Frank Slack, and

faculty

Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics, and Development track students.

CELLULAR AND MOLECULAR PHYSIOLOGY

B-147 Sterling Hall of Medicine, 737.2215

www.physiology.yale.edu

M.Phil., Ph.D.

Chair (Interim)

Michael Caplan

Director of Graduate Studies

Emile Boulpaep (B-142 SHM, 785.4055, emile.boulpaep@yale.edu)

Professors Peter Aronson (*Internal Medicine/Nephrology*), Emile Boulpaep, Thomas Brown (*Psychology*), Cecilia Canessa, Lloyd Cantley (*Internal Medicine/Nephrology*), Michael Caplan, W. Knox Chandler, Lawrence Cohen, Barbara Ehrlich (*Pharmacology*), Biff Forbush III, John Geibel (*Surgery*), Leonard Kaczmarek (*Pharmacology*), Patricia Preisig (*Internal Medicine/Nephrology*), George Richerson (*Neurology*), W. Mark Saltzman (*Biomedical Engineering*), Joseph Santos-Sacchi (*Surgery/Otolaryngology*), Gerald Shulman (*Internal Medicine/Endocrinology*), Fred Sigworth, Carolyn Slayman (*Genetics*), Clifford Slayman, Fred Wright (*Internal Medicine/Nephrology*), Lawrence Young (*Internal Medicine/Cardiology*), Z. Jimmy Zhou (*Ophthalmology*)

Associate Professors Angelique Bordey (*Neurosurgery*), Marie Egan (*Pediatrics*), Michael Nitabach, Vincent Pieribone, David Zenisek

Assistant Professors Susumu Tomita, Xiaoyong Yang (*Comparative Medicine*), Yufeng Zhou

Fields of Study

Fields of study range from cellular and molecular physiology to integrative medical biology. Areas of current interest include: ion channels, transporters and pumps, membrane biophysics, cellular and systems neurobiology, protein trafficking, epithelial transport, signal transduction pathways, vascular biology, organ physiology, genetic models of human disease, pathophysiology, structural biology of membrane proteins, and physiological genomics.

Special Admissions Requirements

We welcome applications from students with backgrounds in the biological, chemical, and/or physical sciences. These include majors in biology, biochemistry, physiology, genetics, chemistry, physics, mathematics, engineering, computer science, and psychology. Courses in biology, biochemistry, organic and physical chemistry, and mathematics through elementary calculus are recommended. The GRE General Test is required. To enter the Ph.D. program, students will apply to the Physiology and Integrative Medical Biology track within the interdepartmental graduate program in the Biological and Biomedical Sciences.

Special Requirements for the Ph.D. Degree

Formal requirements for the Ph.D. degree include two or three terms of course work, a qualifying examination taken by the end of the second year, submission of a thesis prospectus, two terms of teaching, and completion and satisfactory defense of the thesis. Students are expected to design a suitable program of courses in consultation with a faculty adviser. The director of graduate studies will provide general oversight of the course selections. These courses will provide a coherent background for the expected area of thesis research and also satisfy the department's subject and proficiency requirements. Students must pass at least six graduate-level courses, including C&MP 520a, C&MP 550a, and C&MP 560b. Also during the first two terms, each student should explore research projects by performing rotations in at least three laboratories to create an informed basis upon which to select a thesis project by the end of the first year. There is no foreign language requirement. The qualifying examination, which must be passed by the end of the student's fourth term, will cover areas of physiology that complement the student's major research interest.

An important dimension of graduate training in Cellular and Molecular Physiology is the acquisition of teaching skills through participation in courses appropriate for the student's academic interests. Ph.D. students are expected to participate in two terms (or the equivalent) of teaching, at least at the level of Teaching Fellow 2. Students are not expected to teach during their first year.

After satisfying the departmental predissertation requirements, passing the qualifying examination, submitting a satisfactory thesis prospectus, and having fulfilled the teaching requirement, students are admitted to candidacy. The completed dissertation must describe original research making a significant contribution to knowledge.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study.

Master's Degrees

M.Phil. See Degree Requirements. Awarded to students who have fulfilled all the requirements for the Ph.D. except the prospectus, teaching requirement, and dissertation, normally at the end of the second year. Students are not admitted for this degree.

M.S. Awarded only to students who are not continuing for the Ph.D. degree but who have successfully completed one year of the doctoral program (i.e., passing of at least four courses, including two Honors grades, and three successful laboratory rotations). Students are not admitted for this degree.

Program materials are available upon request to the Department Registrar, Department of Cellular and Molecular Physiology, Yale University, School of Medicine, 333 Cedar Street, PO Box 208026, New Haven CT 06520-8026.

Courses

C&MP 520a, Current Perspectives in Physiology Susumu Tomita, Yufeng Zhou

This seminar explores a diverse range of current topics in physiology, emphasizing readings and discussions of recent primary literature. A variety of expert physiologists present topics such as structural biology, membrane transport, signal transduction, sensory systems, and neurophysiology. Instructors guide the discussion regarding the background, the experiments, the methods, and most importantly the impact of relevant research papers. The aim of the course is to understand how physiological approaches integrate the study of organismal function from genes, to systems, to behavior and disease. TTH 2:30–3:45

C&MP 550a^U/ENAS 550a^U/MCDB 550a^U, Physiological Systems Emile Boulpaep, W. Mark Saltzman

The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. MWF 9:25–10:15

C&MP 560b^U/ENAS 570b^U/MCDB 560b^U, Cellular and Molecular Physiology:

Molecular Machines in Human Disease Emile Boulpaep, Fred Sigworth

This course focuses on understanding the processes that transfer molecules across membranes at the cellular, molecular, biophysical, and physiological levels. Students learn about the different classes of molecular machines that mediate membrane transport, generate electrical currents, or perform mechanical displacement. Emphasis is placed upon the relationship between the molecular structures of membrane proteins, their normal function, and abnormal function in human disease. The interactions among transport proteins in determining the physiological behaviors of cells and tissues are also stressed. Molecular motors are introduced and their mechanical relationship to cell function is explored. Students also read papers from the scientific literature that establish the connections between mutations in genes encoding membrane proteins and a wide variety of human genetic diseases. MWF 9:25–10:15

C&MP 570b, Sensory Physiology David Zenisek, Joseph Santos-Sacchi,
Z. Jimmy Zhou

An overview of the mammalian special sensory systems, including molecular and cellular bases of vision, audition, taste, olfaction, and somatosensation. Faculty with focus in those areas lead presentations and discussions on peripheral and central mechanisms. Psychophysical aspects of sensation are introduced. TTH 2:30–3:45

C&MP 600, Medical Physiology Case Conferences Emile Boulpaep and staff

Two-term course taught in groups of 10–12 students by the same group leader(s) throughout the year. Workshop format permits students to apply basic concepts of physiology to clinical syndromes and disease processes. Students are expected to participate actively in a weekly discussion of a clinical case that illustrates principles of human physiology and pathophysiology at the whole-body, system, organ, cellular, or molecular level. Prerequisite: C&MP 550a or permission of instructor. TH 11–12:30

C&MP 610, Medical Research Scholars Program: Mentored Clinical Experience

Raymond Russell, Michael Caplan

The goals of this course are to introduce MRSP students to aspects of clinically important human diseases. Students explore each disease over three half-hour sessions led by a clinician-scientist who is an expert in the relevant organ system. Students explore two disease processes per term. The first of the three sessions is devoted to a discussion of the clinical presentation, natural history, pathology, epidemiology, treatment, and prognosis of the disease process. During this session students have the opportunity to view gross or microscopic specimens of diseased tissue in association with members of the Pathology faculty. Students are assigned readings in pathology, pathophysiology, and clinical texts to prepare for the first class session. The second session focuses on translational aspects of the disease process. Students read and present papers relevant to the molecular basis of the disease and cutting-edge approaches to its therapy. In the third session students meet with patients who have experienced the disease and/or visit and explore facilities associated with diagnosis and treatment of the disease process. Prior to the third session students receive guidance as to what they will observe and how to approach the experience, and at the end of the session, the group discusses its thoughts and impressions. Students are expected to prepare for sessions, to participate actively, and to be scrupulously respectful of patients and patient facilities.

C&MP 620b/NBIO 610b, Fundamentals in Neurophysiology Vincent Pieribone,
Fred Sigworth

This course is designed for students who wish to gain a theoretical and practical knowledge of modern neurophysiology. Graduate students specializing in neurophysiology and non-neurophysiology are encouraged to attend, as the course begins at a very basic level and progresses to more complicated topics. Topics include properties of ion channels, firing properties of neurons, synaptic transmission, and neurophysiology methodology.

C&MP 710b/MB&B 710b4, Electron Cryo-Microscopy for Protein Structure

Determination Fred Sigworth, Hongwei Wang

Understanding cellular function requires structural and biochemical studies at an ever-increasing level of complexity. The course is an introduction into the concepts and

applications of high-resolution electron cryo-microscopy. This rapidly emerging new technique is the only tool known to date that allows biological macromolecules to be studied at all levels of resolution ranging from their cellular organization to near-atomic detail. TTH 9–10:15

C&MP 750/PSYC 750, Research Topics in the Neurobiology of Learning and

Memory Thomas Brown

Discussion and analysis of current work on the neurobiological foundations of learning and memory systems in mammals. Informal weekly discussions span several levels of analysis, including molecular and biophysical studies, cellular and systems neurophysiology and neuro-anatomy, and contemporary behavioral neuroscience. HTBA

CHEMICAL ENGINEERING

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Chair

Menachem Elimelech

Director of Graduate Studies

Gary Haller

Professors Eric Altman, Menachem Elimelech, Abbas Firoozabadi (*Adjunct*), Thomas Graedel, Gary Haller, Michael Loewenberg, Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, Mark Saltzman, T. Kyle Vanderlick, Paul Van Tassel, Kurt Zilm

Associate Professors Yehia Khalil (*Adjunct*), William Mitch, Jordan Peccia

Assistant Professors Eric Dufresne, Tarek Fahmy, Jodie Lutkenhaus, Chinedum Osuji, Andre Taylor, Corey Wilson, Julie Zimmerman

FIELDS OF STUDY

Fields include separation processes, catalysis, combustion, statistical mechanics of adsorption, high-temperature chemical reaction engineering, colloids and complex fluids, nanotechnology, convective heat and mass transfer, biomolecular engineering, biotechnology, molecular beams, aerosol science and technology, materials processing, surface science, and environmental engineering.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

CHEMISTRY

Sterling Chemistry Laboratory, 432.3913
www.chem.yale.edu/
 M.S., Ph.D.

Chair

Scott Miller (Rm 1, SCL, 432.3912, chemistry.chair@yale.edu)

Director of Graduate Studies

J. Patrick Loria (Rm 1, SCL, 432.3913, chemistry.dgs@yale.edu)

Professors Sidney Altman (*Molecular, Cellular & Developmental Biology*), Victor Batista, Jerome Berson (*Emeritus*), Gary Brudvig, Robert Crabtree, Craig Crews (*Molecular, Cellular & Developmental Biology*), R. James Cross, Jr., Donald Crothers (*Emeritus*), John Faller, Gary Haller (*Engineering & Applied Science*), Francesco Iachello (*Physics*), Mark Johnson, William Jorgensen, J. Patrick Loria, J. Michael McBride, Scott Miller, Peter Moore, Lynne Regan (*Molecular Biophysics & Biochemistry*), James Rothman (*Cell Biology*), Martin Saunders, Alanna Schepartz, Charles Schmuttenmaer, Dieter Söll (*Molecular Biophysics & Biochemistry*), Thomas Steitz (*Molecular Biophysics & Biochemistry*), Scott Strobel (*Molecular Biophysics & Biochemistry*), John Tully, Patrick Vaccaro, Harry Wasserman (*Emeritus*), Kenneth Wiberg (*Emeritus*), Frederick Ziegler (*Emeritus*), Kurt Zilm

Associate Professor Ann Valentine

Assistant Professors Nilay Hazari, Seth Herzon, David Spiegel, Elsa Yan

Fields of Study

Fields include bio-inorganic chemistry, bio-organic chemistry, biophysical chemistry, chemical physics, inorganic chemistry, organic chemistry, physical chemistry, physical-organic chemistry, synthetic-organic chemistry, and theoretical chemistry.

Special Admissions Requirements

Applicants are expected to have completed or be completing a standard undergraduate chemistry major including a year of elementary organic chemistry, with laboratory, and a year of elementary physical chemistry. Other majors are acceptable if the above requirements are met. The GRE General Test and the Subject Test in Chemistry are required. Students whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL) and the Test of Spoken English (TSE) if the TOEFL Internet-based test is not taken.

Special Requirements for the Ph.D. Degree

A foreign language is not required. Three term courses are required in each of the first two terms of residence, and participation in additional courses is encouraged in subsequent terms. Courses are chosen according to the student's background and research area. To be admitted to candidacy a student must (1) receive at least two term grades of Honors,

exclusive of those for research; (2) pass either three cumulative examinations and one oral examination (organic students) or two oral examinations (nonorganic students) by the end of the second year of study; and (3) submit a thesis prospectus no later than the end of the third year of study. Remaining degree requirements include completing eight cumulative examinations (organic students), a written thesis describing the research, and an oral defense of the thesis. The ability to communicate scientific knowledge to others outside the specialized area is crucial to any career in chemistry. Therefore, all students are required to teach a minimum of two terms at the level of Teaching Fellow 3 or higher.

Master's Degree

M.S. (en route to the Ph.D.) A student must pass at least five graduate-level term courses in the Chemistry department exclusive of seminars and research. The student must obtain at least one term grade of Honors or three of High Pass in graduate-level courses. One full year of residence is required.

Program materials are available upon request to the Director of Graduate Studies, Department of Chemistry, Yale University, PO Box 208107, New Haven CT 06520-8107.

Courses

CHEM 518a^u, Advanced Organic Chemistry William Jorgensen

Concise overview of structure, properties, thermodynamics, kinetics, reactions, and intermolecular interactions for organic molecular systems. MW 11:35–12:50

[CHEM 519b, Advanced Organic Chemistry II]

CHEM 521b^u, Introduction to Chemical Biology Alanna Schepartz

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. TTH 9–10:15

CHEM 523a^u, Synthetic Methods in Organic Chemistry David Spiegel

A discussion of modern methods. Topics include 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 other students, CHEM 518a is more appropriate. MWF 10:30–11:20

CHEM 524b, Advanced Synthetic Methods in Chemistry Scott Miller

Selected topics in organic synthesis. Strategies for the synthesis of complex, biologically active molecules, including retrosynthetic analysis. Considerable emphasis is placed on strategy-level reactions, asymmetric catalysis, and applications to targets. Reaction mechanisms are emphasized throughout the course. MWF 8:20–9:10

CHEM 525b^u, Spectroscopic Methods of Structure Determination Martin Saunders

The background and use of spectroscopic methods emphasizing NMR in organic chemistry. The course includes the use of programs for simulating spin-spin coupling and rapid rearrangement reactions in NMR. All methods commonly used by organic chemists for determining molecular structures of species in solution, in the gas phase, and in solids are included. MWF 11:35–12:25

CHEM 526b^U, Computational Chemistry and Biochemistry William Jorgensen

An introduction to modern computational methods employed for the study of chemistry and biochemistry, including molecular mechanics, quantum mechanics, statistical mechanics, and molecular dynamics. Special emphasis on the hands-on use of computational packages for current applications ranging from organic reactions to protein-ligand binding and dynamics.

CHEM 528a, Natural Product Synthesis Seth Herzon

Survey of natural products syntheses, with an emphasis on those that contain unique strategies, transformations, or reagents. Key transformations are introduced in the context of various syntheses. Retrosynthetic analysis and synthetic planning are discussed.

MWF 8:20–9:10

CHEM 530b^U, Statistical Methods and Thermodynamics Victor Batista

The fundamentals of statistical mechanics are 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; Monte Carlo and molecular dynamics simulations. MWF 9:25–10:15

[CHEM 535a, Chemical Dynamics]**CHEM 540a^U, Molecules and Radiation I** Kurt Zilm

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. MWF 8:20–9:10

CHEM 542b^U, Molecules and Radiation II Mark Johnson

An extension of the material covered in CHEM 540a to atomic and molecular spectroscopy, including rotational, vibrational, and electronic spectroscopy, as well as an introduction to laser spectroscopy. MW 11:35–12:50

[CHEM 547b, Electron Paramagnetic Resonance]**CHEM 548b, Nuclear Magnetic Resonance in Liquids** J. Patrick Loria

A theoretical treatment of solution NMR spectroscopy with emphasis on applications to proteins and biological macromolecules. This includes classical and quantum mechanical descriptions of NMR, product operator formalism, multidimensional NMR, phase cycling, gradient selection, relaxation phenomena, and protein resonance assignments.

TTH 11:35–12:50

CHEM 549b^U, Biophysical Chemistry Peter Moore

A detailed discussion of several important experimental techniques used to study the properties of biological macromolecules, focusing on the application of Fourier methods and concepts to NMR spectroscopic, optical, and electron microscopy, image reconstruction, X-ray scattering/diffraction, and mass spectrometry. Emphasis on the physical chemistry that underlies both the execution of such experiments and the interpretation of the resulting data. TTH 9–10:15

CHEM 550b^U, Theoretical and Inorganic Chemistry John Faller

Covers the major physical methods used in the determination of molecular structure, bonding, and physical properties of metal complexes. Aimed at advanced undergraduate and first-year graduate students. Students should be familiar with both inorganic coordination chemistry and physical chemistry. TTH 9–10:15

CHEM 552a^U, Organometallic Chemistry Nilay Hazari

A survey of the organometallic chemistry of the transition elements and of homogeneous catalysis. TTH 9–10:15

CHEM 554b, Bio-Inorganic Chemistry Gary Brudvig

An advanced introduction to biological inorganic chemistry. Important topics in metallo-protein chemistry are illustrated. Objective is to define and understand function in terms of structure. Topics include catalysis with and without electron transfer, and carbon, oxygen, and nitrogen metabolism. MWF 8:20–9:10

[CHEM 555b, Inorganic Mechanisms]**CHEM 556a, Biochemical Kinetics and Dynamics** J. Patrick Loria

An advanced treatment of enzymology. Topics include transition state theory and derivation of steady-state and pre-steady-state rate equations. The role of entropy and enthalpy in accelerating chemical reactions is considered, along with modern methods for the study of enzyme chemistry. These topics are supplemented with in-depth analysis of the primary literature. MWF 9:25–10:15

CHEM 557a^U, Modern Coordination Chemistry John Faller

The principles of modern inorganic chemistry. Main group and transition element chemistry: reactions, bonding, structure, and spectra. TTH 11:35–12:50

CHEM 558b, Biophysical Spectroscopy Elsa Yan

A discussion of application of spectroscopy to biomolecules. Topics include Raman, single-molecule, fluorescence, FTIR, optical ultrafast, NMR and EPR spectroscopies. Emphasis is placed on interpreting spectroscopic data to gain structural and dynamic information to answer biological questions at the molecular level. MW 11:35–12:50

CHEM 560La, Advanced Physical Methods in Molecular Science I Patrick Vaccaro

A laboratory course introducing physical chemistry tools used in the experimental and theoretical investigation of large and small molecules. Modules include electronics, vacuum technology, optical spectroscopy and lasers, and computer programming. F 3–4

CHEM 561Lb, Advanced Physical Methods in Molecular Science II

R. James Cross, Jr.

A laboratory course introducing physical chemistry tools used in the experimental and theoretical investigation of large and small molecules. Modules include machining materials, magnetic resonance, optical spectroscopy and lasers, and computational tools. F 3–4

CHEM 562L, Laboratory in Instrument Design and the Mechanical Arts Kurt Zilm, David Johnson

Familiarization with modern machine shop practices and techniques. Use of basic metal-working machinery and instruction in techniques of precision measurement and properties of commonly used metals, alloys, and plastics.

CHEM 564L, Advanced Mechanical Instrumentation Kurt Zilm, David Johnson

A course geared for both the arts and sciences that goes beyond the basic introductory shop courses, offering an in-depth foundation study utilizing hands-on instructional techniques that must be learned from experience. Prerequisite: CHEM 562L.

CHEM 565L, Introduction to Glass Blowing Patrick Vaccaro, Daryl Smith

This course provides a basic introduction to the fabrication of scientific apparatus from glass. Topics covered include laboratory set-up, the fundamental skills and techniques of glass blowing, the operation of glass fabrication equipment, and requisite safety procedures.

CHEM 570a^U, Introductory Quantum Chemistry John Tully

The elements of quantum mechanics developed and illustrated with applications to chemical problems. Suitable for first-year graduate students in chemistry who have had some exposure to quantum mechanics as part of an undergraduate chemistry course. TTH 9–10:15

[CHEM 572a, Advanced Quantum Mechanics]

CHEM 600–670, Research Seminars Faculty

Presentation of a student's research results to his/her adviser and fellow research group members. Extensive discussion and literature review are normally a part of the series.

CHEM 700, Laboratory Rotation for First-Year Biophysical and Chemical Biology Graduate Students Gary Brudvig, Craig Crews

CHEM 720, Current Topics in Organic Chemistry Faculty

A seminar series based on invited speakers in the general area of organic chemistry.

CHEM 730, Molecular Science Seminar Faculty

A seminar series based on invited speakers in the areas of physical, inorganic, and biological chemistry.

CHEM 990, Research Faculty

Individual research for Ph.D. degree candidates in the Department of Chemistry, under the direct supervision of one or more faculty members.

CLASSICS

402 Phelps Hall, 432.0977

www.yale.edu/classics/

M.A., M.Phil., Ph.D.

Chair

Christina Kraus

Director of Graduate Studies

Joseph Manning (404 Phelps, 432.0980)

Professors Egbert Bakker (*on leave* [F]), Victor Bers, Kirk Freudenburg, Verity Harte (*Classics; Philosophy; on leave* [Sp]), Joseph Manning (*Classics; History*), Donald Kagan (*Classics; History*), Diana Kleiner (*Classics; History of Art; on leave* [Sp]), Christina Kraus, John Matthews (*Classics; History*), William Metcalf (*Adjunct; Curator Coins & Medals, Art Gallery*)

Associate Professors Emily Greenwood, Celia Schultz

Assistant Professors Milette Gaifman (*Classics; History of Art*), Jay Fisher (*on leave*), Pauline LeVen, Irene Peirano (*on leave*)

Lecturers Veronika Grimm, Joseph Solodow

Affiliated Faculty Alexander Beecroft (*Comparative Literature*), Susanne Bobzien (*Philosophy*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Bentley Layton (*Religious Studies*), Dale Martin (*Religious Studies*), Susan Matheson (*Curator Ancient Art*), David Quint (*Comparative Literature*), Barbara Sattler (*Philosophy*), Barbara Shailor (*Deputy Provost for the Arts; Classical Philology*)

The degree program in Classical Philology seeks to provide an overall knowledge of Greek and Roman civilization, combined with specialized work in a number of fields or disciplines within the total area of classical antiquity.

Admission Requirements

A minimum of three years (four preferred) of college training in one of the classical languages and two years (three preferred) in the other.

Requirements for the Ph.D. Degree in Classics

(1) Diagnostic sight translation examinations in Greek and Latin (these are taken before the beginning of the first term and must have been passed at the latest by the end of the second term in residence); (2) a proseminar, in the first term, offering an introduction to the discipline and its various subdisciplines; (3) departmental reading examinations in French and German by the beginning of the third term in residence; (4) oral examinations in Greek and Roman history by the end of the fourth term in residence; (5) a minimum of fourteen term courses, at least eight of which must be seminars (including four courses in the history of Greek and Latin literature, two literary seminars in one language,

and one in the other); one course in historical or comparative linguistics, one course in ancient history (either an 800-level seminar or a 600-level materials course), and one in classical art and archaeology; (6) Greek and Latin composition (this requirement may but need not be satisfied by courses taken under (5) above); (7) translation examinations in Greek and Latin, based on the Classics Ph.D. reading list, by the beginning of the fifth term in residence; (8) oral examinations in Greek and Latin literature, based on the Classics Ph.D. reading list, by the end of the fifth term in residence; (9) special fields oral examinations by the end of the sixth term, consisting of two areas of special concentration in each language selected by the candidate in consultation with the director of graduate studies; (10) a dissertation prospectus by the end of the seventh term in residence; (11) a dissertation.

In addition to the Graduate School's requirement of Honors grades in at least one year course or two term courses, students must have a High Pass average in the remaining courses. Admission to candidacy for the Ph.D. is granted upon completion of all predisertation requirements not later than the end of the seventh term of study.

The faculty considers experience in the teaching of language and literature to be an important part of this program. Students in Classics typically teach in their third and fourth years of study.

Combined Programs

CLASSICS AND ANCIENT HISTORY

Admission requirements Students may apply to either the Department of Classics or the Department of History. In the former case, the requirements are the same as for Classical Philology; in addition, at least two term courses in Greek or Roman history are required for admission to the program.

Requirements for the Ph.D. degree in Classics and Ancient History (1) Diagnostic sight translation examinations in Greek and Latin (these are taken before the beginning of the first term and must have been passed at the latest by the end of the second term in residence); (2) a proseminar, in the first term, offering an introduction to the discipline and its various subdisciplines; (3) departmental reading examinations in French and German by the beginning of the second year in residence; (4) a minimum of fourteen term courses, including two courses in the history of Greek or Latin literature, one seminar in Greek or Latin literature, and six courses in Greek and Roman history (three of these must be either seminars or materials courses, two in one language, one in the other), and two courses in another period of history; (5) a translation examination in Greek or Latin, based on the Classics Ph.D. reading list, by the beginning of the fifth term in residence; (6) an oral examination in Greek or Latin literature, based on the Classics Ph.D. reading list, by the end of the fifth term in residence; (7) a translation examination in the other ancient language based on a 1,000-page reading list approved by the director of graduate studies, by the beginning of the fifth term in residence; (8) oral examinations in Greek and Roman history on topics approved by the director of graduate studies, by the end of the sixth term in residence; (9) a dissertation prospectus by the end of the seventh term in residence; (10) a dissertation.

CLASSICAL ART AND ARCHAEOLOGY

The program is offered in collaboration with the Department of the History of Art and is designed to give a general knowledge of the development of art in Greece and Italy from the Bronze Age to late antiquity, combining this with a detailed study of one particular period and area; and an acquaintance with the contribution made by field archaeology to our understanding of the classical world. It is expected that each student will be given the opportunity to visit the major sites and monuments. Students are required to pass fourteen term courses, to include three seminars, divided between the two departments; distribution may be adjusted to suit the interests of individual students. Students must demonstrate a competence in Greek and Latin, usually by passing at least one 400/700-level course in each language. They must also pass departmental examinations in German and one other modern language, usually Italian or French, by the beginning of the second year in residence. They will be admitted to candidacy for the Ph.D. after passing a written and oral comprehensive examination in classical art and archaeology and by securing approval of their dissertation prospectus. Further details should be obtained from the director of graduate studies.

Prerequisites for admission: a year's course in Greek and Roman art or archaeology; a minimum of two years of college training in one classical language and one in the other (more preferred).

CLASSICS AND COMPARATIVE LITERATURE

Admission requirements Prerequisites for admission through the Department of Classics: same as for Classical Philology. (For admission requirements in the Department of Comparative Literature, consult the director of graduate studies of that department.) After admission to the Department of Classics, qualified students may apply to be admitted to this joint program, normally during the first term of residence; the directors of graduate studies of both departments should be consulted before application to the joint program is made.

Degree requirements (1) Diagnostic sight translation examinations in Greek and Latin (these are taken before the beginning of the first term and must have been passed at the latest by the beginning of the second term in residence); (2) a proseminar, in the first term, offering an introduction to the discipline and its various subdisciplines; (3) fourteen term courses including at least seven in Classics, including two courses in the history of Greek or Latin literature and two seminars; and at least six courses in Comparative Literature, including: at least four courses on post-classical European literature and two courses on literary theory or methodology; (4) literary proficiency in German and one other modern language during the first two years; (5) translation examinations in Greek and Latin, based on the Classics Ph.D. reading list, by the beginning of the fifth term in residence; (6) oral examinations in Greek and Latin literature, based on the Ph.D. reading list, by the end of the fifth term in residence; (7) an oral examination in the Comparative Literature department on six topics appropriate to both disciplines, selected in consultation with the two directors of graduate studies, by the end of the sixth term; (8) a dissertation prospectus by the end of the seventh term in residence; (9) a dissertation.

CLASSICS AND PHILOSOPHY

Superior students, preferably with a background in Classical languages and literature, may be admitted to a joint Ph.D. program in Philosophy and Classics. For details about this program, see www.yale.edu/classics/gradprogram.html.

CLASSICS AND RENAISSANCE STUDIES

Admission requirements Same as for Classical Philology. Applications should be submitted directly to Classics with an indication that the student wishes to apply for the combined degree in Classics and Renaissance Studies.

Degree requirements (1) Diagnostic sight translation examinations in Greek and Latin (these are taken before the beginning of the first term and must have been passed at the latest by the end of the second term in residence); (2) a proseminar, in the first term, offering an introduction to the discipline and its various subdisciplines; (3) sixteen term courses, eight of which will be courses in Classics and will include at least four courses in Greek and Latin literature, a course in historical or comparative linguistics, and at least three seminars; the eight remaining courses making up the Renaissance Studies portion of the degree will be broken down as follows: two terms of the Renaissance Studies Core Course, six additional term courses to be taken in at least two disciplines (such as Literature, History, History of Art, Music, Religious Studies, etc.); one of these courses should meet the normal Classics requirements of a course in classical art or archaeology; (4) literary proficiency in Italian, as set by Renaissance Studies, and a second language, normally German or French; (5) translation examinations in Greek and Latin, based on the Classics Ph.D. reading list, by the end of the fifth term in residence; (6) oral examinations on seven or eight topics appropriate to both disciplines, selected in consultation with the directors of graduate studies in both disciplines, by the end of the sixth term in residence; (7) oral examinations in Greek and Latin literature, based on the Classics Ph.D. reading list, by the end of the seventh term in residence; (8) a dissertation prospectus, by the end of the seventh term in residence; (9) a dissertation.

For information about the Ph.D. program in Graeco-Arabic Studies, please contact Professor Gutas, Department of Near Eastern Languages and Civilizations.

Master's Degrees

M.Phil. See Degree Requirements.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program qualify for the M.A. degree upon completion of seven courses, ordinarily with a High Pass average in two successive terms.

Program materials are available upon request to the Director of Graduate Studies, Department of Classics, Yale University, PO Box 208266, New Haven CT 06520-8266.

Courses

GREK 712a^U, Aristotle on Voluntary Action, Choice, and Responsibility

Susanne Bobzien, Verity Harte

Close study of Aristotle's *Nicomachean Ethics* in Greek. Focus on Book III, Chapters 1–5, in which Aristotle sets out his theory of the voluntary, practical deliberation, choice (or intention), and responsibility. Prerequisites: PHIL 125a or equivalent and intermediate Greek, or permission of instructor.

GREK 734a, Thucydides Emily Greenwood

Examination of the narrative structure and design of Thucydides's *History*, its intellectual context, and its generic affinities, aimed at answering two simple and disarming questions: what kind of a text is Thucydides's *History*, and how does it work? The close reading in Greek of passages that have proved canonical for Thucydidean interpretation enables us to discuss trends and turning points in Thucydidean scholarship. TTH 2:30–3:45

GREK 750a^U, Euripides's Late Tragedies Pauline LeVen

Close reading of three late plays of Euripides, *Helen*, *Ion*, and *Iphigenia in Tauris*. Class discussion focuses on Euripides's literary and dramatic technique and on the issues of myth, geography, as well as cultural and personal identity in these tragedies. We also consider how the plays (qualified as “romantic tragedies,” “paratragedies,” and “tragi-comedies”) question the identity of the tragic genre and open new dramatic possibilities at the end of the fifth century B.C. MW 11:35–12:50

GREK 755b^U, Athenian Law Courts Victor Bers

Rhetoric and law, procedural and substantive, in the Athenian courts of the fifth and fourth centuries B.C.E. as seen in forensic speeches and discursive treatments, and as satirized in Aristophanes's *Wasps*. TTH 9–10:15

GREK 761b^U, Ancient Greek Wisdom Poetry Egbert Bakker

Study and interpretation of archaic Greek poetry that is explicitly addressed to its audience, in the form of advice, exhortation, or general instruction. The course focuses on Hesiod, *Works and Days*, the traditional prototype of “didactic poetry,” and on archaic Greek elegy (Solon, Theognis, Tyrtaeus). Issues to be addressed include questions of genre, occasion, and performance context as well as the relation of this kind of poetry to the epic tradition. MW 11:35–12:50

GREK 790a^U, Advanced Greek Prose Composition Victor Bers

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. MW 9–10:15, additional session M 10:30–11:20

LATN 727a^U/HIST 510a^U, Tacitus and Pliny John Matthews

The culture of the Flavio-Trajanic period as seen through readings in the historical works of Tacitus and the letters of the younger Pliny, with special emphasis on the personal connections between them, and on the social background and literary formation of the two writers. M 1:30–3:20

LATN 730a^U, Ovid, *Fasti* and Exile Poems Kirk Freudenburg

The primary project of the course is to read through Ovid's *Fasti*, attending to the basic demands of close reading as well as to larger matters of genre, style, and cultural context. The course requirements include selected further readings from relevant Latin texts (e.g., Augustus's *Res Gestae*, small selections from Ovid's *Metamorphoses*, the *Tristia*, and *Ex Ponto*) as well as works of modern scholarship on issues of "time," intertextuality, Augustan religion, and Ovid's late poetry and exile. TTH 2:30–3:45

LATN 736b, Cicero's Letters William Metcalf

An introduction to the correspondence of Cicero, with particular attention to its social and historical context. Readings focus on his changing relationships with major political figures of the day, his proconsulship, and his reaction to the fall of the Roman republic. MW 4–5:15

LATN 765b^U, Lucan Christina Kraus

Reading of selected Latin passages from Lucan's epic poem *The Civil War* (the whole poem to be read in English translation). Topics to be covered include design and style of Imperial epic; Lucan's manipulation of the epic tradition; the lure and nature of violence in civil war narrative. MW 2:30–3:45

LATN 790b^U, Latin Syntax and Style Joseph Solodow

A systematic review of syntax and an introduction to Latin style. Selections from Latin prose authors are read and analyzed, and students compose short pieces of Latin prose. For students with some experience reading Latin literature who desire a better foundation in forms, syntax, idiom, and style. MW 9–10:15

CLSS 645a^U/HIST 507a^U, Numismatics William Metcalf

An introduction to the history of ancient coinage and the modern methodology of numismatic study. Brief consideration of the Greek background is followed by detailed treatment of the Roman republic and empire. Prerequisite: proficiency in Greek and Latin. TH 1:30–3:20

CLSS 824a, Classical Greek Lyric Poetry Pauline LeVen

An examination of canonical and less canonical lyric texts, from Pindar's and Bacchylides's epinicians and dithyrambs to the "New Dithyramb" and epigraphic hymns. In addition to close reading and interpretation of the texts in their social and intellectual contexts, attention is paid to contemporary reflections on poetry and musical practice in Plato's and Aristotle's philosophical writings. M 2:30–4:20

CLSS 832b/HSAR 559b, Envisioning the "Other" in Greek Art Milette Gaifman

The notion of the "other," which saw its great rise with the emergence of structural anthropology, has by now become a well-established concept in the social sciences and the humanities. In ancient Greek culture the "other" has been ascribed to groups such as non-Greeks (e.g., Persians), non-citizens (e.g., slaves or women), the elderly, or the Greeks of the very deep past. The course explores how different social groups were portrayed in Greek art, in a variety of media (vase paintings, free-standing sculpture, reliefs) and how the distinction and tension between the "self" and the "other" were negotiated visually. Looking at the case of Greece of the Archaic and Classical periods, the seminar

considers the ways in which visual culture was constitutive of social norms and ideologies. Readings combine art-historical and archaeological accounts of ancient Greek monuments and objects, primary texts (e.g., Herodotos, Pausanias), as well as theoretical discussions on the notion of the “other” and the agency of art in society. W 10:30–12:20

CLSS 837a/CPLT 542a, Ancient Literary Criticism Kirk Freudenburg

This course takes a “thematic” approach to literary criticism in antiquity, with special emphasis on the culture(s) of criticism in the Roman world. The home base for the course is the literary-theoretical and rhetorical works of selected Roman authors, especially Cicero (*Brutus, Orator*), Varro, Horace, and Seneca. The larger historical picture is filled in by looking both backward to Greek sources, especially to Plato and Aristotle, and forward to Quintilian, Tacitus, Longinus, and others. Weekly discussions center on topics that arise from the theoretical pronouncements and debates of ancient writers, as well as from the actual practices (and meta-linguistic commentaries) of the poets themselves. Topics include theories of imitation in antiquity; theories of style (order, structure, metaphor, language, word choice, etc.); definitions of a “poem” and of the poet’s place in society; genre theory and canon formation (especially in Rome); what grammarians do and how they structure modes of evaluation. W 2:30–4:20

CLSS 840a/HIST 508a, The Greek World in Transition, Fourth to Third

Century B.C. Joseph Manning

The seminar investigates the Mediterranean states during the period ca. 400–200 B.C., that is, across the traditional “Classical/Hellenistic” historical divide. The primary states we are concerned with are the Greek city-states (both individual states and *koina*) and the Ptolemaic empire, although we also look from time to time at other Hellenistic kingdoms. Among our goals is to compare the public economies across this period and in different regions of the Mediterranean. Emphasis is on comparison. Our goal is to examine Greek states in transition from the point of view of their economies, political organization and political economic thought, and culture, broadly defined, as well as to assess the Greek institutional impact on new areas such as the eastern and southern Hellenistic states. Emphasis on research methods and source criticism. T 1:30–3:20

CLSS 846a/ARCG 749a/HSAR 570a, Becoming Hadrian: Autobiography and Art in the Second Century A.D. Diana Kleiner

Marguerite Yourcenar’s famed fictional *Memoirs of Hadrian* serves as the starting point for an exploration of Hadrian and the art he commissioned in Rome and abroad. Hadrian’s passion for life, quest after peace, romantic wanderlust, veneration of Greek culture, and craving for love, along with his acceptance of death’s inexorableness, led him to commission some of Rome’s greatest monuments. The emperor’s flair for leadership and talent as an amateur architect inform student projects on the sculpture, mosaics, and buildings of the age, among them the portraiture of Hadrian’s lover Antinous, the Pantheon, and Hadrian’s Wall in Britain. Special attention is paid to Hadrian’s Villa at Tivoli, an empire unto itself where Hadrian’s autobiography was fully realized. Qualified undergraduates who have taken Roman Art: Empire, Identity, and Society and/or Roman Architecture may be admitted with permission of the instructor. T 1:30–3:20

CLSS 875b, Narratological and Linguistic Perspectives on Greek and Latin Narrative

Egbert Bakker

Narratives can differ profoundly across genres and authors. The field of narratology has developed sophisticated tools, such as “voice” or “focalization,” to chart and measure such differences. In this seminar, narratological methods are complemented with a linguistic study of elements of the language that have a strong bearing on how the story is told, in particular, tense and deixis. The seminar covers a broad range of narrative genres in Greek and Latin literature (epic, historiography, messenger speech, narrative in oratory, novel). Seminar participants present an in-depth analysis of a passage that has been selected as representative of its genre/author. Emphasis throughout is on the ways in which such “technical” analysis is important for the wider interpretation of the genre or work in question. M 2:30–4:20

CLSS 881a, Proseminar Classical Studies William Metcalf

An introduction to the bibliography and disciplines of classical scholarship. Faculty address larger questions of method and theory, as well as specialized subdisciplines such as linguistics, papyrology, epigraphy, palaeography, and numismatics. This course is required of all entering graduate students. TTH 4–5:15

CLSS 884b/HIST 517b, The Thirty Tyrants Donald Kagan

A study of the rule of the Thirty at Athens after the Athenian defeat in the Peloponnesian War. The ancient sources, chiefly the relevant passages in Xenophon's *Hellenica*, Diodorus Siculus, and Plutarch's *Lives*, are read in the original. Reading knowledge of French, German, or Italian desirable. TH 2:30–4:20

CLSS 891b *Translatio*: Translation and the Classics Emily Greenwood

A study of Latin authors as both translators and the object of translation. Starting with the theory and practice of translation in Roman literature, we examine statements about translation in Lucretius, Cicero, Horace, Quintilian, Pliny the Younger, and St. Jerome. The second part of the course studies translations of Latin authors into English, using Catullus, Virgil, and Ovid as case studies. Finally, we examine the way in which translations of Greco-Roman classics are marketed by the publishing industry, and the cultural politics involved in the adaptation of Greco-Roman classics into other media. The seminars are equally concerned with what Roman authors say and imply about translation, and how these same authors continue to be transformed by translations and adaptations of their work. W 3:30–5:20

CLSS 898a, History of Latin Literature I Christina Kraus

A survey of Latin literature from the earliest texts to the sixth century C.E., with the main focus on the period from the second century B.C.E. to the second century C.E. Assignments are drawn primarily from the graduate reading list. Students are expected to read widely in the ancient text; this broad reading is offset by close analysis of short passages in class. Individual class sessions combine lecture and discussion. Selected short pieces of secondary literature are used to guide discussion; in constructing a narrative for the evolution of Latin literature we explore several possible models of literary history (e.g., diachronic, synchronic, generic, and topical). Weekly translation quizzes; several short

writing assignments (4–6 pages) on closely focused topics, including *explications de texte* and analysis of commentaries. TTH 11:35–12:50

CLSS 899b, History of Latin Literature II Kirk Freudenburg

Continuation of CLSS 898a. TTH 11:35–12:50

CLSS 900a/b, Directed Reading

By arrangement with faculty.

CLSS 910a/b, Directed Reading

By arrangement with faculty.

COMPARATIVE LITERATURE

451 College, Rm 202, 432.2760
www.yale.edu/complit/
 M.A., M.Phil., Ph.D.

Chair

Dudley Andrew

Director of Graduate Studies

Pericles Lewis

Professors Dudley Andrew, Katerina Clark, Roberto González Echevarría, Benjamin Harshav, Carol Jacobs, Pericles Lewis, Rainer Nägele, David Quint, Haun Saussy, Katie Trumpener

Associate Professor Ala Alryyes

Assistant Professors Alexander Beecroft, Moira Fradinger, David Gabriel, Barry McCrea

Senior Lecturer Richard Maxwell

Fields of Study

The Department of Comparative Literature introduces students to the study and understanding of literature beyond linguistic or national boundaries; the theory, interpretation, and criticism of literature; and its interactions with adjacent fields like visual and material culture, linguistics, film, psychology, law, and philosophy. The comparative perspective invites the exploration of such transnational phenomena as literary or cultural periods and trends (Renaissance, Romanticism, Modernism, postcolonialism) or genres and modes of discourse. Students may specialize in any cultures or languages, to the extent that they are sufficiently covered at Yale. The Ph.D. degree qualifies the candidate to teach comparative literature as well as the national literature(s) of her or his specialization.

Special Admissions Requirements

Applicants must hold a B.A. or equivalent degree and should normally have majored in comparative literature, English, a classical or foreign literature, or in an interdepartmental major that includes literature. They must be ready to take advanced courses in two foreign literatures in addition to English upon admission. The GRE General Test is required. A ten- to twenty-page writing sample, written in English, should be submitted with the application.

Special Requirements for the Ph.D. Degree

Students must successfully complete fourteen term courses, including at least seven listed under the departmental heading. The student's overall schedule must fulfill the following requirements: (1) at least one course in medieval or classical European literature, philology, or linguistics (or their equivalents in other cultures); one course in the Renaissance

or Baroque (or equivalents); and one course in the modern period; (2) three courses in literary theory or methodology; (3) course work dealing with texts from three literatures, one of which may be English or American. Any course may be counted for several requirements simultaneously.

Languages: Literary proficiency in four languages (including English, at least one other modern language, and one classical or ancient language, such as Latin, Greek, Biblical Hebrew, Classical Arabic, Classical Chinese, Provençal). The fulfillment of this requirement will be demonstrated by a written exam consisting of a translation of a literary or critical text, to be held by the end of the sixth term; or by an equivalent level in the student's course work.

Orals: An oral examination to be taken in the third year of studies, demonstrating both the breadth and specialization as well as the comparative scope of the student's acquired knowledge. The examination consists of seven topics that include texts from at least three national literatures and several historical periods (at least one modern and one before the Renaissance). The texts discussed should also include representatives of the three traditional literary genres (poetry, drama, narrative fiction).

The Ph.D. dissertation, supervised by a dissertation director (or directors) and approved by the departmental faculty, completes the degree. Its initial step is a dissertation prospectus, to be submitted and approved by the dissertation director and a standing faculty committee no later than halfway through the seventh term of study. Admission to candidacy for the Ph.D. is granted after six terms of residence and the completion of all requirements (courses, languages, orals, prospectus) except the dissertation.

Teaching: Training in teaching, through teaching fellowships, is an important part of every student's program. Normally students will teach in their third and fourth years.

Combined Ph.D. Programs

COMPARATIVE LITERATURE AND CLASSICS

The Department of Comparative Literature also offers, in conjunction with the Department of Classical Languages and Literatures, a combined Ph.D. in Comparative Literature and Classics. For further details, see Classics.

COMPARATIVE LITERATURE AND FILM STUDIES

The Department of Comparative Literature also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in Comparative Literature and Film Studies. For further details, see Film Studies. Applicants to the joint program must indicate on their application that they are applying both to Film Studies and to Comparative Literature. All documentation within the application should include this information.

COMPARATIVE LITERATURE AND RENAISSANCE STUDIES

The Department of Comparative Literature also offers, in conjunction with the Renaissance Studies program, a combined Ph.D. in Comparative Literature and Renaissance Studies. For further details, see Renaissance Studies.

Master's Degrees

M.Phil. See Degree Requirements. Additionally, students in Comparative Literature are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may receive the M.A. upon completion of ten courses with at least two grades of Honors and a maximum of three grades of Pass, and the demonstration of proficiency in two of the languages, ancient or modern, through course work or departmental examinations. No student is admitted to a terminal M.A.

Program materials are available upon request to the Director of Graduate Studies, Department of Comparative Literature, Yale University, PO Box 208299, New Haven CT 06520-8299.

Courses

CPLT 511b^U, Introduction to Theory of Literature Haun Saussy

An examination of concepts and assumptions active in contemporary views of literature, with their history. Shifting definitions of “literary theory”; accounts of meaning, interpretation, and representation; examinations of historicist, formalist, psychoanalytic, Marxist, structuralist, post-structuralist, feminist, and media-centered approaches to theory and literature. TTH 11:35–12:25

CPLT 515a, Proseminar in Comparative Literature Haun Saussy

Introductory proseminar for all first-year graduate students in Comparative Literature (and other interested persons). Critical readings of formative texts in the theory and practice of the discipline, from the late eighteenth century to the present. Topics to be covered include the nature of literature; translation; national identities and identities beyond the nation; interpretation and evaluation; the humanities and the human; media. The course is taken for a grade of Satisfactory/Unsatisfactory. T 9:25–11:15

CPLT 519a, Bilingualism Haun Saussy

The possibility that a text may be written or read in two or more different languages simultaneously opens a set of productive difficulties for translation, interpretation, sociolinguistics, genre study, and allied disciplines. Working with examples from antiquity to the present in a variety of languages, we try to get at the implications of this problem. Readings from Weinreich, Ferguson, Saussure, Derrida, de Man, Deleuze, Khatibi, and from Augustine, Montaigne, Folengo, Bunyan, Tsvetaeva, Kafka, Joyce, Nabokov, and Celan. TH 3:30–5:20

CPLT 520b/ENGL 969b/WGSS 776b, Narratives of Formation Barry McCrea

An examination of models of personal progress and maturation in a variety of narratives and periods. We read critical anthropological and psychoanalytic texts in conjunction with primary texts. All non-English language texts are available in translation. Authors may include some of the following: Mme de Lafayette, anonymous author of *Lazarillo de Tormes*, Dickens, Balzac, Musil, Wilde, James, Forster, Chandler, Bechdel. M 9:25–11:15

CPLT 523a, Adventures in Literacy Michael Holquist

This course is an experiment combining literature, cognitive science, and linguistics. It is an attempt to understand the fundamental difference between speaking and other forms of inscribing information (writing, digitalization, etc.) through a study of the history and neuroscience of the act of reading. Since the subject of the course is militantly interdisciplinary, the seminar brings in frequent guests from departments across the university, including cognitive scientists from Haskins Laboratory. Texts include literary texts (Kafka, Poe, Gogol, Proust), classics in linguistics, and recent work being done on the study of literacy's effects on the brain using fMRI imaging. Students have the opportunity to do their own research under the directorship of eminent experts in relevant fields. A course for graduate students and advanced Yale undergraduates. T 1:30–3:20

CPLT 535b^U/GMAN 561b^U, Literary Ethics: Isak Dinesen and W. G. Sebald

Carol Jacobs

We concentrate on the prose works of Isak Dinesen and W. G. Sebald. In reading these singularly popular writers, we think through how literature and ethics redefine one another, the way in which the performance of the work of art, and specifically reflections on the nature of language and representability, demand a rethinking of conscience and moral gesture. M 1:30–3:20

CPLT 536a/GMAN 536a^U, Around Kafka Henry Sussman

A course treating Kafka as a distinctive and indispensable Imaginary as well as a particular author, mutating into a plethora of adaptations, whether by Beckett, Bernhard, Welles, Murakami, or Pamuk, and into the graphic novel as well. T 3:30–5:20

CPLT 541a/PHIL 708a, Poetics I: Theory of the Work of Literature

Benjamin Harshav

The course presents a comprehensive theory of works of literature as the highest sign-complexes in human culture. From rhythm and sound patterns through metaphor and fictional worlds to genre and representation, a work of literature combines elements of structure with a network of necessary and possible or contradictory constructs. The seminar develops a conceptual network for the descriptive analysis of individual works of poetry and fiction. The theory focuses on questions of fictionality and art in language, yet goes beyond linguistics and philosophy of language, on the one hand, and narratology, on the other. It is grounded in close readings of poems and narrative texts by Kafka, Joyce, Eliot, Dostoevsky, and others. M 1:30–3:20

CPLT 542a/CLSS 837a, Ancient Literary Criticism Kirk Freudenburg

This course takes a “thematic” approach to literary criticism in antiquity, with special emphasis on the culture(s) of criticism in the Roman world. The home base for the course is the literary-theoretical and rhetorical works of selected Roman authors, especially Cicero (*Brutus*, *Orator*), Varro, Horace, and Seneca. The larger historical picture is filled in by looking both backward to Greek sources, especially to Plato and Aristotle, and forward to Quintilian, Tacitus, Longinus, and others. Weekly discussions center on topics that arise from the theoretical pronouncements and debates of ancient writers, as well as from the actual practices (and meta-linguistic commentaries) of the poets themselves. Topics include theories of imitation in antiquity; theories of style (order, structure,

metaphor, language, word choice, etc.); definitions of a “poem” and of the poet’s place in society; genre theory and canon formation (especially in Rome); what grammarians do and how they structure modes of evaluation. W 2:30–4:20

CPLT 570b/RUSS 748b, Marxist Theory John MacKay

Not a survey, this course examines selected methodologies of social-historical interpretation in the humanities (primarily literature, moving image media, photography, music, art history) that stem from or emerge out of the Marxist tradition. Problems to be discussed include periodization, base and superstructure, reification and commodification, and alternative cultural practices. We may discuss works by (among others) members of the Frankfurt School, Fredric Jameson, Raymond Williams, Franco Moretti, Etienne Balibar, Jacques Rancière, and members of the *October* group. Regular writing assignments and in-class reports; open to interested undergraduates. M 7–8:50

CPLT 571a/RUSS 675a, Promised Lands: Slavery, Literature, and Modernity in

Russia and the United States John MacKay

Close, comparative, contextualized examination of literary and other forms of cultural production associated with U.S. slavery and Russian serfdom. Special attention is paid to the relation between bondage and national, cultural, and personal identity, the role of bondage in definitions of “aesthetic experience” in the pre- and post-emancipation periods, the relation between literacy and the literary, literature of protest in the two countries, and connections between geographical and subjective space within cultures of enslavement. We examine works by Pushkin, Aksakov, Gogol, Simms, Cooper, Crevecoeur, Radishchev, Karamzin, Goncharov, Tolstoy, Kennedy and the “plantation novelists,” Stowe, Melville, Turgenev, slave and serf autobiographers, freedman’s textbooks, Fet, Lanier, Page, Chesnutt, and Bunin; historical treatments by Kolchin, Genovese, and others; theoretical works by Said, Jameson, Saidiya Hartman, Bakhtin, and others. Requirements: in-class presentations; research paper. No knowledge of Russian required. T 3:30–5:20

CPLT 578a/ENGL 984a/PHIL 711a, Metapragmatics and Textual Culture

Michael Warner

An introduction to theoretical issues of textual analysis, and the difference between structuralist and metapragmatic approaches to language and culture. We review debates over performativity, the *langue/parole* distinction, indexicality and metaindexicality, and the nature of text. We then see how these traditions for analyzing the social dimensions of language inflect various attempts to theorize modern forms of discourse and power—including the public sphere, concepts of genre and media, religion, and the practice of criticism itself. T 1:30–3:20

CPLT 598a/ENGL 971a, Moderns, 1914–1926 Pericles Lewis

An intensive research-oriented course on British literature, 1914–1926, with some attention to European, Irish, and American influences. Major figures to be considered include Joyce, Lawrence, Shaw, O’Casey, Yeats, Pound, Eliot, Strachey, Woolf, and Forster. Students pursue group research projects on poetry, drama, the novel, or intellectual history. The final syllabus depends on student interests. TH 9:25–11:15

CPLT 625b^U/GMAN 673b^U, Advocates and Representatives Rüdiger Campe

In contradistinction to our familiar thinking on communication as two parties speaking about the world, the course develops a triangular scene in which one person speaks on behalf of another person before a third party. This is the model of communication in law (in the idea of advocacy), religions (in the idea of intercession), and politics (in the idea of representation). Readings are taken from ancient rhetoric (Aristotle, Quintilian), Jewish and religious texts (on the “paraclete” or helper), as well as modern social and literary theory (Parsons, Derrida). We also examine selected scenes from ancient and modern drama as well as paradigmatic works by Kafka, Canetti, and Celan. W 3:30–5:20

CPLT 633b^U, Picture Book to Graphic Novel Katie Trumpener

The first half of this course surveys the history of the picture book, from the early modern period to the late twentieth century, considering the Anglo-American tradition within a broader European context; the second half considers its relationship first to the comic strip and comic book, then to the contemporary graphic novel, which repeatedly adapt picture book formats and techniques in their attempt to meditate on childhood, family history, and historical experience. Organized historically, thematically, and generically, the course focuses throughout on the complex relationship between image and narrative, format and address. MW 2:30–3:45

CPLT 672b/ENGL 672b, Milton David Quint

A study of Milton’s poetry and some of his controversial prose. We investigate the relation of the poetry to Milton’s literary tradition and historical contexts, focusing on issues of genre and on the religious, social, and political forces that shaped Milton’s writing. TH 9:25–11:15

CPLT 674a^U/SPAN 660a^U, Cervantes: *Don Quijote* Roberto González Echevarría

A close reading of Cervantes’s masterpiece with emphasis on its significance for modern fiction. The relationship of author, characters, and reader; reality and fantasy in fiction; literary imitation vs. literary invention. Conducted in English. W 3:30–5:20

CPLT 697b/AFAM 835b/AMST 822b/ENGL 929b, The Big Easy: Literary New Orleans Joseph Roach

An exploration of the sources of creative inspiration that writers find in NOLA, including its cultural mystique, its colonial history, its troubled assimilation into Anglo-North America, its tortured racial politics, its natural and built environment, its spirit-world practices, its raucous festive life, its eccentric characters, its food, its music, its predisposition to catastrophe, and its capacity for reinvention and survival. T 1:30–3:20

CPLT 698a/PHIL 704a, Hegel, Introductory Lectures on Aesthetics

Karsten Harries

M 1:30–3:20

CPLT 708a/ITAL 560a, Age of Disenchantment Giuseppe Mazzotta

This course focuses on the literary debates, theological arguments, and scientific shifts taking place between the Council of Ferrara-Florence (1437) and the Council of Trent and beyond, by reading key texts by Valla, Cusa, Pulci, Luther, Erasmus, Ariosto, Campanella,

Bruno, Galileo, and Bellarmino. It examines issues such as the crisis of belief, the authority of the past, the emergence of freedom, new aesthetics, and the effort toward a new theological language for modern times. T 3:30–5:20

CPLT 733b/FREN 820b/HSAR 576b, The Age of the Cathedral R. Howard Bloch

A study of the culture and architectural monuments of the High Middle Ages with accompanying historical and literary works. Emphasis on Saint-Denis, Notre-Dame, Chartres. Readings include Abelard, Suger, Rutebeuf, Saint Bernard, Joinville, Thibaut de Champagne, Guibert de Nogent, William of Saint-Thierry, Aelfred of Rivaulx, the “Miracles de Notre Dame de Chartres,” “La Queste del Saint Graal.” Discussion of romanesque and gothic, the rise of communes, urban and economic renewal, intellectual life of twelfth- and thirteenth-century Paris, trades and guilds, the economics and industry of cathedral building, sculpture, and stained glass, Crusade against the Albigensians and in the Middle East, sainthood and kingship, expansion of the royal domain, the growth of the judicial state and parliament, monasticism, mysticism, relics, the ancillary architectural arts – tapestry and textiles, liturgical objects and garments, metalwork, woodwork, iron work – and the fate of such objects after the Revolution of 1789 and restoration in the nineteenth century. W 3:30–5:20

CPLT 734b/FREN 930b, Fact and Fiction in the Archives Alice Kaplan

The turn to archival research in French literary studies; theoretical and personal essays on the archive (Derrida, Davis, Farge, Coeuré); and fiction that includes archival digging as part of a larger investment in memory. Focus on postwar literature and theory. Includes some practical work. M 3:30–5:20

CPLT 756a/ENGL 728a, Defoe, Sterne, Scott Ala Alryyès

Readings of fiction and other prose works of three authors who seminally contributed to the development of the poetics of the novel, setting up modes of fabulation that had a lasting influence on European and world fiction. Focus on how Defoe, Sterne, and Walter Scott negotiated boundaries between fiction and “reality” – crossing disciplines and complicating such categories as persons, things, description, knowledge, science, rhetoric, history, nation – and also on how their writings have proven a fundamental influence on our own critical and theoretical approaches and systems. W 3:30–5:20

CPLT 783a/GMAN 660a^U, Transformations of the Classical Elegy by Goethe, Hölderlin, and Rilke Rainer Nägele

This course is open to both graduate and qualified undergraduate students with a reading knowledge of German. The seminar concentrates on Goethe’s *Römische Elegien*, some of the major elegies of Hölderlin, and Rilke’s *Duino elegies*. W 3:30–5:20

CPLT 784a^U/GMAN 647a^U/PHIL 607a, Adorno’s Aesthetic Theory Rainer Nägele

This course is open to both graduate and qualified undergraduate students with a reading knowledge of German. The seminar concentrates on Adorno’s *Ästhetische Theorie* and its position within the Frankfurt School and in the literary and philosophical discussion of postwar Germany. TH 1:30–3:20

CPLT 840a/FILM 840a/GMAN 652a^U/HSAR 687a/RUSS 712a, Moscow/Berlin:

Leftist Avant-Gardes and Interwar Modernism Katerina Clark, Katie Trumpener
 From 1918 to the mid-1930s, Moscow and Berlin both became central gathering points for left-wing modernists. Although each city developed its own modes of modernism, they did so in sustained dialogue, given massive Russian emigration to Berlin after 1918, the Weimar obsession with early Soviet aesthetics (and cinema), intellectuals visiting in both directions, and the large-scale emigration of German leftists to the Soviet Union after 1933. The course ends by considering the shaping influence of Soviet intellectuals (and German emigrants returning from Moscow) on East Berlin “late modernism” of the 1940s and ’50s. Centered on literature and film, the course also considers a wide array of art forms (including painting, photography, architecture, music, and aesthetic theory). Works by modernists such as Eisenstein, Pudovkin, Vertov, Kosintsev, Trauberg, Alexandrov, Shklovsky, Nabokov, Babel, Tretiakov, Mayakovsky, El Lissitsky, Rodchenko, Malevich, Tatlin, Shostakovich, Lukacs, Benjamin, Brecht, Richter, Ruttmann, Dudow, Beckmann, Schwitters, Grosz, Heartfield, Döblin, Moholy-Nagy, van der Rohe, Weill, Krenek, Eisler, Busch. Texts are available in English translation; knowledge of Russian and/or German still very helpful. Where able, students should read texts in the original. At the first meeting, students help shape the final syllabus. W 1:30–3:20

CPLT 899a/FREN 893a, Realism and Naturalism Maurice Samuels

This seminar interrogates the nineteenth-century French Realist and Naturalist novel in light of various efforts to define its practice. How does theory constitute Realism as a category or object? How does Realism articulate the aims of theory? And how did nineteenth-century Realist and Naturalist textual practices intersect with other discourses besides the literary? Novelists to be studied include Balzac, Stendhal, Sand, Flaubert, and Zola. Theorists to be studied include Auerbach, Barthes, Girard, Jameson, and Lukács. Some attention is also paid to Realist painting. Reading knowledge of French required. W 9:25–11:15

CPLT 900a, Directed Reading Faculty**CPLT 900b Directed Reading** Faculty**CPLT 901a, Individual Research** Faculty**CPLT 901b, Individual Research** Faculty**CPLT 902b^U/FILM 718b^U/GMAN 636b^U, Theatricality in Film** Brigitte Peucker

This course examines the multiple implications of theatricality in and for the cinema: theatricality as excess; the appropriation of theatrical modes for film; theatricality as modernist self-reflexivity; performance and the relation of theatricality to subjectivity (performing the self); ritual and re-enactment in film; theatricality and the real; the material image. Readings by Arnheim, Bazin, Bateson, Barthes, Bell, Butler, Cavell, Egginton, Fried, Mitry, and others. Films by von Sternberg, Bergman, Hitchcock, Fassbinder, Haneke, Pabst, Wilder, Greenaway, von Trier, Kiarostami, Kubrick. T 3:30–5:20, screening M 7

CPLT 903a/FILM 625a^U/HSAR 726a, Media and the Logic of Repetition

Francesco Casetti

An analysis of such common practices as adaptation, remake, prequel, sequel, quotation that operate in film, above all, but also in fiction, television, painting, and in every art. Examples are taken from various media, as repetition is examined from the point of view of semiotics (Barthes, Eco), cultural history (Benjamin), and philosophy (Deleuze).

T 1:30–3:20

CPLT 924b^U, Readings in Hebrew Poetry Benjamin Harshav

Modernism in Hebrew poetry: close readings of the poetry of Nathan Alterman, Lea Goldberg, Nathan Zach, Yona Volakh, Avot Yeshurun. Advanced undergraduate course, open to graduate students. Prerequisite: a high level of reading Hebrew texts in poetry and criticism, and permission of instructor. T 1:30–3:20

CPLT 942b/SPAN 912b, The Borges Effect Roberto González Echevarría

Since the publication of *Ficciones* in 1944 and especially since achieving worldwide acclaim after receiving *ex-aequo*, with Samuel Beckett, the Formentor Prize in 1961, Jorge Luis Borges has become one of the most influential modern writers. He is a recognizable and often acknowledged presence in the work of novelists and short-story writers, as well as in that of philosophers and literary theorists. There is a Borges “effect,” which can be perceived in John Barth, Julio Cortázar, Gabriel García Márquez, Italo Calvino, Umberto Eco, and in Maurice Blanchot, Michel Foucault, Gerard Genette, and Jacques Derrida, among others. That effect is also projected retrospectively in Borges’s particular way of reading classics like Homer, Dante, and Cervantes. An elegant, playfully ironic skepticism, together with a fondness for aporias, enigmas, puzzles, labyrinths as well as for minor genres such as the detective story, are the most recognizable components of Borges’s style and thought. Taken together these components suggest theories about writing and reading. We read closely Borges’s most influential stories, such as “Tlön, Uqbar, Orbis Tertius,” “Pierre Menard, Author of the *Quijote*,” and “The Garden of Forking Paths,” as well as his essays on Homer, Dante, and Cervantes. We then follow his track in the writers mentioned. Class discussions in English and readings in English or the French, Spanish, or Italian originals. W 3:30–5:20

CPLT 946b^U, The Arabic Novel in Translation Ala Alryyes

Study of a select set of modern Arabic novels in translation. We read works by Haykal, Mahfouz, Jabra, Salih, Khoury, al-Shaykh, and al-Ghitani because they are exceptionally good and because their themes and forms mirror and diverge from those of the Western novel, suggesting alternative approaches to narrative and literary theory and the poetics of translation. These novels fictionalize distinctive Arab modern themes such as the persistence of orality and the vexed relation between dialect and formal language; the clash between tradition and modernity; the chasm between ordinary lives and official history; defeat and exile; patriarchy and gender questions. Yet the seminar’s guiding principle is that literature includes culture and politics, and not vice versa. In addition to novels, the seminar examines a number of important films and plays, focusing on the portrayal of alternative political representations. T 3:30–5:20

CPLT 962b, Latin American Intellectual Debates of the Nineteenth and Twentieth Centuries Moira Fradinger

This seminar looks at central cultural debates in the region over a period of two centuries, mainly through the literary and political form of the essay. It explores polemics over the idea of America, debates around the Indian question, issues of cultural hybridity, transculturation, negritude, and the discussion over the region's modernity and post-modernity. Authors include de Hostos, Alberdi, Bello, Martí, Sarmiento, Rodó, Ortiz, Vasconcelos, Reyes, González Prada, Mariátegui, Mañach, Cabrera, Zea, Roumain, Césaire, Fanon, Damas, Chamoiseau, Rama, Retamar, Benítez Rojo, Ribeiro, Cornejo Polar, García Canclini, Viñas, and Schwarz. Taught in English. W 3:30–5:20

CPLT 987a/AFAM 805a/AFST 949a/FREN 949a, Novel, Film, and History in French Africa Christopher L. Miller

African history as represented in historiography, novels, and films. Limited to French and Francophone Africa. Themes include empire and epic; orality and literacy; the slave trade; contact, conquest, and resistance; the Congo Free State; the role of colonial intermediaries; the two world wars; decolonization and neocolonialism; and the 1994 genocide in Rwanda. Reading knowledge of French required. TH 1:30–3:20

CPLT 989b/AFAM 851b/FREN 943b, Creole Identities and Fictions

Christopher L. Miller

Focusing on the French and English Caribbean, this course analyzes the quintessential but ambiguous American condition: that of the “Creole.” Encompassing all non-native cultures, this term is inseparable from issues of race and slavery. Readings of historical and literary texts: Moreau de Saint-Méry, Bernardin de Saint-Pierre, Madame de Staël, Charlotte Brontë (and reinventions of *Wuthering Heights* by Jean Rhys and Maryse Condé), the Créolistes of Martinique. Attention to Louisiana and to the Haitian Revolution. Reading knowledge of French required. TH 1:30–3:20

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS

300 George, Suite 501, 737.6029

<http://cbb.yale.edu/>

M.S., Ph.D.

Directors of Graduate Studies

Mark Gerstein (Bass 432A, 432.6105, mark.gerstein@yale.edu)

Perry Miller (300 George St., Suite 501, 737.2903, perry.miller@yale.edu)

Professors James Aspnes (*Computer Science*), Joseph Chang (*Statistics*), Ronald Coifman (*Mathematics; Computer Science*), Xing Wang Deng (*Molecular, Cellular & Developmental Biology*), Donald Engelman (*Molecular Biophysics & Biochemistry*), Mark Gerstein (*Biomedical Informatics; Molecular Biophysics & Biochemistry; Computer Science*), William Jorgensen (*Chemistry*), Douglas Kankel (*Molecular, Cellular & Developmental Biology*), Kenneth Kidd (*Genetics; Ecology & Evolutionary Biology*), Paul Lizardi (*Pathology*), Elias Lolis (*Pharmacology*), Perry Miller (*Anesthesiology; Medical Informatics; Molecular, Cellular & Developmental Biology*), Willard Miranker (*Computer Science*), Anna Pyle (*Molecular Biophysics & Biochemistry*), Martin Schultz (*Computer Science*), Gordon Shepherd (*Neuroscience*), Abraham Silberschatz (*Computer Science*), Michael Snyder (*Molecular, Cellular & Developmental Biology; Molecular Biophysics & Biochemistry*), Dieter Söll (*Molecular Biophysics & Biochemistry; Chemistry*), Günter Wagner (*Ecology & Evolutionary Biology*), Heping Zhang (*Epidemiology & Public Health; Statistics*), Hongyu Zhao (*Epidemiology & Public Health; Genetics*), Steven Zucker (*Computer Science; Electrical Engineering; Biomedical Engineering*)

Associate Professors Kei-Hoi Cheung (*Anesthesiology; Computer Science; Genetics*), Andrew Miranker (*Molecular Biophysics & Biochemistry*), Valerie Reinke (*Genetics*)

Assistant Professors Thierry Emonet (*Molecular, Cellular & Developmental Biology*), Alison Galvani (*Epidemiology & Public Health*), Antonio Giraldez (*Genetics*), Tae Hoon Kim (*Genetics*), Steven Kleinstein (*Pathology*), Michael Krauthammer (*Pathology*), Steven Ma (*Epidemiology & Public Health*), Annette Molinaro (*Epidemiology & Public Health*), James Noonan (*Genetics*), Jeffrey Townsend (*Ecology & Evolutionary Biology*), David Tuck (*Pathology*)

Fields of Study

Computational biology and bioinformatics (CB&B) is a rapidly developing multidisciplinary field. The systematic acquisition of data made possible by genomics and proteomics technologies has created a tremendous gap between available data and their biological interpretation. Given the rate of data generation, it is well recognized that this gap will not be closed with direct individual experimentation. Computational and theoretical approaches to understanding biological systems provide an essential vehicle to help close this gap. These activities include computational modeling of biological processes, computational management of large-scale projects, database development and data mining, algorithm development, and high-performance computing, as well as statistical and mathematical analyses.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental program in the Biological and Biomedical Sciences.

Special Admissions Requirements

Applicants are expected (1) to have a strong foundation in the basic sciences, such as biology, chemistry, and mathematics, and (2) to have training in computing/informatics, including significant computer programming experience. The Graduate Record Examination (GRE) General Test is required, and the GRE Subject Test in cell and molecular biology, biology, biochemistry, chemistry, computer science, or other relevant discipline is recommended. Alternatively, the Medical College Admission Test (MCAT) may be substituted for the GRE tests. Applicants for whom English is not their native language are required to submit results from the Test of English as a Foreign Language (TOEFL).

Special Requirements for the Ph.D. Degree

With the help of a faculty advisory committee, each student plans a program that includes courses, seminars, laboratory rotations, and independent reading. Students are expected to gain competence in three core areas: (1) computational biology and bioinformatics, (2) biological sciences, and (3) informatics (including computer science, statistics, and applied mathematics). The courses taken to satisfy the core areas of competency may vary considerably. A typical program will include nine courses. Completion of the core curriculum will typically take three to four terms, depending in part on the prior training of the student. Students will typically take two to three courses each term and three research rotations during the first year. After the first year, students will start working in the laboratory of their Ph.D. thesis supervisor. Students must pass a qualifying examination normally given at the end of the second year or the beginning of the third year. There is no language requirement. Students will serve as teaching assistants in two term courses.

M.D./Ph.D. Students

Students pursuing the joint M.D./Ph.D. degrees must satisfy the course requirements listed above for Ph.D. students. With DGS approval, some courses taken toward the M.D. degree can be counted toward the nine required courses. Such courses must have a graduate course number and the student must register for them as graduate courses (in which grades are received). Laboratory rotations are available but not required. One teaching assistantship is required.

Master's Degree

M.S. (en route to the Ph.D.) To qualify for the awarding of the M.S. degree a student must (1) complete two years (four terms) of study in the Ph.D. program, with nine required courses taken at Yale, (2) complete the required course work for the Ph.D. program with an average grade of High Pass, (3) successfully complete three research rotations, and (4) meet the Graduate School's Honors requirement.

Courses

CB&B 645b/STAT 645b, Statistical Methods in Genetics and Bioinformatics

Hongyu Zhou

Stochastic modeling and statistical methods applied to problems such as mapping quantitative trait loci, analyzing gene expression data, sequence alignment, and reconstructing

evolutionary trees. Statistical methods include maximum likelihood, Bayesian inference, Monte Carlo Markov chains, and some methods of classification and clustering. Models introduced include variance components, hidden Markov models, Bayesian networks, and coalescent. Recommended background: STAT 541a, STAT 542b. Prior knowledge of biology is not required. TTH 10:30–11:45

CB&B 740a, Clinical and Translational Informatics Richard Shiffman,

Michael Krauthammer

The course provides an introduction to clinical and translational informatics. Topics include (1) overview of biomedical informatics, (2) design, function, and evaluation of clinical information systems, (3) clinical decision making and practice guidelines, (4) clinical decision support systems, (5) informatics support of clinical research, (6) privacy and confidentiality of clinical data, (7) standards, (8) issues in defining the clinical phenotype, and (9) topics in translational bioinformatics. Permission of the instructor required. HTBA

CB&B 750a/MCDB 750a, Core Topics in Biomedical Informatics Perry Miller and faculty

Introduction to common unifying themes that serve as the foundation for different areas of biomedical informatics, including clinical, neuro-, and genome informatics. The course is designed for students with significant computer experience and course work who plan to build computational tools for use in bioscience research. Emphasis is on understanding basic principles underlying informatics approaches to biomedical data modeling, interoperability among biomedical databases and software tools, standardized biomedical vocabularies and ontologies, modeling of biological systems, and other topics of interest. The course involves lectures, class discussions, student presentations, and computer programming assignments. Permission of the instructor required. HTBA

CB&B 752b/CPSC 752b^U/MB&B 752b^U/MCDB 752b^U, Bioinformatics: Practical Application of Simulation and Data Mining Mark Gerstein

Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine learning approaches for data integration. Prerequisites: MB&B 301b and MATH 115a or b, or permission of the instructor. MW 1–2:15

[CHEM 526a^U, Computational Chemistry and Biochemistry]

Additional courses focused on the biological sciences and on areas of informatics are selected by the student in consultation with CB&B faculty.

COMPUTER SCIENCE

A. K. Watson Hall, 432.1246

www.cs.yale.edu/

M.S., M.Phil., Ph.D.

Chair

Abraham Silberschatz

Director of Graduate Studies

Drew McDermott (508 AKW, 432.1283, drew.mcdermott@yale.edu)

Professors Dana Angluin, James Aspnes, Ronald Coifman (*Mathematics*), Julie Dorsey, Stanley Eisenstat, Joan Feigenbaum, Michael Fischer, David Gelernter, Paul Hudak, Drew McDermott, Willard Miranker (*Adjunct*), A. Stephen Morse (*Electrical Engineering*), Vladimir Rokhlin, Holly Rushmeier, Martin Schultz, Zhong Shao, Abraham Silberschatz, Daniel Spielman, Steven Zucker

Associate Professors Mark Gerstein (*Molecular Biophysics & Biochemistry*), Brian Scassellati, Yang Richard Yang

Assistant Professors Daniel Abadi, Bryan Ford, Max Krohn

Fields of Study

Artificial intelligence (vision, robotics, planning, computational neuroscience, knowledge representation, neural networks); programming languages (functional programming, parallel languages and architectures, programming environments, formal semantics, compilation techniques, modern computer architecture, type theory/systems, and meta-programming); systems (databases, operating systems, networks, software engineering); scientific computing (numerical linear and nonlinear algebra, numerical solution of partial differential equations, mathematical software, parallel algorithms); theory of computation (algorithms and data structures, complexity, distributed systems, learning, online algorithms, graph algorithms, geometric algorithms, fault tolerance, reliable communication, cryptography, security, and electronic commerce); and topics of discrete mathematics with application to computer science (combinatorics, graph theory, combinatorial optimization).

Research Facilities

The department operates a high-bandwidth, local-area computer network based mainly on distributed workstations and servers, with connections to worldwide networks. Workstations include Dell dual-processor PCs (running Linux or Windows/XP). Laboratory contains specialized equipment for graphics, vision, and robotics research. Various printers, including color printers, as well as image scanners, are also available. The primary educational facility consists of thirty-seven PC workstations supported by a large Intel PC server. This facility is used for courses and unsponsored research by Computer Science majors and first-year graduate students. Access to computing, through both the workstations and remote login facilities, is available to everyone in the department.

Special Admissions Requirements

Applicants for admission should have strong preparation in mathematics, engineering, or science. They should be competent in programming but need no computer science beyond that basic level. The GRE General Test and a pertinent Subject Test are required.

Special Requirements for the Ph.D. Degree

There is no foreign language requirement. To be admitted to candidacy, a student must (1) pass ten courses (including CPSC 690 and CPSC 691) with at least two grades of Honors, the remainder at least High Pass, including three advanced courses in an area of specialization; (2) take six advanced courses in areas of general computer science; (3) successfully complete a research project in CPSC 690, 691, and submit a written report on it to the faculty; (4) pass a qualifying examination in an area of specialization; (5) be accepted as a thesis student by a regular department faculty member; (6) serve as a teaching assistant for two terms; and (7) submit a written dissertation prospectus, with a tentative title for the dissertation. To satisfy the distribution requirement (requirement 2 above), the student must take one course in programming languages or systems, one programming-intensive course, two theory courses, and two in application areas. In order to gain teaching experience, all graduate students are required to serve as teaching assistants for two terms during their first three years of study. All requirements for admission to candidacy must be completed prior to the end of the third year.

Master's Degrees

M.Phil. See Degree Requirements.

M.S. (en route to the Ph.D.) To qualify for the M.S., the student must pass eight courses at the 500 level or above from an approved list. An average grade of at least High Pass is required, with at least one grade of Honors.

Terminal Master's Degree Program Students may also be admitted to a terminal master's degree program directly. The requirements are the same as for the M.S. en route to the Ph.D. This program is normally completed in one year, but a part-time program may be spread over as many as four years.

A brochure providing additional information about the department, faculty, courses, and facilities is available from the Graduate Coordinator, Department of Computer Science, Yale University, PO Box 208285, New Haven CT 06520-8285; e-mail, cs-admissions@cs.yale.edu.

Courses

[CPSC 521a^u, **Compilers and Interpreters**]

CPSC 522b^u, Operating Systems Max Krohn

The design and implementation of operating systems. Topics include synchronization, deadlocks, process management, storage management, file systems, security, protection, and networking. MW 1–2:15

[CPSC 524b^U, Parallel Programming Techniques]**CPSC 525b^U, Theory of Distributed Systems** James Aspnes

Models of asynchronous distributed computing systems. Fundamental concepts of concurrency and synchronization, communication, reliability, topological and geometric constraints, time and space complexity, and distributed algorithms. (Taught in alternate years.) MWF 11:35–12:25

[CPSC 528b, Language-Based Security]**CPSC 530a^U, Formal Semantics** Zhong Shao

Introduction to formal approaches to programming language design and implementation. Topics include the lambda-calculus, type theory, denotational semantics, type-directed compilation, higher-order modules, and application of formal methods to systems software and Internet programming. MW 1–2:15

[CPSC 531a, Computer Music: Algorithmic and Heuristic Composition]**CPSC 532a, Computer Music: Sound Representation and Synthesis**

MW 2:30–3:45

CPSC 533b, Computer Networks Richard Yang

An introduction to the design, implementation, analysis, and evaluation of computer networks and their protocols. Topics include layered network architectures, applications, transport, congestion, routing, data link protocols, local area networks, performance analysis, multimedia networking, network security, and network management. Emphasis on protocols used on the Internet. TTH 11–2:15

[CPSC 534b^U, Mobile Computing and Wireless Networking]**CPSC 535a^U, Large-Scale Network Design** Richard Yang

MW 2:30–3:45

CPSC 537a^U, Introduction to Databases Abraham Silberschatz

An introduction to database systems. Data modeling. The relational model and the SQL query language. Relational database design, integrity constraints, functional dependencies, and natural forms. Object-oriented databases. Implementation of databases: file structures, indexing, query processing, transactions, concurrency control, recovery systems, and security. TTH 2:30–3:45

CPSC 538b, Database System Implementation and Architectures Daniel Abadi

A study of systems programming techniques, with a focus on database systems. Half the course is spent studying the design of a traditional DBMS, supplemented by a hands-on exercise in which students build various components (e.g., a catalog-manager, a buffer-manager, and a query execution engine) of a DBMS prototype. The other half is spent on nontraditional architectures (parallel databases, data warehouses, stream databases, Web databases). MW 2:30–3:45

CPSC 540b^U, Numerical Computation Vladimir Rokhlin

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. TTH 1–2:15

CPSC 545b^U, Introduction to Data Mining Vladimir Rokhlin

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. TTH 1–2:15

[CPSC 555a/ECON 563a, Economics and Computation]

[CPSC 562a, Graphs and Networks]

[CPSC 563b^U, Introduction to Machine Learning]

[CPSC 565b, Topics in Algorithms]

CPSC 567a^U, Cryptography and Computer Security Michael Fischer

A survey of such private and public key cryptographic techniques as DES, RSA, and zero-knowledge proofs, and their application to problems of maintaining privacy and security in computer networks. Focus on technology, with consideration of such societal issues as balancing individual privacy concerns against the needs of law enforcement, vulnerability of societal institutions to electronic attack, export regulations and international competitiveness, and development of secure information. MW 2:30–3:45

CPSC 568a^U, Introduction to Computational Complexity Joan Feigenbaum

Introduction to the theory of computational complexity. Basis complexity classes, including polynomial time, nondeterministic polynomial time, probabilistic polynomial space, logarithmic space, and nondeterministic logarithmic space. The roles of reductions, completeness, randomness, and interaction in the formal study of computation. TTH 2:30–3:45

[CPSC 569b^U, Randomized Algorithms]

CPSC 570a^U, Artificial Intelligence Brian Scassellati

Introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning. MWF 10:30–11:20

CPSC 573b, Intelligent Robotics Brian Scassellati

An 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. MWF 10:30–11:20

CPSC 575b/ENAS 575b^U, Computational Vision and Biological Perception

Steven Zucker

An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. MW 1–2:15

CPSC 577a^U, Neural Networks for Computing Willard Miranker

Artificial neural networks as a computational paradigm studied with application to problems in associative memory, learning, pattern recognition, perception, robotics, and other areas. Development of models for the dynamics of neurons and methods such as learning for designing neural networks. Concepts, designs, and methods compared and tested in software simulation. Brain and consciousness studies are optional topics.

TTH 11:35–12:50

CPSC 578b^U, Computer Graphics Julie Dorsey

An introduction to the basic concepts of two- and three-dimensional computer graphics. Topics include affine and projective transformations, clipping and windowing, visual perception, scene modeling and animation, algorithms for visible surface determination, reflection models, illumination algorithms, and color theory. Assumes solid C or C++ programming skills and a basic knowledge of calculus and linear algebra.

TTH 2:30–3:45

CPSC 579a^U, Advanced Topics in Computer Graphics Holly Rushmeier

An in-depth study of advanced algorithms and systems for rendering, modeling, and animation in computer graphics. Topics vary and may include radiance modeling, global illumination, subdivision surfaces, NURBS, physically based fluids systems, and character animation. TTH 1–2:15

CPSC 662a, Spectral Graph Theory Daniel Spielman

An applied approach to Spectral Graph Theory. The combinatorial meaning of the eigenvalues and eigenvectors of matrices associated with graphs. Applications to optimization, numerical linear algebra, error-correcting codes, and testing graph isomorphism. Prerequisites: linear algebra, graph theory, and permission of the instructor.

CPSC 671a, Advanced Artificial Intelligence Drew McDermott

This course is intended for students who have taken CPSC 470/570, or an equivalent graduate or undergraduate course. In the fall of 2009 the focus is on “Automated Planning,” the problem of finding, for some sort of agent acting in some sort of environment, structures of actions and other commitments to achieve some goal and/or optimize some objective function.

CPSC 690a or b, Independent Project I

By arrangement with faculty.

CPSC 691a or b, Independent Project II

By arrangement with faculty.

CPSC 692a or b, Independent Project

Individual research for students in the M.S. program. Requires a faculty supervisor and the permission of the director of graduate studies.

CPSC 723b, Graduate Seminar Bryan Ford

TH 2:30–3:45

CPSC 772a, Graduate Seminar Max Krohn

TH 2:30–3:45

CPSC 752b^U/CB&B 752b/MB&B 752b^U/MCDB 752b, Bioinformatics: Practical**Application of Simulation and Data Mining** Mark Gerstein

Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine learning approaches for data integration. Prerequisites: MB&B 301b and MATH 115a or b, or permission of the instructor. MW 1–2:15

CPSC 820a or b, Directed Readings in Programming Languages and Systems

By arrangement with faculty.

CPSC 840a or b, Directed Readings in Numerical Analysis

By arrangement with faculty.

CPSC 860a or b, Directed Readings in Theory

By arrangement with faculty.

CPSC 870a or b, Directed Readings in Artificial Intelligence

By arrangement with faculty.

EAST ASIAN LANGUAGES AND LITERATURES

308 Hall of Graduate Studies, 432.2860

www.yale.edu/eall/

M.A., M.Phil., Ph.D.

Chair

John Treat

Director of Graduate Studies

Tina Lu (304 HGS, 432.7529, tina.lu@yale.edu)

Professors Kang-i Sun Chang, Eiichi Ishigami (*Visiting* [F]), Edward Kamens, Tina Lu, Haun Saussy (*Comparative Literature*), John Treat

Associate Professors Aaron Gerow, Christopher Hill

Assistant Professors Paize Keulemans, Jing Tsu

Senior Lecturer Koichi Shinohara (*Religious Studies*)

Lecturer Drake Langford

Senior Lectors Seungja Choi, Koichi Hiroe, Zhengguo Kang, Ninghui Liang, Angela Lee-Smith, 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, Qing-rui Liao, Fan Liu, Yukie Mammoto, Yu-Lin Wang-Saussy, Jianhua Shen, Haiwen Wang

Fields of Study

Fields for doctoral study are Chinese literature and Japanese literature. (See also the Combined Ph.D. Program in Film Studies.) Although the primary emphasis is on these East Asian subjects, the department welcomes applicants who are seeking to integrate their interests in Chinese or Japanese literature with interdisciplinary studies in such fields as history, history of art, linguistics, religious studies, comparative literature, film studies, literary theory and criticism, and the social sciences.

Special Admissions Requirements

The department requires entering students in Chinese or Japanese (and the Combined Program in Film Studies) to have completed at least three years of study, or the equivalent, of either Chinese or Japanese. Students applying in Chinese are expected to have completed at least one year of literary Chinese. Students applying in premodern Japanese are expected to have completed at least one year of literary Japanese. This is a doctoral program; no students are admitted for terminal master's degrees.

Special Requirements for the Ph.D. Degree

During the first three years of study, students are required to take at least fourteen term courses. Usually students complete twelve term courses in years 1 and 2, and then take

two tutorials or two seminars in year 3. Students concentrating in Chinese or Japanese literature are encouraged to take at least one term course in Western literature or literary theory. By the end of the second year, all students must prove their proficiency in a language other than their primary language of study that is relevant to their course of study and is approved by the DGS. By the end of the third year, students specializing in pre-modern Japanese literature must pass a reading test in literary Chinese. At the end of the second full academic year, the student must take a written examination in the language of his or her specialization, including both its modern and premodern forms.

At the end of each academic year, until a student is admitted to candidacy, a faculty committee will review the student's progress. For the second-year review, the student must submit a revised seminar research paper, on a topic selected in consultation with the adviser, no later than April 1 of the fourth term. No later than the end of the sixth term the student will take the qualifying oral examination. The exam will cover three fields distinguished by period and/or genre in one or more East Asian national literatures or in other fields closely related to the student's developing specialization. These fields and accompanying reading lists will be selected in consultation with the examiners and the director of graduate studies in order to allow the student to demonstrate knowledge and command of a range of topics. After having successfully passed the qualifying oral examination, students will be required to submit a dissertation prospectus to the department for approval by October 1 of the seventh term in order to complete the process of admission to candidacy for the Ph.D.

Opportunities to obtain experience in teaching language and literature form an important part of this program. Students in East Asian Languages and Literatures normally teach in their third and fourth years in the Graduate School.

Combined Ph.D. Program

The Department of East Asian Languages and Literatures also offers, in conjunction with the Program in Film Studies, a combined Ph.D. in East Asian Languages and Literatures and Film Studies. For further details, see Film Studies. Applicants to the combined program must indicate on their application that they are applying both to Film Studies and to East Asian Languages and Literatures. All documentation within the application should include this information.

Master's Degrees

M.Phil. The successful completion of all predissertation requirements, including the qualifying examination, will make a student eligible for an M.Phil. degree.

M.A. (en route to the Ph.D.) The successful completion of twelve term courses and languages required in the first two years of study will make a student eligible for an M.A. degree.

Additional program materials are available at the department Web site, www.yale.edu/eall/.

Courses

Courses in Chinese language at the elementary, intermediate, and advanced levels are listed in *Yale College Programs of Study*.

CHNS 501a^U/WGSS 770a^U, Women and Literature in Traditional China

Kang-i Sun Chang

This course focuses on 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, Daoist 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. All readings in translation; no knowledge of Chinese required. TTH 1–2:15

CHNS 520b^U, Romance in Chinese Late Imperial Literature Tina Lu

In a society in which orthodox values demanded that unrelated men and women never have contact, how and why should romance be depicted? This course traces the theme of romance across literature of nine centuries, from a few examples in the Tang down to the Qing dynasty. We consider fiction and drama. TH 2:30–4:20

CHNS 560a^U, Introduction to Literary Chinese I Yu-Lin Wang-Saussy

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 or 151b or equivalent. TTH 9–10:15

CHNS 570b^U, Advanced Readings in Modern Chinese Jing Tsu

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. W 3:30–5:20

CHNS 571b^U, Introduction to Literary Chinese II Yu-Lin Wang-Saussy

Continuation of CHNS 560a. After CHNS 560a or equivalent. TTH 9–10:15

CHNS 580b^U, Classical Tales from Tang to Qing Tina Lu

Close reading and translation of classical tales from the Tang, Ming, and Qing dynasties. Focus on strengthening students' reading ability in classical Chinese. Attention to canonical Chinese narratives as well as some lesser-known texts. Discussion of themes such as romance, magical transformations, and proto-martial arts, including how these themes were transformed over time. Prerequisite: CHNS 571b or equivalent. TTH 11:35–12:50

CHNS 581a^U, Chinese Informal Prose Tina Lu

We translate, study, and discuss classical essays: first, important models of *guwen* (ancient-style prose) from the Tang and the Song, and second, the transformation of these models in the late Ming and early Qing into *xiaopin* ("lesser works"). Why was *guwen* used at once for the philosophical and speculative writing and for describing the minutiae of everyday life? MW 11:35–12:50

CHNS 595b^U, Chinese Philosophical Texts Haun Saussy

Readings in early Chinese thought, with attention to questions of style, rhetoric, and organization. Selections from the *Shi ji* (Records of the Historian), Mengzi (Mencius), Xunzi, Zhuangzi, *Huainan zi*, Dong Zhongshu, and *Baihu tonglun* (*Discussion in the White Tiger Hall*). Most readings are in classical Chinese. After CHNS 571b or equivalent. WF 1–2:15

CHNS 603a^U, Readings in Classical Chinese Poetry Kang-i Sun Chang

Fundamentals of classical Chinese poetry and poetics. Primary readings in Chinese, lectures and discussion in English and Chinese. Because readings are different year to year, this course may be repeated for credit. W 1:30–3:20

CHNS 655b, Scientism, Culture, and Literature Jing Tsu

Analyzes late Qing and early Republican popular fiction and science treatises in relation to westernization, technology, and modernity with comparative perspectives from Europe and America. We engage with issues of epistemology, semiotics, technology, translation, and cultural history. T 3:30–5:20

CHNS 811a, Migration, Language, and Literatures Jing Tsu

Examines fiction and literary criticism from the twentieth century to the present, with a focus on theories of diaspora, language, nationalism, and ethnicity, as well as on the different social and cultural contexts that engender modern Chinese literary writing in Chinese and/or other languages. W 3:30–5:20

CHNS 900, Directed Readings Faculty

Offered by permission of instructor and DGS to meet special needs not met by regular courses.

CHNS 990, Directed Research Faculty

Offered as needed with permission of instructor and DGS for student preparation of dissertation prospectus.

Courses in Japanese language at the elementary, intermediate, and advanced levels are listed in *Yale College Programs of Study*.

JAPN 559a^U, Readings in Literature and the Humanities John Treat

Canonical Japanese short stories and essays read in line-by-line translation. Use of reference works and the Internet to research structures and vocabulary. Intended for those at the fourth-year level in their study of modern Japanese, this course is designed to help students prepare for either graduate-level courses in Japanese literature or independent study of written Japanese. TTH 11:30–12:45

JAPN 561b^U, Readings in Literary Japanese Drake Langford

Close analytical reading of a selection of texts from the Nara through Tokugawa period: prose, poetry, and various genres. After JAPN 570a or equivalent. TTH 9–10:15

JAPN 562b^U, The Culture of Postwar Japan Christopher Hill

Intensive look at a transformative period of Japanese artistic and intellectual culture, focusing on literature, film, and debates over the place of politics in art from 1945 to 1970. Memory and war responsibility; the reimagining of eros; avant-garde experimentation. W 3:30–5:20

JAPN 570a^U, Introduction to Literary Japanese Drake Langford

Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. Prerequisite: JAPN 151 or equivalent. TTH 9–10:15

JAPN 578a^U, Modern Japanese Fiction Christopher Hill

An introduction to Japanese fiction from the 1890s. Novels and stories by such writers as Natsume Soseki, Tanizaki, Jun'ichiro, and Oe Kenzaburo; discussion of major trends such as modernism and writing by women. No knowledge of Japanese required. TTH 1–2:15

JAPN 581b^U, Japanese Literatures after 1970 John Treat

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. No knowledge of Japanese required. TTH 2:30–3:45

JAPN 582b^U, Imagining Space in Japanese Fiction and Film Christopher Hill

Representations of space in modern fiction and selected films. Aesthetic forms as they establish social and psychological space, urbanization, wartime destruction, and rural transformations as they affect the representation of space. Writers and directors include Kawabata, Enchi, Ôe, Murakami, Miyazaki. No knowledge of Japanese required. TTH 1–2:15

JAPN 706a, Readings in Ancient Japanese Texts Eiichi Ishigami

Close study of historical materials of the Nara and Heian periods. Reading knowledge of literary Japanese required, familiarity with *kanbun* recommended. F 9:25–11:15

JAPN 835a, Modernity and Culture in Imperial Japan Christopher Hill

Formations of modernity in Japan from the late Meiji to the early Shôwa period and their political and economic contexts. Materials include literature, essays, philosophy, and other sources such as visual texts according to student interest. W 3:30–5:20

JAPN 885b, Modern Japanese Novel John Treat

A seminar primarily designed as a three-year course in which graduate students specializing in Japanese literature are required to read major works of modern Japanese fiction in the original. W 2:30–4:20

JAPN 900, Directed Readings Faculty

Offered by permission of instructor and DGS to meet special needs not met by regular courses.

JAPN 990, Directed Research Faculty

Offered as needed with permission of instructor and DGS for student preparation of dissertation prospectus.

Courses in Korean language at the elementary, intermediate, and advanced levels are listed in *Yale College Programs of Study*.

EAST ASIAN STUDIES

The MacMillan Center
320 Luce Hall, 34 Hillhouse, 432.3426
research.yale.edu/eastasianstudies/
M.A.

Chair

Haun Saussy (Rm 214, 451 College, 432.4753, haun.saussy@yale.edu)

Director of Graduate Studies

Peter Perdue (Rm 2682, 320 York St., 432.6145, peter.c.perdue@yale.edu)

Professors Kang-i Sun Chang (*East Asian Languages & Literatures*), Deborah Davis (*Sociology*), Fabian Drixler (*History*), Koichi Hamada (*Economics*), Valerie Hansen (*History*), Eichi Ishigami (*Visiting, East Asian Languages & Literatures*), Edward Kamens (*East Asian Languages & Literatures*), William Kelly (*Anthropology*), Tina Lu (*East Asian Languages and Literatures*), Peter Perdue (*History*), Frances Rosenbluth (*Political Science*), Haun Saussy (*Comparative Literature; East Asian Languages & Literatures*), Helen Siu (*Anthropology*), Jonathan Spence (*History*), John Whittier Treat (*East Asian Languages & Literatures*), Mimi Hall Yiengpruksawan (*History of Art*)

Associate Professors Aaron Gerow (*East Asian Languages & Literatures; Film Studies*), Christopher Hill (*East Asian Languages & Literatures*), Pierre Landry (*Political Science*), Lillian Tseng (*History of Art*)

Assistant Professors Alexander Beecroft (*Comparative Literature*), Seok-Ju Cho (*Political Science*), Jacob Dalton (*Religious Studies*), William Honeychurch (*Anthropology*), Reginald Jackson (*East Asian Languages & Literatures; Theater Studies*), Paize Keulemans (*East Asian Languages & Literatures*), Karen Nakamura (*Anthropology*), Jing Tsu (*East Asian Languages & Literatures*), Jessica Weiss (*Political Science*)

Senior Lecturers Annping Chin (*History*), Koichi Shinohara (*Religious Studies; East Asian Languages & Literatures*)

Lecturers Heekyoung Cho, Justin Jetsy, Toby Lincoln

Senior Lectors Seungja Choi, Koichi Hiroe, Zhengguo Kang, 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, Angela Lee-Smith, Rongzhen Li, Qingui Liao, Fan Liu, Yukie Mammoto, Yu-lin Wang Saussy, Jianhua Shen, Haiwen Wang

Fields of Study

The Master of Arts program in East Asian Studies offers a concentrated course of study designed to provide a broad understanding of Chinese, Japanese, or Korean history, culture, contemporary society, politics, and economy. This program is designed for students preparing to go on to the doctorate in one of the disciplines of East Asian Studies

(i.e., anthropology; economics; history; history of art; language and literature including comparative literature, film studies, and theater studies; political science; sociology; etc.), as well as for those students seeking a terminal M.A. degree before entering the business world, the media, government service, or a professional school.

Course of Study for the M.A. Degree

The program is designed to be completed by successfully taking eight courses approved for graduate credit by the director of graduate studies over the course of one academic year. Normally, students entering the program are expected to have already completed the equivalent of at least two years of Chinese, Japanese, or Korean language, so that the three-year language requirement can be completed in the two terms spent at Yale. A program of study for completion of the degree in one year consists of at least eight term courses that normally include two terms of language study at Yale's third-year level (unless the language requirement has already been met through previous study) and six other term courses selected from the current year's offerings of advanced language courses and lecture courses or seminars in any relevant subject area, with the approval of the director of graduate studies.

Special Requirements for the M.A. Degree

Students must earn two Honors grades ("H") over the course of their two terms at Yale. Honors grades earned in any Chinese or Japanese language class cannot be counted toward satisfying this requirement, except with the permission of the director of graduate studies.

Joint-Degree Programs

As the East Asian Studies M.A. degree is a one-year program, there are no joint-degree programs available. Students interested in pursuing additional degrees in the Yale professional schools should consider applying separately to those programs in order to complete such degrees before or after the East Asian Studies M.A. degree.

Program materials are available upon request to the Council on East Asian Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; e-mail, eastasian.studies@yale.edu; Web site, <http://research.yale.edu/eastasianstudies>. Applications are available online at www.yale.edu/graduateschool/admissions; e-mail, graduate.admissions@yale.edu.

Please consult the course information available online at <http://research.yale.edu/eastasianstudies/academic.php> and <http://students.yale.edu/oci/> for a complete listing of East Asian-related courses offered at Yale University.

ECOLOGY AND EVOLUTIONARY BIOLOGY

Osborn Memorial Laboratories
165 Prospect, 432.3837
www.eeb.yale.edu/
M.S. (en route to the Ph.D.), Ph.D.

Chair

Richard Prum

Director of Graduate Studies

Paul Turner

Professors Leo Buss, Michael Donoghue, Jacques Gauthier (*Geology & Geophysics*), Vivian Irish (*Molecular, Cellular & Developmental Biology*), Kenneth Kidd (*Genetics; Psychiatry*), Jeffrey Powell, Richard Prum, Oswald Schmitz (*Forestry & Environmental Studies*), David Skelly (*Forestry & Environmental Studies*), Stephen Stearns, J. Rimas Vaisnys (*Electrical Engineering*), Günter Wagner

Associate Professors Walter Jetz, David Post, Paul Turner

Assistant Professors Suzanne Alonzo, Antonia Monteiro (*on leave*), Thomas Near (*on leave*), Melinda Smith, Jeffrey Townsend, David Vasseur

Lecturers Adalgisa Caccone, Mary Beth Decker, Marta Martinez Wells

Fields of Study

The Department of Ecology and Evolutionary Biology (E&EB) offers training programs in organismal biology, ecology, and evolutionary biology including molecular evolution, phylogeny, molecular population genetics, developmental evolution, and evolutionary theory.

Special Admissions Requirements

Applicants should have had training in one of the following fields: biology, mathematics, chemistry, physics, statistics, and/or geology. Candidates are selected, regardless of their major, based on overall preparation for a career in research in ecology and evolutionary biology. Some, planning for careers in applied fields, may have prepared with courses in public policy, economics, and agriculture.

Special Requirements for the Ph.D. Degree

Each entering student, in consultation with the director of graduate studies, develops a specific program of courses, seminars, laboratory research, and independent reading tailored to the student's interests, background, and goals. There are normally no foreign language requirements. All first-year students carry out two research rotations. Students have the option of a rotation over their first summer. Students must participate in (1) a program of ethics of research and authorship; (2) weekly E&EB seminars; and (3) symposia of faculty and graduate student research. In addition, during their first two years of study, graduate students must enroll in a minimum of three additional graduate-level

courses (numbered 500 and above). Teaching experience is regarded as an integral part of the graduate training program. All students are required to teach three courses, normally at the TF 3 level, during their first two years of study.

By the middle of the fourth term of study, each student organizes a formal prospectus consultative meeting with his/her advisory committee to discuss the planned dissertation research. Before the beginning of the fifth term, students present and defend their planned dissertation research at a prospectus meeting, where the department determines the viability and appropriateness of the student's Ph.D. proposal. A successful prospectus meeting and completion of course requirements result in admission to candidacy for the Ph.D. The remaining requirements include completion, presentation, and successful defense of the dissertation, and submission of copies of the dissertation to the Graduate School and to the Kline Science Library.

In cases where the dissertation committee decides that preliminary field work during the summer after the fourth term is necessary prior to the prospectus, the prospectus meeting can be delayed by one term. A request for a delay must come from the dissertation committee adviser and must be approved by the DGS. In these exceptional cases admission to candidacy may not be required for registration for the third year of graduate study.

Honors Requirement

Students must meet the Graduate School's requirement of Honors in two courses by the end of the fourth term of study. The E&EB department also requires an average grade of at least High Pass in course work during the first two years of study.

Master's Degree

M.S. (en route to the Ph.D.) Satisfactory completion of the first two years of study leading to the Ph.D. up to, but not necessarily including, the prospectus.

Additional material providing information on the department, faculty, courses, and facilities is available from Karen Broderick, Office of the Director of Graduate Studies, Department of Ecology and Evolutionary Biology, Yale University, PO Box 208106, New Haven CT 06520-8106; e-mail: karen.broderick@yale.edu; phone: 203.432.3837; fax: 203.432.2374; Web site: www.eeb.yale.edu/.

Courses

E&EB 500a/b, Advanced Topics in Ecology and Evolutionary Biology Staff
Topics to be announced. 2 HTBA

E&EB 510a^U/STAT 501a^U, Introduction to Statistics: Life Sciences Günter Wagner
Statistical and probabilistic analysis of biological problems is presented with a unified foundation in basic statistical theory. A general lecture covering statistical theory and a discipline-based lecture covering statistical modeling of biological problems drawn from genetics, ecology, epidemiology, and bioinformatics. Graduate students are expected to finish a course project in addition to regular homework and exams. TTH 1– 2:15

E&EB 520a^U, General Ecology David Post, David Vasseur, Melinda Smith

A broad consideration of the theory and practice of ecology, including the ecology of individuals, population dynamics and regulation, community structure, ecosystem function, and ecological interactions on broad spatial and temporal scales. Topics such as climate change, fisheries management, and infectious disease are placed in an ecological context. MWF 10:30–11:20

E&EB 522b^U, Principles of Evolution, Ecology, and Behavior Stephen Stearns

The major 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. MWF 11:35–12:25

E&EB 523Lb^U, Laboratory for Principles of Evolution, Ecology, and Behavior

Marta Wells

Experimental approaches to organismal and population biology, including study of the diversity of life. TWTW 1:30

E&EB 525b^U, Evolutionary Biology Paul Turner, Jeffrey Townsend

An overview of evolutionary biology as the discipline uniting all of the life sciences. Evolution explains the origin of life and Earth's biodiversity, and how organisms acquire adaptations that improve survival and reproduction. This course uses reading and discussion of scientific papers to emphasize that evolutionary biology is a dynamic science, involving active research to better understand the mysteries of life. We discuss 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: EEB 122. TTH 11:35–12:50

E&EB 526Lb^U, Laboratory for Evolutionary Biology Adalgisa Caccone

The companion laboratory to E&EB 525b. Study of 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. W 1:30–4:30

E&EB 540a^U, Animal Behavior Suzanne Alonzo

An introduction to the study of animal behavior from an evolutionary and ecological perspective. History and methods of studying animal behavior. Topics include foraging, predation, communication, reproduction, cooperation, and the role of behavior in conservation. MW 9–10:15, 1 HTBA

E&EB 546b^U, Plant Diversity and Evolution Faculty

Introduction to the evolutionary relationships of plant lineages. Exploration of the complexity, diversity, and characteristics of the major plant groups, including the green algae, mosses, ferns, conifers, and flowering plants, within a phylogenetic context. MW 1–2:15

E&EB 547Lb^U, Laboratory for Plant Diversity and Evolution Faculty

Local flora field research; hands-on experience with the plant groups examined in the accompanying lectures. T 1–4

[E&EB 548b^U, Insect Development and Evolution]**[E&EB 549Lb^U, Laboratory for Insect Development and Evolution]****E&EB 550a^U, Biology of Terrestrial Arthropods** Marta Martinez Wells

Evolutionary history and diversity of terrestrial arthropods (body plan, phylogenetic relations, 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). TTH 11:35–12:50

E&EB 551La^U, Laboratory for Biology of Terrestrial Arthropods

Marta Martinez Wells

Comparative anatomy, dissections, identification, and classifications of terrestrial arthropods; specimen collection; field trips. W 1:30

[E&EB 557b, Invertebrates II]**[E&EB 558Lb, Laboratory for Invertebrates II]****E&EB 564b^U, Ichthyology** Faculty

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. MWF 1:30–2:20

E&EB 565b^U, Laboratory for Ichthyology Faculty

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. Must be taken concurrently with E&EB 564. HTBA

E&EB 575a, Biological Oceanography Marybeth Decker

Exploration of a range of coastal and pelagic ecosystems and how these environments function as coupled physical/biological systems. This natural science course provides a foundation for those interested in the ecology of marine systems and in the management of coastal zones. (Three hours lecture, field trips.) MW 11:35–12:50

E&EB 626a^U, Molecular Ecology Adalgisa Caccone

An overview of molecular genetic tools used to investigate ecological and evolutionary processes in natural populations. The use of molecular markers is explored through the hierarchy of life from studies of genetic individuality, parentage, kinship, population substructure, species boundaries, phylogenetics of closely related species. TTH 11:35–12:50

E&EB 627a or b, Research Topics in Molecular Ecology Adalgisa Caccone

2 HTBA

E&EB 630a, Ecosystem Analysis Melinda Smith, Peter Raymond

An outdoors overview of major themes in the study of ecosystems, aimed specifically at understanding how the structure of ecosystems develops (e.g., biodiversity) and how ecosystems function (e.g., process nutrients or pollutants). Special topics addressed include the impacts of global changes, such as climate change and eutrophication, on ecosystem structure and function. Experimental, descriptive, and analytical approaches are explored through field-based group and independent projects focused on New England ecosystems. Prerequisite: E&EB 220a or similar course or permission of instructor. MW 1–5

E&EB 632b, The Analysis of Ecological Time Series David Vasseur

An introduction to the theory and practice of time series analysis in ecology. Topics include detrending, model fitting, and frequency-domain analysis of univariate and multivariate data, with a particular emphasis on linking biological and physical processes. Students develop practical skills by addressing a variety of contemporary ecological problems using data of their own choosing. HTBA

[E&EB 640b, Community Ecology]

[E&EB 660b^U, Wildlife Conservation Ecology]

[E&EB 665a^U/F&ES 32019a, Landscape Ecology]

[E&EB 670a^U/F&ES 32011a, Aquatic Ecology]

E&EB 672b^U, Ornithology Richard Prum

Structure, function, behavior, evolution, and diversity of birds. A general overview of avian biology and evolution. Topics include the evolutionary origin of birds, avian phylogeny, anatomy, physiology, neurobiology, behavior, breeding systems, and biogeography. MWF 9:25–10:15

E&EB 673Lb^U, Laboratory for Ornithology Richard Prum

Laboratory and field studies of avian morphology, diversity, phylogeny, classification, identification, and behavior. Must be taken concurrently with E&EB 672b^U. HTBA

[E&EB 678b, Mathematical Models and Quantitative Methods in Evolution and Ecology]

E&EB 710b, Sexual Selection and Social Evolution Suzanne Alonzo

This course examines theoretical and empirical research on topics in the field of sexual selection and mating systems evolution (such as mate choice, sperm competition, sexual conflict, and parental care) and social evolution (cooperation, kin selection, communication, group living, and cooperative breeding). After covering topics within sexual selection and social evolution separately, the course then examines recent research that brings these fields together to form an understanding of how social interactions shape evolutionary dynamics, especially in the context of reproduction. Students help lead weekly discussions and develop an individual project to conduct (such as a meta-analysis, development of new theory, or synthetic review) on which they give a presentation and write a paper by the end of the term. W 10:30–12:20

E&EB 729a, Microbial Ecology and Evolution Paul Turner

This course examines the ecology and evolution of microbes, with an emphasis on prokaryotes (bacteria, Archaea) and viruses. Considering that evolution has been acting on microbes longer than all other organisms, this course emphasizes that evolution and ecology insights can be obtained through microbial research. The evolutionary ecology of microorganisms is studied from individual, population, and community perspectives. Species interactions including competition, predation, parasitism, and mutualism as well as microbial communication through quorum sensing is examined through the lens of evolutionary ecology. Sex and reproduction, genome architecture and reduction, novel evolutionary mechanisms, and life in extreme environments are examined from a microbial perspective. The result is an understanding of microbes in their natural habitats, and of the power in using microbes to elucidate fundamental principles in ecology and evolution. HTBA

E&EB 810a, Dynamics of Evolving Systems J. Rimas Vaisnys

An introduction to the ways in which the structure and behavior of evolving biological systems can be described, modeled, and analyzed. Examination of model systems as well as modeling of laboratory and field phenomena. TTH 11:35–12:50

[E&EB 826a^U, Phylogenetics and Macroevolution]

[E&EB 827La^U, Laboratory for Phylogenetics and Macroevolution]

E&EB 900a-b, First-Year Introduction to Research and Rotations DGS**E&EB 930a, Seminar in Systematics** Staff**E&EB 950a or b, Second-Year Research**

By arrangement with faculty.

E&EB 960a/b, Studies in Evolutionary Medicine Stephen Stearns, Durland Fish,
Alison Galvani, Paul Turner

This two-term course begins in January. Students learn the major principles of evolutionary biology and apply them to issues in medical research and practice by presenting and discussing original papers from the current research literature. Such issues include lactose and alcohol tolerance; the Hygiene Hypotheses and autoimmune disease; human genetic variation in drug response and pathogen resistance; spontaneous abortions, immune genes, and mate choice; parental conflicts over reproductive investment mediated by genetic imprinting; life history tradeoffs and the evolution of aging; the evolution of virulence and drug resistance.

ECONOMICS

28 Hillhouse, 432.3575

www.econ.yale.edu/

M.A., M.Phil., Ph.D.

Chair

Christopher Udry[F] (28 Hillhouse, 432.3571)

Benjamin Polak [Sp] (28 Hillhouse, 432.3571)

Director of Graduate Studies

Truman Bewley (30 Hillhouse, Rm 30, 432.3719, truman.bewley@yale.edu)

Professors Joseph Altonji, Donald Andrews, Lanier Benkard, Dirk Bergemann, Steven Berry, Truman Bewley, William Brainard (*Emeritus*), Donald Brown, Xiaohong Chen, Zhiwu Chen (*School of Management*), Eduardo Engel, Robert Evenson (*Emeritus*), Ray Fair, Howard Forman (*School of Public Health*), John Geanakoplos, Michael Golosov, Timothy Guinnane, Philip Haile, Koichi Hamada, Johannes Horner, Jonathan Ingersoll (*School of Management*), Gerald Jaynes, Dean Karlan, Yuichi Kitamura, Alvin Klevorick, Richard Levin, Giovanni Maggi, Robert Mendelsohn (*Forestry & Environmental Studies*), Giuseppe Moscarini, William Nordhaus, Joseph Peck (*Emeritus*), Peter Phillips, Benjamin Polak, Gustav Ranis (*Emeritus*), Mark Rosenzweig, Larry Samuelson, Herbert Scarf, T. Paul Schultz (*Emeritus*), Robert Shiller, Martin Shubik (*Emeritus*), Anthony Smith, T. N. Srinivasan, Alex Tsyvinski, Christopher Udry, Edward Vytlačil

Associate Professors Donato Gerardi, Justine Hastings

Assistant Professors Konstantinos Arkolakis, David Atkin, Irene Brambilla, Björn Bruegemann, Eduardo Faingold, Amanda Kowalski, Fabian Lange, Guillermo Ordonez, Taisuke Otsu, Kareen Rozen, Melissa Tartari, Ebonya Washington

Fields of Study

Fields include economic theory, including microeconomics, macroeconomics, mathematical economics; econometrics; economic history; labor economics; industrial organization; financial economics; behavioral finance; public economics; public finance; international trade; international finance; economic development; behavioral economics; law and economics.

Special Admissions Requirements

Please see www.econ.yale.edu/graduate/application_info.htm

Special Requirements for the Ph.D. Degree

The following requirements must be satisfied in addition to those prescribed by the Graduate School.

Prior to Registration for the Second Year. (a) Students must have taken for credit and passed at least six economics graduate courses. (b) Students must pass written

comprehensive examinations in micro- and macroeconomics. These examinations, which are given in May and late August of each year, must be taken in the spring term of the first year. Each exam will be graded separately, and in the event of failure, students will retake only the part of the exam they did not pass. Students may take the comprehensive examination no more than twice.

Prior to Registration for the Third Year. (a) Students must have taken at least fourteen term courses in Economics and have received a grade of at least Pass in each of them. With the permission of the director of graduate studies, courses in related fields and independent reading courses can be used to fulfill this requirement. Workshops may not be used to satisfy it. (b) Students must have received an average of at least High Pass in the courses they have taken. The admissibility of courses for this requirement is the same as for the fourteen-course requirement mentioned above. Grades within the Economics department include pluses and minuses. A failure counts as a zero, a P– as a 1, a P as a 2, a P+ as a 3, and so on up to a 9 for H+. The arithmetic average of these numbers must be at least 4.5.

Admission to Candidacy. Students must be admitted to candidacy prior to registration for the fourth year of study. Students are recommended to the Graduate School for admission to candidacy by the Department of Economics after having completed department requirements listed above, the Graduate School's prospectus requirement, and the following additional requirements: (a) Students must have completed two one-term prospectus workshops. In order for workshops to count toward the prospectus requirement, students must make a presentation in each workshop and present original work in one of them. If students can find no workshop whatsoever in their areas of interest, they may substitute independent study guided by a faculty member, provided the independent study leads to a dissertation prospectus that is accepted. (b) Students must receive a grade of High Pass– or better in ECON 551b (Econometrics II) or 552b (Econometrics III). More advanced courses may be substituted for these with special permission of the director of graduate studies. (c) Students must receive a grade of Satisfactory on an applied econometrics paper, which is evaluated by the faculty adviser of the paper and another faculty member. (d) Students must complete with a grade of at least High Pass– a term of economic history, drawn from a list of courses approved by the director of graduate studies and economic history instructors. (e) Students must pass an oral examination in two fields. At least one field must have substantial empirical and institutional content. The choice of fields must be approved by the director of graduate studies. In the event of failure, students may take the oral examination no more than twice.

Submitting the Dissertation. A student's dissertation research is guided by a committee of two Graduate School faculty members, at least one of whom must be a member of the Economics department. One of the committee members is designated as chair. When a first draft of the dissertation is completed, the director of graduate studies appoints a third reader.

Programs in Law and Economics

The Economics department participates in the J.D./M.A. and J.D./Ph.D. programs, which are described under Policies and Regulations.

Master's Degrees

M.Phil. The M.Phil. degree is awarded to students in the Ph.D. program upon completion of fourteen term courses, with at least two grades of Honors. In addition, students must satisfy the qualifying requirements in economic theory, econometrics, economic history, and two special fields, as well as the oral examination.

M.A. (en route to the Ph.D.) The M.A. degree is awarded upon completion of eight term courses with an average grade of High Pass, and satisfactory completion of one of the following: the comprehensive examination in economic theory, the course requirement in econometrics, or the course requirement in economic history.

The M.A. in International and Development Economics is described under International and Development Economics.

Program materials are available on our Web site: www.econ.yale.edu.

Courses

ECON 500a, General Economic Theory: Microeconomics Truman Bewley,
John Geanakoplos

Introduction to optimization methods and partial equilibrium. Theories of utility and consumer behavior production and firm behavior. Introduction to uncertainty and the economics of information, and to noncompetitive market structures.

ECON 501b, General Economic Theory: Microeconomics Dirk Bergemann,
Johannes Horner

General equilibrium and welfare economics. Allocation involving time. Public sector economics. Uncertainty and the economics of information. Introduction to social choice.

ECON 502a, Mathematics for Economists Donald Brown

This course covers mathematical methods important in economic theory, including Kuhn-Tucker theory, continuous time optimal control theory, dynamic programming, zero sum games, and repeated sum games.

ECON 510a, General Economic Theory: Macroeconomics Eduardo Engel,
Bjoern Bruegemann

Analysis of short-run determination of aggregate employment, income, prices, and interest rates in closed and open economies. Stabilization policies.

ECON 511b, General Economic Theory: Macroeconomics Giuseppe Moscarini,
Michael Golosov

Theories of saving, investment, portfolio choice, and financial markets. Longer-run developments; economic growth, capital accumulation, income distribution.

ECON 520a, Advanced Microeconomic Theory I Donato Gerardi, Joel Watson

A formal introduction to game theory and information economics. Alternative non-cooperative solution concepts are studied and applied to problems in oligopoly, bargaining, auctions, strategic social choice, and repeated games.

ECON 521b, Advanced Microeconomic Theory II Dirk Bergemann, Juuso Valimäki
Contracts and the economics of organization. Topics may include dynamic contracts (both explicit and implicit), career concerns, hierarchies, Bayesian mechanism design, renegotiation, and corporate control.

ECON 522a and 523b, Microeconomic Theory Lunch Staff

A forum for advanced students to examine critically recent papers in the literature and present their own work.

[**ECON 524a, Behavioral Applied Theory**]

ECON 525a, Advanced Macroeconomics I Guillermo Ordoñez and staff

Heterogeneous agent economics, investment, scrapping and firing, nonquadratic adjustment costs, financial constraints, financial intermediation, psychology of decision making under risk, optimal risk management, financial markets, consumption behavior, monetary policy, term structure of interest rates.

ECON 526b, Advanced Macroeconomics II Alex Tsyvinski, Michael Golosov

Macroeconomic equilibrium in the presence of uninsurable labor income risk. Implications for savings, asset prices, unemployment.

ECON 527a/LAW 20083, Behavioral and Institutional Economics Robert Shiller

Behavioral economics incorporates insights from other social sciences, such as psychology and sociology, into economic models, and attempts to explain anomalies that defy standard economic analysis. Institutional economics is the study of the evolution of economic organizations, laws, contracts, and customs as part of a historical and continuing process of economic development. Behavioral economics and institutional economics are naturally treated together, since so much of the logic and design of economic institutions has to do with complexities of human behavior. The course emphasizes two main topics—behavioral macroeconomics and behavioral finance—though references are made to other branches of economics as well. Because macroeconomics is a major part of this course, it is part of the graduate macroeconomics sequence (including also ECON 510a, 511b, 525a, and 526b). However, this course does not list these other courses as requirements.

ECON 530a, Mathematical Economics I Herakles Polemarchakis

This is a first course in general equilibrium analysis of market economies. The focus of the course is Walrasian competition, monopolistic competition, and competition in markets with affective agents, i.e., affective competition. Topics include testable implications of these models, counterfactual analysis, and algorithms for solving calibrated models. The mathematical framework is Tame Topology and O-minimal Structures, where the Tarski-Seidenberg Theorem on Quantifier Elimination and Laskowski's Theorem on the VC-Dimension of Definable Sets are the basis of our analysis.

ECON 531a/b, Mathematical Economics II John Geanakoplos

This course examines the foundations of money and finance from the perspective of general equilibrium with incomplete markets. The relevant mathematical tools from elementary stochastic processes to differential topology are developed in the course. Topics

include asset pricing, variations of capital asset pricing model, the “Hahn paradox” on the value of fiat money, default and bankruptcy, collateral equilibrium, market crashes, adverse selection and moral hazard with perfect competition, credit card equilibrium, and general equilibrium with asymmetric information.

[ECON 535a and b, Prospectus Workshop in Mathematical Economics]

ECON 537a and 538b, Microeconomic Theory Workshop Staff

Presentations by research scholars and participating students.

ECON 540a and 541b, Student Workshop in Macroeconomics Staff

A course that gives third- and fourth-year students doing research in macroeconomics an opportunity to prepare their prospectuses and to present their dissertation work. Each student is required to make at least two presentations per term. For third-year students and beyond, at least one of the presentations in the first term should be a mock job talk.

ECON 542a and 543b, Macroeconomics Workshop Staff

A forum for presentation and discussion of state-of-the-art research in macroeconomics. Presentations by research scholars and participating students of papers in closed economy and open economy macroeconomics and monetary economics.

ECON 544a/INRL 560a, Economic Analysis Cheryl Doss

An introduction for International Relations students to more advanced concepts of micro- and macroeconomic analysis in an applied context. Different economies in different stages of development are used as illustrations of these concepts. Areas covered include employment, income, and interest rate determination as well as theories of consumption, investment, pricing, money, and production. MW 9–10:15

ECON 545a, Microeconomics Michael Boozer

A survey of the main features of current economic analysis and of the application of the theory to a number of important economic questions, covering microeconomics and demand theory, the theory of the firm, and market structures. For IDE students.

ECON 546a, Macroeconomics Irasema Alonso

This course presents a basic framework to understand macroeconomic behavior and the effects of macroeconomic policies. Topics include consumption and investment, labor market, short-run income determinations, unemployment, inflation, growth, and the effects of monetary and fiscal policies. The emphasis is on the relation between the underlying assumptions of macroeconomic framework and policy implications derived from it. For IDE students.

ECON 550a, Econometrics I Donald Andrews

Probability: concepts and axiomatic development. Data: tools of descriptive statistics and data reduction. Random variables and probability distributions; univariate distributions (continuous and discrete); multivariate distributions; functions of random variables and transformations; the notion of statistical inference; sampling concepts and distributions; asymptotic theory; point and interval estimation; hypothesis testing.

ECON 551b, Econometrics II Taisuke Otsu

Provides a basic knowledge of econometric theory, and an ability to carry out empirical work in economics. Topics include linear regression and extensions, including regression diagnostics, generalized least squares, statistical inference, dynamic models, instrumental variables and maximum likelihood procedures, simultaneous equations, nonlinear and qualitative-choice models. Examples from cross-section, time series, and panel data applications.

ECON 552b, Econometrics III Donald Andrews, Yuichi Kitamura

The treatment of the subject is rigorous, attentive to modern developments, and proceeds to research level in several areas. Linear models from core curriculum. Topics include linear estimation theory, multiple and multivariate regressions, Kruskal's theorem and its applications, classical statistical testing by likelihood ratio, Lagrange multiplier and Wald procedures, bootstrap methods, specification tests, Stein-like estimation, instrumental variables, and an introduction to inferential methods in simultaneous stochastic equations.

ECON 553a, Econometrics IV: Time Series Econometrics Peter Phillips

A sequel to ECON 552, the course proceeds to research level in time series econometrics. Topics include an introduction to ergodic theory, Wold decomposition, spectral theory, martingales, martingale convergence theory, mixing processes, strong laws, and central limit theory for weak dependent sequences with applications to econometric models and model determination.

ECON 554b, Econometrics V Donald Andrews, Yuichi Kitamura

The first half of this course is about nonlinear parametric models. Specification, estimation, and testing within the Likelihood and Generalized Method of Moments frameworks. First-order asymptotics for both smooth and non-smooth objective functions. Efficiency and robustness. A short account of high-order asymptotics for smooth problems. The second part is on nonparametric and semiparametric methods. Nonparametric estimation by kernels, series, splines, and other methods. Bias reduction and bandwidth selection. The course of dimensionality and additive models. Specification and estimation of semiparametric models. U-statistics and asymptotic properties. Efficiency and adaptation.

ECON 555b, Applied Econometrics II: Microeconometrics Edward Vytlačil

This course develops the concepts needed to approach empirical problems in microeconomics with econometrics. The focus is less on developing a catalogue of econometric methods than on developing a conceptual basis for understanding how data, econometric methodology, and assumptions combine to produce statistical inference.

ECON 558a, Econometrics Michael Booser

Application of statistical analysis to economic data. Basic probability theory, linear regression, specification and estimation of economic models, time series analysis, and forecasting. The computer is used. For IDE students.

ECON 561a, Computational Method for Economic Dynamics Tony Smith

[ECON 563a/CPSC 555a, Economics and Computation]**ECON 567a and 568b, Econometrics Workshop** Staff

A forum for state-of-the-art research in econometrics. Its primary purpose is to disseminate the results and the technical machinery of ongoing research in theoretical and applied fields.

ECON 570a and 571b, Prospectus Workshop in Econometrics Staff

A course for third- and fourth-year students doing research in econometrics to prepare their prospectus and present dissertation work.

ECON 580a, General Economic History: Western Europe Timothy Guinnane

A survey of some major events and issues in the economic development of Western Europe during the eighteenth and nineteenth centuries, stressing the causes, nature, and consequences of the industrial revolution in Britain and on the Continent, and the implications of the historical record for modern conceptions of economic growth. Prerequisites: simultaneous enrollment in or successful completion of ECON 500a and ECON 510a; permission of the instructor.

ECON 581b, American Economic History Ben Chabot

This course examines both the long-term factors (such as industrialization and the development of markets) and the epochal events (such as the Revolution, Civil War, and Great Depression) that have shaped the development of the American economy. The objectives of this course are to familiarize students with the major topics and debates in American economic history.

[ECON 582a, General Economic History: Latin America]**[ECON 583a, Topics in Economic History]****[ECON 585b, Readings in Economic History]****ECON 588a and 589b, Economic History Workshop** Staff

A forum for discussion and criticism of research in progress. Presenters include graduate students, Yale faculty, and visitors. Topics concerned with long-run trends in economic organization are suitable for the seminar. Special emphasis given to the use of statistics and of economic theory in historical research.

ECON 600a, Industrial Organization I Steven Berry, Lanier Bankard

Begins by locating the study of industrial organization within the broader research traditions of economics and related social sciences. Alternative theories of decision making, of organizational behavior, and of market evolution are sketched and contrasted with standard neoclassical theories. Detailed examination of the determinants and consequences of industrial market structure.

ECON 601b, Industrial Organization II Justine Hastings, Philip Haile

Examination of alternative modes of public control of economic sectors with primary emphasis on antitrust and public utility regulation in the U.S. economy. Public policy issues in sectors of major detailed governmental involvement.

ECON 606a and 607b, Prospectus Workshop in Industrial Organization Staff

For third-year students in microeconomics, intended to guide students in the early stages of theoretical and empirical dissertation research. Emphasis on regular writing assignments and oral presentations.

ECON 608a and 609b, Industrial Organization Seminar Staff

For advanced graduate students in applied microeconomics, serving as a forum for presentation and discussion of work in progress of students, Yale faculty members, and invited speakers.

ECON 630a, Labor Economics Fabian Lange

Topics include static and dynamic approaches to demand, human capital and wage determination, wage income inequality, unemployment and minimum wages, matching and job turnover, immigration and international trade, unions, implicit contract theory, and efficiency wage hypothesis.

ECON 631b, Labor Economics Joseph Altonji and staff

Topics include static and dynamic models of labor supply, human capital wage function estimation, firm-specific training, compensating wage differentials, discrimination, household production, bargaining models of household behavior, intergenerational transfers, and mobility.

ECON 638a and 639b, Labor and Population Workshop Staff

A forum primarily for graduate students to present their research plans and findings. Discussions encompass empirical microeconomic research relating to both high- and low-income countries.

ECON 640a/b, Prospectus Workshop in Labor Economics and Public Finance Staff

Workshop for students doing research in labor economics and public finance.

ECON 670a/MGMT 740a, Financial Economics I Zhiwu Chen

Current issues in theoretical financial economics are addressed through the study of current papers. Focuses on the development of the problem-solving skills essential for research in this area. T 2:30–5:20

ECON 671b/MGMT 741b, Financial Economics II Jonathan Ingersoll

Current issues in theoretical financial economics are addressed through the study of current papers. Focuses on the development of the problem-solving skills essential for research in this area.

ECON 672a, Behavioral Finance Nicholas Barberis

Much of modern financial economics works with models in which agents are rational, in that they maximize expected utility and use Bayes's law to update their beliefs. Behavioral finance is a large and active field that studies models in which some agents are less than fully rational. Such models have two building blocks: limits to arbitrage, which make it difficult for rational traders to undo the dislocations caused by less rational traders; and psychology, which catalogues the kinds of deviations from full rationality we might expect to see. We discuss these two topics, and then consider a number of applications: asset pricing (the aggregate stock market and the cross-section of average returns); individual

trading behavior; and corporate finance (security issuance, corporate investment, and mergers). This is a research-oriented course aimed at Ph.D. students. Undergraduate students with outstanding academic records and prior experience of graduate courses may register with the instructor's permission. Grades are based on a small number of referee reports and a final exam.

ECON 680a, Public Finance I Justine Hastings, Amanda Kowalski

ECON 681b, Public Finance II Alex Tsyvinski

Topics include theory of public goods, an introduction to preference revelation, the problem of externalities and their control, and the methodology of cost-benefit analysis and some applications.

ECON 702b, International Economics Andrea Bubula

International monetary theory and its implications for economic policy. Topics include mechanisms of adjustment in the balance of payments; fiscal, monetary, and exchange rate policy for internal and external balance; international movements of capital. For IDE students.

[ECON 709a, International Economics and Open Economy Macroeconomics]

ECON 720a, International Trade I Giovanni Maggi

This course covers the theory of international trade, policy, and institutions. Discussion of Classical, Neo-classical, and more recent imperfect-Competition-Scale-Economies-based static models of trade. The course presents dynamic extensions of some of the models that explore the relations among trade, innovation, and growth. The analytics of trade policy issues, such as gains from trade, tariffs and quotas, customs unions and free trade areas, and the political economy of trade policy making, are discussed.

[ECON 721b, International Trade II]

[ECON 724b, International Finance]

ECON 730a, Economic Development I Christopher Udry, T. N. Srinivasan

Development theory at both aggregate and sectoral levels; analysis of growth, employment, poverty, and distribution of income in both closed and open developing economy contexts.

ECON 731b, Economic Development II Dean Karlan, Mark Rosenzweig

Analysis of development experiences since World War II. Planning and policy making across countries and time. Models of development, growth, foreign trade, and investment. Trade, capital, and technology flows and increasing interdependence. The political economy of policy making and policy reform.

ECON 732b, Economic Development IDE Michael Booser

Examines the models of classical and modern economists to explain the transition of developing economies into modern economic growth, as well as their relevance to income distribution, poverty alleviation, and human development. For IDE students.

[ECON 735b^U, Economics of Agriculture]

[ECON 736a^U, Economics of Technology]**ECON 737a^U, Economics of Natural Resources** Robert Mendelsohn

Linking of abstract economic concepts to concrete policy and management decisions. Application of theoretical tools of economics to global warming, pollution control, fisheries, forestry, recreation, and mining.

ECON 738a or b, Workshop on Environmental and Natural Resources

William Nordhaus, Robert Mendelsohn

ECON 749a and 750b, Trade and Development Workshop Staff

A forum for graduate students and faculty with an interest in the economic problems of developing countries. Faculty, students, and a limited number of outside speakers discuss research in progress.

ECON 756a/b, Prospectus Workshop in Development Staff

Workshop for students doing research in development to present and discuss work.

[ECON 776b^U, Economics of Population]**[ECON 788a/PLSC 575a, Political Competition]****ECON 790b/PLSC 725b, Political Economy** Ebonya Washington

Political competition in democracies is party competition. We develop, from the formal viewpoint, theories of party competition in democracies. We develop a theory in which parties (1) compete over several issues, not just one issue as in A. Downs; (2) are uncertain about how citizens respond to platforms; and (3) represent interest groups in the population. Applications, particularly to the theory of income distribution and tax.

HTBA

ECON 792b/PLSC 721b, Political Economy of Institutions and Development

Alexandre Debs

How do political institutions affect economic outcomes? How do economic conditions determine political institutions? This course reviews recent advances in the emerging field of the political economy of institutions and development, with a focus on formal modeling and quantitative studies. We start with an introduction to the importance of institutions in affecting economic performance. Second, we review some basic models of democratic politics, focusing on the impact of economic conditions (such as inequality) on political outcomes. Third, we cover major theories of democratization, for example studying the effect of income and inequality on institutional change. Fourth, we study basic models of dictatorships, looking at the effect of nondemocratic institutions on growth and international conflict. Finally, we take a critical look at the role of institutions and consider the possibility of policy persistence despite institutional change.

F 9:25–11:15

ECON 899a or b, Individual Reading and Research

By arrangement with faculty.

ELECTRICAL ENGINEERING

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Chair

A. Stephen Morse

Director of Graduate Studies

Jung Han

Professors Richard Barker (*Emeritus*), James Duncan, Jung Han, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), J. Rimas Vaisnys, Jerry Woodall (*Adjunct*)

Associate Professors Hür Köser, Richard Lethin (*Adjunct*), Yiorgos Makris, Andreas Savvides, Lawrence Staib, Hemant Tagare, Sekhar Tatikonda, Yang Richard Yang, Edmund Yeh

Assistant Professors Eugenio Culurciello, Hongxing Tang

FIELDS OF STUDY

Fields include control systems, neural networks, communications and signal processing, wireless networks, image sensors, sensor networks, biomedical sensory systems, micro-electronic materials and semiconductor devices, nanoelectronic science and technology, optoelectronic materials and devices, microelectromechanical systems (MEMS), computer engineering, and VLSI design and testing.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

ENGINEERING & APPLIED SCIENCE

Dunham Laboratory, 432.4250

www.seas.yale.edu/

M.S., M.Phil., Ph.D.

Dean

T. Kyle Vanderlick

Deputy Dean

Bruce Carmichael

Associate Dean for Educational Affairs

Roman Kuc

Programs of study are offered in the areas of applied mechanics and mechanical engineering, applied physics, chemical engineering, electrical engineering, biomedical engineering, and environmental engineering. All programs are under the School of Engineering & Applied Science.

Applied Physics

Chair

A. Douglas Stone

Director of Graduate Studies

Robert Grober

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*), Karyn Le Hur, Marshall Long, Tso-Ping Ma, Daniel Prober, Nicholas Read, Mark Reed, Robert Schoelkopf, Ramamurti Shankar, Mitchell Smooke, A. Douglas Stone, John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*)

Associate Professor Sohrab Ismail-Beigi

FIELDS OF STUDY

Fields include areas of theoretical and experimental condensed-matter and materials physics, optical and laser physics, quantum engineering, and nanoscale science. Specific programs include surface and interface science, first principles electronic structure methods, photonic materials and devices, complex oxides, magnetic and superconducting artificially engineered systems, quantum computing and superconducting device research, quantum transport and nanotube physics, quantum optics, and random lasers.

Biomedical Engineering

Chair

Mark Saltzman

Director of Graduate Studies

Richard Carson

Professors Richard Carson, James Duncan, Douglas Rothman, Mark Saltzman, Fred Sigworth, Steven Zucker (*Computer Science*)

Associate Professors Todd Constable, Fahmeed Hyder, Erin Lavik, Laura Niklason, Lawrence Staib, Hemant Tagare

Assistant Professors Robin de Graaf, Tarek Fahmy, Themis Kyriakides, Mark Laubach, Michael Levene, Xenios Papademetris, Erik Shapiro

FIELDS OF STUDY

Fields include the physics of image formation (MRI, ultrasound, nuclear medicine, and X-ray), NMR spectroscopy, PET and modeling, digital image analysis and processing, computer vision, biological signals and sensors, biomechanics, physiology and human factors engineering, drug delivery, biotechnology, biomechanics of the spine, and tissue engineering.

Chemical Engineering

Chair

Menachem Elimelech

Director of Graduate Studies

Gary Haller

Professors Eric Altman, Menachem Elimelech, Abbas Firoozabadi (*Adjunct*), Thomas Graedel, Gary Haller, Michael Loewenberg, Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, Mark Saltzman, T. Kyle Vanderlick, Paul Van Tassel, Kurt Zilm

Associate Professors Yehia Khalil (*Adjunct*), William Mitch, Jordan Peccia

Assistant Professors Eric Dufresne, Tarek Fahmy, Jodie Lutkenhaus, Chinedum Osuji, Andre Taylor, Corey Wilson, Julie Zimmerman

FIELDS OF STUDY

Fields include separation processes, catalysis, combustion, statistical mechanics of adsorption, high-temperature chemical reaction engineering, colloids and complex fluids, nanotechnology, convective heat and mass transfer, biomolecular engineering, biotechnology, molecular beams, aerosol science and technology, materials processing, surface science, and environmental engineering.

Electrical Engineering

Chair

A. Stephen Morse

Director of Graduate Studies

Jung Han

Professors Richard Barker (*Emeritus*), James Duncan, Jung Han, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), J. Rimvas Vaisnys, Jerry Woodall (*Adjunct*)

Associate Professors Hür Köser, Richard Lethin (*Adjunct*), Yiorgos Makris, Andreas Savvides, Lawrence Staib, Hemant Tagare, Sekhar Tatikonda, Yang Richard Yang, Edmund Yeh

Assistant Professors Eugenio Culurciello, Hongxing Tang

FIELDS OF STUDY

Fields include control systems, neural networks, communications and signal processing, wireless networks, image sensors, sensor networks, biomedical sensory systems, micro-electronic materials and semiconductor devices, nanoelectronic science and technology, optoelectronic materials and devices, microelectromechanical systems (MEMS), computer engineering, and VLSI design and testing.

Environmental Engineering

Professors Gaboury Benoit, Stephen Edberg, Menachem Elimelech, Thomas Graedel, Edward Kaplan, Joseph Pignatello (*Adjunct*), James Saiers

Associate Professors Michelle Bell, Ruth Blake, Yehia Khalil (*Adjunct*), William Mitch, Jordan Peccia

Assistant Professor Julie Zimmerman

Lecturer James Wallis

FIELDS OF STUDY

Fields include aquatic and environmental chemistry, physical and chemical processes for water quality control, transport and fate of pollutants in the environment, environmental nanotechnology, green engineering, environmental engineering microbiology, environmental molecular biology, bioaerosols, water reuse, disinfection by-product formation, emerging contaminants, membrane separations for water quality control, industrial ecology, and chemical reactions at the mineral-water interface.

Mechanical Engineering

Chair

Mitchell Smooke

Director of Graduate Studies

Alessandro Gomez

Professors David Bercovici, Ira Bernstein (*Emeritus*), Boa-Teh Chu (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, Robert Gordon, Shun-Ichiro Karato, Amable Liñan-Martinez (*Adjunct*), Marshall Long, Daniel Rosner, Ronald Smith, Mitchell Smooke, Forman Williams (*Adjunct*)

Associate Professors Jerzy Bławdziewicz, Corey O'Hern, Ainissa Ramirez, Jan Schroers, Udo Schwarz

Assistant Professors Aaron Dollar, Eric Dufresne, John Morrell, Nicholas Ouellette, Hong Tang

Lecturers Beth Anne Bennett, Arthur McClung, Kailasnath Purushothaman

FIELDS OF STUDY

Fluids and thermal sciences Dynamics and stability of drops and bubbles; dynamics of thin liquid films; macroscopic and particle-scale dynamics of emulsions, foams, and colloidal suspensions; electrospray theory and characterization; electrical propulsion applications; combustion and flames; computational methods for fluid dynamics and reacting flows; turbulence; particle tracking in fluid mechanics; laser diagnostics of reacting and nonreacting flows.

Soft matter/complex fluids Jamming and slow dynamics in gels, glasses, and granular materials; mechanical properties of soft and biological materials; dynamics of macromolecules. Several faculty in Mechanical Engineering are also affiliated with the Integrated Graduate Program in Physical and Engineering Biology (<http://www.peb.yale.edu>).

Material science Characterization of crystallization and other phase transformations; studies of thin films; MEMS; smart materials such as shape memory alloys, amorphous metals, and nanomaterials including nanocomposites; NEMS; nano-imprinting; classical and quantum optomechanics; atomic-scale investigations of surface interactions and properties; classical and quantum nanomechanics; and nanotribology.

Robotics/mechatronics Machine and mechanism design; dynamics and control; robotic grasping and manipulation; human-machine interface; rehabilitation robotics; haptics; electromechanical energy conversion; biomechanics of human movement; human-powered vehicles.

Integrated Graduate Program in Physical and Engineering Biology (IGPPEB)

The Yale IGPPEB program brings together faculty drawn mainly from four member areas (MB&B, MCDB, Physics, and Engineering). All faculty involved recognize the importance of interdisciplinary research at the interface of the biological and physical sciences, and have recently developed interdisciplinary research collaborations among IGPPEB colleagues. Core courses for Engineering students in this Ph.D. program are listed in the core course list below for each participating department.

Special Requirements for the Ph.D. Degree

A pamphlet titled *Qualification Procedure for the Ph.D. Degree in Engineering & Applied Science* describes the requirements in detail. The student is strongly encouraged to read it carefully. Here, key requirements are briefly summarized.

The student plans his/her course of study in consultation with faculty advisers (the student's advisory committee). A minimum of ten term courses is required, to be completed in the first two years. (Students registered in Applied Physics must take a minimum of twelve term courses.) Well-prepared students may petition for course waivers based on courses taken in a previous graduate degree program. Similarly, students may place out of certain ENAS courses via an examination prepared by the course instructor. Placing out of the course will not reduce the total number of required courses. Core courses, as identified by each department/program, should be taken in the first year unless otherwise noted by the department. With the permission of the departmental director of graduate studies, students may substitute more advanced courses that cover

the same topics. No more than two courses can be Special Investigations, and at least two must be outside the area of the dissertation.

Each term, the faculty review the overall performance of the student and report their findings to the director of graduate studies who, in consultation with the associate dean, determines whether the student may continue toward the Ph.D. degree. By the end of the second term, it is expected that a faculty member has agreed to accept the student as a research assistant. By October 5 of the third year, an area examination must be passed and a written prospectus submitted before dissertation research is begun. These events result in the student's admission to candidacy. Subsequently, the student will report orally each year to the full advisory committee on progress. When the research is nearing completion, but before the thesis writing has commenced, the full advisory committee will advise the student on the thesis plan. A final oral presentation of the dissertation research is required to be given during term time. There is no foreign language requirement.

Teaching experience is regarded as an integral part of the graduate training program at Yale University, and all Engineering graduate students are required to serve as a Teaching Fellow for one term, typically during year two. Teaching duties normally involve assisting in laboratories or discussion sections and grading papers and are not expected to require more than ten hours per week. Students are not permitted to teach during the first year of study.

Core Course Requirements for the Ph.D. Degree

The core courses for each department and program are as follows:

Applied Physics Solid State Physics I (ENAS 850) and II (ENAS 851), Quantum Mechanics I (PHYS 508) and II (PHYS 608), Electromagnetic Theory I (PHYS 502), Statistical Physics I (PHYS 512). Two of these courses may be taken in the second year. In addition, there is a math requirement which must be met by taking Mathematical Methods I (ENAS 500) or Mathematical Methods of Physics (PHYS 506) in the first year. Students in the IGPPEB program must also take Methods and Logic in Interdisciplinary Research (ENAS 517), Biological Physics (ENAS 541), Biology Boot Camp (MB&B 520), Integrated Workshop (ENAS 991), and Systems Modeling in Biology (MCDB 561).

Biomedical Engineering Physiological Systems (ENAS 550), Physical and Chemical Basis of Biosensing (ENAS 510). One of these courses may be taken in the second year. In addition, there is a math requirement which must be met by taking Mathematical Methods I (ENAS 500) or Advanced Engineering Mathematics (ENAS 505) in the first year.

Chemical Engineering Classical and Statistical Thermodynamics (ENAS 521), Energy, Mass, and Momentum Processes (ENAS 603), Chemical Reaction Engineering (ENAS 602). In addition, there is a math requirement which must be met by taking Mathematical Methods I (ENAS 500) or Advanced Engineering Mathematics (ENAS 505) in the first year. Students in the IGPPEB program must also take Methods and Logic in Interdisciplinary Research (ENAS 517), Biological Physics (ENAS 541), Biology Boot Camp (MB&B 520), Integrated Workshop (ENAS 991) and Systems Modeling in Biology (MCDB 561).

Environmental Engineering Aquatic Chemistry (ENAS 640), Biological Processes in Environmental Engineering (ENAS 641), Environmental Physicochemical Processes (ENAS 642). In addition, there is a math requirement which must be met by taking one of the following courses in the first year: Mathematical Methods I (ENAS 500), Advanced Engineering Mathematics (ENAS 505), Applied Spatial Statistics (F&ES 77107), Multivariate Statistical Analysis in the Environmental Sciences (F&ES 77113), or Multivariate Statistics for Social Sciences (STAT 660).

Electrical Engineering (Microelectronics track) Solid State Physics I (ENAS 850), Semiconductor Silicon Devices and Technology (ENAS 986).

Electrical Engineering (System and Signals track) Linear Systems (ENAS 902), Stochastic Processes (ENAS 502).

Electrical Engineering (Computer Engineering track) Introduction to VLSI System Design (ENAS 875), Advanced Topics in Computer Engineering (ENAS 921).

Mechanical Engineering Students must demonstrate competence in one of four areas: Fluid and Thermal Sciences, Soft Matter/Complex Fluids, Materials Science, or Robotics/Mechatronics. Core courses for these areas are specified in the *Qualification Procedure*. Some of the core courses may be taken in the second year. In addition, there is a math requirement which must be met by taking Mathematical Methods I (ENAS 500), Mathematical Methods of Physics (PHYS 506), or Linear Systems (ENAS 902), depending on the research area. Some research areas will also require Mathematical Methods II (ENAS 501). Students in the IGPPEB program must also take Methods and Logic in Interdisciplinary Research (ENAS 517), Biological Physics (ENAS 541), Biology Boot Camp (MB&B 520), Integrated Workshop (ENAS 991), and Systems Modeling in Biology (MCDB 561).

Honors Requirement

Students must meet the Graduate School's Honors requirement in at least two term courses (excluding Special Investigations) by the end of the second term of full-time study. An extension of one term may be granted at the discretion of the DGS.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.S. (en route to the Ph.D.) To qualify for the M.S., the student must pass eight term courses; no more than two may be Special Investigations. An average grade of at least High Pass is required, with at least one grade of Honors.

Master's Degree Program Students may also be admitted directly to a terminal master's degree program. The requirements are the same as for the M.S. en route to the Ph.D., although there are no core course requirements for students in this program. This program is normally completed in one year, but a part-time program may be spread over as many as four years. Some courses are available in the evening, to suit the needs of students from local industry.

Program materials are available upon request to the Office of Graduate Studies, School of Engineering and Applied Science, Yale University, PO Box 208267, New Haven CT 06520-8267; e-mail, engineering@yale.edu; Web site, www.seas.yale.edu/.

Courses

The list of courses may be slightly modified by the time term begins. Please check the Web site <http://www.seas.yale.edu/departments-graduate-courses.php> for the most updated course listing.

ENAS 500a, Mathematical Methods I Robert Grober

Vector analysis in three dimensions (2 weeks), linear algebra (4 weeks), functions of a complex variable (4 weeks), topics at the discretion of the instructor (3 weeks), e.g., (1) specific examples to reinforce the material already presented and (2) new topics (to choose among: Fourier series in one and more dimensions, Laplace transformations, Fourier integrals in one and more dimensions, optimization, elements of ODE).

TTH 2:30–3:45

ENAS 501b, Mathematical Methods II Jerzy Blawdziewicz

Special functions, the Laplace transformations, Fourier series, Fourier integrals, and partial differential equations including separation of variables, methods of characteristics, variational techniques, and a brief discussion of numerical methods. TTH 1–2:15

ENAS 502b^u, Stochastic Processes Sekhar Tatikonda

Elements of set and measure theory. Probability distributions, moments, characteristic functions. The central limit theorem. Basic properties of random processes. Stationarity and ergodicity. Correlation functions and power spectra. Linear and nonlinear operations on random processes. MW 9–10:15

ENAS 503a/AMTH 605a/STAT 667a, Probabilistic Networks, Algorithms, and

Applications Sekhar Tatikonda

This course examines probabilistic and computational methods for the statistical modeling of complex data. The emphasis is on the unifying framework provided by graphical models, a formalism that merges aspects of graph theory and probability theory. Graphical models: Markov random fields, Bayesian networks, and factor graphs. Algorithms: filtering, smoothing, belief-propagation, sum-product, and junction tree. Variational techniques: mean-field and convex relaxations. Markov processes on graphs: MCMC, factored HMMs, and Glauber dynamics. Some statistical physics techniques: cavity and replica methods. Applications to error-correcting codes, computer vision, bio-informatics, and combinatorial optimization.

ENAS 505a, Advanced Engineering Mathematics Michael Loewenberg

A beginning graduate-level introduction is given to ordinary and partial differential equations, vector and tensor analysis, and linear algebra. Laplace transform, series expansion, Fourier transform, and matrix methods are given particular attention. Applications to problems frequently encountered by chemical, biomedical, and environmental engineers are stressed throughout. MW 2:30–3:45

ENAS 506a^U, Basic Quantum Mechanics Robert Schoelkopf

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. TTH 2:30–3:45

ENAS 509b^U, Electronic Materials: Fundamentals and Applications Minjoo Lee

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. MW 11:35–12:50

ENAS 510a^U, Physical and Chemical Basis of Bioimaging and Biosensing

Douglas Rothman, Fred Sigworth, Richard Carson

Basic principles and technologies for imaging and sensing the chemical, electrical, and structural properties of living tissues and biological macromolecules. Topics include magnetic resonance spectroscopy, MRI, positron emission tomography, and fluorescent probes. TTH 1–2:15

[ENAS 511b^U, Physics and Devices of Optical Communication]**ENAS 513a^U, Introduction to Analysis** Staff

Foundations of real analysis, including metric spaces and point set topology, infinite series, and function spaces. TTH 1–2:15

ENAS 514b^U, Real Analysis Philip Gressman

The Lebesgue integral, Fourier series, applications to differential equations. TTH 1–2:15

ENAS 517a/MB&B 517a2/PHYS 517a2, Methods and Logic in Interdisciplinary

Research Eric Dufresne, Enrique de la Cruz, Thierry Emonet, Paul Forscher, Christine Jacobs-Wagner, Michael Levene, Simon Mochrie, Corey O'Hern, Lynne Regan, Elizabeth Rhoades, Corey Wilson

This half-term IGPPEB class is intended to introduce students to integrated approaches to research. Each session is led by faculty with complementary expertise and discusses papers that use different approaches to the same topic (for example, physical and biological or experiment and theory). Counts as 0.5 credit toward MB&B graduate course requirements. TH 7–8:50

ENAS 518a/MB&B 635a^U, Mathematical Methods in Biophysics Yong Xiong,

Elizabeth Rhoades, Corey O'Hern

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. It is a prerequisite for subsequent IGPPEB classes. Prerequisites for this course: MATH 120a or b and MB&B 300a or equivalents, or permission of instructors. MWF 10:30–11:20

ENAS 521a, Classical and Statistical Thermodynamics Abbas Firoozabadi

A unified approach to bulk-phase equilibrium thermodynamics, bulk-phase irreversible thermodynamics, and interfacial thermodynamics in the framework of classical

thermodynamics, and an introduction to statistical thermodynamics. Both the activity coefficient and the equations of state are used in the description of bulk phases. Emphasis on classical thermodynamics of multicomponents, including concepts of stability and criticality, curvature effect, and gravity effect. The choice of Gibbs free energy function covers applications to a broad range of problems in chemical, environmental, biomedical, and petroleum engineering. The introduction includes theory of Gibbs canonical ensembles and the partition functions, fluctuations, and Boltzmann's statistics, Fermi-Dirac and Bose-Einstein statistics. Application to ideal monatomic and diatomic gases is covered. MW 9–10:15

ENAS 525a^U, Optimization I Eric Denardo

Focus on linear programming, a resource-allocation method widely used by engineers, managers, economists, and social scientists. The theory of linear programming (the simplex method, sensitivity analysis, prices, duality, and geometry) is coupled with a survey of its principal uses. TTH 1–2:15

ENAS 530a, Optimization Techniques A. Stephen Morse

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. MW 2:30–3:45

ENAS 534a, Biomaterials Erin Lavik

Introduction to materials, classes of materials from atomic structure to physical properties. Major classes of materials: metals, ceramics and glasses, and polymers, addressing their specific characteristics, properties, and biological applications. Throughout the presentation of the synthesis, characterization, and properties of the classes of materials, a connection is made to the selection of materials for use in specific biological applications by matching the material's properties to those necessary for success in the application. Case studies address the successes and failures of particular materials from each of the classes in biological applications. TTH 9–10:15

ENAS 535b, Tissue/Biomaterial Interactions Themis Kyriakides

The course addresses 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. In addition, specific areas such as biomaterials for tissue engineering and the importance of stem/progenitor cells, and biomaterial-mediated gene and drug delivery are addressed. HTBA

ENAS 541a/MB&B 523a/PHYS 523a, Biological Physics Simon Mochrie

An introduction to the physics of biological systems, including molecular motors, protein folding, membrane self-assembly, ion pumping, and bacterial locomotion. Background concepts in probability and statistical mechanics are introduced as necessary, as well as key constituents of living cells. Required for students in IGPPEB. TTH 2:30–3:45

ENAS 549b, Biomedical Data Analysis Richard Carson

This course focuses on the analysis of biological and medical data associated with applications of biomedical engineering. It provides basics of probability and statistics, and analytical approaches for determination of quantitative biological parameters from noisy,

experimental data. Programming in Matlab to achieve these goals is a major portion of the course. Applications include Michaelis-Menten enzyme kinetics, Hodgkin Huxley, neuroreceptor assays, receptor occupancy, MR spectroscopy, PET neuroimaging, brain image segmentation and reconstruction, and molecular diffusion. MWF 9:25–10:15

ENAS 550a^U/C&MP 550a^U/MCDB 550a^U, Physiological Systems Emile Boulpaep,
W. Mark Saltzman

Regulation and control in biological systems, emphasizing human physiology and principles of feedback. The physiology of membranes and membrane transport systems is discussed. The cellular and molecular principles of organ and tissue physiology are explained by coverage of major human physiological systems including renal, cardiovascular, respiratory, endocrine, digestive, and nervous systems. MWF 9:25–10:15

ENAS 551a^U, Biomedical Engineering I: Quantitative Physiology Tarek Fahmy

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. The lectures in the course are coordinated with the sequence of lectures in ENAS 550a to illustrate how engineering analysis can be used to understand physiological processes. In addition, the course presents elements of pharmacokinetics, heat and mass transfer in physiological systems, hemodialysis, drug delivery, and tissue engineering. TTH 11:35–12:50

ENAS 553b, Immuno-Engineering Tarek Fahmy

This course focuses on the applications of engineering techniques and methods to the study of immunology and immunological problems. The course introduces the fundamentals of immunity, followed by examples of how quantitative analysis and biomaterial intervention have helped us shape our understanding of how the immune system works and how to repair its defects. The course is a mixture of lectures and weekly readings. TTH 2:30–3:45

ENAS 557b^U, Biomechanics Staff

An introduction to the application of mechanical engineering principles to biological materials and systems. Topics include ligaments, tendons, bones, muscles; joints, gait analysis; exercise physiology. The basic concepts are directed toward an understanding of the science of orthopaedic surgery and sports medicine. TTH 2:30–3:45

[ENAS 560a, Measurement and Noise]

[ENAS 562b^U, Digital Systems Testing and Design for Testability]

ENAS 563b^U, Fault Tolerant Computer Systems Staff

This course provides an in-depth overview of the theory and practice of fault tolerant systems. Sources of defects as well as hardware and software fault tolerance techniques to mitigate their effects are reviewed. Case studies are used to demonstrate the practical applications of the theory presented in the lectures. T 1:30–3:20

ENAS 564b^U, Tissue Engineering Erin Lavik

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.
MW 9:25–10:15, W 2:30–4:20

ENAS 570b^U/C&MP 560b^U/MCDB 560b^U, Cellular and Molecular Physiology:

Molecular Machines in Human Disease Michael Caplan, Emile Boulpaep,

Mark Mooseker, Fred Sigworth

This course focuses on understanding the processes that transfer molecules across membranes at the cellular, molecular, biophysical, and physiological levels. Students learn about the different classes of molecular machines that mediate membrane transport, generate electrical currents, or perform mechanical displacement. Emphasis is placed upon the relationship between the molecular structures of membrane proteins and their individual functions. The interactions among transport proteins in determining the physiological behaviors of cells and tissues are also stressed. Molecular motors are introduced and their mechanical relationship to cell function is explored. Students read papers from the scientific literature that establish the connections between mutations in genes encoding membrane proteins and a wide variety of human genetic diseases.
MWF 9:25–10:15

ENAS 575b^U/CPSC 575b, Computational Vision and Biological Perception

Steven Zucker

An overview of computational vision with a biological emphasis. Suitable as an introduction to biological perception for computer science and engineering students, as well as an introduction to computational vision for mathematics, psychology, and physiology students. After MATH 120a or b and CPSC 112a or b, or with permission of instructor.
MW 1–2:15

ENAS 585b^U, Fundamentals of Neuroimaging Fahmeed Hyder, Douglas Rothman

To understand the neuroenergetic and neurochemical basis of several dominant neuroimaging methods, including fMRI. Topics range from technical aspects of different methods to interpretation of the neuroimaging results. Controversies and/or challenges for application of fMRI and related methods in medicine are identified. TH 3:30–5:20

ENAS 600a^U, Computer-Aided Engineering Marshall Long

Aspects of computer-aided design and manufacture including reasons for increased use of CAD/CAM, the computer's role in the mechanical engineering design and its manufacturing process, hardware and software elements of typical commercial systems, and computer graphics and drafting. TTH 9–10:15

ENAS 602b, Chemical Reaction Engineering Lisa Pfefferle

Applications of physical-chemical and chemical-engineering principles to the design of chemical process reactors. Ideal reactors treated in detail in the first half of the course, practical homogeneous and catalytic reactors in the second. TTH 9–10:15

ENAS 603b, Energy, Mass, and Momentum Processes Daniel Rosner

Application of continuum mechanics approach to the understanding and prediction of fluid flow systems that may be chemically reactive, turbulent, or multiphase.
MW 11:35–12:50

ENAS 605b, Colloidal Chemical Engineering Paul Van Tassel

A graduate-level introduction to modern colloid science as practiced by engineers. Topics include self-assembly in solution and at surfaces, surface chemistry, the electric double layer, colloidal forces, and polymers. Applications to problems frequently encountered by chemical, biomedical, and environmental engineers are stressed throughout. HTBA

ENAS 606b, Polymer Physics Chinedum Osuji

A graduate-level introduction to the physics and physical chemistry of macromolecules. This course covers the static and dynamic properties of polymers in solution, melt and surface adsorbed states and their relevance in industrial polymer processing, nanotechnology, materials science, and biophysics. Starting from basic considerations of polymerization mechanisms, control of chain architecture, and a survey of polymer morphology, the course also extensively addresses experimental methods for the study of structure and dynamics via various scattering (light, x-ray, neutron) and spectroscopic methods (rheology, photon correlation spectroscopy) as integral components of polymer physics. TTH 11:35–12:50

ENAS 608b, Surface and Surface Processes Eric Altman

The chemistry and physics of solid surfaces. Emphasis on fundamental aspects of the following areas of surface science: surface crystallography and reconstruction; kinetics of gas-solid interactions; adsorption; heterogeneous catalysis by transition metal surfaces; oxidation and corrosion; and nucleation and growth of thin films by physical and chemical vapor deposition. HTBA

ENAS 610a^U, Biomolecular Engineering Corey Wilson

A survey of the principles and scope of biomolecular engineering. An advanced discussion on a broad range of concepts at the interface of applied mathematics, biology, biophysical chemistry, and chemical engineering – whose express purpose is developing novel molecular tools, materials, and approaches based on biological building blocks and machinery. Topics include understanding and modeling the physicochemical properties that confer function in biological systems, low- and high-resolution protein engineering, and the design of synthetic interactomes. TTH 1–2:15

ENAS 611a^U, Separation Processes Paul Van Tassel

Theory and design of separation processes for multicomponent and/or multiphase mixtures via equilibrium and rate phenomena. Included are single-stage and cascaded absorption, adsorption, extraction, distillation, filtration, and crystallization processes. HTBA

[ENAS 614b, Surface and Thin-Film Characterization]

[ENAS 615b, Synthesis of Nanomaterials]

[ENAS 616b, Multiscale Modeling and Design in Biology]

ENAS 618a, Principles and Practice of Heterogeneous Catalysis Gary Haller

Emphasis on heterogeneous characterization by spectroscopic techniques. Following the introduction of principles we review several large-scale industrial applications, which include catalytic reforming of naphtha (metal and bimetallic catalysts), catalytic cracking (zeolite catalysts), catalytic hydrotreating, automobile pollution catalysts, and chemical productions such as ethylene oxide, methanol, etc. HTBA

ENAS 626a^U, Chemical Engineering Process Control Eric Altman

Transient regime modeling and simulations of chemical processes. Conventional and state-space methods of analysis and control design. Applications of modern control methods in chemical engineering. Course work includes a design project. TTH 9–10:15

[ENAS 628b^U, Sensors and Biosensors]

ENAS 639a, Management of Water Resources and Environmental Systems

Gideon Oron

The general purpose of the course is to allow the participants to have an integrative view and to consider broad aspects of analyzing problems related to water resources and environmental issues. The integrative approach is based on management modeling, considering simultaneously engineering aspects, water quality, environmental characteristics, economic aspects, and community welfare facets. The purpose is to incorporate all effective factors into a quantitative optimal situation, allowing all participating partners in the analyzed enterprise to gain their share and satisfaction. The presented approach is a decision-supporting tool toward reaching an optimal situation, subject to a series of given limitations. TTH 1–2:15

ENAS 640b/F&ES 60109b, Aquatic Chemistry Helmut Ernstberger

A detailed examination of the principles governing chemical reactions in water. Emphasis is on developing the ability to predict the aqueous chemistry of natural and perturbed systems based on a knowledge of their biogeochemical setting. Focus is on inorganic chemistry, and topics include elementary thermodynamics, acid-base equilibria, alkalinity, speciation, solubility, mineral stability, redox chemistry, and surface complexation reactions. Illustrative examples are taken from the aquatic chemistry of estuaries, lakes, rivers, wetlands, soils, aquifers, and the atmosphere. A standard software package used to predict chemical equilibria may also be presented. TTH 11:35–12:50

ENAS 641a^U, Biological Processes in Environmental Engineering Jordon Peccia

Fundamental aspects of microbiology and biochemistry, including stoichiometry, kinetics, and energetics of biochemical reactions, microbial growth, and microbial ecology, as they pertain to biological processes for the transformation of environmental contaminants; principles for analysis and design of aerobic and anaerobic processes including suspended- and attached-growth systems, for treatment of conventional and hazardous pollutants in municipal and industrial wastewaters and in groundwater. MW 1–2:15

ENAS 642b, Environmental Physicochemical Processes Menachem Elimelech

Fundamental and applied concepts of physical and chemical (“physicochemical”) processes relevant to water quality control. Topics include chemical reaction engineering, overview of water and waste water treatment plants, colloid chemistry for solid-liquid separation processes, physical and chemical aspects of coagulation, coagulation in natural waters, filtration in engineered and natural systems, adsorption, membrane processes, disinfection and oxidation, disinfection by-products. TTH 2:30–3:45

[ENAS 643a, Transport and Fate of Organic Chemicals in the Environment]

[ENAS 644a, Environmental Organic Chemistry]

ENAS 645b/F&ES 96007b, Industrial Ecology Thomas Graedel

Industrial ecology is an organizing concept that is increasingly applied to define various interactions of today's technological society with both natural and altered environments. Technology and its potential for modification and change are central to this topic, as are implications for government policy and corporate response. The course discusses how industrial ecology is being applied in corporations to minimize the environmental impacts of products, processes, and services, and shows how industrial ecology serves as a technological framework for science, policy, and management in government and society. MW 1–2:15

ENAS 646b/F&ES 61021b, Hydrology and Water Resources James Saiers

An introduction to the essential elements of hydrogeologic processes. Course topics include groundwater flow, occurrence and movement of water in the vadose zone, stream-flow generation, groundwater contamination, and transport of chemicals in groundwater. Computer software packages are used to reinforce concepts presented in class. A modest background in general physics and calculus is required. MW 11:35–12:50

ENAS 648a, Environmental Transport Processes Joseph Pignatello

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. MW 1:30–3:45

ENAS 649a/MGT 611a, Policy Modeling Edward Kaplan

Building on earlier course work in quantitative analysis and statistics, Policy Modeling provides an operational framework for exploring the costs and benefits of public policy decisions. The techniques employed include “back of the envelope” probabilistic models, Markov processes, queuing theory, and linear/integer programming. With an eye toward making better decisions, these techniques are applied to a number of important policy problems. In addition to lectures, assigned articles and text readings, and short problem sets, students are responsible for completing a take-home midterm exam and a number of cases. In some instances, it is possible to take a real problem from formulation to solution, and compare the student's own analysis to what actually happened. Prerequisites: Decision Analysis and Game Theory, Data Analysis and Statistics, or a demonstrated proficiency in quantitative methods. HTBA

ENAS 655a^U, Environmental Risk Assessment Yehia Khalil

Fundamentals and applications of probabilistic risk assessment and management in the context of environmental issues. Focus on developing and applying probabilistic and deterministic models to quantify potential risks of industrial processes and support risk-based decisions that account for societal, environmental, and economic constraints. Case studies emphasize the importance of green energy sources, professional ethics, and public health and safety. WF 4–5:15

[ENAS 658a, MEMS Design]

[ENAS 718a^U, Heterojunction Devices]

ENAS 747a^U, Applied Numerical Methods I Beth Anne Bennett

Topics include root-finding methods, numerical solution of systems of linear and nonlinear equations, eigenvalue/eigenvector approximation, polynomial-based interpolation, and numerical integration. For each topic, several methods are covered, ranging from older, simpler methods to newer, more advanced methods. Additional topics such as computational cost, error analysis, and convergence analysis are studied in a variety of contexts throughout the course. TTH 11:35–12:50

ENAS 748b^U, Applied Numerical Methods II Beth Anne Bennett

Topics include the numerical solution of ordinary and partial differential equations, both linear and nonlinear. Ordinary differential equations are solved via one-step, multistep, and Runge-Kutta methods (for initial value problems) and shooting methods and finite difference methods (for boundary value problems). Partial differential equations (parabolic, elliptic, and hyperbolic) are solved via explicit and implicit finite difference methods, including pseudo-transient continuation for elliptic problems. Additional topics such as computational cost, error analysis, and stability analysis are studied in a variety of contexts throughout the course. ENAS 747a is not a prerequisite. TTH 11:35–12:50

[ENAS 761a/G&G 525a, Introduction to Continuum Mechanics]**ENAS 787b, Intermolecular and Surface Forces** Udo Schwarz

Modern materials science often exploits the fact that atoms located at surfaces or in thin layers behave differently from bulk atoms to achieve new or greatly altered material properties. This course provides an in-depth discussion of intermolecular and surface forces, which determine the mechanical and chemical properties of surfaces. In a first part, we discuss the fundamental principles and concepts of forces between atoms and molecules. Part two generalizes these concepts to surface forces. Part three then gives a variety of examples. The course is of interest to students studying thin film growth, surface coatings, mechanical and chemical properties of surfaces, soft matter including biomembranes, and colloidal suspensions. HTBA

ENAS 802a^U, Nano and Microsystem Technology Hong Tang

Cross-disciplinary laboratory experiments covering microfabrication, silicon micro-machining, MEMS device fabrication and characterization, scanned probe microscopy, electron microscopy, microfluidics, lab-on-a-chip system. Students fabricate MEMS, BioMEMS, and microfluidic devices in a cleanroom environment. TH 1:30–5:20

ENAS 806b^U, Photovoltaic Energy Minjoo Lee

Survey of photovoltaic energy devices, systems, and applications, including review of optical and electrical properties of semiconductors. Topics include solar radiation, solar cell design, performance analysis, solar cell materials, device processing, photovoltaic systems, and economic analysis. MW 1–2:15

ENAS 812b/NSCI 612b, Molecular Transport and Intervention in the Brain

Mark Saltzman, Richard Carson

This course is a graduate-level seminar on mechanisms and rates of movement of molecules in the brain and the design of novel drug delivery systems. Topics include mathematical methods for modeling diffusion and flow processes, diffusion in the brain

interstitium, fluid flows in the brain and spinal cord, the blood-brain barrier, microdialysis measurements, controlled release systems, microfluidic approaches for drug delivery. Weekly readings are assigned from neuroscience and engineering texts; current papers from the literature are used to guide discussion each week. HTBA

[ENAS 816a, Techniques of Microwave Measurements and RF Design]

[ENAS 817a/PHYS 677a, Noise, Dissipation, Amplification, and Information]

ENAS 818a/PHYS 634a, Mesoscopic Physics I Michel Devoret

Introduction to the physics of nanoscale solid state systems which are large and disordered enough to be described in terms of simple macroscopic parameters like resistance, capacitance, and inductance, but small and cold enough that effects usually associated with microscopic particles, like quantum-mechanical coherence and/or charge quantization, dominate. Emphasis is placed on transport and noise phenomena in the normal and superconducting regimes. MW 9–10:15

ENAS 821b^U, Physics of Medical Imaging Todd Constable

The physics of image formation with special emphasis on techniques with medical applications. Concepts that are common to different types of imaging are emphasized, along with an understanding of how information is limited by the basic physical phenomena involved. Mathematical concepts of image analysis, the formation of images by ionizing radiation, ultrasound, NMR, and other energy forms, and methods of evaluating image quality. MW 11:35–12:50

ENAS 825a, Physics of Magnetic Resonance Spectroscopy in Vivo Graeme Mason,
Robin de Graaf

The physics of chemical measurements performed with nuclear magnetic resonance spectroscopy, with special emphasis on applications to measurements studies in living tissue. Concepts that are common to magnetic resonance imaging are introduced. Topics include safety, equipment design, techniques of spectroscopic data analysis, and metabolic modeling of dynamic spectroscopic measurements. WF 2:30–3:45

ENAS 836b^U, Biophotonics and Optical Microscopy Michael Levene

A review of linear and nonlinear optical microscopies and other biophotonics applications. Topics include wide-field techniques, linear and nonlinear laser scanning microscopy, fundamentals of geometrical and physical optics, optical image formation, laser physics, single molecule techniques, fluorescence correlation spectroscopy, and light scattering. Discussion of fluorescence and the underlying physics of light-matter interactions that provide biologically relevant signals. MW 4–5:15

[ENAS 849b, Statistical Physics II]

ENAS 850a^U and 851b^U/PHYS 548a^U and 549b^U, Solid State Physics I and II Staff,
Charles Ahn

A two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structures, phonon, energy bands, semiconductors, Fermi surfaces, magnetic resonance, phase transitions, and superconductivity. TTH 1–2:15

ENAS 852b/PHYS 610b, Quantum Many-Body Theory Yoram Alhassid

Second quantization, quantum statistical mechanics, Hartree-Fock approximation, linear response theory, random phase approximation, perturbation theory and Feynman diagrams, Landau theory of Fermi liquids, BCS theory, Hartree-Fock-Bogoliubov method. Applications to solids and finite-size systems such as quantum dots, nuclei, and nanoparticles. TTH 11:35–12:50

ENAS 860b/PHYS 667b, Special Topics in Condensed Matter Physics: Quantum Hall Effect and Conformal Field Theory Staff

Aspects of the quantum Hall effect, particularly the fractional effect, and conformal field theory, plus the connections between the two. Quantum Hall states, composite particles, quasiparticles, fractional charge, and statistics. Future applications to rotating trapped atoms. Conformal symmetry in two dimensions, applications to classical critical phenomena, [+-] quantum field theory. Nonabelian quantum Hall states and the relation with conformal field theory and Chern-Simons gauge theory. Background required: statistical mechanics, and either many-body theory or quantum field theory.

[ENAS 863b/PHYS 633b, Introduction to Superconductivity]**[ENAS 864a, Current Topics in Nanoelectronics, Nanomechanics, and Nanophotonics]****ENAS 866a, MOS Device Physics and Technology** Tso-Ping Ma

Topics include basic MOS device physics, science and technology of thermal SiO₂, interface properties of MOS structures, experimental techniques to probe MOS parameters, hot-carrier effects, radiation effects, channel mobility and carrier transport in MOS inversion layers, scaling of MOS devices, low-temperature properties of MOS devices, SOI device physics and technology, advanced gate dielectrics, MOS devices with wide-bandgap semiconductors, nonvolatile memory devices, ferroelectric memory devices, single-electron MOS transistors, and other MOS topics of current interest. T 3:30–5:20

ENAS 875a^U, Introduction to VLSI System Design Richard Lethin

Chip design. Provides background in integrated devices, circuits, and digital subsystems needed for design and implementation of silicon logic chips. Historical context, scaling, technology projections, physical limits. CMOS fabrication overview, complementary logical circuits, design methodology, computer-aided design techniques, timing, and area estimation. Case studies of recent research and commercial chips. Objectives of the course are (1) to give students the ability to complete the course project (design of a digital CMOS subsystem chip through layout), and (2) to understand the directions that future chip technologies may take. Selected projects are fabricated and packaged for testing by students. Prerequisite: circuits at the level of introductory physics and computer programming. HTBA

ENAS 902a, Linear Systems A. Stephen Morse

Background linear algebra; finite-dimensional, linear-continuous, and discrete dynamical systems; state equations, pulse and impulse response matrices, weighting patterns, transfer matrices. Stability, Lyapunov's equation, controllability, observability, system

reduction, minimal realizations, equivalent systems, McMillan degree, Markov matrices. Recommended for all students interested in robotics, systems, and information sciences. MW 1–2:15

ENAS 907b^U, Computer Systems Staff

Introduction to the development of computer architectures specialized for cognitive processing, including both offline “thinking machines” and embedded devices. The history of machines, from early conceptions in defense systems to contemporary initiatives. Instruction sets, memory systems, parallel processing, analog architectures, probabilistic architectures. Application and algorithm characteristics. TH 1:30–3:20

ENAS 912a^U, Biomedical Image Processing and Analysis James Duncan,
Lawrence Staib

A study of the basic computational principles related to processing an 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/restoration, image segmentation, and image registration. TTH 9–10:15

[ENAS 917a^U, Optical Properties of Semiconductors]

ENAS 920b, Programming for Image Analysis Xenophon Papademetris

Topics include using scripting languages for visualization, introduction to scripting languages, in particular Tcl, introduction to the Visualization Toolkit (Tcl) and local extensions, designing graphical user interfaces using Tk, introduction to Object Oriented programming (using [Incr Tcl]), using compiled languages to implement additional algorithms, introduction to C++ programming, extending VTK by implementing additional image processing algorithms, an overview of the Insight Toolkit (ITK), and advanced software engineering techniques. Prerequisites: ENAS 912a, or permission of the instructor. WF 2:30–3:45

ENAS 921b, Advanced Topics in Computer Engineering Andreas Savvides
HTBA

ENAS 930b, Advanced Semiconductor Fundamentals Jung Han

Topics to include semiconductor physics, optical properties, electrical transport properties, thermal properties, and piezoelectric properties. HTBA

[ENAS 936b^U, Systems and Control]

ENAS 944a^U, Digital Communications Systems Edmund Yeh

An introduction to the rapidly expanding field of mobile and fixed, voice and data communications systems. A review of analog and digital signals and their time and frequency domain representations. Topics include modulation methods, including amplitude; frequency and time division multiplexing for continuous and discrete/digital signals; an overview of modern voice and data communications networks; and an overview of information theory, including entropy, the quantification of information, data rates, coding, and compression. Examples and demonstrations are drawn from radio, telephone, television, computer, cellular, and satellite communications networks. TTH 1–2:15

ENAS 954b^U/STAT 664b^U, Information Theory Hannes Leeb

Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithmic complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, mutual information, channel capacity. Basic theorems of data compression and coding for noisy channels. Applications in statistics, communication networks, and finance. TTH 9–10:15

ENAS 960a^U, Networked Embedded Systems and Sensor Networks

Andreas Savvides

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. TTH 11:35–12:50

[ENAS 961b^U, Advanced Topics in Networks and Sensing Systems]**ENAS 964b, Communication Networks** Edmund Yeh

Introduction to analytical approaches to the study of communication networks. Topics include delay models, buffer overflow, multiaccess communication, routing, and congestion control. Analytical techniques include basic queuing theory, queuing networks, large deviations, optimization, and distributed algorithms. Basic knowledge of probability is required. MW 2:30–3:45

ENAS 986b^U, Semiconductor Silicon Devices and Technology Tso-Ping Ma

Introduction to integrated circuit technology, theory of solid state 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, MOS capacitors, MOSFETS, and integrated circuits. MW 9–10:15

ENAS 990a and b, Special Investigations Faculty

Faculty-supervised individual projects with emphasis on research, laboratory, or theory. Students must define the scope of the proposed project with the faculty member who has agreed to act as supervisor, and submit a brief abstract to the director of graduate studies for approval.

ENAS 991b/PHYS 991b/MB&B 591b, Integrated Workshop Corey Wilson

This required course for students in IGPPEB involves hands-on laboratory modules with students working in pairs. A biology student is paired with a physics or engineering student; a computation/theory student is paired with an experimental student. The modules are devised so that a range of skills are acquired, and students learn from each other.

ENGLISH LANGUAGE AND LITERATURE

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Chair

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Linda Peterson [F] (106a LC, 432.2226, graduate.english@yale.edu)

Paul Fry [Sp] (106a LC, 432.2226, graduate.english@yale.edu)

Professors Elizabeth Alexander, Harold Bloom, Leslie Brisman, David Bromwich, Jill Campbell, Janice Carlisle, Michael Denning, Wai Chee Dimock, Roberta Frank, Paul Fry, Langdon Hammer, Margaret Homans, Amy Hungerford, David Scott Kastan, Pericles Lewis, Lawrence Manley, Alastair Minnis, Linda Peterson, Caryl Phillips, David Quint, Claude Rawson, Joseph Roach, Marc Robinson, John Rogers, Robert Stepto, Katie Trumpener, Michael Warner, Ruth Bernard Yeazell

Associate Professors Ala Alryyes, Jessica Brantley, Stefanie Markovits

Assistant Professors Susan Chambers, Ian Cornelius, Paul Grimstad, Barry McCrea, Justin Neuman, Catherine Nicholson, Jessica Pressman, Sam See, Caleb Smith, Brian Walsh, R. John Williams

Fields of Study

Fields include English language and literature from Old English to the present, American literature, and Anglophone literature.

Special Requirements for the Ph.D. Degree

In order to fulfill the basic requirements for the program, a student must:

1. Complete thirteen courses — six courses with at least one grade of Honors and a maximum of one grade of Pass by July 15 following the first year; at least twelve courses with grades of Honors in at least four of these courses and not more than one Pass by July 15 following the second year. One of these thirteen courses must be The Teaching of English, ENGL 990.

2. Satisfy the language requirement in one of three ways by the end of the second year.

Two languages, by course and exam: one language to be completed by passing an advanced literature course at Yale (graduate or upper-level undergraduate course taught in and requiring papers in the language in question) with a grade of Honors or High Pass; the other to be passed by departmental exam (reading knowledge with dictionary).

Two languages by exam: strong reading knowledge of one language, as demonstrated by passing a departmental exam without use of a dictionary; reading knowledge of a second language, demonstrated by passing a departmental exam with dictionary.

Three languages by departmental exam or, in the case of an ancient language, by satisfactory completion of two terms of introductory Latin or Greek (Greek 110-111 or Latin 110-111). Languages to be selected from the following: (a) Latin or Greek; (b) French or German; (c) one of the preceding languages or Biblical Hebrew, Italian, Russian, Spanish, or another language agreed upon by the director of graduate studies (DGS). Students specializing in periods after 1750 may, with the permission of the DGS, substitute a third language for selection (a). Two terms of Old English (or one term of Old English and one of the History of the Language) may be substituted for selection (c).

3. Pass the oral examination (before or as early as possible in the fifth term of residence).
4. Teach a minimum of two terms.
5. Submit a dissertation prospectus from three to six months after passing orals.
6. Submit a dissertation.

Upon completion of all predissertation requirements, including the prospectus, students are admitted to candidacy for the Ph.D. Admission to candidacy must take place by the end of the third year of study.

Combined Ph.D. Programs

ENGLISH AND AFRICAN AMERICAN STUDIES

A combined Ph.D. degree is available with African American Studies. For further details, see African American Studies.

ENGLISH AND RENAISSANCE STUDIES

The Department of English Language and Literature also offers, in conjunction with the Renaissance Studies program, a combined Ph.D. in English Language and Literature and Renaissance Studies. For further details, see Renaissance Studies.

Master's Degrees

M.Phil. See Degree Requirements. Additionally, students in English are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may receive the M.A. upon completion of six courses with at least one grade of Honors and a maximum of one grade of Pass, and the passing of two of the languages by departmental examinations.

Terminal Master's Degree Program Students enrolled in the master's degree program must complete either seven term courses or six term courses and a special project within the English department (one or two of these courses may be taken in other departments with approval of the director of graduate studies). There must be at least one grade of Honors, and there may not be more than one grade of Pass. Students must also pass examinations in two languages, ancient or modern. Full-time students normally complete the program in one year.

Courses

ENGL 500a/LING 500a, Introduction to Old English Language and Literature

Roberta Frank

The essentials of the language, some prose readings, and close study of several poems: *Caedmon's Hymn*, *The Dream of the Rood*, *The Battle of Maldon*, *The Wife's Lament*, *The Wanderer*, and *The Seafarer*. MW 9–10:15

ENGL 501b/LING 501b, *Beowulf* and the Northern Heroic Tradition Roberta Frank

A close reading of the poem *Beowulf*, with some attention to shorter heroic poems. W 9:25–11:15

ENGL 533b, Medieval Drama Jessica Brantley

An exploration of medieval dramatic traditions in the context of contemporary performative practices, including liturgy, song, spectacle, recitation, and meditative reading. F 1:30–3:20

ENGL 546b, Chaucer's *Canterbury Tales* and Three Earlier Poems: Discourses of

Dissent Alastair Minnis

A study of *The Book of the Duchess*, *The House of Fame*, and *The Legend of Good Women*, in addition to a substantial selection of *Canterbury Tales*. These texts are related to the “discourses of dissent” current in Chaucer's day, an age of extreme political, social, and intellectual turmoil. M 3:30–5:20

ENGL 590a, Materializing the Word: The Book as Object, Technology, Concept, and Event, 1500–1800 David Scott Kastan

An exploration of various aspects of books as they appeared and were experienced in early modern England. We focus on the material and institutional conditions that enabled—and sometimes inhibited—reading and writing in the period, though also work closely with actual volumes, with the aim of understanding not only the historical conditions shaping the production, circulation, and reception of books (not only printed books) but also what this understanding might contribute to our scholarly reconstructions of the period. W 1:30–3:20

ENGL 595a, Early Modern Drama and the English Reformation Brian Walsh

This course examines how drama of the late Tudor and early Stuart periods put continually evolving aspects of the English Reformation under scrutiny. Through close examination of the language and dramaturgy of plays by Marlowe, Greene, Shakespeare, Dekker, Peele, Jonson, Webster, Cary, Fletcher, and others, we consider how practical and theoretical shifts in spiritual life that the break with Rome entailed were advocated, contested, and more generally worked through in dramatic poetry and stage action. The question of Protestant Christian identity broached by these plays allows us also to investigate representations of and allusions to other confessional identities, namely Catholicism, Islam, and Judaism. Our main focus is the plays themselves, but we also devote attention to primary texts from the period that represent facets of its traffic in religious ideas and controversies, to recent trends in historical scholarship on the Reformation—such as the vigorous re-appraisal of “traditional religion” and its persistence in English culture—as well as to examples of what some scholars have called the “turn to religion” in literary

criticism of early modern England, especially over issues that impinge on the stage such as idolatry, ritual aspects of performance, and debates over theater as a “desacralizing” institution. TH 1:30–3:20

ENGL 606b, History and Historical Drama in the Age of Shakespeare

Lawrence Manley

A study of the imagination of history on the English stage in the reigns of Elizabeth I and James I. Plays by Shakespeare, Marlowe, Peele, Dekker, Webster, Ford, and others in relation to both non-dramatic forms of historical writing and contemporary affairs. W 3:30–5:20

ENGL 672b/CPLT 672b, Milton David Quint

A study of Milton’s poetry and some of his controversial prose. We investigate the relation of the poetry to Milton’s literary tradition and historical contexts, focusing on issues of genre and on the religious, social, and political forces that shaped Milton’s writing. TH 9:25–11:15

ENGL 711a, English Satire 1660–1750 Claude Rawson

A study of English satire in verse and prose in the period 1660–1750. Authors include Rochester, Dryden, Swift, Pope, Gay, Fielding, Johnson. T 1:30–3:20

ENGL 728a/CPLT 756a, Defoe, Sterne, Scott Ala Alryyes

Readings of fiction and other prose works of three authors who seminally contributed to the development of the poetics of the novel, setting up modes of fabulation that had a lasting influence on European and world fiction. Focus on how Defoe, Sterne, and Walter Scott negotiated boundaries between fiction and “reality” — crossing disciplines and complicating such categories as persons, things, description, knowledge, science, rhetoric, history, nation — and also on how their writings have proven a fundamental influence on our own critical and theoretical approaches and systems. W 3:30–5:20

ENGL 772a, Romantic Poetry and Criticism David Bromwich

Readings in selected Romantic poets and critics, including Wordsworth, Coleridge, Hazlitt, and Keats. M 1:30–3:20

ENGL 810b^U, Victorian Poetry Leslie Brisman

The major Victorian poets, Tennyson and Browning, in the context of the Romanticism they inherit and transform. Significant attention to Barrett Browning’s *Aurora Leigh*, and some attention to Swinburne, the Rossettis, and Morris. MW 11:35–12:50

ENGL 819a, Novels of the 1860s Janice Carlisle

An examination of the relation between literary works and their cultural, economic, political, and technological contexts, focusing on a well-defined historical period, the high-Victorian decade of the 1860s. Readings include canonical favorites such as Dickens’s *Great Expectations* and lesser-known novels such as Eliza Lynn Linton’s *Lizzie Lorton of Greyrigg*, as well as historical accounts of Victorian Britain from G. M. Young’s classic *Portrait of an Age* (1936) to the volume written for the New Oxford History of England (1998). W 9:25–11:15

ENGL 851b/AMST 886b, American Literature: Fields, Genealogies, Webs

Wai Chee Dimock

A survey of genres and methods, with special attention to these broad areas of inquiry: multiple diasporas; cross-mappings of poetry and prose; movement across words, image, music; memories, adaptations, and rewritings from the nineteenth century to the twenty-first; morphologies of the human, the subhuman, and the nonhuman; and the fate of close reading in a global world. We read Hawthorne in conjunction with Maryse Condé; Poe with Ishmael Reed; Whitman with Allen Ginsberg and Sherman Alexie; Faulkner with Suzan-Lori Parks; Olaudah Equiano with Dave Eggers; Emily Dickinson with Richard Powers. W 1:30–3:20

ENGL 868a, Antebellum American Literature and Culture Caleb Smith

The literature and culture of the United States in the antebellum period, roughly 1830–1861. Readings include literary works by Melville, Emerson, Hawthorne, Dickinson, Douglass, Thoreau, Whitman, and Poe, as well as important documents from the political, legal, and intellectual history of the age. A study of a single, transformative period, the seminar is also designed to introduce students to the modern history of Americanist criticism, from F. O. Matthiessen's "American Renaissance" (1941), through the various critiques of identity and ideology, to the historicism and renewed trans-nationalism of contemporary "New Americanists." Special attention is paid to the problems of judgment and justice that have animated the critical debates. M 3:30–5:20

ENGL 874b, Henry James, Novel Theory and Critical Practice Ruth Bernard Yeazell

A close reading of selected novels and tales by Henry James in light of critical and theoretical commentary from James's day to ours. Focus both on James's development as a novelist and on the history of novel criticism in the twentieth century. TH 1:30–3:20

ENGL 901b, Research Seminar: Twentieth-Century Poetry

Langdon Hammer

A broad overview of twentieth-century poetry in English and an introduction to research in the field. In addition to reading and discussing influential works of literary criticism and theory from Hugh Kenner's *The Pound Era* and Harold Bloom's *A Map of Misreading* to recent statements on lyric poetry by Allen Grossman, Susan Stewart, and Mutlu Blasing, students plan individual archival projects on specific literary magazines, poetic movements, and poets, using the Beinecke and other libraries, and share their research in workshop-format meetings. We discuss Ezra Pound and Wallace Stevens in the first weeks of the term; poets studied later depend on student choices. F 9:25–11:15

ENGL 929b/AFAM 835b/AMST 822b/CPLT 697b, The Big Easy: Literary New Orleans

Joseph Roach

An exploration of the sources of creative inspiration that writers find in NOLA, including its cultural mystique, its colonial history, its troubled assimilation into Anglo-North America, its tortured racial politics, its natural and built environment, its spirit-world practices, its raucous festive life, its eccentric characters, its food, its music, its predisposition to catastrophe, and its capacity for reinvention and survival. T 1:30–3:20

ENGL 932b, Modern American Drama Marc Robinson

A seminar on American drama from World War I to 1960. Among the playwrights considered are O'Neill, Stein, Wilder, Barnes, Hurston, Odets, Williams, Miller, and Bowles. T 9:25–11:15

ENGL 948b^U/AFAM 588b^U/AMST 710b^U, Autobiography in America Robert Stepto
At least a dozen North American autobiographies are studied, mostly from the “American Renaissance” to the present. Discussion of various autobiographical forms and strategies as well as of various experiences of American selfhood and citizenship. Slave narratives, spiritual autobiographies, immigrant narratives, autobiographies of childhood or adolescence, relations between autobiography and class, region, or occupation. M 1:30–3:20

ENGL 969b/CPLT 520b/WGSS 776b, Narratives of Formation Barry McCrea
An examination of models of personal progress and maturation in a variety of narratives and periods. We read critical anthropological and psychoanalytic texts in conjunction with primary texts. All non-English-language texts are read in translation. Authors may include some of the following: Mme de Lafayette, anonymous author of *Lazarillo de Tormes*, Dickens, Balzac, Musil, Wilde, James, Forster, Chandler, Bechdel. M 9:25–11:15

ENGL 971a/CPLT 598a, Moderns, 1914–1926 Pericles Lewis
An intensive research-oriented course on British literature, 1914–1926, with some attention to European, Irish, and American influences. Major figures to be considered include Joyce, Lawrence, Shaw, O'Casey, Yeats, Pound, Eliot, Strachey, Woolf, and Forster. Students pursue group research projects on poetry, drama, the novel, or intellectual history. The final syllabus depends on student interests. TH 9:25–11:15

ENGL 984a/CPLT 578a/PHIL 711a, Metapragmatics and Textual Culture

Michael Warner

An introduction to theoretical issues of textual analysis, and the difference between structuralist and metapragmatic approaches to language and culture. We review debates over performativity, the *langue/parole* distinction, indexicality and metaindexicality, and the nature of text. We then see how these traditions for analyzing the social dimensions of language inflect various attempts to theorize modern forms of discourse and power—including the public sphere, concepts of genre and media, religion, and the practice of criticism itself. T 1:30–3:20

ENGL 988b^U/AFAM 838b^U, Contemporary African American Poetry

Elizabeth Alexander

In this course we study African American poetry of the contemporary era, from 1960 to the present. We also cover predominant theoretical approaches to African American poetry and poetics. Authors include late Gwendolyn Brooks and Robert Hayden, Amiri Baraka, Lucille Clifton, Audre Lorde, Yusef Komunyakaa, Rita Dove, Michael Harper, and poets of the new generation. W 1:30–3:20

ENGL 990a, The Teaching of English Amy Hungerford

An introduction to the teaching of literature and writing. Weekly seminars address a series of issues about teaching: guiding classroom discussion; introducing students to

various literary genres; formulating aims and assignments; grading and commenting on written work; lecturing and serving as a teaching assistant; preparing syllabuses and lesson plans. T 9:25–11:15

ENGL 995a/b, Directed Reading Staff

Designed to help fill gaps in students' programs when there are corresponding gaps in the department's offerings. By arrangement with faculty and with the approval of the director of graduate studies.

ENVIRONMENTAL ENGINEERING

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Professors Gaboury Benoit, Stephen Edberg, Menachem Elimelech, Thomas Graedel, Edward Kaplan, Joseph Pignatello (*Adjunct*), James Saiers

Associate Professors Michelle Bell, Ruth Blake, Yehia Khalil (*Adjunct*), William Mitch, Jordan Peccia

Assistant Professor Julie Zimmerman

Lecturer James Wallis

FIELDS OF STUDY

Fields include aquatic and environmental chemistry, physical and chemical processes for water quality control, transport and fate of pollutants in the environment, environmental nanotechnology, green engineering, environmental engineering microbiology, environmental molecular biology, bioaerosols, water reuse, disinfection by-product formation, emerging contaminants, membrane separations for water quality control, industrial ecology, and chemical reactions at the mineral-water interface.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

EPIDEMIOLOGY AND PUBLIC HEALTH

60 College Street, 785.6383
<http://info.med.yale.edu/eph/>
 M.S., M.Phil., Ph.D.

Dean

Paul Cleary

Director of Graduate Studies

Christian Tschudi (785.6383)

Acting Director of Medical Studies

Mayur Desai

Director of Medical Research

Elizabeth Claus

Professors Serap Aksoy, Elizabeth Bradley, Michael Bracken, Kelly Brownell (*Psychology*), Richard Bucala (*Medicine*), Michael Cappello (*Pediatrics*), Elizabeth Claus, Paul Cleary, Erol Fikrig (*Medicine*), Durland Fish, Robert Heimer, Theodore Holford, Jeannette Ickovics, Edward Kaplan (*School of Management*), Stanislav Kasl, Harlan Krumholz (*Medicine*), Brian Leaderer, Robert Makuch, Lawrence Marks, Susan Mayne, Diane McMahon-Pratt, I. George Miller (*Pediatrics*), A. David Paltiel, Peter Peduzzi, Rafael Pérez-Escamilla, Jeffrey Powell (*Ecology and Evolutionary Biology*), Harvey Risch, Robert Rosenheck (*Psychiatry*), Nancy Ruddle (*Emeritus*), Peter Salovey (*Psychology*), Mark Schlesinger, Jody Sindelar, Mary Tinetti (*Medicine*), Daniel Zelterman, Heping Zhang, Hongyu Zhao, Tongzhang Zheng

Associate Professors Colleen Barry, Susan Busch, Rani Desai (*Psychiatry*), Alison Galvani, Yongtao Guan, Josephine Hoh, Melinda Irwin, Amy Justice (*Medicine*), Trace Kershaw, Douglas Leslie (*Psychiatry*), Becca Levy, Haiqun Lin, Judith Lichtman, Xiaomei Ma, Linda Niccolai, Melinda Pettigrew, Jennifer Prah Ruger, Nina Stachenfeld (*Obstetrics, Gynecology & Reproductive Sciences*), Christian Tschudi, Herbert Yu, Yong Zhu

Assistant Professors Michelle Bell (*Forestry & Environmental Studies*), Andrew DeWan, Maria Diuk-Wasser, Andrew Epstein, Jason Fletcher, Jhumka Gupta, Patricia Keenan, Kaveh Khoshnood, Tene Lewis, Shuangge Ma, Kathleen McCarty, Annette Molinaro, Ingrid Nembhard, Anita Wang, Yawei Zhang

Fields of Study

Programs of study are offered in the areas of Biostatistics, Chronic Disease Epidemiology, Environmental Health Sciences, Health Policy and Administration, and Epidemiology of Microbial Diseases (infectious disease epidemiology, vector-borne diseases, immunology, and parasitology). The Social and Behavioral Program (SBS), within the Chronic Disease Epidemiology division, offers students specialized instruction in the theory and methods of the social and behavioral sciences. All programs are under the faculty of the Department of Epidemiology and Public Health.

Special Admissions Requirements

Applicants should have a strong background in the biological and/or social sciences. Students pursuing a Biostatistics specialty should have a strong background in mathematics. The GRE General Test is required. Students whose native language is not English must submit scores from the TOEFL, TSE, or IELTS examination.

Academic Requirements

The normal requirement for the degree of Doctor of Philosophy can be up to six years of graduate study. The average time to completion for students in Epidemiology and Public Health is five years. Generally the first two years are devoted primarily to course work and rotations for students in some areas. All doctoral students are required to successfully complete a minimum of ten graduate-level courses and must satisfy the individual divisional requirements. Courses such as Dissertation Research, Preparing for Qualifying Exams, or Seminar do not count toward the course requirements. However, students must register for these “courses” in order for them to appear on the transcript.

The Graduate School uses grades of Honors, High Pass, Pass, or Fail. Students are required to earn a grade of Honors in at least two full-term courses in the first two years, and are expected to maintain a High Pass average. (This applies to courses taken after matriculation in the Graduate School and during the nine-month academic year.) The Honors requirement must be met in courses other than those concerned exclusively with dissertation research and preparation. See Course and Honors Requirement for more details.

The special course requirements for each division are: *Biostatistics*, an average of three to four courses per term plus seminars and colloquia; *Chronic Disease Epidemiology*, an average of three to four courses per term plus seminars and colloquia; *Environmental Health Sciences*, an average of three to four courses per term plus seminars and colloquia; *Epidemiology of Microbial Diseases*, two years of course work, lab rotations, and seminars developed with a faculty adviser; *Health Policy and Administration*, an average of three to four courses per term plus seminars and colloquia.

Teaching is regarded as an integral aspect of the graduate training program. Doctoral students are required to satisfactorily complete four terms as Teaching Fellows (10 hours/week). These teaching experiences are typically completed during the second and third years of study. First-year students are encouraged to focus their efforts on course work and in most instances are not permitted to serve as Teaching Fellows. First-year students may be allowed to serve as Teaching Fellows if they have been awarded advanced standing. Advanced standing is available only to students who have completed previous graduate study at Yale (e.g., the M.P.H. program); see Transfer Credit and Advanced Standing. If a student has been awarded one year of advanced standing, he/she will be allowed to teach both fall and spring terms of the first year. If a student has been awarded one term of advanced standing, he/she will only be allowed to teach during the spring term of the first year. Students interested in serving as Teaching Fellows during their first year of doctoral study should submit a petition to the DGS well before the start of the term in which they hope to participate in a course.

All doctoral students are required to complete 40 hours (four Level 2 assignments at 10 hours/week or an equivalent combination) as a Teaching Assistant. Graduate research assistantship opportunities may take the place of teaching in the third year of study. Furthermore, a waiver of 10 hours is possible if the student is working as a project assistant (generally no more than 10 hours per week and with prior approval of the DGS). By year four, all students are engaged in full-time research activities.

Special Requirements for the Ph.D. Degree

At the end of years one and two, advisers will be asked to complete a progress report for each student evaluating their academic progress and describing their readiness for teaching and/or conducting research. This is then discussed with the student and reviewed by the DGS. Students who have not progressed adequately will be asked to meet with the DGS to address the situation. Advisers of students in year three who have not been admitted to candidacy by May of that year will also be asked to complete a progress report. Once a student is admitted to candidacy, he/she is required by the Graduate School to complete an annual Dissertation Progress Report.

To be admitted to candidacy, students must: (1) satisfactorily complete the course requirements for their division as outlined in the most current School of Public Health Bulletin, achieving grades of Honors in at least two and achieving an overall HP average; (2) obtain an average grade of High Pass on the qualifying examination; and (3) submit an approved dissertation prospectus. The qualifying examination must be taken by the end of the second full academic year. With the assistance of the faculty adviser, each student requests appropriate faculty members to join a dissertation advisory committee (DAC). The dissertation prospectus must be approved within a year of passing the qualifying examination.

The DAC reviews and approves the prospectus as developed by the student and recommends to the director of graduate studies (DGS) and the Departmental Doctoral Committee that the prospectus be approved. Each DAC is expected to meet as a group at least twice each year, and more frequently if necessary. The student schedules meetings of the DAC. The chairperson/adviser of the DAC produces a summary evaluation of progress and plans for the coming year. This document is to be distributed to each committee member for comments and signature. Each student and the DGS are to receive a copy of the signed document from the DAC chairperson/adviser.

After approval of the prospectus the DAC reviews the progress of the dissertation research and the dissertation and decides when it is ready to be submitted to the readers. At that time the chair (adviser) of the DAC submits its recommendation to the DGS and the Departmental Doctoral Committee, together with the approved dissertation and its recommendation of suitable readers.

Doctoral dissertations originating in EPH must be presented in a public seminar. This presentation is scheduled after the submission of the dissertation to the readers and preferably prior to the receipt and consideration of the readers' reports. At least one member of the DAC supervising the dissertation and at least one member of the Departmental Doctoral Committee are required to attend the presentation.

Master's Degrees (in Epidemiology and Public Health)

Terminal M.S. in EPH The department offers a terminal master's degree program leading to an M.S. in Epidemiology and Public Health in two specialty areas: Biostatistics (a two-year program) and Chronic Disease Epidemiology (a one-year program). All students must fulfill both the departmental and Graduate School requirements for a terminal M.S. degree.

Students must have an overall grade average of High Pass, including a grade of Honors in at least one full-term graduate course (for students enrolled in the one-year program in Chronic Disease Epidemiology) or in at least two full-term graduate courses (for students enrolled in the two-year program in Biostatistics). In order to maintain the minimum average of High Pass, each grade of Pass must be balanced by one grade of Honors. For more details, please see Course and Honors Requirements under Policies and Regulations.

A Biostatistics or Chronic Disease Epidemiology student who is withdrawing from the Ph.D. program, and has successfully completed all required course work for the terminal M.S. degree (described below), may apply and be recommended for the M.S. in EPH. In other divisions (Environmental Health Sciences, Epidemiology of Microbial Diseases, or Health Policy Administration) students must have successfully completed (prior to withdrawal) at least one year of the doctoral program in order to receive an M.S.

M.Phil. (en route to the Ph.D.) Students who have completed all requirements for the Ph.D. except the dissertation may petition the Graduate School for the Master of Philosophy degree.

FIELDS OF STUDY

Terminal M.S. in EPH—Biostatistics

Faculty in the Biostatistics division of the Department of Epidemiology and Public Health offer a two-year terminal Master of Science degree. Fields include clinical trials, epidemiologic methodology, statistical genetics, and mathematical models for infectious diseases.

Requirements for M.S. in EPH—Biostatistics Applicants should have a strong background in quantitative sciences such as mathematics. In addition, it is recommended that applicants have undergraduate course work in the biological and social sciences. At a minimum, applicants would have taken one year of calculus and a course in linear algebra prior to enrolling in this program.

The GRE General Test is required. Students whose native language is not English must submit scores from the TOEFL, TSE, or IELTS examination.

A minimum of twelve courses must be completed, and a grade of Honors achieved in at least two courses with an overall grade average of High Pass. An acceptable master's thesis must be submitted.

Terminal M.S. in EPH—Chronic Disease Epidemiology

Faculty in the Chronic Disease Epidemiology division of the Department of Epidemiology and Public Health offer a one-year terminal Master of Science degree. This one-year

program is designed for medical and health care professionals who seek the skills necessary to conduct epidemiological research in their professional practice.

Requirements for M.S. in EPH—Chronic Disease Epidemiology Applicants should have a basic understanding of quantitative science and statistics. It is recommended that candidates have strong science backgrounds and demonstrated competency in statistical analysis and logical thinking. Applicants from rigorous programs in the biological or social sciences will be given preference. At a minimum, applicants should have one year of course work in statistics or equivalent prior to enrolling in this program. Part-time enrollment is not encouraged.

Applicants must take the GRE General Test. Students whose native language is not English must take the TOEFL or IELTS examination.

A minimum of ten courses must be completed and a grade of Honors achieved in at least one course. It is expected that this program will be completed during a single academic year. Satisfactory completion of the capstone experience is required. Examples of a capstone experience are completion of an NIH-type grant application that is deemed reasonably competitive by a faculty member; completion of a manuscript that is suitable for submission for publication; completion of a systematic review deemed eligible for publication. Manuscripts and grant applications may be derived from any of the courses taken by the student.

M.D./Ph.D. Program Requirements for Epidemiology and Public Health

All M.D./Ph.D. students must meet with the director of graduate studies in Epidemiology and Public Health as soon as they affiliate with EPH. Students in this program are expected to meet the guidelines listed below in the timeframe outlined. The director of graduate studies must approve any variations to these requirements.

TEACHING

One term of teaching as a TA 2 (10 hours/week) is required. If a student has served as a teaching assistant elsewhere on campus, this experience may be counted toward the requirement. Divisional approval is required to waive the teaching requirement on the basis of previous Yale teaching experience.

ROTATIONS/INTERNSHIPS

Students should do two four-week rotations/internships with potential advisers in EPH. These short-term research projects will be with a specific Principal Investigator and can be either in a lab, or field work, or analysis of an existing dataset. The purpose of these rotations/internships is to learn lab or field technique and to allow the student time to determine if the PI's research interests are compatible with his/her research interests. These rotations/internships are usually done during the summer between the first and second years of medical school course work. In some cases, a student may need to defer this activity until the summer after the second year after taking certain courses and/or completing readings so that he/she possesses the background necessary for a successful rotation/internship.

REQUIRED COURSE WORK

M.D./Ph.D. students are generally expected to take the same courses as traditional Ph.D. students. Divisional requirements may vary; therefore students should confer with the DGS and their Ph.D. adviser.

TIMELINE FOR QUALIFYING EXAM

Students generally take medical school courses in years 1 and 2, then EPH doctoral course work in years 3 and 4 (all or part of year 3). The qualifying exam is generally completed by the summer following the fourth year.

PROSPECTUS TIMELINE

Students are encouraged to develop their prospectus during their third and fourth years of study, while taking courses in EPH. Upon completion of the qualifying exam, students should focus entirely on completion of the prospectus, which should be submitted no later than six months after the completion of the qualifying exam.

Ph.D. or terminal M.S. degree program materials are available upon request from the Office of the Director of Graduate Studies (c/o M. Elliot), Epidemiology and Public Health, Yale University, PO Box 208034, New Haven CT 06520-8034; 203.785.6383; e-mail, eph.doctoral@yale.edu.

Courses for all Epidemiology and Public Health Graduate School Degrees

BIS 505a, Introduction to Statistical Thinking I Elizabeth Claus

This course provides an introduction to the use of statistics in the fields of epidemiology and public health. Topics include descriptive statistics, probability distributions, parameter estimation, and hypothesis testing, as well as an introduction to sampling and simple linear regression. Statistical analysis using the SAS software on the PC is introduced.

BIS 505b, Introduction to Statistical Thinking II Daniel Zelterman

This continuation of BIS 505a covers multiple regression, analysis of variance, nonparametric tests, survival analysis, Poisson regression, and logistic regression. The course concludes with a review of commonly used statistical methods. As in the first term, the SAS software package is used for statistical analysis. Prerequisite: BIS 505a.

BIS 511a, GIS Applications in Epidemiology and Public Health Theodore Holford

The study of epidemiology often seeks to determine associations between exposure risk and disease that are spatially dependent. Geographic information systems (GIS) are modern computer-based tools for the capture, storage, analysis, and display of spatial information. GIS technologies are just beginning to be used for public health planning and decision making. Public health applications of GIS provide cost-effective methods for evaluation interventions and modeling future trends, and also provide a visual tool for data exploration. This class teaches the technical and design aspects of implementing a GIS project in public health and provides students with basic tools for using GIS. Examples are given to introduce a variety of applications in the field of epidemiology.

BIS 525a and b, Seminar in Biostatistics Faculty

Faculty and invited speakers present and discuss current research.

BIS 538b, Survey Sampling: Methods and Management Robert Makuch

This course reviews the major sampling plans: simple, stratified, systematic, and cluster random sampling. The uses of weighted data and ratio estimation are discussed. The course emphasizes application of methodology, including use of SUDAAN. Prerequisite: BIS 505b or equivalent.

BIS 540a, Fundamentals of Clinical Trials Robert Makuch

This course addresses issues related to the design, conduct, and analysis of clinical trials. Topics include protocol development, examination and selection of appropriate experimental design, methods of randomization, sample size determination, appropriate methods of data analysis including time-to-event (possibly censored) data, and interim monitoring and ethical issues. Prerequisite: BIS 505a or equivalent and second-year status.

BIS 561b, Practical Issues and Case Studies in Multicenter Clinical Trials

Peter Peduzzi, Maria Ciarleglio

This course addresses practical issues related to the design, conduct, monitoring, and analysis of multicenter randomized clinical trials. Topics include organizational, regulatory, and ethical issues; an overview of design strategies; topics in sample size estimation, interim monitoring and analysis; and case studies of landmark clinical trials, such as the polio vaccine field trial, Physicians Health Study, and the VA Shingles Prevention Trial. Prerequisite: BIS 505a.

BIS 623b, Applied Regression Analysis Heping Zhang

This course covers linear regression, estimation, and testing hypotheses in multivariate regression, regression diagnostics, analysis of variance, and adjusting for covariates. Emphasis is on the application of methods. SAS software is used throughout the course. Prerequisite: BIS 505b or equivalent.

BIS 625a, Categorical Data Analysis Daniel Zelterman

This course presents methods for analyzing categorical data in public health, epidemiology, and medicine. Topics include discrete distributions, log-linear models, and logistic regression. Emphasis is placed on the application of the methods and the interpretation of results by applying the techniques to a variety of data sets. Prerequisite: BIS 505b.

BIS 628b, Longitudinal Data Analysis Haiqun Lin

This course covers methods for analyzing data in which repeated measures have been obtained for individuals over time. Different methods are discussed to handle both continuous and discrete longitudinal response data. Both subject-specific and population averaged approaches are covered (with particular reference to capturing the heterogeneity between different individuals). Some of the approaches covered include linear, nonlinear, and generalized mixed effects models, as well as generalized estimating equations. The course also covers exploratory methods, approaches for handling missing data, and possibly transition models and advanced topics such as multivariate longitudinal responses, nonparametric longitudinal responses, the joint consideration of longitudinal

and survival data, and the joint consideration of longitudinal and spatial data. Emphasis is placed on applying the methods, understanding underlying assumptions, and interpreting results. Both SAS and S-Plus/R software are used throughout the course. Prerequisites: BIS 623a and BIS 625a.

BIS 630b, Applied Survival Analysis Robert Makuch

This half-term course demonstrates statistical methods for analyzing and interpreting time to failure data. The techniques described include the construction and analysis of failure rates, survival curves, significant tests for comparing survival curves, and semi-parametric models for the analysis of time to failure data including the proportional hazards model. Skills for using statistical software to perform the calculation are developed. In addition, study design is covered, including sample size and power calculations. Prerequisites: BIS 505a and BIS 505b; BIS 623a or BIS 625a.

BIS 631a/GENE 631a, Topics in Genetic Epidemiology Elizabeth Claus,

Hongyu Zhao, Kenneth Kidd

This course discusses the role of human genetics in epidemiology and public health, focusing on the epidemiology of Mendelian disorders and the genetic and environmental contributions to common, complex familial traits. Topics of discussion include (1) study designs for assessing the importance of genetic factors (population-based as well as family-based designs such as high-risk pedigrees and twin studies), (2) methods for determining mode of inheritance, and (3) the identification and mapping of genes through linkage analyses, candidate-gene approaches, genome-wide association studies, and admixture mapping. Applications of these approaches to clinical medicine are presented. Prerequisites: BIS 505a and BIS 505b (or equivalent) as well as course work in basic genetics. Offered every other year.

BIS 632b, Design and Analysis of Epidemiologic Studies Theodore Holford

This half-term course considers methods for analyzing the association of one or more factors with disease. Topics include the analysis of cohort studies, case-control studies, and vital rates. The analysis of matched data is also discussed. Emphasis is placed on the application and interpretation of the techniques. Issues of study design are also covered. Prerequisites: BIS 505a and BIS 505b; BIS 623a or BIS 625a.

BIS 640b, Quantitative and Computational Methods in Bioinformatics Faculty

The Human Genome Project has created a great opportunity for biomedical research by providing enormous genetic information. A bottleneck in understanding the biological processes is the problem of how to make best use of the generated information. This course covers statistical techniques in clustering and classification, and artificial neural network, as well as computer algorithms for optimization and search. These techniques and algorithms are applied for and demonstrated in DNA sequencing, microarray analyses, and protein structure classifications. Students should have one year of master's-level statistical training or equivalent. The Ph.D. and M.D. students in Biostatistics are encouraged to take this course. Prerequisite: BIS 623a or equivalent.

BIS 643b, Theory of Survival Analysis and Its Applications Shuangge Ma

This course presents the statistical theory underlying survival analysis. It covers different models of censoring and the three major approaches to analyzing this type of data:

parametric, nonparametric, and semi-parametric methods. The application of this theory through some exemplary data sets is also presented. Prerequisite: STAT 541a, 542b. Offered every other year.

BIS 645a, Statistical Methods in Human Genetics Elizabeth Claus, Hongyu Zhao
Probability modeling and statistical methodology for the analysis of human genetics data are presented. Topics include population genetics, single locus and polygenic inheritance, linkage analysis, quantitative genetics, population-based and family-based disease-marker associations, genetic risk prediction models, and DNA fingerprinting. Prerequisites: Genetics; BIS 505a and b or equivalent; and permission of the instructor. Offered every other year.

BIS 646b, Nonparametric Statistical Methods and Their Applications

Yongtao Guan

BIS 651b, Spatial Statistics Theodore Holford, Yongtao Guan
Statistical methods for the analysis of spatial data that arise from health studies are developed in order to account for spatially correlated outcomes. Techniques to be discussed include methodology for continuous responses such as inverse distance weighting and Kriging. Bayesian models for smoothing disease risk maps are derived. Environmental exposure models are developed. In addition, spatial/temporal models are discussed that allow the analysis of both sources of correlation. Techniques are illustrated using data from ongoing studies. Prerequisites: STAT 541a and STAT 542b. Offered every other year.

BIS 691b, Theory of Generalized Linear Models Shuangge Ma
Most data encountered in practice cannot be described with simple linear models. Generalized linear models are an extension of the linear modeling process that allows models to be fit to data that follow probability distributions other than the normal distribution. Generalized linear models also relax the requirement of equality or constancy of variances. This course covers statistical theories, computational algorithms, and applications of generalized linear models. Prerequisites: STAT 541a, 542b. Offered every other year.

BIS 695c, Summer Rotation in Statistical Research Theodore Holford
The purpose of this course is to provide students with the opportunity of gaining practical experience in the analysis and the development of biostatistical methods as part of a health sciences research team including medicine, public health, pharmaceutical industry, or health care delivery. This experience in a research laboratory provides a basis for developing a dissertation proposal that has practical significance for addressing important scientific questions. Students work with a biostatistics faculty mentor to select a suitable placement for the rotation, and a one-page description of the plans will be submitted to the head of the Biostatistics division at least three weeks prior to starting the program, for approval by the biostatistical faculty within two weeks. Upon completion of the rotation, a written report of the work must be submitted to the head of the Biostatistics division no later than October 1, and an oral presentation given during the fall term. Prerequisite: completion of one term of the Ph.D. program.

CDE 505a/PSYC 657a, Social and Behavioral Influences on Health Becca Levy

This course provides students with an introduction to social and behavioral science issues that influence patterns of health and health care delivery. The focus is on the integration of biomedical, social, psychological, and behavioral factors that must be taken into consideration when public health initiatives are developed and implemented. This course emphasizes the integration of research from the social and behavioral sciences with epidemiology and biomedical sciences. T 1–2:50

CDE 508a/EMD 508a, Principles of Epidemiology I Linda Niccolai

This course presents an introduction to epidemiologic concepts and methods. Topics include measurement of disease rates, descriptive epidemiology, ecologic studies, cohort studies, case-control studies, cross-sectional studies, randomized controlled trials, causation, random variation and statistical significance, bias, confounding, effect modification, epidemic investigation, measurement validity, screening, and molecular epidemiology. The course utilizes a wide variety of case studies from both chronic and infectious disease epidemiology.

CDE 516b, Principles of Epidemiology II Mayur Desai

This is an intermediate-level course on epidemiologic principles and quantitative methods used in epidemiologic studies. Topics covered at the introductory level are revisited and covered in more depth and breadth, with an emphasis on quantitative issues involved in the design, analysis, and interpretation of epidemiologic studies. Certain new concepts and areas of studies are also introduced. Through readings, lectures, and problem sets, students are expected to (1) develop an increased understanding of epidemiologic principles and methods; (2) identify strengths and pitfalls in the design, analysis, and interpretation of epidemiologic studies in the literature; (3) improve relevant quantitative skills; and (4) master epidemiologic methods to a degree necessary to initiate their own research projects and analyses. Prerequisites: CDE 508a and BIS 505a.

CDE 518b, Introduction to Pharmacoepidemiology Michael Bracken

The course provides a basic orientation to the study of safety, efficacy, and utilization of ethical pharmaceuticals. The application of epidemiologic methods to the field is emphasized. Among the subjects considered are the usefulness of databases from HMOs, governmental, international, and other sources; current pharmacoepidemiology research within Yale School of Medicine; the role of the Food and Drug Administration; the assessment of drug safety; and assessment of quality of life and the role of pharmacoepidemiology in a managed care environment. Prerequisites: CDE/EMD 508a, BIS 505a, and BIS 505b.

CDE 523b, Measurement Issues in Chronic Disease Epidemiology Xiaomei Ma

This course addresses the measurement issues in chronic disease epidemiology from a practical perspective. The first part of the course covers the use and limitations of currently available techniques for measuring exposure to a number of etiologic factors such as diet, alcohol, tobacco, physical activity, psychological factors, and environmental/occupational exposures. The latter part of the course focuses on the measurement of outcome for some of the major chronic diseases, along with some practical considerations involved in conducting chronic disease epidemiology research. Prerequisite: CDE/EMD 508a.

[CDE 531a, Health and Aging]**CDE 532b, Epidemiology of Cancer** Brenda Cartmel

This course applies epidemiologic methods to the study of cancer etiology and prevention. Introductory sessions cover cancer biology, carcinogenesis, cancer incidence and mortality rates in the United States, and international variation in cancer rates. The course then focuses on risk factors for cancer (including tobacco, alcohol, diet, radiation, and occupation) and on major cancer sites (including colon, breast, and prostate). Emphasis is placed on critical reading of the literature. Prerequisite: CDE/EMD 508a, or permission of the instructor.

CDE 533a, Topics in Perinatal Epidemiology Kathleen Belanger

Pregnancy, delivery, and reproduction provide the course's organizing focus. The current perinatal epidemiologic literature is critically reviewed from a methodological perspective. Subjects studied include infertility, miscarriage, fetal growth retardation, preterm labor and delivery, aspects of prenatal care, perinatal risks for cancer and other chronic diseases, SIDS, and infant mortality. Students develop an understanding of what evidence is needed to establish causal relationships in this specialty. Implications of research findings for public health policy, individual decision making, and future studies are considered.

CDE 534b, Approaches to Data Management and Analysis of Epidemiologic Data

Mayur Desai

This course provides students with basic skills of data management and data analysis. The SAS statistical program is used. Main topics include using SAS data sets, data manipulation, bivariate and multivariable analyses. Using existing data sets, students test their own hypotheses and develop a research project. Emphasis is placed on the practical application of the skills learned. The course is a useful preparation for the summer internship and for thesis data analysis. Prerequisites: BIS 505a, CDE/EMD 508, and CDE major or doctoral status (permission of the instructors for non-CDE majors required); students must have taken or must be currently taking BIS 505b and CDE 516b.

CDE 535b, Epidemiology of Heart Disease and Stroke Judith Lichtman

Heart disease and stroke are the leading cause of death and disability among industrialized nations. This course introduces students to the major categories of cerebrovascular and cardiovascular disease. Students are challenged to think about how individual diseases contribute to the epidemic of cardiovascular disease and stroke in the United States. In this course, students learn basic principles about the rates of disease, risk factors, clinical trial results, and outcomes of vascular diseases. Through the critical review of current studies, students apply basic epidemiology to critically evaluate current literature and topics in the field of vascular epidemiology. Sessions include a clinical overview of a specific disease or risk factor, as well as highly interactive discussion of a specific epidemiologic topic or principle. Students are encouraged to develop their own solutions to current gaps in the epidemiologic literature.

CDE 545b, Health Disparities by Race and Sex: Epidemiology and Intervention

Beth Jones

The United States Public Health Service states that "eliminating health disparities" is one of the two overarching goals for the national health promotion/disease prevention

agenda. This course takes a life course perspective to examine the epidemiology of disparities from the perinatal period (e.g., birth weight) to older adulthood (e.g., mortality). We focus on differences in morbidity and mortality between females and males and between diverse racial/ethnic groups. The primary focus of this course is on understanding the critical determinants and consequences of health disparities, learning to think critically about studies in the field, and developing creative ideas for new approaches to research, intervention, and policy. The course covers state-of-the-science information, taken primarily from journal articles, across a broad range of topics including heart disease, cancer, and AIDS, as well as important psychological, social, and behavioral factors that influence health. Emphasis is placed on methodological issues, including measurement, study design, and conducting ethically responsible community-based research. This course focuses not just on understanding disparities, but on evaluating and developing interventions to reduce or eliminate them. Prerequisite: CDE 505a or 571b.

[CDE 562a, Nutrition and Chronic Disease]

CDE 570a, Epidemiology of Psychiatric Disorders Selby Jacobs

This course reviews the application of traditional epidemiologic methods to the study of psychiatric disorders. Emphasis is on study design and assessments. New technologies for case identification are discussed. Application of these methods to studies of the epidemiology and genetics of the major psychiatric disorders (e.g., depression, schizophrenia, anxiety disorders) is reviewed. Prerequisite: CDE/EMD 508a.

CDE 571b, Psychosocial and Behavioral Epidemiology Tene Lewis

This course provides a systematic overview of psychosocial and behavioral influences on health, illness, and recovery. The factors of interest that influence health include: individual stable characteristics (e.g., traits), characteristics of the primary social environment (e.g., family, friends), settings defined by social roles (e.g., work), and broader contextual factors reflecting social structural variables (e.g., social class). The interplay of the foregoing factors of interest with biomedical and clinical variables constitutes a central theme. Prerequisite: CDE 505a.

CDE 572a, Preventive Interventions: Theory, Methods, and Evaluation

Melinda Irwin

This course reviews the theory, methods, and evaluation of health promotion and disease prevention interventions conducted in multiple settings. Topics of promotion and prevention include physical activity, nutrition, obesity, cancer, cancer screening, cardiovascular disease, diabetes, smoking, alcohol and substance abuse, HIV and STDs, condom and contraception use, adolescent pregnancy, and psychiatric and mental health problems. The course combines didactic presentations, discussion, and critiques of health promotion and disease prevention interventions by students. This course is intended to increase the student's skills in evaluating health promotion and disease prevention interventions, at both the individual and community levels. Prerequisite: CDE 505a.

CDE 574b, Developing a Health Promotion and Disease Prevention Intervention

Trace Kershaw

This course is intended to be a practical "how to" application of concepts and methods learned in CDE 572a. The primary objective of this course is to gain experience in

intervention research by developing a health promotion and disease prevention intervention. Students choose a health problem (e.g., physical inactivity, smoking, HIV risk) and develop an intervention focused on favorably changing the determinants and behavior that influence the health problem. The course emphasizes transferring concepts from the abstract to the concrete. Students develop an intervention manual consisting of actual intervention materials, and methods that specifically outline how the intervention will be designed, conducted, evaluated, and disseminated. Throughout the course students participate in a peer review process to evaluate and give feedback for each section of the intervention manual. Prerequisite: CDE 572a.

CDE 575b, Religion, Health, and Society Peter Van Ness

This course examines the impact of various dimensions of religiousness on mortality and health status, giving special attention to the relation between religion and other social factors such as age, gender, race, and class. Discussion focuses on the public health implications of the epidemiological findings including the nature and significance of faith-based programs serving health needs. Special attention is given to studies drawn from religiously diverse populations.

[CDE 576b, Social Psychological Theories of Health]

CDE 617b, Developing a Research Protocol Stanislav Kasl

The objective of this course is to develop a research protocol from hypothesis formation to appropriate study design. Review of relevant background literature, consideration of appropriate statistical techniques, provision of adequate personnel and environment, and understanding of strengths and weaknesses of the proposed study are included. Students are divided into groups, with each group responsible for developing a research protocol suitable for submission as a grant proposal to NIH. Special attention is given to writing techniques and style. Prerequisites: CDE 516b (can be taken concurrently), doctoral student status, or permission of instructor.

CDE 619a, Advanced Epidemiologic Research Methods Harvey Risch

This advanced course focuses on quantitative issues and techniques relevant to the design and analysis of observational epidemiologic studies. Starting with formal definitions of the commonly used epidemiologic parameters, and assuming a working knowledge of ANOVA and linear regression, the course covers analyses based on various related types of regression, e.g., logistic, Poisson, Cox, etc. The GLIM and PECAN computer programs are described and used throughout. Students analyze and discuss data sets of generally increasing complexity. Prerequisites: BIS 505a, 505b, Ph.D. student status, or permission of the instructor.

CDE 630a, Molecular Epidemiology of Chronic Disease Herbert Yu

The course provides an in-depth overview of issues addressed in molecular epidemiology and its application in cancer research. Subjects covered in the course include basic biochemistry and molecular biology, biological mechanisms related to molecular epidemiology research, principles of molecular and biochemical analysis, biotechnologies and laboratory methods used in molecular epidemiology, and interpretation of study results. The course emphasizes the development of abilities to design and conduct molecular epidemiology research and to critically evaluate findings in the literature. Prerequisite:

CDE/EMD 508a or permission of the instructor (biochemistry, cell and molecular biology are helpful, but not required).

CDE 650a, Introduction to Evidence-Based Health Care Michael Bracken

Evidence-based health care uses best current evidence in addressing clinical or public health questions. This course introduces principles of evidence-based practice in formulating clinical or public health questions, systematically searching for evidence, and applying it to the question. Types of questions considered include: examining the comparative effectiveness of clinical and public health interventions, etiology, diagnostic testing, and prognosis. Particular consideration is given to the methodology of synthesizing evidence in a systematic review. Also addressed is the role of evidence in informing economic analysis of health care programs, clinical decision analysis, and clinical practice guidelines. Using a problem-based approach, students contribute actively to the classes and small-group sessions. Students complete a systematic review in their own field of interest using Cochrane Collaboration methodology. Prerequisite: students must have passed or be concurrently taking CDE 516b, or obtain permission of instructor.

CDE 660b, Doctoral Seminar in Epidemiology Faculty

In this seminar, doctoral students present and discuss recently published articles that have strong relevance to the methodological conduct of epidemiological research, or that make significant advances to the content area of specific disease etiology, prevention, prognosis, diagnosis, and treatment. In addition, faculty present their ongoing research and scholarship, and more advanced students share their prospectus and preliminary results for comment and feedback from course participants. Prerequisite: doctoral student status or permission of faculty.

[CDE 669a, Research Seminar in Psychosocial Epidemiology]

CDE 670a and b, Advanced Field Methods in Chronic Disease Epidemiology

Faculty

This course offers direct experience in field methods in chronic disease epidemiology for doctoral students who have not yet taken qualifying exams. Students are expected to actively participate as part of a research team (8–10 hours per week) doing field research in some aspect of chronic disease epidemiology. It is expected that their progress will be directly supervised by the Principal Investigator of the research project. This course can be taken for one or two terms and may be taken for credit (pass/fail). Prerequisite: doctoral student status.

EHS 502a, Physiology for Environmental Health Sciences Catherine Yeckel

The purpose of this course is to describe the basic physical properties associated with exposure to environmental stress and the physiological strategies used to maintain homeostasis in the human body. Prerequisites: biology, chemistry.

EHS 503b, Introduction to Toxicology Jonathan Borak, Cheryl Fields

This course examines factors that affect the toxicity of foreign substances. The course first focuses on absorption, distribution, excretion, and metabolism and their contributions to dose-response relationships. Specific toxicological problems are then considered including the effects of metals and solvents, chemical carcinogenesis, neurotoxicology, and developmental toxicology.

EHS 505b, Introduction to Industrial Hygiene Judy Sparer

Students are introduced to the practice of industrial hygiene: the recognition, evaluation, and control of health hazards in the workplace. Several visits are made to industrial worksites. Topics include regulation of health and safety in the workplace, air sampling and interpretation of sampling results, and approaches to reducing place exposures.

EHS 507a, Environmental Epidemiology Tongzhang Zheng

Environmental epidemiology can provide insight about the association between environmental exposures of a population and adverse health outcomes. The potentials and the limitations of environmental epidemiology are explored as they are inherent in the design of suitable studies and as they manifest themselves in actual studies that have been conducted. The analysis and interpretation of such studies, as well as the consequences for the design and conduct of proposed studies, are examined. Prerequisite: CDE/EMD 508a or permission of the instructor.

EHS 508a, Assessing Exposures to Environmental Stressors Brian Leaderer

This course examines human exposure to environmental stressors as it applies to environmental epidemiology and risk assessment. Indirect and direct methods of assessing exposures are reviewed and case studies are presented.

EHS 510b, Fundamentals of Environmental Health and Risk Assessment

Kathleen McCarty, Michelle Bell

This course is an overview of environmental health. Students are introduced to the fundamentals of environmental health from the perspective of using risk analysis to reduce environmentally induced disease. The principles used to apply toxicologic, statistical, and pharmacokinetics factors in the assessment of health risk from chemicals are emphasized. Quantitative risk assessment, exposure assessment, and risk characterization are emphasized.

EHS 511a, Applied Risk Assessment I Jonathan Borak

This course introduces students to the nomenclature, concepts, and basic skills of quantitative risk assessment (QRA). The goal is to provide an understanding necessary to read and critically evaluate QRA. Emphasis is on the intellectual and conceptual basis of risk assessment, particularly its dependence on toxicology and epidemiology, rather than its mathematical constructs and statistical models. Specific cases consider the use of risk assessment for setting occupational exposure limits, establishing community exposure limits, and quantifying the hazards of environmental exposures to chemicals in air and drinking water.

EHS 514a, Environmental Chemistry Meredith Stowe

The basic chemical principles underlying environmental pollutants in water, soil, air, and specialized media are introduced. Various categories of federally regulated compounds and elements are examined with respect to group characteristics, analytical measurement techniques of choice, sampling methods, and data interpretation. Selected chemical agents are studied with regard to their fate (possible transformations/decomposition) in the environment. Students develop insight into some current problems faced in applying pollutant measurements to public health, e.g., analytical precision, uncertainty, detection limits, chemical speciation, and toxicological properties.

EHS 521b, Physical Activity: Physiology and Epidemiology Faculty

This course offers a general introduction to the health issues stemming from physical inactivity (or disuse). Basic principles of energy metabolism are covered, as well as both basic and state-of-the-art methods for physical activity assessment. Students examine the major physiologic systems' adaptation to exercise training and to de-training and how this adaptation may vary by age and sex. The relation of disuse to major chronic diseases across the age spectrum is discussed, as well as individual and community-based intervention strategies to modify behavior and ameliorate the putative effects of a sedentary lifestyle. Finally, the role of the built environment as an environmental "toxin" is examined using the basic principles of environmental health risk assessment (hazard identification, exposure assessment, dose-response, risk characterization, and risk management). Prerequisites: EHS 502a and second-year status.

EHS 525a and b, Seminar in Environmental Health Faculty

Students are introduced to a wide variety of research topics, policy topics, and applications in environmental health. Faculty members, public health professionals, and students make brief oral presentations and engage in related dialogues. The course is designed to help students develop topics for their M.P.H. theses. Second-year students have the opportunity to receive feedback on their developing research. Prerequisite: permission of the instructor.

[EHS 535b, Disaster Preparedness]**EHS 545b, Introduction to Environmental Genetics** Yong Zhu

The course provides an introduction to genetic susceptibility markers and their interactions with environmental exposures in human disease development. The first part of the course covers basic concepts of human genetics that are fundamental to understanding and conducting environmental genetic studies. The second part of the course emphasizes the genetic responses and effects of exposures to environmental agents. The final part of the course utilizes profiles from gene-environment interactions to illustrate possible etiology of human diseases such as cancer and asthma.

[EHS 553b, Epidemiological Methods in Injury Control]**EHS 570a, Public Health Management of Disasters** David Cone

This course addresses the role of public health in disaster preparedness and management. It includes discussion of concepts in basic science, human responses to injury and illness, public health systems, and policy. Major topics include types of disasters and their consequences; the role of public health systems in disasters; hazard assessment and community vulnerability management; and mental health and environmental health issues in disasters. Practical applications of the concepts developed are emphasized, as are both the similarities and differences between domestic and foreign disaster management. Prerequisite: CDE/EMD 508a.

EHS 573b, Occupational Epidemiology Faculty

This course considers various approaches to the epidemiologic evaluation of health hazards in the workplace. The work includes consideration of specific substances. Critical review of the literature is stressed. Intermediate to advanced techniques in study design

and analysis of occupational epidemiologic studies are included. Prerequisites: BIS 505a and CDE/EMD 508a.

EHS 575a and b, Introduction to Occupational and Environmental Medicine

Faculty

This yearlong course presents a broad overview of the principles of occupational and environmental medicine. In the fall term the major diseases of environmental origin are presented. In the spring term the major hazards — chemical, physical, and biologic — and the settings in which they occur are examined. Prerequisite: M.D. degree or permission of the instructor.

EHS 580b, Environmental Hormones and Human Health Yawei Zhang

This course provides students a scientific orientation in environmental hormones and human health. The course introduces the basic concepts of four different types of hormones, including endogenous hormones, natural environmental hormones, pharmaceutical hormones, and environmental endocrine disruptors. The course discusses the current understanding of the relationship between hormones and human health, with emphasis on the methodology of studying the relationship between environmental hormones and environmental endocrine disruptors and human cancer risk. Prerequisites: EMD/CDE 508a and BIS 505a.

EHS 585b/FE&S 96004b, The Environment and Human Health Michelle Bell

This course provides an overview of the critical relationships between the environment and human health. The class explores the interaction between health and different parts of the environmental system including water, indoor and outdoor air, agriculture, and food. Other topics include environmental justice, case studies of environmental health disasters, risk, urbanization, health in the workplace, and links between climate change and health.

EMD 508a/CDE 508a, Principles of Epidemiology I Linda Niccolai

This course presents an introduction to epidemiologic concepts and methods. Topics include measurement of disease rates, descriptive epidemiology, ecologic studies, cohort studies, case-control studies, cross-sectional studies, randomized controlled trials, causation, random variation and statistical significance, bias, confounding, effect modification, epidemic investigation, measurement validity, screening, and molecular epidemiology. The course utilizes a wide variety of case studies from both chronic and infectious disease epidemiology.

EMD 512a, Immunology for Epidemiologists Faculty

This course is designed to introduce students to the fundamentals of immunology including antigens, antibodies, methods for detecting antibodies, cells of the immune system, products of such cells, and immune mechanisms. Experience will be gained in the analysis of primary research papers with relevance to immunologic aspects of epidemiologic studies. Prerequisite: two terms of college biology.

EMD 530b, Hospital Epidemiology Louise-Marie Dembry

The history, descriptive epidemiology, surveillance methods, risk analysis methods, and economics of nosocomial infections are outlined in this introductory course. In-depth

explorations of host, agent, and environmental factors influencing typical nosocomial illnesses in pediatric and adult services are reviewed by clinical faculty. Descriptive and analytical epidemiological methods are emphasized.

[EMD 536b, Investigation of Disease Outbreaks]

EMD 542b, Biology and Epidemiology of Infectious Agents Melinda Pettigrew

This course explores the basic biology of infectious agents. Through a theme-based, integrated approach, students learn about the developmental, cellular, and molecular biology of bacteria, viruses, and eukaryotic parasites of public health importance. Emphasis is placed on transmission, host-pathogen interactions, and mechanisms of virulence. Prerequisite: EMD 512a.

EMD 548a/ARCG 762a^U/F&ES 77001a/G&G 562a^U, Remote Sensing: Observing the Earth from Space Ronald Smith, Xuhui Lee, Mark Ashton

Course topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, and merging satellite imagery with GIS in their applications to weather and climate, oceanography, surficial geology, ecology and epidemiology, forestry, agriculture, and watershed management. Preference to students in F&ES, Geology and Geophysics, Archaeology, Anthropology, and Studies in the Environment. Prerequisites: college-level physics or chemistry, two courses in geology and natural science of the environment or equivalents, and computer literacy. TTH 9–10:15

EMD 557b/NURS 713b, Public Health Issues in HIV/AIDS Kaveh Khoshnood

An introductory, broad-based survey course for students of all levels interested in the epidemiology of HIV/AIDS. The course covers virology, clinical issues, natural history of infection, laboratory testing, transmission, and prevention of HIV/AIDS. The course, designed to give students a general, comprehensive understanding of HIV/AIDS issues, is targeted to students beginning work in public health or HIV/AIDS, or for those who wish to expand their specialized knowledge base regarding HIV/AIDS. Regular attendance at the Yale AIDS Colloquium Series (YACS) and written synopsis are required.

[EMD 560b, Epidemiologic Methods in STD/HIV Research]

EMD 565a, Modeling the Epidemiology and Evolution of Infectious Diseases

Alison Galvani

This course is designed for students to develop an understanding of the ways mathematical and computational modeling can be used to explore the epidemiology and evolutionary ecology of infectious diseases. The appropriateness of alternative modeling techniques for different types of research questions is explained. Interdisciplinary approaches are highlighted, including combining epidemiology with population genetics, evolutionary biology, and economics.

EMD 572b, Ecology and Epidemiology of Vector-Borne and Zoonotic Diseases

M. Diuk-Wasser

The purpose of this course is to explore factors underlying the risk to humans of acquiring vector-borne and zoonotic diseases (VBZD) like malaria, dengue, West Nile virus,

Lyme disease, rabies, hantavirus, etc. Students learn how human risk for these diseases can be described and predicted by understanding the ecology of vectors and reservoirs and the factors allowing for maintenance and transmission of pathogens. The course utilizes a combination of lectures, discussion of primary literature, practical exercises on risk mapping, and guest speakers.

EMD 583b, Public Health Surveillance Amanda Durante

This course is intended to provide students with a strong foundation in public health surveillance of both infectious and noninfectious disease. The course teaches the theory and practice of surveillance, supported by many examples of surveillance systems from the developing world. The class builds on and reinforces basic epidemiological concepts. Students are given the opportunity to design and evaluate a surveillance system.

[EMD 642a/GENE 642a/MBIO 642a/MCDB 642a, Roles of Microorganisms in the Living World]

EMD 670a, 670b, 671a, Advanced Research Laboratories Christian Tschudi

This course is required for all EMD graduate students and is taken for three terms. The course offers experience in directed research and reading in selected research laboratories. The first two terms must be taken in the first year of the doctoral program while the third term is normally taken in the summer after the first year. Prerequisite: doctoral student status.

EMD 680a/MBIO 680a, Molecular and Cellular Processes of Parasitic Eukaryotes

Diane McMahon-Pratt, Christian Tschudi

An introductory topic-based course in modern parasitology: for each topic there is an introductory lecture followed by a journal club-like discussion session of relevant papers selected from the literature. This course provides an introduction to basic biological concepts of parasitic eukaryotes causing diseases in humans. Topics include strategies used by parasitic eukaryotes to establish infections in the host and approaches to disease control, through either chemotherapy, vaccines, or genomics. In addition, emphasis is placed on evaluating the quality and limitation of scientific publications and developing skills in scientific communication. Prerequisite: permission of the instructor.

EMD 682a, Vector-Borne Diseases: Biotechnology Applied to Disease Control

Serap Aksoy, Brian Weiss

Insects transmit many emerging and re-emerging human and agriculture-related diseases. These insect-borne diseases have a directly negative impact on public health, especially in the developing world, and can cause further indirect devastation by significantly reducing agricultural productivity and nutrient availability and exacerbate poverty and deepen disparities. This course introduces students to the major groups of important arthropod disease vectors and the pathogens they transmit. Lectures cover aspects of the ecology and physiology of arthropod vectors as they relate to pathogen transmission and disease control strategies. A major focus of the course is on evaluating the insect-based disease intervention methods. Current research trends are presented and critically evaluated. Prerequisites: biology, chemistry, microbiology, or permission of the instructors.

EMD 684b/MBIO 684b, Advanced Topics in Molecular Parasitology

Diane McMahon-Pratt, Christian Tschudi

An advanced seminar in modern parasitology. The class is focused on the reading and critical evaluation of papers from the current literature selected by the students in cellular and molecular mechanisms of parasitism. Prerequisites: EMD 680a is highly recommended; permission of the instructor. F 12–1:30

EPH 600b, Research Ethics and Responsibilities Christian Tschudi

This course seeks to introduce major concepts in the ethical conduct of research and some of the personal and professional issues that researchers encounter in their work. Sessions are run in a seminar/discussion format. Prerequisite: permission of the instructor.

HPA 510a, Health Policy and Health Systems Mark Schlesinger

This course provides an introduction to the making and understanding of health policy. The various goals of policy making and the alternative means of achieving those goals are examined. Health issues are placed in the context of broader social goals and values. The current performance of the health care system is assessed, with particular emphasis on shifting needs, rising costs, and changing institutional arrangements. The course provides an overview of the important actors in the health care and political systems and introduces students to methods for understanding their behavior. Students apply these methods to a set of concrete policy issues.

HPA 514b, Health Politics and Policy Colleen Barry

This course is designed to familiarize students with the various processes by which governmental health policy is made in the United States, and with current policy debates. One focus of the course is to understand the politics underlying the successes and failures of health policy making during the course of the twentieth century. This includes a discussion of the relevant governmental institutions, political actors, the major national programs that have been established, and how political actors use resources and set their strategies.

HPA 518a, Practice Seminar in Health Management Richard D'Aquila

The practice seminar is designed to hone students' skills in reviewing and critiquing the analyses and conclusions of experts in health management. Students are exposed to a variety of "real-world" issues facing health care managers and leaders. The course begins with two didactic sessions presenting the management background and issues related to the current year's course topics. (Examples of relevant topics might be managed care, information management, etc.) The chosen themes are then addressed from multiple perspectives, including those of hospitals, clinics, long-term care facilities, integrated health systems, managed care organizations, pharmaceutical companies, regulatory agencies, and research organizations. Required for second-year Health Management students. Prerequisites: HPA 510a and HPA 560a.

HPA 529a, Advanced Applications in Policy Analysis Patricia Keenan

This course provides students with policy analysis skills and teaches students to think critically and write succinctly about health care policy. The course integrates the study of policy analysis and the world of health politics as analysts must do in real life. The course begins broadly by thinking first about the nature of public policy and the theories

of policy analysis and policy decision making. Next, eight key components of the policy analysis process are considered, and the impact of major political organizations and institutions on the process of analyzing and selecting public health care policy is jointly examined. Prerequisite: HPA 510a.

[HPA 538a, Regulation and Public Health Policy]

HPA 542a, Health of Women and Children Mary Alice Lee

The focus of this course is women's and children's health care in the United States. Emerging health issues and related health policy are presented and discussed in terms of epidemiology, including racial/ethnic disparities and effects of poverty; utilization and financing of children's health care; and existing programs and public policies that facilitate access to care. Data sources and data needs are identified. Topics may include history of MCH programs and policy, Medicaid and SCHIP, low birth weight and infant mortality, maternal mortality, reproductive health, breast and cervical cancer screening, pediatric oral health, pediatric asthma, childhood obesity, adolescent health care and teen pregnancy, children with special health care needs, childhood injuries, and injury prevention. Students are expected to critically evaluate the public health implications of selected conditions and the effect of public policy on availability, accessibility, acceptability of services, and accountability in health care for women and children.

HPA 544a, Public Law and Public Health: The Law, the Individual, and the State

John Culhane

This course provides students with a basic orientation to the law, the legal system, and legal decision making as they relate to the public's health. Emphasis is on the relation between the autonomy of the individual and the power of the state in addressing issues affecting the public's health. Topics include civil commitment, right to refuse treatment, foster care, religious practices, and seat belt and helmet laws. Issues that must be considered in assessing the state's silence, omission, intervention, or intrusion into health matters of the person, the family, or the group are discussed. Prerequisite: second-year M.P.H. status.

HPA 545b, Health Care Disparities Shelley Geballe

This course explores what constitutes and explains a disparity in health care. Emphasis is placed on studying the history of disparities in the United States in order to understand the current state of disparities, and on evaluating the effectiveness of ongoing strategies to eliminate them, such as increasing insurance coverage and the delivery of culturally competent health care. The course also examines sociological models that explain disparities in health care and requires students to evaluate and expand on these models. Prerequisites: HPA 510a, CDE 505a.

HPA 546a, Ethical Issues in Public Health Bruce Jennings

Public health policy is always the product of controversy. Scientific considerations blend with political and ethical conflicts in public health; questions of autonomy, coercion, justice, and the common good are central. This seminar discusses these issues of ethics and political theory in reference to selected public health issues such as preventive medicine and behavior modification, smoking, control of infectious disease, and contraception and teen pregnancy.

HPA 547a, Law and Ethics for Health Care Organizations Theodore Ruger

This course is a survey of legal topics important to the management of health care organizations. It is designed to acquaint the future health care manager with the basic legal issues that daily affect the provision of health care services. The course examines the relationships among the parties involved in the delivery of health care; the law of business organizations, including that of corporations and partnerships; the legal constraints that affect health care organizations, including state and federal regulatory laws, labor relations, and antitrust doctrines; and doctrines particularly applicable to managed care organizations. The course also considers a variety of emerging legal issues in the health care field.

HPA 555a and b, Health Management Practicum John Bradley

The Health Management Practicum is a project-based learning experience. Students work 8–10 hours per week for one or two terms. Designed to parallel the Doctor-Patient Encounter class offered to medical students in which students are paired with practicing physicians, the Health Management Practicum allows students to focus on current issues confronting a hospital department while working under the guidance of a departmental administrator. Prerequisite: permission of the instructor.

[HPA 560b, Health Care Finance and Delivery]**HPA 561b, Capstone Course in Health Management** Elizabeth Bradley

This course presents a range of management issues in health services delivery. The course integrates the tools of accounting, finance, marketing, organizational behavior, operations research, and strategic planning in the context of health systems management. Influences and constraints related to the political and regulatory environment are explored.

HPA 562b, Managing Performance Improvement in Health Care Delivery**Organizations** Ingrid Nembhard

This course is designed to provide participants with a foundation for developing, implementing, and analyzing efforts to improve health care delivery by provider organizations. Participants become familiar with the internal problems of managing performance improvement in health care delivery organizations at multiple levels—individual, interpersonal, group, and organizational. Additionally, they acquire knowledge of (1) fundamental management theories and perspectives related to performance improvement (e.g., on motivation, leadership, knowledge transfer, goal-setting, contingencies, managing superiors and self), and (2) recent initiatives by health care organizations. Through case studies, readings, exercises, and class discussions, participants are introduced to analytic frameworks, concepts, tools, and skills necessary for facilitating organizational learning, quality improvement, innovation, and overall performance in health care organizations.

[HPA 564a, Integrated Clinical/Financial Information Management]**HPA 570a, Cost-Effectiveness Analysis and Decision Making** A. David Paltiel

This course introduces students to the methods of decision analysis and cost-effectiveness analysis in health-related technology assessment, resource allocation, and clinical decision making. The course aims to develop the following: (1) technical competence in the

methods used; (2) practical skills in applying these tools to case-based studies of medical decisions and public health choices; and (3) an appreciation of the uses and limitations of these methods at the levels of national policy, health care organizations, and individual patient care.

HPA 583b, Methods in Health Services Research Andrew Epstein

This course introduces students to both quantitative and qualitative methods for research in health services. Topics include research objectives and hypotheses formulation, study design, sampling techniques, measurement, data analysis, results presentation, and discussion. Students synthesize these skills in the final paper. Prerequisite: BIS 505a.

HPA 586b, Microeconomics for Health Care Professionals Jason Fletcher

This course introduces students to microeconomics. Emphasis is placed on topics in microeconomics of particular relevance to the health care sector. Attention is paid to issues of equity and distribution, uncertainty and attitudes toward risk, and alternatives to price competition. This course is designed for students with minimal previous exposure to economics.

HPA 587b, Health Care Economics Susan Busch

This course applies the principles learned in Microeconomics for Health Care Professionals (HPA 586b) to the health of individuals, to health care institutions and markets, as well as to health care policy. The economic aspects of health behaviors, hospital markets, cost-benefit analysis, regulation, and the market for physician services are covered. Prerequisite: microeconomics or permission of the instructor.

[HPA 590b, Economics of Drugs and Crime]

HPA 592a/NURS 723a, Concepts and Principles of Aging Mary Bourbonniere

This multidisciplinary course provides the major concepts and principles of gerontology. Students are introduced to a variety of theories of aging in the biopsychosocial spheres. Delivery systems of care for the elderly are explored along with recent social policy initiatives as they relate to the elderly. Research initiatives are presented throughout the course.

HPA 597b, Capstone Course in Health Policy Mark Schlesinger

This seminar is designed as the capstone educational experience for students concentrating in health policy. It integrates previous course work in health policy and public health and facilitates students' transition from the academic setting into the world of professional policy analysis. Students explore different strategies for policy analysis and associated models of professionalism. They learn how to select the appropriate strategy and disciplinary perspective for addressing a social problem. Students also learn how to identify and frame health policy problems. They gain an understanding of how framing may be used to change the focus of policy debates. Finally, students learn to present ideas in the sort of crisp and concise fashion required of professional policy analysis. These issues are studied in a series of applied areas, including substance abuse and the community obligations of managed care plans. Prerequisite: HPA 510a or equivalent.

HPA 598a, Medicaid/SCHIP – Increasing Access to Care for Low-Income Children and Families Mary Alice Lee

In this course, Medicaid and SCHIP are examined and evaluated in terms of program history, eligibility, enrollment trends, benefits, financing, and program administration. Factors that contribute to eligible children being uninsured are identified and discussed. The effect of SCHIP on uninsured children and enrollment in Medicaid is examined. Eligibility and benefits for other adults (elderly and disabled) are discussed. Emerging issues, including the impact of state budget crises, Medicare prescription drug coverage, federal budget, and other factors are identified and assessed in terms of possible effects on eligibility, enrollment, and benefits. Prerequisites: HPA core courses.

HPA 599b/INRL 524b/PHIL 705b/PLSC 594b, Global Health Ethics, Politics, and Economics Thomas Pogge, Jennifer Ruger

Billions lack access to basic medical care, and global health inequalities are wide and growing. Such radical disparities cast doubt on the justice of supranational institutional arrangements (such as the TRIPS Agreement) and also pose ethical challenges for the global health community, especially international and domestic health and development institutions. Seeking to illuminate the normative issues involved, this course features a series of distinguished visitors, including academics as well as a few important representatives of international organizations, politics, foundations, NGOs, and relevant industries. M 1:30–3:20

HPA 600a and b, Readings in Health Services Research and Policy Faculty

This seminar explores current and cutting-edge topics in the broad fields of community and personal health services. It is designed to familiarize students with a breadth of research opportunities. Students review existing research projects and critique recent research publications. Prerequisite: Ph.D. student status or permission of the instructor.

[HPA 603b, The Ethical Conduct of Research]

HPA 617a, Colloquium in Health Policy and Health Services Research I

Jody Sindelar, Susan Busch

This seminar focuses on the analysis of current issues in health policy and on state-of-the-art methodological issues in health services research. The format includes guest speakers and presentations by EPH as well as other faculty and graduate students of ongoing research projects. Students participate in critical discussions of the issues that arise in both types of sessions. Prerequisite: Ph.D. student status or permission of the instructors.

HPA 617b, Colloquium in Health Policy and Health Services Research II

Jody Sindelar, Susan Busch

This seminar includes in-depth discussions of major policy concerns in the health and health care of vulnerable populations such as the poor, young, old, and disabled. The seminar also includes student presentations of their own research. Prerequisite: Ph.D. student status or permission of the instructors.

HPA 650a, Colloquium on Mental Health Services Research I Jason Fletcher

This seminar focuses on state-of-the-art methods in the evaluation and measurement of need for treatment and organization of mental health services. Students review ongoing research projects and develop research on the use of mental health services, prepare annotated bibliographies, and participate in the examination of relevant issues. Prerequisite: Ph.D. student status or permission of the instructor.

HPA 650b, Colloquium on Mental Health Services Research II

Jody Sindelar, Susan Busch

This seminar focuses on social and cultural factors in the development, diagnosis, treatment, and prevention of mental illness. Attention is given to the underlying theory and research in the social epidemiology of mental illness and the relation between stress and psychiatric status. The seminar also includes student presentations of their own research in mental health services and/or social psychiatry. Prerequisite: Ph.D. student status or permission of the instructors.

EUROPEAN AND RUSSIAN STUDIES

The MacMillan Center
242 Luce Hall, 34 Hillhouse, 432.3423
www.yale.edu/macmillan/europeanstudies/
M.A.

Chair

Steven Pincus

Director of Graduate Studies

Timothy Snyder (245 Luce Hall, 432.3423)

Professors Julia Adams (*Sociology*), Vladimir Alexandrov (*Slavic Languages & Literatures*), Ivo Banac (*History*), Dirk Bergemann (*Economics*), R. Howard Bloch (*French*), Paul Bushkovitch (*History*), David Cameron (*Political Science*), Katerina Clark (*Slavic Languages & Literatures*), Mirjan Damaška (*Law, Emeritus*), Laura Engelstein (*History*), Paul Freedman (*History*), John Gaddis (*History*), Harvey Goldblatt (*Slavic Languages & Literatures*), Philip Gorski (*Sociology*), Robert Greenberg (*Adjunct; Slavic Languages & Literatures*), Benjamin Harshav (*Comparative Literature*), Stathis Kalyvas (*Political Science*), Paul Kennedy (*History*), John MacKay (*Slavic Languages & Literatures*), Steven Pincus (*History*), Susan Rose-Ackerman (*Law*), Frank Snowden (*History*), Timothy Snyder (*History*), Ivan Szelenyi (*Sociology*), Katie Trumpener (*Comparative Literature*), Tomas Venclova (*Slavic Languages & Literatures*), Miroslav Volf (*Divinity, on leave [Sp]*), Jay Winter (*History*)

Associate Professors Keith Darden (*Political Science*), Hilary Fink (*Slavic Languages & Literatures*), Nicholas Sambanis (*Political Science*)

Assistant Professor Kate Holland (*Slavic Languages & Literatures*)

Senior Lectors Irina Dolgova, Krystyna Illakowicz, Rita Lipson, Constantine Muravnik, George Syrimis (*Hellenic Studies*), Julia Titus, Karen von Kunes (*Slavic Languages & Literatures*)

The European Studies Council formulates and implements new curricular and research programs reflective of current developments in Europe. The geographical scope of the council's activities extends from Ireland to the lands of the former Soviet Union. Its concept of Europe transcends the conventional divisions into Western, Central, and Eastern Europe, and includes the Balkans and Russia. In 2006 the U.S. Department of Education again designated the council a National Resource Center under its HEA Title VI program. Further information on the council and the Graduate Certificate of Concentration in European Studies is provided under Non-Degree-Granting Programs, Councils, and Research Institutes in this bulletin.

The council administers an M.A. program in European and Russian Studies. This M.A. program is unusual in its embrace of the entire spectrum of European nations and cultures. The requirements permit students to choose a particular national or thematic focus, geared to their individual interests and language skills, while demanding that they acquaint themselves with the traditions and issues associated with the other parts

of Europe. Students specializing in Russia and Eastern Europe, for example, will concentrate their efforts in that area, but will also take courses that may concern Europe-wide problems or the countries of Central or Western Europe. In this way, the program translates the political realities and challenges of the post-Cold War era into a flexible and challenging academic opportunity.

Fields of Study

European languages and literatures; economics; history; political science; law; music; sociology.

Special Requirements for the M.A. Degree

When applying to the program, students will specify as an area of primary concentration either (1) Russia and Eastern Europe, or (2) Central and Western Europe. All students must complete sixteen term courses (or their equivalent) in the various fields related to European and Russian studies. Students are required to take courses in at least three of the major disciplines relevant to the program (history, literature, social sciences, and law). For the purposes of this program, history includes history of art, history of science, and history of music. One of the sixteen term courses may be taken for audit. For students focusing on Russia and Eastern Europe, two of the sixteen required courses (excluding language courses) must concern the nations of Central and Western Europe. For those focusing on Central and Western Europe, two courses must concern Russia and Eastern Europe.

For the purposes of this program, language courses in European languages count toward the sixteen required courses, even though they have undergraduate course numbers. If students take a course of language study to fulfill degree requirements, the language course may not be taken for audit. Students with previous language preparation may in certain cases receive documentation of their language proficiency on the basis of this work. By the time the degree is completed, all students must demonstrate proficiency in two European languages besides English. Those wishing to focus on Russia and Eastern Europe will need to demonstrate knowledge of Russian or an Eastern European language; those focusing on Central and Western Europe will need to demonstrate knowledge of one of the appropriate languages. In all cases, students are required to demonstrate proficiency in two European languages by the end of the third term at Yale. The only exception to this rule is completion of the appropriate full sequence of Yale language classes, certified by the Yale instructor or the director of graduate studies. Students who wish to take examinations in French, German, Italian, Spanish, or other West European languages should register for a placement examination (with reading, oral, and grammar portions) with the appropriate Yale department. Students with Russian competence must receive the grade of 1+ or higher on the ACTFL/ETS Rating Scale as administered by the Slavic Languages and Literatures department at Yale, including reading, oral, and grammar portions. Students with competence in an East European language (such as Polish, Czech, Ukrainian, Hungarian, and others by special arrangement) or other European languages must take Yale department-administered examinations.

Through agreements the MacMillan Center has negotiated with the professional schools, CES now offers joint master's degrees with the following: the Law School, the

School of Management, the School of Forestry & Environmental Studies, and the School of Public Health. Application for admission must be made both to the Graduate School and to the appropriate professional school, with notation made on each application that this is to be considered for the joint-degree program. Contact the European Studies director of graduate studies for up-to-date information.

The Master's Thesis

The master's thesis is based on research in a topic approved by the director of graduate studies and advised by a faculty member with specialized competence in the chosen topic. The thesis is normally written in conjunction with E&RS 950. Students may register for an independent study to prepare topics and begin research. The master's thesis is due in two copies no later than April 10 of the student's second year.

Program materials are available upon request to the Council on European Studies, Yale University, PO Box 208206, New Haven CT 06520-8206.

Courses

E&RS 642a/HIST 698a, Religious Liberty in American and French Experience

Rita Hernon-Bélot

Each year this course focuses on the specialty of the visiting professor from the École des Hautes Études en Sciences Sociales (France). This course aims to offer an historical investigation on the long run, from early modern to modern, with a final focus on current issues, in a time when historical nationally bound legacies have to face global challenges. The path has been far more twisted for France, where pluralism is not rooted in society and culture but has been enforced by the state. The course addresses not only the comparison between the two patterns, but the way they have been competing and maybe still are. It also takes into account the many different means of interrelationships and exchanges, among them the sharp and influential analysis of friendly visitors like Jefferson or Tocqueville. It stresses the invaluable contribution American historiography brought to that field by reminding the French of the complex relationship between religion and politics, and above all between religion and democracy.

E&RS 652b/INRL 549b, The European Union's Contemporary Challenges Faculty

Each year, this course addresses a different set of issues facing the EU. Recent issues have included trade policy, regulation policy, building European monetary power, international trade policy and the WTO, and science, precaution, and policy making. The course is taught by the EU fellow visiting the MacMillan Center.

E&RS 940a or b, Independent Study

By arrangement with faculty.

E&RS 950a or b, Master's Thesis

By arrangement with faculty.

EXPERIMENTAL PATHOLOGY

140 Brady Memorial Laboratory, 785.3624

www.yalepath.org/

M.S., M.Phil., Ph.D.

Chair

Jon Morrow

Director of Graduate Studies

Gerald Shadel (BML 371, 785.2475, gerald.shadel@yale.edu)

Professors Richard Bucala (*Internal Medicine*), Junjie Chen (*Therapeutic Radiology*), David Chhieng, Young Choi, José Costa (*Internal Medicine-Oncology*), S. Evans Downing (*Emeritus*), Gary Friedlaender (*Orthopaedics*), Earl Glusac (*Dermatology*), Michael Kashgarian (*Emeritus, Molecular, Cellular & Developmental Biology*), Jung Kim (*Emeritus*), Diane Krause (*Laboratory Medicine*), Paul Lizardi, Joseph Madri, Nita Jane Maihle (*Obstetrics, Gynecology & Reproductive Sciences*), Vincent Marchesi (*Director, Boyer Center for Molecular Medicine; Cell Biology*), Jennifer McNiff (*Dermatology*), Mark Mooseker (*Molecular, Cellular & Developmental Biology*), Jon Morrow (*Molecular, Cellular & Developmental Biology*), Jordan Pober (*Immunobiology; Dermatology*), David Rimm, Marie Robert (*Internal Medicine*), John Rose, Gerald Shadel, John Sinard (*Ophthalmology*), Jeffrey Sklar (*Laboratory Medicine*), David Stern, Fattaneh Tavassoli (*Obstetrics, Gynecology & Reproductive Sciences*), A. Brian West, Raymond Yesner (*Emeritus*)

Associate Professors Marcus Bosenberg (*Dermatology*), Janet Brandsma (*Comparative Medicine*), Shawn Cowper (*Dermatology*), G. Kenneth Haines III, Liming Hao, Robert Homer, Pei Hui, Dhanpat Jain, Diane Kowalski (*Surgery/Otolaryngology*), Gary Kupfer (*Pediatrics*), Rossitza Lazova (*Dermatology*), Wang Min, Gilbert Moeckel, Vinita Parkash, Antonio Subtil-Deoliveira (*Dermatology*), Alexander Vortmeyer

Assistant Professors Adebowale Adeniran, Veerle Bossuyt, Demetrios Braddock, Guoping Cai, Paul Cohen, Angela Galan, Malini Harigopal, Anita Huttner, Sihem Khelifa, Steven Kleinstein, Christine Ko (*Dermatology*), Michael Krauthammer, Themis Kyriakides, Robert Means, Kisha Mitchell, Marguerite Pinto, Michael Robek, Ozlen Saglam, Constantine Theoharis, David Tuck, Zenta Walther, Qin Yan, Eduardo Zambrano

Instructor Angelique Levi

Fields of Study

Fields include molecular and cellular basis of diseases, including cancer; biology, biochemistry, genetics, and pathology of molecules, cells, tissues, and organ systems, including plasma membrane dynamics, mitochondrial dysfunction, signal transduction, and response to stimuli of connective tissue; assembly of viruses and their interactions with animal cells; somatic cell genetics and birth defects; biology of endothelial cells; and computational and high-throughput approaches to understanding disease pathology.

Special Admissions Requirements

A strong background in basic sciences is recommended for applicants to the program, including biology, chemistry through organic and physical chemistry, mathematics through calculus, biochemistry, genetics, or immunology. GRE General Test or MCAT is required.

To enter the Ph.D. program, students apply to an interest-based track, usually the Pharmacological Sciences and Molecular Medicine track, within the interdepartmental graduate program in the Biological and Biomedical Sciences (see the entry on Biological and Biomedical Sciences, under Non-Degree-Granting Programs, Councils, and Research Centers).

Special Requirements for the Ph.D. Degree

Course requirements Experimental Pathology students must take PATH 650b, Cellular and Molecular Biology of Cancer, and PATH 690a, Molecular Mechanisms of Disease. Three additional courses are required, which can include courses in biochemistry, genetics, immunology, cell biology, and pathology, to be chosen in consultation with the director of graduate studies (DGS), according to the student's background and interest. All requirements of the Graduate School of Arts and Sciences, including the Honors requirement, must be met. In year one, students must also take a seminar course (one in each term) and do three laboratory rotations.

Qualifying examination The qualifying examination of the Experimental Pathology graduate program comprises (1) two literature reading periods, (2) a research proposal broadly based on the proposed thesis research project, and (3) an oral exam in which the student is examined by the qualifying exam committee on the research proposal, the reading periods, and general knowledge of experimental pathology. This exam is usually taken in the second term of the second year and is described below.

1. The qualifying examination committee consisting of three faculty members will be chosen to examine the student. At least one of the committee members must have a primary appointment in the Department of Pathology and the thesis adviser is not on the exam committee. The student will read with two committee members and write the research proposal with initial guidance from the third committee member. At the oral exam itself one member of the committee will be selected as the chairperson responsible for documenting the results of the exam for submission to the DGS. Members of the exam committee should have expertise in areas chosen for reading. The exam committee and topics must be approved by the DGS.
2. Prior to the examination, the student will prepare a research proposal of approximately ten pages in the general area of the thesis project. The proposal will consist of the following sections: Specific Aims, Background and Significance, Experimental Plan, and Literature Cited. The proposal should describe three years of work in the topic area by a single postdoctoral fellow (i.e., similar to an NIH postdoctoral fellowship application).
3. All oral exams will follow the same general format. The oral examination will focus on the student's ability to present and defend the research proposal. The student should come to the exam with a short (30-40 minute) presentation of the thesis-

related proposal with visual aids. The actual presentation will take longer since exam committee faculty will interrupt with questions. The committee can also ask questions on topics covered during the reading period and general topics in experimental pathology that will have been covered in courses. The final evaluation by the exam committee faculty takes into account the student's performance on the examination and performance in lab (based on the adviser's evaluation, solicited by the DGS). A written summary of the qualifying examination evaluation will be prepared by the examination committee chairperson and submitted to the DGS. If the student does not pass the exam, the committee has the option of recommending an additional course of reading and/or written work. The DGS has final discretion in approving or modifying the recommendations of the committee.

Prospectus Upon successful completion of the qualifying examination, the student will constitute a dissertation committee including at minimum three members in addition to the dissertation/thesis adviser. At least two of the committee members must be Pathology department faculty. The membership of the committee must be approved by the DGS. The student will prepare a written thesis prospectus, consisting of a summary of background information in the field of interest, the specific questions to be answered, a rationale for choosing those questions, and a research plan for addressing those questions. Upon completing the course requirement with at least two terms of Honors, passing the qualifying examination, and submitting a thesis prospectus, students will be admitted to candidacy. This should take place by the end of the third year, and preferably in the second year. Students must then submit a written thesis describing the research and present a thesis research seminar.

Additional requirements There is no foreign language requirement. In accordance with the BBS program, Ph.D. students are expected to participate in two terms (or the equivalent) of teaching.

M.D./Ph.D. Students

M.D./Ph.D. students must satisfy the requirements listed above for the Ph.D. with the following modifications: Two laboratory rotations are required. Assisting in teaching of one course is required. With the approval of the DGS and associate dean, some courses taken toward the M.D. degree can be counted toward the five courses required for the Ph.D., although PATH 650b, Cellular and Molecular Biology of Cancer, and PATH 690a, Molecular Mechanisms of Disease, are still required.

Master's Degrees

M.S. Students are not admitted for this degree. On a case-by-case basis and subject to faculty vote, students who are not continuing for the Ph.D. may be considered for this degree if they have successfully completed one year of the doctoral program and received a grade of Honors in at least two core courses (i.e., excluding rotations and seminar courses).

M.Phil. See Graduate School requirements. Awarded only to students who are continuing for the Ph.D. Students are not admitted for this degree.

Program materials are available upon request to the Director of Graduate Studies, Department of Experimental Pathology, Yale University, PO Box 208023, New Haven CT 06520-8023; Web site, www.yalepath.org/DEPT/edu/gradtraing.htm.

Courses

Note: Pathology 600, 616, 617, and 618b are primarily geared toward medical students, but may be taken by graduate students with the permission of the director of medical studies.

PATH 600, Pathological Basis of Human Disease David Rimm and staff

Fundamental principles underlying the pathological alterations in function and structure that constitute the reaction of the organism to injury. Pathology of diseases involving special organs and systems. Correlation of the clinical and anatomical manifestations is emphasized. For EPH graduate students and MSTP students who are required to take PATH 100 for graduate credit.

PATH 616, Autopsy Pathology John Sinard and staff

Participation in the autopsy service with members of the house staff in Pathology. Participation in autopsies and the presentation and review of the clinical and anatomical findings of postmortem examinations with senior members of the department. Opportunities exist for correlation studies with previous biopsies, and clinical investigative and cell biologic techniques in relation to necropsy material. Six weeks minimum, full time. Enrollment limited to two students.

PATH 617, Anatomic Pathology A. Brian West and staff

The department offers an elective to medical students in the third and fourth years that provides a broad experience in general diagnostic techniques. Students have opportunities to participate in surgical pathology, cytology (including fine-needle aspiration), and autopsy. A daily diagnostic conference is scheduled for both residents and students, and an additional two hours of conference are provided each week exclusively for the students. In addition to direct responsibilities in the handling of the cases, the student has the opportunity to apply the special techniques of electron microscopy, immunohistochemistry, and flow cytometry. A minimum of four weeks is suggested for this elective. Five students are accommodated every four to six weeks.

PATH 618b, Clinical and Pathologic Correlates in Renal Disease

Michael Kashgarian

A series of clinical pathologic conferences designed to illustrate clinicopathologic correlates in renal disease. At each session, one student acts as clinician and another as pathologist in the evaluation and discussion of case material from autopsies or renal biopsies. Discussions are informal, but require preparation in advance and all participants are expected to contribute in each session. One two-hour session per week for six weeks. Given once in spring term. Limited to twelve students.

PATH 620a and b, Laboratory Rotations in Experimental Pathology Gerald Shadel

Laboratory rotations for first-year graduate students.

PATH 630b, Biomaterial-Tissue Interactions Themis Kyriakides

An in-depth survey of the interactions between tissues and biomaterials, with an emphasis on the molecular- and cellular-level events that influence the performance and longevity of clinically relevant devices. Background in chemistry and cell biology is assumed. Open to advanced undergraduates with permission of the organizer. TH 9–10:15

PATH 650b, Cellular and Molecular Biology of Cancer David Stern, Robert Means

A comprehensive survey of cancer research from the cellular to the clinical level. The relation of cancer to intracellular and intercellular regulation of cell proliferation is emphasized, as are animal models for cancer research. Background in molecular genetics and cell biology is assumed. Open to advanced undergraduates with permission of the organizers. MWF 1–2

PATH 670b, Biological Mechanisms of Reaction to Injury Michael Kashgarian,
Jon Morrow, Joseph Madri, Jeffrey Sklar

An introduction to human biology and disease as a manifestation of reaction to injury. Topics include organ structure and function, cell injury, circulatory and inflammatory responses, disordered physiology, and neoplasia.

PATH 680a, Seminar in Pharmacology and Molecular Medicine TBA

Readings and discussion in topics relevant to cell biology, signal transduction, immunology, and molecular medicine. The overall theme of the papers discussed is pathogenesis of human infectious disease. The class emphasizes analysis of primary research literature and development of presentation skills. M 3–5

PATH 690a, Molecular Mechanisms of Disease Michael Robek

This course covers aspects of the fundamental molecular and cellular mechanisms underlying various human diseases. Many of the disorders discussed represent major forms of infectious, degenerative, vascular, neoplastic, and inflammatory disease. Additionally, certain rarer diseases that illustrate good models for investigation and/or application of basic biologic principles are covered in the course. The objective is to highlight advances in experimental and molecular medicine as they relate to understanding the pathogenesis of disease and the formulation of therapies. TTH 2–3:30

FILM STUDIES

53 Wall, Rm 216, 436.4668
www.yale.edu/filmstudiesprogram/
M.Phil., Ph.D.

Chair

John MacKay

Director of Graduate Studies

Dudley Andrew [F] (Rm 219, 53 Wall, dudley.andrew@yale.edu)
Brigitte Peucker [Sp] (Rm 219, 53 Wall, brigitte.peucker@yale.edu)

Professors Dudley Andrew,* Ora Avni, David Bromwich, Hazel Carby, Francesco Casetti* [F], Katerina Clark,* Michael Denning, Thomas Elsaesser (*Visiting* [Sp]), John Mack Faragher, David Joselit, Thomas Kavanagh,* John MacKay,* Millicent Marcus,* Christopher L. Miller, Charles Musser,* Alexander Nemerov, Brigitte Peucker,* Joseph Roach, Michael Roemer, Katie Trumpener,* Laura Wexler

Associate Professor Aaron Gerow*

Assistant Professors Seth Fein,* Moira Fradinger, Terri Francis,* Karen Nakamura

Senior Lecturer Ronald Gregg*

Lecturer Ashish Chadha

*Member of the Graduate Committee

Fields of Study

Film Studies is an interdisciplinary field drawing on the study of the history of art, national cultures and literatures, literary theory, philosophy, anthropology, and other areas. To study film at Yale, every doctoral student must be accepted into a combined program involving another discipline. Film Studies offers a combined Ph.D. with African American Studies, American Studies, Comparative Literature, East Asian Languages and Literatures, French, German, History of Art, Italian, and Slavic Languages and Literatures. In addition to acquiring a firm grounding in the methods and core material of both film studies and another discipline, the candidate is advised to coordinate a plan of study involving comprehensive knowledge of one or more areas of specialization. Such areas include:

1. Historiography, including archival history, history of technology, silent film.
2. Aesthetics: theories of the image, adaptation, film/philosophy, avant-garde film.
3. European film: British-Irish, French, German, Italian, Slavic.
4. American culture: Hollywood, independent film, African American cinema.
5. World film: global image exchange; cinema in Asia, Latin America, and Africa.
6. Documentary as an aesthetic, cultural, and ideological practice.

Through course work, examinations, and the dissertation, the candidate links a film specialty with material and methods coming from the participating discipline. Directors of graduate studies from both programs monitor the candidate's plans and progress.

Special Admissions Requirements

Combined-program applicants should familiarize themselves fully not only with the Film Studies entrance requirements but with those of the other graduate program as well. Since combined-program applicants must be admitted by both Film Studies and the other department, candidates should make sure that the material they submit with the application clearly addresses the requirements and mission of both graduate programs.

The application for Film Studies is administered by the Office of Graduate Admissions. All applications are to be completed online and can be accessed by visiting its Web site at www.yale.edu/graduateschool/admissions/. In the “Programs of Study” section of the application, the applicant should do the following: choose Film Studies in Step 1 and the combined department in Step 3. All applications including writing samples are read by the admissions committees in both units.

Special Requirements for the Ph.D. Degree

Every student selected for the combined program is subject to the supervision of the Film Studies program and the relevant participating department. A written protocol between each department and Film Studies outlines the requirements and schedule to be borne in mind as a plan of study is worked out in consultation with the director of graduate studies of Film Studies and the director of graduate studies of the participating department. In all cases, students are required to take two core seminars in Film Studies (FILM 601 and FILM 603) as well as at least four additional Film Studies seminars. Course requirements vary for participating departments but comprise a total of sixteen courses (fourteen for American Studies, fifteen for History of Art). A student advances to candidacy by completing a qualifying examination and a dissertation prospectus.

1. Qualifying examinations follow the regulations of the participating department with at least one member of the Film Studies Graduate Committee participating.
2. The dissertation prospectus is presented to a faculty committee involving at least one member of the other department who is not a member of the Film Studies Graduate Committee and may include the entire faculty of that other department. The prospectus is also circulated to the entire Film Studies Graduate Committee for their information and ratification. Once the student and dissertation adviser deem the dissertation finished or near completion, a defense shall be held involving at least one member of the Film Studies Graduate Committee and one member of the participating department who is not on that committee.

The faculty in Film Studies considers participation in the Teaching Fellows Program to be essential to the professional preparation of graduate students. Students normally teach in years three and four. Every student is expected to serve two assignments as a teaching fellow, preferably in film courses such as Introduction to Film; Film Theory; World Cinema.

Master's Degree

M.Phil. See Degree Requirements under Policies and Regulations.

Courses

FILM 601a, Approaches to Film Study Dudley Andrew

A series of distinct approaches to a series of problems in film studies, meant to provide an anchor for graduate students who want to participate in the professional discourse of this field. Formalist, semiotic, and cognitive analyses of films are broadened by hermeneutics and various historical approaches that go beyond texts to their contexts. The obtuse voices of the films examined each week are allowed to take the lead in our discussions. Three eight-page papers. TH 9:25–11:15

FILM 625a^U/CPLT 903a/HSAR 726a, Media and the Logic of Repetition

Francesco Casetti

An analysis of such common practices as adaptation, remake, prequel, sequel, quotation that operate in film, above all, but in fiction, television, painting, and in every art. Examples are taken from various media, as repetition is examined from the point of view of semiotics (Barthes, Eco), cultural history (Benjamin), and philosophy (Deleuze). T 1:30–3:20

FILM 640b^U, Sexual Modernity and Hollywood Censorship Ronald Gregg

Examines the genre of romantic comedy, censorship, and the representation of sexual modernity in Hollywood film from the 1920s to the 1960s. Analyzes the tension between the studios' censorship code and the influential European émigré filmmakers who developed filmic strategies to subvert it and to present modern perspectives on sexuality and gender. The course focuses mainly on the romantic comedies of the directors Ernst Lubitsch and Billy Wilder, with some attention to the films of Cecil B. DeMille and Howard Hawks. Screenings include *The Marriage Circle*, *The Love Parade*, *Trouble in Paradise*, *Design for Living*, *Ninotchka*, *The Major and the Minor*, *The Seven Year Itch*, *Some Like It Hot*, *The Apartment*, and *Irma La Douce*.

FILM 718b^U/CPLT 902b^U/GMAN 636b^U, Theatricality in Film Brigitte Peucker

This course examines the multiple implications of theatricality in and for the cinema: theatricality as excess; the appropriation of theatrical modes for film; theatricality as modernist self-reflexivity; performance and the relation of theatricality to subjectivity (performing the self); ritual and reenactment in film; theatricality and the real; the material image. Readings by Arnheim, Bazin, Bateson, Barthes, Bell, Butler, Cavell, Egginton, Fried, Mitry, and others. Films by von Sternberg, Bergman, Hitchcock, Fassbinder, Haneke, Pabst, Wilder, Greenaway, von Trier, Kiarostami, Kubrick. T 3:30–5:20, screening M 7

FILM 732b/ITAL 595b, Cinematic Neorealism Millicent Marcus

The course considers the complex relationship between the theory and practice of Italian cinematic neorealism. We screen a film weekly and analyze it in the context of an evolving theoretical paradigm, beginning with Rossellini's *Open City* (1945) and *Paisa'* (1946), and flashing back to the proto-neorealist *Ossessione* (Visconti, 1942). We devote a great deal of attention to De Sica's contributions to neorealism, including *Shoeshine* (1946), *Bicycle Thief* (1948), *Miracle in Milan* (1951), and *Umberto D* (1952), in addition to De Santis's *Bitter Rice* and Visconti's *La terra trema* (1948). The course also includes a study of the movement's afterlife in *Bellissima* (Visconti, 1951) and the recent revisitations of neo-

realism in *Icicle Thief* (Nichetti, 1989) and *Celluloide* (Lizzani, 1996), before concluding with Gianni Amelio's *Stolen Children* (1992), which has been hailed as the harbinger of a realist revival in the 1990s. In English. W 3:30–5:20, screening SU 7

FILM 736a^U/AMST 813a^U, Contemporary Documentary Film and Video

Charles Musser

Examination of documentary and related nonfiction forms in the last three decades. Issues include film truth, performance, ethics, race and gender, and the filmmaker as participant-observer. Filmmakers include Frederick Wiseman, William Greaves, Chris Choy, Errol Morris, Lourdes Portillo, Trin T. Minh-Ha, Sue Friedrich, and Marlon Riggs. M 6:30–10:30

FILM 757a^U, French New Wave Dudley Andrew

This lecture course lays out “the idea of cinema” that developed in the wake of WWII as French critics inaugurated the New Wave school around 1960. The intellectual development of directors such as Truffaut, Godard, and Rohmer is seen via texts by Bazin, Rivette, Robbe-Grillet, Barthes. Postwar cultural life led to a new film aesthetic from Bresson and Cocteau through the masterworks of the New Wave, affecting the 1968 generation right up to Assayas and Desplechin today. Graduate discussion section. MW 11:35–12:25, 1 HTBA

FILM 808b/HSAR 713b, The Movement of Images: Modern Cinema and the Museum Thomas Elsaesser

Over the past two decades, the cinema has redefined itself in several ways: as a photographic medium, as popular entertainment, and as a significant public sphere. But it has also entered the museum and gallery spaces: classic directors like Renoir and Hitchcock are granted museum retrospectives, and contemporary filmmakers receive commissions for new work, or curate shows that cast a fresh light on film, its pre-histories, alternative histories, and post-histories. This might signal that the cinema has finally come of age as *the* art form of the twentieth century, and thus has earned the right to enter into the traditional institutions of patronage, artistic heritage, and cultural patrimony. Or does this move into the museum merely confirm the “death” of cinema, and is it even predicated on the cinema’s demise, making it ready to be preserved and even embalmed? How complementary or contradictory are the “black box” and the “white cube” in such a new arrangement of space, spectator, and *dispositif*? The course looks at some of the major exhibitions and retrospectives devoted to “the moving image” from the mid-1990s to the present, and asks what theoretical shifts, perspective corrections, and critical readjustments accompany these displacements, on the side of cinema studies, as well as on the part of art history. W 1:30–3:20

FILM 840a/CPLT 840a/GMAN 652a^U/HSAR 687a/RUSS 712a, Moscow/Berlin:

Leftist Avant-Gardes and Interwar Modernism Katerina Clark, Katie Trumpener
From 1918 to the mid-1930s, Moscow and Berlin were both central gathering points for left-wing modernists. Each city developed its own modes of modernism, yet in sustained dialogue, given massive Russian emigration to Berlin after 1918, the Weimar obsession with early Soviet aesthetics (and cinema), intellectuals traveling in both directions, and the large-scale emigration of German leftists to the Soviet Union after 1933. The course

ends by considering the shaping influence of Soviet intellectuals (and German emigrants returning from Moscow) on East Berlin “late modernism” of the 1940s and ’50s. Centered on literature and film, the course also considers a wide array of art forms (including painting, photography, architecture, music, and aesthetic theory). Works by modernists such as Eisenstein, Pudovkin, Vertov, Kozintsev, Trauberg, Shklovsky, El Lissitzky, Rodchenko, Malevich, Shostakovich, Tretiakov, Babel, Lukacs, Moholy-Nagy, Benjamin, Brecht, Richter, Beckmann, Schwitters, Grosz, Heartfield, Döblin, Ruttmann, van der Rohe, Eisler, Busch. Texts are available in English translation; knowledge of Russian and/or German very helpful. At the first meeting, students help shape the final syllabus.

W 1:30–3:20

FORESTRY & ENVIRONMENTAL STUDIES

Kroon Hall, 432.5100
<http://environment.yale.edu>
 M.S., M.Phil., Ph.D.

Dean

Sir Peter Crane

Director of Doctoral Studies

David Skelly (208 Kroon, 432.3603, david.skelly@yale.edu)

Professors Mark Ashton, Gaboury Benoit, Graeme Berlyn, Benjamin Cashore, Peter Crane, Lisa Curran, Michael Dove, Daniel Esty, Thomas Graedel, Timothy Gregoire, Stephen Kellert, Xuhui Lee, Robert Mendelsohn, Chadwick Oliver, James Saiers, Oswald Schmitz, David Skelly, John Wargo

Associate Professors Michele Bell, Marian Chertow, Sheila Olmstead, Peter Raymond, Karen Seto

Assistant Professors Robert Bailis, Mark Bradford, Alexander Felson, Karen Hébert, Julie Zimmerman

Non-Ladder Faculty Paul Anastas, Shimon Anisfeld, Ellen Brennan-Galvin, Richard Burroughs, Ann Camp, Carol Carpenter, Susan Clark, Amity Doolittle, Paul Draghi, Helmut Ernstberger, Gordon Geballe, Bradford Gentry, John Grim, Arnulf Grubler, Lloyd Irland, Anthony Leiserowitz, Reid Lifset, Florencia Montagnini, Jonathan Reuning-Scherer, Thomas Siccama, Mary Evelyn Tucker

Courtesy Joint Appointments Michelle Addington, James Axley, Ruth Blake, Adalgisa (Gisela) Caccone, David Cromwell, Michael Donoghue, Menachem Elimelech, Robert Evenson, Durland Fish, Willis Jenkins, Brian Leaderer, William Mitch, William Nordhaus, Jeffrey Powell, Richard Prum, James Scott, Kalyanakrishnan Sivaramakrishnan, Ronald Smith, Karl Turekian, Ernesto Zedillo

Visiting Faculty, Fellows, Adjunct Faculty, and Faculty with primary appointments elsewhere Dale Bryk, Maureen Burke, Douglas Daly, Mary Beth Decker, William Ellis, James Fickle, Emil Frankel, Lawrence Kelly, Roy Lee, Lin Heng Lye, James Lyons, James MacBroom, David Mattson, Fabian Michaelangeli, Arvid Nelson, John Nolon, Charles Peters, Stephen Ramsey, Nicholas Robinson, Marjorie Shansky, Dennis Stevenson, Fred Strebeigh, Simon Tay, Charles Dana Tomlin, Gerald Torres, William Vance, Helga Weixz, Gary Yohoe

Fields of Study

Fields include agroforestry; biodiversity conservation; biostatistics and biometry; community ecology; ecosystems ecology; ecosystems management; environmental anthropology; environmental biophysics and meteorology; environmental chemistry; environmental ethics; environmental governance; environmental health risk assessment; environmental history; environmental law and politics; environmental and

resource policy; forest ecology; hydrology; industrial ecology; industrial environmental management; plant physiology and anatomy; pollution management; population ecology; resource economics; energy and the environment, silviculture, social ecology; stand development, tropical ecology and conservation; urban planning; water resource management; environmental management and social ecology in developing countries; urban ecology.

Special Admissions Requirements

Applicants should hold a bachelor's or master's degree in a field related to natural resources, such as forestry, or in a relevant discipline of the natural or social sciences, such as biology, chemistry, economics, or mathematics. The GRE General Test is required but Subject Tests are optional.

Special Requirements for the Ph.D. Degree

Students are required to take the Doctoral Student Seminar before the second term of their program. Aside from this requirement, there is no required curriculum of credit courses and no formal language requirement. Courses of study are individually designated through consultation between degree candidates and their advisers and dissertation committees. The amount of course work required will depend on the previous training of the student, but the normal requirement for a student with no previous graduate training is three or four courses per term for four terms. The program of each student will be evaluated at the end of the first year of residence. At least two term grades of Honors are required in the first two years of study; however, it is anticipated that grades of Honors or High Pass will be achieved in two-thirds of all courses taken. A written and oral qualifying examination is required upon completion of the course requirements. Students are expected to take the examination by the end of their second year, though this can be extended to the third year in cases with appropriate extenuating circumstances. At the time of the qualifying examination, the student must present a prospectus of the research work proposed for the dissertation. Successful completion of the qualifying examination and submission of the prospectus will result in admission to candidacy. Upon completion of the dissertation, the candidate must make unbound copies of the dissertation available to the faculty and appear for an oral examination at a time and place designated by the director of doctoral studies. Copies of the approved dissertation must be submitted to the Graduate School, and one copy to the library of the School of Forestry & Environmental Studies. Depending upon the nature of the dissertation topic, completion of the Ph.D. degree normally requires four years.

Teaching and research experiences are regarded as integral parts of the graduate training program in Forestry & Environmental Studies. All students are required to serve as teaching fellows (10 hours per week) for two terms prior to the end of their fourth year of study. In addition, before the end of their fourth year of study, all doctoral students must complete a two-term research project/assistantship with their major adviser (10 hours per week). The nature of teaching assignments and research duties is determined in cooperation with the student's major adviser and the director of graduate studies.

Master's Degrees

M.Phil. (en route to the Ph.D.) Students may petition for this degree after they have passed the qualifying exam and advanced to candidacy. Applications for this master's degree are not accepted.

M.S. (en route to the Ph.D.) This degree is normally granted only to students who are withdrawing from the Ph.D. program. Applications for this master's degree are not accepted. Requirements that must be met for award of the M.S. are (1) successful completion of two years of course work in residence with two grades of Honors; (2) a written prospectus; (3) fulfillment of one term of the teaching requirement.

For information on the terminal master's degrees offered by the Yale School of Forestry & Environmental Studies (the Master of Forestry, Master of Forest Science, Master of Environmental Management, and Master of Environmental Science degrees) visit the School's Web site, www.yale.edu/environment/, or contact Admissions Director, Yale School of Forestry & Environmental Studies, 195 Prospect Street, New Haven CT 06511.

Courses

For course descriptions, see the School of Forestry & Environmental Studies bulletin.

ECOLOGY

Ecosystem Ecology

F&ES 554a, Tropical Forest Ecology: The Basis for Conservation and Management

F&ES 555a, Ecosystem Pattern and Process

F&ES 557a, Biogeography and Conservation

F&ES 558b, Tropical Field Botany

F&ES 559a, Biological Oceanography

Wildlife Ecology and Conservation Biology

F&ES 561b, Species and Ecosystem Conservation: An Interdisciplinary Approach

F&ES 562a, Biodiversity Conservation

F&ES 601a, Environmental Writing

F&ES 900a, Doctoral Student Seminar

FORESTRY

Forest Biology

F&ES 650b, Fire: Science and Policy

F&ES 652b, Seminar in Ecological Restoration

F&ES 654a, Structure, Function, and Development of Trees and Other Vascular Plants

F&ES 655b, Research Methods in Anatomy and Physiology of Trees

F&ES 656b, Physiology of Trees and Forests

F&ES 671a, Natural History and Taxonomy of Trees

Forest Management

F&ES 657b, Managing Resources

F&ES 658a, Global Resources and the Environment

F&ES 659b, Principles in Applied Ecology: The Practice of Silviculture

F&ES 660a, Forest Dynamics: Growth and Development of Forest Stands
 F&ES 662a, Seminar in Advanced Silviculture
 F&ES 663b, Invasive Species: Ecology, Policy, and Management
 F&ES 664a, Financial Analysis for Land Management
 F&ES 666a, Management Plans for Protected Areas
 F&ES 668b, Field Trips in Forest Resource Management and Silviculture
 F&ES 669b, Forest Management Operations for Professional Foresters
 F&ES 671a, Natural History and Taxonomy of Trees

PHYSICAL SCIENCES

Atmospheric Sciences

F&ES 703b, Climate and Life
 F&ES 722b, Boundary Layer Meteorology
 G&G 657a, Marine, Atmospheric, and Surficial Geochemistry

Environmental Chemistry

F&ES 443a, Environmental Chemical Analysis
 F&ES 706b, Organic Pollutants in the Environment
 F&ES 707b, Aquatic Chemistry
 F&ES 708a, Biogeochemistry and Pollution
 CENG 377a, Water Quality Control

Soil Science

F&ES 709a, Introduction to Soil Science
 F&ES 723b, Seminar in Soil Conservation and Management

Water Resources

F&ES 710b, Coastal Ecosystem Governance
 F&ES 711a, Munson Series: Ocean Acidification, A New Challenge for Researchers and Policymakers
 F&ES 712b, Water Resource Management
 F&ES 713a, Coastal Ecosystems: Natural Processes and Anthropogenic Impacts
 F&ES 719a, River Processes and Restoration
 F&ES 724a, Watershed Cycles and Processes
 F&ES 725a, Remote Sensing of Land-Cover and Land-Use Change
 F&ES 726a, Systems Modeling of the Environment
 F&ES 751a, Sampling Methodology and Practice
 F&ES 753b, Regression Modeling of Ecological and Environmental Data
 F&ES 754a, Introduction to Statistics in the Environmental Sciences
 F&ES 755b, Modeling Geographic Space
 F&ES 756a, Modeling Geographic Objects
 F&ES 758b, Multivariate Statistical Analysis in the Environmental Sciences
 F&ES 760a, Research Methods
 F&ES 761a, Social Science Research Methods
 F&ES 912a,b, Preparation for Research
 ARCG 726b, Remote Sensing of the Earth from Space
 ECON 173b, Econometrics

SOCIAL SCIENCES**Economics**

F&ES 800a, Economics of Pollution

F&ES 802b, Valuing the Environment

F&ES 867b, Environment and Development: An Economic Approach

F&ES 865a, Agriculture and the Environment

MGT 820a, Energy Markets Strategy

Environmental Policy

F&ES 813b, Emerging Markets for Ecosystem Services

F&ES 815a, The New Corporate Social Responsibility: Public Problems, Private Solutions and Strategic Responses

F&ES 816b, Transportation and the Urban Future

F&ES 817a, Energy Systems Analysis

F&ES 819b, Strategies for Land Conservation

F&ES 820a, Local Environmental Law and Land Use Practices

F&ES 821a, Private Investment and the Environment: Legal Foundations and Tools

F&ES 822b, Transportation's Role in a Changing Economy

F&ES 823a, History of the Environment and Ecological Science

F&ES 824b, Environmental Law and Policy

F&ES 826a, Foundations of Natural Resource Policy and Management

F&ES 828b, Comparative Environmental Law in Global Legal Systems

F&ES 829a/F&ES 245a/EVST 245a/PLSC 146a, International Environmental Policy and Governance

F&ES 852a,b, Business and the Environment Clinic

F&ES 837b, Seminar on Leadership in Natural Resources and the Environment

F&ES 849b, Natural Resource Policy Practicum

F&ES 850a, International Organizations and Conferences

F&ES 851a,b, Environmental Diplomacy Practicum

F&ES 853a, Capitalism : Success, Crisis, and Reform

F&ES 860b, Understanding Environmental Campaigns and Policy Making: Strategies and Tactics

F&ES 863a, Forecasting Energy Futures: Pitfalls and Prospects

LAW 20316a,b, Environmental Protection Clinic

Social and Political Ecology

F&ES 831b, Society and Natural Resources

F&ES 832a, Society and Environment: Introduction to Theory and Method

F&ES 833b, Seminar on "Values of the Natural Environment"

F&ES 836a, Agrarian Societies: Culture, Society, History, and Development

F&ES 839a, Social Science of Development and Conservation: Advanced Readings

F&ES 842a, Cities and Sustainability in the Developing World

F&ES 846b, Topics in Environmental Justice

F&ES 861a, American Indian Religions and Ecology

F&ES 862b / 80079b, Institutions and the Environment

F&ES 864b, Environment and Political Action

ANTH 561a, Anthropology of the Global Economy for Development and Conservation

ANTH 572b, Disaster, Degradation, Dystopia: Social Science Approaches to Environmental Perturbation and Change

ANTH 582b, Households, Communities, Gender (for Development and Conservation)

ARCH 903a, Introduction to Planning and Development

RLST 872b, World Religions and Ecology: Asian Religions

INTERDISCIPLINARY

Professional and Environmental Ethics

F&ES 916a, Professional Ethics: Orientation to the Field

F&ES 917b, Ecological Urbanism

Health and Environment

F&ES 915b, Assessing Exposures to Environmental Stressors The Environment and Human Health

EHS 503a, Introduction to Toxicology

EHS 511a, Applied Risk Assessment I

EMD 572a, Ecology and Epidemiology of Vector-borne and Zoonotic Diseases

Environmental Management and Technology

F&ES 906b, Industrial Ecology

F&ES 908a, Corporate Environmental Management and Strategy

F&ES 909b, Caribbean Coastal Development: Cesium and CZM

F&ES 911a, Greening Business Operations

F&ES 917b, Ecological Urbanism

F&ES 918a, Linkages of Sustainability

ANTH 572a, Ecology and Epidemiology of Vector-Borne and Zoonotic Diseases

MGT 684a, Management and the Environment: Issues and Topics

SOCY 535b, Consumption and Sustainability

FRENCH

82–90 Wall Street, 3d floor, 432.4900

www.yale.edu/french/

M.A., M.Phil., Ph.D.

Chair

Thomas Kavanagh

Director of Graduate Studies

Maurice Samuels [F] (82–90 Wall St., Rm 325, 432.5046)

R. Howard Bloch [Sp] (82–90 Wall St., Rm 325, 432.5046)

Professors Dudley Andrew (*Film*), Ora Avni, R. Howard Bloch, Edwin Duval, Marie-Hélène Girard (*Visiting*), Alice Kaplan, Thomas Kavanagh, John Merriman (*History*), Christopher L. Miller, Maurice Samuels

Associate Professor Jean-Jacques Poucel

Assistant Professors Edwige Tamalet Talbayev, Charles Walton (*History*), Yue Zhuo

Lecturer Farid Laroussi

Fields of Study

Fields include French literature, criticism, theory, and culture from the early Middle Ages to the present, and the French-language literatures of Africa, the Caribbean, and the Maghreb.

Special Admissions Requirements

A thorough command of French is expected, as well as a good preparation in all fields of French literature. A strong background in at least one other foreign language is also expected. Applicants should submit a twenty-page writing sample in French.

Special Requirements for the Ph.D. Degree

(1) Candidates must demonstrate a reading knowledge of Latin and a second language by passing department-administered examinations, Yale undergraduate courses, or Yale Summer Language Institute courses with at least a B or High Pass grade. Students must fulfill the Latin requirement before the beginning of their third term of study. The other language requirement must be satisfied before the beginning of the fifth term, and before the oral qualifying examination. (2) During the first two years of study, students normally take sixteen term courses. These must include Old French and at least two graduate-level term courses outside the department. They may include one term of a language course (Latin or other) taken as a means of fulfilling one of the language requirements, and as many as four graduate-level term courses outside the department. A grade of Honors must be obtained in at least four of the sixteen courses, two or more of which must be in courses offered by the department. (3) A qualifying oral examination takes place during the sixth term. The examination is designed to demonstrate students' mastery of the French language, their knowledge and command of selected topics in literature, and their

capacity to present and discuss texts and issues. (4) After having successfully passed the qualifying oral examination, students are required to submit a dissertation prospectus for approval, normally no later than the end of the term following the oral examination.

In order to be admitted to candidacy for the Ph.D., students must complete all predisertation requirements, including the prospectus. Students must be admitted to candidacy by the end of the seventh term.

Teaching is considered an integral part of the preparation for the Ph.D. degree, and all students are required to teach for at least one year. Opportunities to teach undergraduate courses normally become available to candidates in their third year, after consideration of the needs of the department and of the students' capacity both to teach and to fulfill their final requirements. Prior to teaching, students take a language-teaching methodology course.

Combined Ph.D. Program

The French department also offers two combined Ph.D.s: one in French and African American Studies (in conjunction with the program in African American Studies), and one in French and Film Studies (in conjunction with the program in Film Studies). Students in both of these combined degree programs are subject to all the requirements for a Ph.D. in French. In addition, they must fulfill certain requirements particular to the conjoined program.

The combined Ph.D. in French and African American Studies is most appropriate for students who intend to concentrate in and write a dissertation on the literature of the francophone Caribbean. Students must complete two core courses in African American Studies and a third-year colloquium. For this degree, the French department's requirement for a language in addition to Latin will normally be filled by demonstrating reading competence in a Creole language of the Caribbean or in Spanish. The students' oral examinations normally include two topics of African American content. The dissertation prospectus must be approved by the director of graduate studies both in the French department and in African American Studies, and final approval of the dissertation must come from both departments. For further details see African American Studies.

For students in the combined Ph.D. program in French and Film Studies, the oral examination will normally include one topic on film theory and one on French film. Both the dissertation prospectus and the final dissertation must be approved by the French department and the program in Film Studies. In addition, Film Studies requires a dissertation defense. For further details see Film Studies.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations. Additionally, students in French are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may petition for the M.A. degree after a minimum of one year of study in residence, upon completion of the Latin requirement, and of eight courses, of which at least six are in French. Two grades of Honors in French graduate courses are required.

Program materials are available upon request to the Administrative Assistant to the Director of Graduate Studies, French Department, Yale University, PO Box 208251, New Haven CT 06520-8251.

Courses

All classes are taught in French unless otherwise noted.

FREN 610a, Old French Howard Bloch

An introduction to the historical grammar of Old French through reading, translation, and discussion of some of its major literary forms in prose and verse, including epic, romance, *lai*, and *fabliau*. We start with easier later prose work and move back in time to earlier verse. Weekly text readings and chapter study in our grammar book, in-class translation, discussion; final examination with a familiar passage, a sight passage, and a take-home essay. Although the course is conducted in French, students who are not from the French department may translate into and speak English in class and on the final exam. W 3:30–5:20

FREN 751a, Rousseau Thomas Kavanagh

This seminar examines the relation between Rousseau the writer and Rousseau the political philosopher – between such works as *La Nouvelle Héloïse*, *Les Confessions*, *Les Rêveries* on the one hand and the two *Discours*, *Emile*, *Du contrat social*, and the *Essai sur l'origine des langues* on the other. We look at various approaches (psychoanalytic, historical, semio-logical) to resolving this opposition while considering the major contemporary critical assessments of Rousseau (Starobinski, Derrida, de Man, etc.). M 9:25–11:15

FREN 893a/CPLT 899a, Realism and Naturalism Maurice Samuels

This seminar interrogates the nineteenth-century French Realist and Naturalist novel in light of various efforts to define its practice. How does critical theory constitute Realism as a category? How does Realism articulate the aims of theory? And how do nineteenth-century Realist and Naturalist novels intersect with other discourses besides the literary? In addition to several works by Balzac, novels to be studied include Stendhal's *Le Rouge et le Noir*, Sand's *Indiana*, Flaubert's *Madame Bovary*, and Zola's *Nana*. Some attention also paid to Realist painting. W 9:25–11:15

FREN 920a, Roland Barthes Yue Zhuo

A study of Roland Barthes's works in dialogue with the many postwar literary movements and critical trends with which he successively associated. How does the elasticity of Barthes as a thinker allow him to embrace and resist the theories of the time? The seminar is organized around the following topics: semiology and social criticism, popular theater, *Nouvelle critique*, *Nouveau roman*, communities and utopia, autobiography, photography, desire for the novel, and the "neutral." Authors accompanying this intellectual trajectory include Saussure, Lévi-Strauss, Brecht, Michelet, Genette, Robbe-Grillet, Sollers, Sade, Fourier, Goethe, Lacan, and Blanchot. W 1–2:15

FREN 949a/AFAM 805a/AFST 949a/CPLT 987a, Novel, Film, and History in French Africa Christopher L. Miller

African history as represented in historiography, novels, and films. Limited to French and Francophone Africa. Themes include empire and epic; orality and literacy; the slave

trade; contact, conquest, and resistance; the Congo Free State; the role of colonial intermediaries; the two world wars; decolonization and neocolonialism; and the 1994 genocide in Rwanda. TH 1:30–3:20

FREN 957a, Experiments in Twentieth-Century Fiction Ora Avni

This course examines modern novels and short stories that attempt to break away from traditional narratives. We work simultaneously on two planes: (1) broken narratives as they reflect postwar disillusion, fear of loss of the “self,” and the bewilderment of man cast in a world that is no longer coherent; (2) formal experiments with narratives that purport to tell “stories” without the support of “heroes,” “characters,” proper sequence, linear time, or even events that can be attributed to a specific persona. Under these conditions, what is left of stories and storytelling? More importantly, to what extent do these experiments succeed in breaking away from literary tradition? Works by Robbe-Grillet, Sarraute, Des Forêts, Modiano, Chamoiseau, Gary, Cohen, and Nothomb. T 1:30–3:20

FREN 820b/CPLT 733b/HSAR 576b, The Age of the Cathedral R. Howard Bloch

A study of the culture and architectural monuments of the High Middle Ages with accompanying historical and literary works. Emphasis on Saint-Denis, Notre-Dame, Chartres. Readings include Abelard, Suger, Rutebeuf, Saint Bernard, Joinville, Thibaut de Champagne, Guibert de Nogent, William of Saint-Thierry, Aelred of Rivaulx, the “Miracles de Notre Dame de Chartres,” “La Queste del Saint Graal.” Discussion of romanesque and gothic, the rise of communes, urban and economic renewal, intellectual life of twelfth- and thirteenth-century Paris, trades and guilds, the economics and industry of cathedral building, sculpture, and stained glass, Crusade against the Albigensians and in the Middle East, sainthood and kingship, expansion of the royal domain, the growth of the judicial state and parliament, monasticism, mysticism, relics, the ancillary architectural arts—tapestry and textiles, liturgical objects and garments, metalwork, woodwork, iron work—and the fate of such objects after the Revolution of 1789 and restoration in the nineteenth century. W 3:30–5:20

FREN 823b, Poésie Lyrique à la Renaissance Edwin Duval

An overview of lyric poetry as it evolved from the early sixteenth to the early seventeenth century, with an emphasis on close readings of representative poems. Works by Marot, Scève, Labé, Du Bellay, Ronsard, D'Aubigné, Malherbe, and Théophile de Viau. F 1:30–3:20

FREN 921b, Writing the Nation in Maghrebi Literature Edwige Tamalet Talbayev

Exploration of the intersections between literary writing and nation formation in the three countries of the Maghreb (Tunisia, Algeria, Morocco) from the eve of independence to our global, transnational era. Themes include exile and cosmopolitanism, language, nationalism, memory, the relation to France, feminism, trauma and amnesia, terrorism. Readings from Dib, Feraoun, Kateb, Bekri, Amrouche, Djébar, Mokeddem, Cixous, Stora, Derrida, Fanon, Khatibi. T 9:25–11:15

FREN 930b/CPLT 734b, Fact and Fiction in the Archives Alice Kaplan

The turn to archival research in French literary studies; theoretical and personal essays on the archive (Derrida, Davis, Farge, Coeuré); and fiction that includes archival digging as

part of a larger investment in memory. Focus on postwar literature and theory. Includes some practical work. M 3:30–5:20

FREN 938b, L'Extrême Contemporain: Late Twentieth-Century Poetics

Jean-Jacques Poucel

A close study of Yves Bonnefoy, Michel Deguy, Emmanuel Hocquard, Francis Ponge, Denis Roche, and Jacques Roubaud, based on selections of their poetry and theoretical writings. Emphasis on textual analysis, historicity of poetics, and modalities of reception. A sampling of younger poets is interspersed into this initiation to contemporary poetics. W 1:30–3:20

FREN 943b/AFAM 851b/CPLT 989b, Creole Identities and Fictions

Christopher L. Miller

Focusing on the French and English Caribbean, this course analyzes the quintessential but ambiguous American condition: that of the “Creole.” Encompassing all non-native cultures, this term is inseparable from issues of race and slavery. Readings of historical and literary texts: Moreau de Saint-Méry, Bernardin de Saint-Pierre, Madame de Staël, Charlotte Brontë (and reinventions of *Wuthering Heights* by Jean Rhys and Maryse Condé), the Créolistes of Martinique. Attention to Louisiana and to the Haitian Revolution. TH 1:30–3:20

GENETICS

I-313 Sterling Hall of Medicine, 785.5846

<http://info.med.yale.edu/genetics/>

M.S., M.Phil., Ph.D.

Chair

Richard Lifton

Director of Graduate Studies

Charles Radding (TAC S-317, 737.2942, charles.radding@yale.edu)

Professors Edward Adelberg (*Emeritus*), Allen Bale, Douglas Brash (*Therapeutic Radiology*), Susan Baserga (*Molecular Biophysics & Biochemistry*), W. Roy Breg, Jr. (*Emeritus*), Lynn Cooley, Daniel DiMaio, Jerome Eisenstadt (*Emeritus*), Bernard Forget (*Internal Medicine/Hematology*), Joel Gelernter (*Psychiatry; Neurobiology*), Peter Glazer (*Therapeutic Radiology*), Arthur Horwich, Kenneth Kidd, Richard Lifton (*Internal Medicine/Nephrology; Molecular Biophysics & Biochemistry*), Haifan Lin (*Cell Biology*), Maurice Mahoney, Charles Radding (*Emeritus*), Shirleen Roeder (*Molecular, Cellular & Developmental Biology*), Margretta Seashore, Carolyn Slayman, Stefan Somlo (*Internal Medicine/Nephrology*), Joann Sweasy (*Therapeutic Radiology*), Peter Tattersall (*Laboratory Medicine*), Sherman Weissman, Tian Xu, Hongyu Zhao (*Epidemiology & Public Health; Biostatistics*)

Associate Professors Martina Brueckner (*Cardiology, Pediatrics*), Kei-Hoi Cheung (*Medical Informatics*), Judy Cho (*Internal Medicine*), Jeffrey Gruen (*Pediatrics*), Valerie Reinke, Gerald Shadel (*Pathology*), Matthew State (*Child Study Center*)

Assistant Professors Mark Hammarlund, Antonio Giraldez, Natalia Ivanova, Mustafa Khokha (*Pediatrics*), Tae Hoon Kim, Peining Li, Jun Lu, James Noonan, Zhaoxia Sun, Scott Weatherbee

Fields of Study

Molecular Genetics: chromosome structure and function, genetic recombination, viral genetics, DNA damage repair, ribosome biogenesis, protein folding, non-coding RNA function, and the regulation of gene expression. Genomics: genome mapping, genome modification, high-throughput technology, evolutionary genetics, and functional genomics. Cellular and Developmental Genetics: limb development, kidney development, cilia function, stem cell development, genetic control of the cytoskeleton, cell death, aging, cell fate determination, cell cycle progression, cell migration, cell signaling, and growth control. Cancer Genetics: oncogenesis and tumor suppression, tumor progression and metastasis. Model Organism Genetics: forward genetic screens in *Drosophila*, *C. elegans*, yeast, zebrafish, frogs, and mouse, transposon and insertional mutagenesis, gene and protein trapping, mosaic genetics. Medical Genetics: genetic basis of human disease, chromosome rearrangements, population and quantitative genetics.

Special Admissions Requirements

The department welcomes applicants who have a bachelor's or master's degree in biology, chemistry, or a related field, with experience (from course work and/or research) in the field of genetics. GRE General Test scores are required. A pertinent Subject Test in Biochemistry and Molecular Biology, Biology, or Chemistry is recommended.

To enter the Ph.D. program, students apply to the Molecular Cell Biology, Genetics, and Development (MCGD) track within the interdepartmental graduate program in the Biological and Biomedical Sciences (BBS).

Special Requirements for the Ph.D. Degree

The Ph.D. program in Genetics is designed to provide the student with a broad background in general genetics and the opportunity to conduct original research in a specific area of genetics. The student is expected to acquire a broad understanding of genetics, spanning knowledge of at least three basic areas of genetics, which include molecular, cellular, organismal, and population genetics. Normally this requirement is accomplished through the satisfactory completion of formal courses, many of which cover more than one of these areas. Students are required to pass at least six graduate-level courses that are taken for a grade. Advanced graduate study becomes increasingly focused on the successful completion of original research and the preparation of a written dissertation under the direct supervision of a faculty adviser along with the guidance of a thesis committee.

A qualifying examination is given during the second year of study. This examination consists of a period of directed reading with the faculty followed by the submission of two written proposals and an oral examination. Following the completion of course work and the qualifying examination, the student submits a dissertation prospectus and is admitted to candidacy for the Ph.D. degree. There is no language requirement. An important aspect of graduate training in genetics is the acquisition of communication and teaching skills. Students participate in presentation seminars and two terms (or the equivalent) of teaching. Teaching activities are drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school levels. Students are not expected to teach during their first year.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study.

M.D./Ph.D. Students

The requirements for M.D./Ph.D. students differ slightly from those for Ph.D. students. Please refer to the Genetics Handbook at http://info.med.yale.edu/genetics/graduateHandbook/GH_students.php.

Master's Degrees

M.Phil. See Degree Requirements.

M.S. Students are not admitted for this degree. They may receive this recognition if they leave Yale without completing the qualifying exam but have satisfied the course requirements as described above, as well as the Graduate School's Honors requirement.

Prospective applicants are encouraged to visit the BBS Web site (info.med.yale.edu/bbs), MCGD Track.

Courses

GENE 500b, Principles of Human Genetics Allen Bale

A genetics course taught jointly for graduate students and medical students, covering current knowledge in human genetics as applied to the genetic foundations of health and disease. HTBA

GENE 603b/IBIO 603b, Teaching in the Science Education Outreach Program (SEOP) Paula Kavathas

TAs, along with volunteers, teach three projects in genetics to seventh-graders in two or three New Haven schools. In addition, TAs take a short course on teaching and serve as science judges. Dates and times to be determined. For more details visit www.seop.yale.edu. Contact Professor Kavathas.

GENE 625a/MB&B 625a^U/MCDB 625a^U, Basic Concepts of Genetic Analysis

Tian Xu and staff

The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. MW 11:35–12:50

GENE 631a/BIS 631a, Topics in Genetic Epidemiology Hongyu Zhao, Elizabeth Claus, Kenneth Kidd

This course discusses the role of human genetics in epidemiology and public health, focusing on the epidemiology of Mendelian disorders and the genetic and environmental contributions to common, complex familial traits. Topics of discussion include (1) study designs for assessing the importance of genetic factors (population-based as well as family-based designs such as high-risk pedigrees and twin studies), (2) methods for determining mode of inheritance, and (3) the identification and mapping of genes through linkage analyses, candidate-gene approaches, genome-wide association studies, and admixture mapping. Applications of these approaches to clinical medicine are presented. Prerequisites: BIS 505a and BIS 505b (or equivalent) as well as course work in basic genetics. Offered every other year.

[GENE 642a/EMD 642a/MBIO 642a/MCDB 642a, Roles of Microorganisms in the Living World]

[GENE 645a, Statistical Methods in Human Genetics]

GENE 675a and b, Graduate Student Seminar James Noonan and staff

Students gain experience in preparing and delivering seminars and in discussing presentations by other students. A variety of topics in molecular, cellular, developmental, and population genetics are covered. Required for all second-year students in Genetics. Graded Satisfactory/Unsatisfactory. W 4–4:50

GENE 703b, The Mouse in Biomedical Research Caroline Zeiss and staff

This course describes aspects of comparative genomics, construction of genetically altered mice, mouse phenotyping, and study design relevant to the use of mice in the study of human disease. Prerequisites: an undergraduate-level knowledge of genetics and mammalian anatomy and physiology. T 1:45–3:30, TH 2:15–3:30

GENE 705a/MB&B 705a^u/MCDB 505a, Molecular Genetics of Prokaryotes

Nigel Grindley

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. Required: previous or concurrent introductory courses in genetics and biochemistry. MW 11:35–12:50

[GENE 734a/MB&B 734a/MBIO 734a, Molecular Biology of Animal Viruses]**GENE 743b/MB&B 743b^u/MCDB 743b, Advanced Eukaryotic Molecular Biology**

Mark Hochstrasser, Anthony Koleske, Patrick Sung

Selected topics in transcriptional control, regulation of chromatin structure, mRNA processing, mRNA stability, RNA interference, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, somatic hypermutation. Prerequisite: biochemistry or permission of the instructor. TTH 11:35–12:50

GENE 749a/MB&B 749a^u, Medical Impact of Basic Science Joan Steitz,

Enrique De La Cruz, Mark Hochstrasser, Andrew Miranker, Lynn Regan,
Patrick Sung

Consideration of examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Emphasis is placed on the fundamental principles on which these advances rely. Reading is from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Aimed primarily at undergraduates. Prerequisite: biochemistry or permission of the instructor. TTH 1–2:15

GENE 777b/MCDB 677b, Mechanisms of Development Valerie Reinke and staff

This is an advanced course on mechanisms of animal and plant development focusing on the genetic specification of cell organization and identity during embryogenesis and somatic differentiation. The use of evolutionarily conserved signaling pathways to carry out developmental decisions in a range of animals is highlighted. Course work includes student participation in critical analysis of primary literature and a research proposal term paper. M 9–10:15, F 2:30–3:45

GENE 840a and b, Medical Genetics Margretta Seashore

Clinical rotation offering medical and graduate students the opportunity to participate in the Genetic Consultation Clinic, genetic rounds, consultation rounds, and genetic analysis of clinical diagnostic problems.

GENE 900a/CBIO 900a/MCDB 900a, First-Year Introduction to Research

Frank Slack and faculty

Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics, and Development track students.

GENE 901b/CBIO 901b/MCDB 901b, First-Year Introduction to Research

Karin Reinisch, Matthew State

Lab rotations, topic-based seminars for Molecular Cell Biology, Genetics, and Development track students.

GENE 921a and b, Reading Course in Genetics and Molecular Biology

Charles Radding and staff

Directed reading with faculty. Term paper required. Prerequisite: permission of Genetics DGS.

GEOLOGY AND GEOPHYSICS

Kline Geology Laboratory, 432.3124
www.geology.yale.edu/
 M.S., M.Phil., Ph.D.

Chair

David Bercovici

Director of Graduate Studies

Elisabeth Vrba

Professors Jay Ague, David Bercovici, Ruth Blake, Mark Brandon, Derek Briggs, Leo Buss, Michael Donoghue, David Evans, Jacques Gauthier, Thomas Graedel, Leo Hickey, Shun-ichiro Karato, Jun Korenaga, Jeffrey Park, Danny Rye, Adolf Seilacher (*Visiting*), Brian Skinner, Ronald Smith, Karl Turekian, Elisabeth Vrba, John Wettlaufer

Associate Professors Alexey Fedorov, Mark Pagani

Assistant Professors Hagit Affek, Kanani Lee, Maureen Long, Mary-Louise Timmermans, Zhengrong Wang

Lecturer Catherine Skinner

Fields of Study

Fields include geochemistry and petrology, geophysics, ice physics, mineral physics, seismology and geodynamics, structural geology and tectonics, paleontology and paleoecology, oceanography, meteorology, cryospheric dynamics, and climatology.

Special Admissions Requirements

The department welcomes applicants oriented toward the earth sciences who have a bachelor's or master's degree in such fields as biology, chemistry, engineering, mathematics, meteorology, or physics, as well as those trained in geological, geophysical, and geochemical sciences. Scores from a pertinent GRE Subject Test are desirable but not required. The TOEFL or IELTS exam is required for all applicants for whom English is a second language.

Special Requirements for the Ph.D. Degree

There is no formal language requirement and no required curriculum. Students plan their course of study in consultation with their adviser to meet individual interests and needs and to lay the foundations for dissertation research. At the end of the first year the faculty reviews the standing of each student. A student recommended for continuation in the Ph.D. program will be so notified. Some students may be encouraged at that time to pursue only the M.S. degree. At the end of the second year the faculty reviews each student's overall performance to determine whether he or she is qualified to continue for the Ph.D. degree. In order to qualify, a student must have met the Graduate School Honors requirement and maintained a better than passing record in the areas of concentration.

Also, a student must have satisfied the requirements of the Qualifying Exam by having completed two Research Discourses termed (according to their degree of development) the Minor and the Major Discourses. The Major Discourse will be presented at the Qualifying Presentation, followed by an extended question period wherein the student must successfully defend both Discourses. Remaining degree requirements include a dissertation review in the third year; the preparation and defense of the dissertation; and the submission of the dissertation to the Graduate School. The department requires that an additional copy, for which the student will be reimbursed, be deposited with the librarian of the Kline Geology Library.

Teaching experience is regarded as an integral part of the graduate training program in Geology and Geophysics. For that reason all students are required to serve as teaching fellows (5 hours per week) for two terms during the course of their predoctoral training.

Master's Degrees

M.Phil. See Degree Requirements.

M.S. Awarded only to students who are not continuing for the Ph.D. Students are not admitted for this degree. Minimum requirements include satisfactory performance in a course of study (typically 6 or more courses) that is approved by the DGS, and a research project with the approval of the DGS and the student's thesis committee.

Program materials are available at www.geology.yale.edu/ or upon request to the Director of Graduate Studies, Department of Geology and Geophysics, Yale University, PO Box 208109, New Haven CT 06520-8109; e-mail, dgs@geology.yale.edu.

Courses

G&G 500b^U, Mineral Deposits Brian Skinner

An introduction to the formation and distribution of mineral deposits.

[G&G 501a^U/ASTR 540a^U, Radiative Processes in Astrophysics and Geophysics]

[G&G 502a^U, Introduction to Geochemistry]

[G&G 504a^U, Minerals and Human Health]

[G&G 508b, The Global Carbon Cycle]

G&G 510a, Introduction to Isotope Geochemistry Danny Rye, Zhengrong Wang

This class provides an overview of the fundamental principles of stable and radiogenic isotope geochemistry. Emphasis is placed on applications to specific geologic problems, including petrogenesis, geochronology, geothermometry, surface processes, hydrology, and biogeochemistry. MWF 9:25–10:15

[G&G 511a, Stratigraphic Principles and Applications]

G&G 512a^U, Structure and Deformation of the Lithosphere Mark Brandon

An introduction to structure and deformation of tectonic plates. Topics include structure of the crust and mantle; deformation processes at low and high temperatures; origin of folds, faults, and earthquakes; and formation and evolution of plate boundaries and collisional mountain belts. Laboratory exercises and field trips.

G&G 513a^u, Invertebrate Paleontology: Evolving Form and Function Derek Briggs,
Adolf Seilacher

Exploration of the basic constraints and potentials that controlled adaptive radiation in the evolution of the invertebrate skeleton.

[G&G 515b^u, Paleobotany]

[G&G 518a^u, Trace Fossil Analysis]

G&G 519a^u, Introduction to the Physics and Chemistry of Earth Materials

Shun-ichiro Karato

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. TTH 11:35–12:50

G&G 521b^u, Geophysical Fluid Dynamics Mary-Louise Timmermans

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. TTH 1–2:15

[G&G 522a^u, Physics of Weather and Climate]

[G&G 523b^u, Theory of Climate]

[G&G 524a, Mathematical Methods in Geophysics]

[G&G 525a/ENAS 761a, Introduction to Continuum Mechanics]

G&G 526a^u, Introduction to Earth and Planetary Physics Kanani Lee

Composition and structure of the Earth; seismological models; geochemical models; material properties in the Earth (elasticity, anelasticity, viscosity); specific topics on Earth structure (crust, mantle, core).

G&G 529b, Introduction to Geodynamics Jun Korenaga

This introductory course starts with the basics of continuum mechanics and covers a range of topics in geodynamics and relevant fields including the structure and dynamics of lithosphere, thermal convection and magmatism, Rayleigh-Taylor instability and plume dynamics, geoid and dynamic topography, and the thermal history of the core and geodynamo.

G&G 533a^u, Paleogeography David Evans

Quantitative methods for measuring horizontal motions on the surface of the Earth. Histories of continental motions and supercontinents during the past three billion years. True polar wander. Foundations of paleomagnetism, including experience with field sampling and laboratory data acquisition. TTH 2:30–3:45, 1 HTBA

G&G 535a^u, Physical Oceanography Alexey Fedorov

An introduction to ocean dynamics and physical processes controlling the large-scale ocean circulation, ocean stratification, the Gulf Stream, wind-driven waves, tides, tsunamis, coastal upwelling, and other oceanic phenomena. Modern observational, theoretical,

and numerous other techniques used to study the ocean. The ocean role in climate and global climate change. MW 11:35–12:50

G&G 536b, Atmospheric Waves, Convection, and Vortices Ronald Smith

This is an advanced course on atmospheric dynamics covering internal gravity waves, mountain waves and wind storms, the turbulent boundary layer, vortices (tornados, hurricanes, frontal cyclones, lee eddies, and rotors), K-H and vortex stability, and convection-mean flow interaction. Basic principles are emphasized.

G&G 538a/ASTR 520a, Computational Methods in Astrophysics and Geophysics

Paolo Coppi

The analytic and numerical/computational tools necessary for effective research in astronomy, geophysics, and related disciplines. Topics include numerical solutions to differential equations, spectral methods, and Monte Carlo simulations. Applications are made to common astrophysical and geophysical problems including fluids and N-body simulations.

G&G 540a^U, Methods in Geomicrobiology Ruth Blake

A laboratory-based course providing interdisciplinary practical training in geomicrobiological methods including microbial enrichment and cultivation techniques; light, epi-fluorescence, and electron microscopy; and molecular methods (DNA extraction, PCR, T-RFLP, FISH). TTH 1–2:15

G&G 550a^U, Paleontology and Evolutionary Theory Elisabeth Vrba

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. TTH 11:35–12:50

G&G 555b^U, Petrogenesis of Mountain Belts Jay Ague

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, ultra-high pressure and ultra-high temperature metamorphism, spatial and temporal patterns of petrologic processes throughout geologic time, and pressure-temperature-time paths of metamorphic and igneous rocks. MWF 9:25–10:15

[G&G 556b^U, Introduction to Seismology]

[G&G 557b, Advanced Seismology]

G&G 562a^U/ARCG 762a^U/EMD 548a/F&ES 77001a, Remote Sensing: Observing the Earth from Space Ronald Smith and staff

Topics include the spectrum of electromagnetic radiation; satellite-borne radiometers; data transmission and storage; computer image analysis; and GIS analysis of satellite imagery with applications to weather and climate, oceanography, surficial geology, snow and ice, forestry, agriculture, and watershed management. TTH 9–10:15

[G&G 567b^U, Geochemical Approaches to Archaeology]

[G&G 602b^U, Paleoclimates]

G&G 610b^U, Advanced Topics in Macroevolution Elisabeth Vrba

A seminar course for graduate students, and selected undergraduates with a suitable prior background, in which we read and discuss publications on various macroevolutionary topics and current debates. The particular subject matter varies from year to year, often being decided by student request for a specific topic, and is announced before the start of the term. Prerequisite: permission of the instructor.

G&G 611a, Advanced Stratigraphy Leo Hickey

The theory and practice of stratigraphy for those who have a basic grounding in the field. After several lectures, the course is conducted as a series of topical seminars chosen by the instructor and the participants.

[G&G 616a, Advanced Petrology]**[G&G 617b, Leaf Architecture of the Flowering Plants]****G&G 618a, Petrology of Light Stable Isotopes** Danny Rye

The principles and applications of light stable isotopes to geological materials.

G&G 621b, Geochemistry of Heavy and Radioactive Isotopes in Rock Systems

Danny Rye

The principles and application of radioactive and radiogenic isotopes to geological materials.

G&G 631a, Vertebrate Paleontology: Phylogeny of Vertebrates Jacques Gauthier

This seminar course offers a detailed look at current issues in the phylogeny, anatomy, and evolution of fossil and recent vertebrates. Lectures review the broad outline of vertebrate phylogeny and evolution. Lab section is required. HTBA

G&G 650b^U, Deformation of Earth Materials Shun-ichiro Karato

Basics of deformation of materials as applied to geological and geophysical problems. Starting from the basic background of stress-strain and thermodynamics, discussion of materials science of deformation including elastic, anelastic, and plastic deformation. Emphasis is on the nature of deformation of materials under extreme conditions (high-pressure, high water fugacity) that is critical in interpreting seismological observations and geological and geophysical processes. TTH 9–10:15

[G&G 655a^U, Extraordinary Glimpses of Past Life]**G&G 657a, Marine, Atmospheric, and Surficial Geochemistry** Karl Turekian

The processes at the Earth's surface including the atmosphere, oceans, ice caps, and the upper layers of crust are the subjects of the course with the insights gained from radioactive, radiogenic, and light stable isotopes. MWF 9:25–10:15

G&G 659a, Time Series Analysis with Geoscience Applications Jeffrey Park

Introductory course in geoscience data analysis and time series methods, with emphasis on multiple-taper time series techniques. Examples drawn from seismological, paleoclimate, and historical climate data. Weekly computer assignments. FORTRAN or Scilab/Matlab proficiency helpful.

[G&G 660a, Diagenesis, Weathering, and Geochemical Cycles]**G&G 666a/AMTH 666a/ASTR 666a, Statistical Thermodynamics for Astrophysics and Geophysics** John Wettlaufer

Classical thermodynamics is derived from statistical thermodynamics. We then develop kinetics, transport theory, and reciprocity from the linear thermodynamics of irreversible processes. Emphasis is placed on phase transitions, including novel states of matter, nucleation theory, and the thermodynamics of atmospheres. We explore phenomena that are of direct relevance to problems in astrophysical settings, atmospheres, oceans, and the Earth's interior. No quantum mechanics is necessary as a prerequisite. TTH 2:30–3:45

G&G 675b, Quantitative Tectonics Mark Brandon

Introduction to the use of quantitative methods for the study of tectonic processes. The focus of the course shifts each year, covering topics such as flexural isostasy; coupling between climate, surface erosion, and deformation; kinematics of plate motion; thermal methods for studying erosion and faulting; processes and products of deformation. The course consists of a combination of lectures and seminar discussions. Students develop and complete a significant research project, either on their own or as a group. TF 2:30–4:20

G&G 690a and b, Directed Research in Geology and Geophysics

By arrangement with faculty.

G&G 691a or b, Independent Research

In addition to the seminars noted below, others on special topics like evolution, invertebrate and vertebrate paleontology, statistical mechanics and spectroscopy, structural geology and tectonics, petrology, volcanology, and physics of oceans and atmospheres are offered according to student interest, by arrangement with departmental faculty. Seminars are often organized around the research interests of visiting faculty as well. Prerequisite: approval of director of graduate studies and adviser.

G&G 703a, Seminar in Systematics Jacques Gauthier

3 HTBA

[G&G 735a, Introduction to Organic Geochemistry]**G&G 740a, Student Research Seminar** Mark Pagani

This is a seminar class, in which students present seminars on topics related to their own research, either by presenting their results or by discussing literature that provides an introduction to their research topic. The class offers students an opportunity to gain experience in presenting scientific data and arguments in an informal environment and forces them to think about their research in a detailed enough way that would allow them to explain it to a mixed audience. The topics covered in these presentations depend on the diverse interests of the students participating and include all topics associated with research performed within the G&G department and related topics. It therefore exposes the students to the large variety of research fields and provides them basic general Earth science background knowledge.

G&G 742a or b, Seminar in Geophysical Fluid Dynamics Ronald Smith

G&G 744a or b, Seminar in Mantle and Core Processes David Bercovici,
Shun-ichiro Karato

The seminar covers advanced topics concerning physical and chemical processes in the mantle and core of the Earth and planets. Specific topic and hour are arranged in consultation with enrolled graduate students.

G&G 746a or b, Seminar in Global Change Karl Turekian

[G&G 757b, Studies in Global Geoscience]

G&G 767b, Seminar in Ice Physics John Wettlaufer

We bring together the basic thermodynamics and statistical mechanics of crystal growth, surface phase transitions, metastability, and instability to explore the many faces of the surface of ice. These processes control the macroscopic growth shapes of ice crystals, underlie the enigma of the snowflake, and have implications in, inter alia, the atmosphere, the oceans, basic materials science, and astrophysics. HTBA

G&G 775a and b, Seminar in Tectonics Mark Brandon, David Evans

This seminar focuses on advanced topics in the evolution and structure of the lithosphere. The theme for the seminar changes with each semester, covering topics such as the restoration of continents in deep time, true polar wander, lithospheric instabilities, orogenesis at convergent plate boundaries, interactions between climate and tectonics. Meetings are for 1.5 hours, once a week, and are organized around readings from the primary research literature. HTBA

G&G 800a or b, Tutorial in Paleobiology

G&G 805a or b, Fossil Floras

**G&G 810a or b, Tutorial in Structural Geology and Tectonics or Solid Earth
Geophysics**

G&G 820a or b, Tutorial in Meteorology, Oceanography, or Fluid Dynamics

G&G 830a or b, Tutorial in Geochemistry, Petrology, or Mineralogy

G&G 840a or b, Tutorial in Sedimentology

G&G 860a or b, Tutorial in Remote Sensing

GERMANIC LANGUAGES AND LITERATURES

W. L. Harkness Hall, 432.0788
www.yale.edu/german/graduate.html
 M.A., M.Phil., Ph.D.

Chair

Carol Jacobs

Director of Graduate Studies

Rüdiger Campe (307 WLH, rudiger.campe@yale.edu)

Professors Rüdiger Campe, Carol Jacobs, Rainer Nägele, Brigitte Peucker, Henry Sussman (*Visiting* [F])

Associate Professor Kirk Wetters

Assistant Professor Paul North

Lecturer William Whobrey

Affiliated Faculty Seyla Benhabib (*Political Science; Philosophy*), Karsten Harries (*Philosophy*), Steven Smith (*Political Science*), Katie Trumpener (*Comparative Literature; English*), Jay Winter (*History*), Christopher Wood (*History of Art*)

Fields of Study

German literature and culture from the Reformation to the twenty-first century in Germany, Austria, and Switzerland; medieval literature; literary and cultural theory; visuality and German cinema.

Special Admissions Requirement

All students must provide evidence of mastery of German upon application.

Requirements for the Ph.D. Degree

Students are required to demonstrate, besides proficiency in German, a reading knowledge of one other foreign language by the end of the fourth term of study. French is recommended, although occasionally, on consultation with the DGS, other relevant languages may be substituted. The faculty in German considers teaching to be essential to the professional preparation of graduate students. Students normally teach undergraduate language courses under supervision beginning in the third year of study for at least two years. An oral examination must be passed not later than the end of the sixth term of study, and a dissertation prospectus should be submitted soon thereafter, but not later than the start of the seventh term of study. All students will be asked to defend the prospectus in an informal discussion with the faculty. The defense will take place before the prospectus is officially approved, usually early September of the seventh term. Students are admitted to candidacy for the Ph.D. upon completion of all pre-dissertation requirements, including the prospectus.

After the submission of the prospectus, the student's time is devoted to the preparation of the dissertation. A dissertation committee will be set up for each student at work on the dissertation. It is expected that students will periodically pass their work along to members of their committee, so that faculty members in addition to the dissertation adviser can make suggestions well before the dissertation is submitted. Drafts of each chapter must be submitted in a timely fashion to all members of the student's committee: The first chapter should be submitted to the committee by April 1 of the fourth year of study; the second chapter should be submitted by January 1 of the fifth year. There will be a formal review of the first chapter.

Two concentrations are available to graduate students: German Literature and German Studies. There is a special joint degree with Film Studies; see below.

Special Requirements for the Germanic Literature Concentration

During the first two years of study, students are required to take sixteen term courses, four of which may be taken outside the department.

Special Requirements for the German Studies Concentration

During the first two years of study, students are required to take sixteen term courses, seven of which may be taken outside the department. Students are asked to define an area of concentration upon entry, and will meet with appropriate advisers from both within and outside the department.

Joint Ph.D. Program with Film Studies

The Department of Germanic Languages and Literatures also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in Germanic Languages and Literatures and Film Studies. For further details, see Film Studies. Applicants to the joint program must indicate on their application that they are applying both to Film Studies and to Germanic Languages and Literatures. All documentation within the application should include this information.

Master's Degrees

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may qualify for the M.A. degree upon completion of a minimum of eight graduate term courses and the demonstration of reading knowledge in either Latin or French.

Master's Degree Program For the terminal master's degree, students must pass eight term courses, six of which must be in the department, and demonstrate a reading knowledge of French. A comprehensive written examination will be given at the end of the second term. For the quality requirement for the M.A. degree, see Graduate School requirements.

Further information is available upon request to the Registrar, Department of Germanic Languages and Literatures, Yale University, PO Box 208210, New Haven CT 06520-8210; e-mail, german@yale.edu.

Courses

GMAN 536a^U/CPLT 536a^U, Around Kafka Henry Sussman

A course treating Kafka as a distinctive and indispensable Imaginary as well as a particular author, mutating into a plethora of adaptations, whether by Beckett, Bernhard, Welles, Murakami, or Pamuk, and into the graphic novel as well. T 3:30–5:20

GMAN 561b^U/CPLT 535b^U, Literary Ethics: Isak Dinesen and W. G. Sebald

Carol Jacobs

We concentrate on the prose works of Isak Dinesen and W. G. Sebald. In reading these singularly popular writers, we think through how literature and ethics redefine one another, the way in which the performance of the work of art and, specifically, reflections on the nature of language and representability, demand a rethinking of conscience and moral gesture. M 1:30–3:20

GMAN 562b^U, Theories of Time Paul North

In this class we read texts that consciously try to regain time as a concept, category, or intuition after the European enlightenment. Following a singular development, starting from a theorization of the transcendental subject of experience by means of time in Kant, we move toward the pointed dismantling of this configuration in Heidegger, interestingly enough, also by means of time. Bookending the course—but not merely that—the first and last volumes of Proust's *In Search of Lost Time* help explain the urgency that seems to characterize the gesture toward time in what has been called “modernity.”

TH 3:30–5:20

GMAN 625a^U, Confidence Games Kirk Wetters

Starting from Orson Welles's *F for Fake*, which articulates the main questions of the course, we examine some of Welles's immediate sources of inspiration: Clifford Irving (including the recent film about his forged biography of Howard Hughes, *The Hoax*) and the art forger Elmyr d'Hory. From here we look back at the literary tradition of the con artist: eighteenth-century German texts (particularly by Goethe and Schiller) inspired by the figure of Cagliostro, Herman Melville's *The Confidence Man*, Thomas Mann's *Confessions of Felix Krull*, *Confidence Man*, and André Gide's *The Counterfeiters*. To conclude the seminar, the class chooses an additional contemporary con (perhaps James Frey's *A Million Little Pieces*) to investigate in detail. The final meeting of the course is devoted to the Grand Inquisitor scene from Dostoyevsky's *Brothers Karamazov* and to Ben Stiller's *Tropic Thunder*. M 1:30–3:30

GMAN 636b^U/CPLT 902b^U/FILM 718b^U, Theatricality in Film Brigitte Peucker

This course examines the multiple implications of theatricality in and for the cinema: theatricality as excess; the appropriation of theatrical modes for film; theatricality as modernist self-reflexivity; performance and the relation of theatricality to subjectivity (performing the self); ritual and reenactment in film; theatricality and the real; the material image. Readings by Arnheim, Bazin, Bateson, Barthes, Bell, Butler, Cavell, Egginton, Fried, Mitry, and others. Films by von Sternberg, Bergman, Hitchcock, Fassbinder, Haneke, Pabst, Wilder, Greenaway, von Trier, Kiarostami, Kubrick. T 3:30–5:20, screening M 7

GMAN 647a^U/CPLT 784a^U/PHIL 607a, Adorno's Aesthetic Theory Rainer Nägele
Close reading of Adorno's *Ästhetische Theorie*. Reading knowledge of German required.
TH 1:30–3:20

GMAN 652a^U/CPLT 840a/FILM 840a/HSAR 687a/RUSS 712a, Moscow/Berlin:

Leftist Avant-Gardes and Interwar Modernism Katerina Clark, Katie Trumpener
From 1918 to the mid-1930s, Moscow and Berlin were both central gathering points for left-wing modernists. Each city developed its own modes of modernism, yet in sustained dialogue, given massive Russian emigration to Berlin after 1918, the Weimar obsession with early Soviet aesthetics (and cinema), intellectuals traveling in both directions, and the large-scale emigration of German leftists to the Soviet Union after 1933. The course ends by considering the shaping influence of Soviet intellectuals (and German emigrants returning from Moscow) on East Berlin "late modernism" of the 1940s and '50s. Centered on literature and film, the course also considers a wide array of art forms (including painting, photography, architecture, music, and aesthetic theory). Works by modernists such as Eisenstein, Pudovkin, Vertov, Kosinzev, Trauberg, Shklovsky, El Lissitzky, Rodchenko, Malevich, Shostakovich, Tretiakov, Babel, Lukacs, Moholy-Nagy, Benjamin, Brecht, Richter, Beckmann, Schwitters, Grosz, Heartfield, Döblin, Ruttman, van der Rohe, Eisler, Busch. Texts are available in English translation; knowledge of Russian and/or German very helpful. At the first meeting, students help shape the final syllabus.
W 1:30–3:20

GMAN 660a^U/CPLT 783a, Transformations of the Classical Elegy by Goethe, Hölderlin, and Rilke Rainer Nägele

Concentrating on the elegies of Goethe, Hölderlin, and Rilke, the seminar analyzes the transformation of the classical Greek elegy form in modern times. Reading knowledge of German is required. W 3:30–5:20

GMAN 672b^U, Austrian Novels after Musil Kirk Wetters

This seminar explores a constellation of major Austrian novels in the decades and generations following the titanic modernist novels of figures such as Musil, Canetti, and Broch. We concentrate, to begin with, on three works: Heimito von Doderer's *Die Strudelhofstiege*, Ingeborg Bachmann's *Malina*, and Thomas Bernhard's *Auslöschung*. (Interested students are encouraged to start reading these novels over the summer.) If time allows, we consider works of additional authors, for example Albert Paris Gütersloh, Hans Lebert, Marlen Haushofer, Dorothea Zeeman, Peter Handke, Elfriede Jelinek, and Robert Menasse. M 3:30–5:20

GMAN 673b^U/CPLT 625b^U, Advocates and Representatives Rüdiger Campe

In contradistinction to our familiar thinking on communication as two parties speaking about the world, the course develops a triangular scene in which one person speaks on behalf of another person before a third party. This is the model of communication in law (in the idea of advocacy), religions (in the idea of intercession), and politics (in the idea of representation). Readings are taken from ancient rhetoric (Aristotle, Quintilian), Jewish and religious texts (on the "paraclete" or helper), as well as modern social and literary theory (Parsons, Derrida). We also examine selected scenes from ancient and modern drama as well as paradigmatic works by Kafka, Canetti, and Celan. W 3:30–5:20

GMAN 676a^u, Narrating Risk and Contingency Rüdiger Campe

In this course we focus on narrative works from the era of classical probabilistic philosophies. Beginning with Defoe and Wieland, we read narrative texts by Defoe, Voltaire, Goethe, Schiller, Kleist, E.T.A. Hoffmann, Poe, and others. In the background of our readings we look at the history of probabilistic thinking and contemporary debates on risk and risk taking. Contingency as a basic element of narration is discussed throughout.

TH 3:30–5:20

GMAN 677a^u, Passions, 1600–1800 Rüdiger Campe

The course explores theories of passion from Descartes and Hobbes to Baumgarten, Burke, and Kant, and the relationship between literary representation from Shakespeare and Racine to Richardson and Goethe. Theoretical questions concern psychology and epistemology, aesthetics and anthropology. The theatrical performance of passion (seventeenth century) is at issue, as is its narrative representation (eighteenth century).

T 1:30–3:20

GMAN 900a,b, Directed Reading

By arrangement with the faculty.

HISTORY

240 Hall of Graduate Studies, 432.1366

www.yale.edu/history/

M.A., M.Phil., Ph.D.

Chair

Laura Engelstein

Director of Graduate Studies

Steven Pincus (236 HGS, 432.1361)

Professors Jean-Christophe Agnew, Abbas Amanat, Ned Blackhawk, David Blight, Paul Bushkovitch, Jon Butler, George Chauncey, Stephen Davis, Michael Denning, Carlos Eire, Laura Engelstein, John Mack Faragher, Paul Freedman, Joanne Freeman, John Gaddis, Glenda Gilmore, F. Bruce Gordon, Robert Gordon, Timothy Guinnane, Valerie Hansen, Robert Harms, Jonathan Holloway, Paula Hyman, Matthew Jacobson, Gilbert Joseph, Donald Kagan, Paul Kennedy, Daniel Kevles, Benedict Kiernan, Jennifer Klein, Bentley Layton, 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, Francesca Trivellato, Adam Tooze, Frank Turner, John Harley Warner, Anders Winroth, Jay Winter, Keith Wrightson

Associate Professors Bruno Cabanes, Mary Lui, Mridu Rai, Naomi Rogers

Assistant Professors Paola Bertucci, Patrick Cohrs, Fabian Drixler, Beverly Gage, Lillian Guerra, Alyssa Mt. Pleasant, Youval Rotman, Edward Rugemer, Paul Sabin, Celia Schultz, Marci Shore, Bruno Strasser, Charles Walton, Kariann Yokota

Lecturers* Adel Allouche, Nandini Bhattacharya, Annping Chin (*Senior Lecturer*), Becky Conekin (*Senior Lecturer*), Ivano Dal Prete, Seth Fein, Veronika Grimm, Michael Mahoney, William Metcalf, Stuart Semmel (*Senior Lecturer*)

*For a complete listing of lecturers, see the undergraduate bulletin, *Yale College Programs of Study*.

Fields of Study

Fields include ancient, medieval, early modern, and modern Europe (including Britain, Russia, and Eastern Europe), United States, Latin America, East Asia, Southeast Asia, Middle East, Africa, Jewish history; and diplomatic, environmental, ethnic, intellectual, labor, military, political, religious, social, and women's history, as well as the history of science and medicine (see the section in this bulletin on the History of Science and Medicine).

Special Admissions Requirements

The deadline for submission of the application for the History graduate program has been changed to December 15.

The department requires a short book review (maximum two pages) to accompany the application. It should cover the book that has most shaped the applicant's understanding of the kind of work he or she would like to do as a historian.

In addition, the department requires an academic writing sample of not more than 25 pages, double spaced, to be submitted. Normally, the writing sample should be based on research in primary source materials.

Special Requirements for the Ph.D. Degree

All students must pass examinations in at least two foreign languages, one by the end of the first year. Students are urged to do everything in their power to acquire adequate linguistic training before they enter Yale and should at a minimum be prepared to be examined in at least one language upon arrival. Typical language requirements for major subfields are as follows:

African Either (1) French and German or Portuguese or Dutch-Afrikaans; or (2) French or German or Portuguese and Arabic; or (3) French or German or Portuguese or Dutch-Afrikaans and an African language approved by the DGS and the faculty adviser.

American Two languages relevant to the student's research interests, or a high level of proficiency in one language; competence in statistics or other mathematical skill may substitute for a natural language under appropriate circumstances.

Ancient French, German, Greek, and Latin.

Byzantine Greek, Latin, French, German, and any additional language, e.g., Russian, required for dissertation research.

Chinese Chinese and Japanese; additional languages like French, Russian, or German may be necessary for certain dissertation topics.

East European The language of the country of the student's concentration plus two of the following: French, German, Russian, or an approved substitution.

Japanese Japanese and French or German; Chinese may be necessary for certain fields of Japanese history.

Jewish Modern Hebrew and German, and additional languages such as Latin, Arabic, Yiddish, Russian, or Polish, as required by the student's areas of specialization.

Latin American Spanish, Portuguese, and French.

Medieval French, German, and Latin.

Middle East Arabic, Persian, or Turkish (or modern Hebrew, depending on area of research) and a major European research language (French, German, Russian, or an approved substitute).

Modern Western European (including British) French and German; substitutions are permitted with the approval of the DGS.

Russian Russian plus French or German with other languages as required.

Southeast Asian Choice of Dutch, French, Spanish, Portuguese, Chinese, Sanskrit, or Arabic, plus one or more Southeast Asian languages (e.g., Bahasa Indonesian, Burmese, Khmer, Lao, Malay, Tagalog, Thai, Tetum, or Vietnamese). In certain cases, Ph.D. dissertation research on Southeast Asia may also require knowledge of a regional or local language, e.g., Balinese or Cham.

Foreign students whose native language is not English may receive permission during their first year to hand in some written work in their own language. Since, however, the dissertation must be in English, they should be advised to bring their writing skills up to the necessary level at the earliest opportunity.

During the first two years of study, students normally take twelve term courses, at least eight of which shall be chosen from those offered by the department, and must achieve Honors in at least two courses in the first year, and Honors in at least four courses by the end of the second year, with a High Pass average overall. If a student does not meet this standard by the end of the first or second year, the relevant members of the department will consult and promptly advise the student whether the student will be allowed to register for the fall of the following academic year.

Three of the twelve courses must be research seminars in which the student produces an original research paper from primary sources. All graduate students, regardless of field, will be required to take two seminar courses in a time period other than their period of specialty.

In the second year, there are two special seminar requirements.

1. Prospectus Tutorial

This course, normally taken in the second year, must result in a draft prospectus for the dissertation. Its purpose is to familiarize the student with debates in the relevant field and to prepare the student for fieldwork. The prospectus tutorial (HIST 995) counts as one of the three research seminars.

2. Orals Tutorial

Another of the twelve courses, normally taken in the second year, must be a tutorial in any one of the selected orals fields (see below). The orals tutorial (HIST 994) provides an opportunity for students to read for an orals field with one of the future orals committee members and can take the form of one-on-one meetings, small group meetings, or a normally scheduled reading seminar on the topic of the orals field. In some cases, orals tutorial credit will be retroactively granted to students who have taken a course in a reading seminar subject provided that they submit an orals reading list to the DGS for approval. Students seeking retroactive credit for an orals tutorial will still need to complete twelve term courses. The completion of these tutorials is a precondition for enrollment in the third year.

In the third year, students are expected to hold a prospectus colloquium and sit an oral examination.

1. The prospectus colloquium offers the student an opportunity to discuss the dissertation prospectus with the faculty committee in order to gain the committee's advice on the research and writing of the dissertation and its approval for the project. The

dissertation prospectus provides the basis of grant proposals for doing research away from Yale in the fourth year. The prospectus colloquium and any further language requirements normally will be completed before the student takes his/her oral examination.

2. The oral examination for all graduate students must contain one minor field that deals 50 percent or more with the historiography of a region of the world other than the area of the student's major field. Students will have a choice of selecting three or four fields of concentration: a major field and either two or three minor fields. If the student selects the four-field option, the major field will be examined for 30 minutes. In that case, the student's orals tutorial must be in the major field. If the student selects the three-field option, the major field will be examined for 60 minutes and each minor field for 30 minutes. Completion of these requirements will qualify a student for admission to candidacy for the Ph.D., which must take place by the end of the third year of study.

During the third year of study, almost all students serve as teaching fellows in order to acquire crucial professional training. During their first term of teaching, students must attend several training sessions run by the department in conjunction with the Graduate Teaching Center.

Students usually complete the requirements for admission to candidacy in the sixth term, but it is also possible for students who have completed extensive graduate work prior to entering the Ph.D. program to petition for candidacy sooner. Students may petition for credit for previous graduate work only after successful completion of the first year.

In the fourth year, once students have advanced to candidacy, they may continue their studies while serving as teaching fellows or they may decide to pursue their research, either at Yale or elsewhere, using external funding.

In the fifth year, strongly preferably in the fall term, students are required to submit a chapter of the dissertation (not necessarily the first chapter) to the dissertation committee. This chapter will then be discussed with the student by members of the committee, preferably in a colloquium, to give the student additional advice and counsel on the progress of the dissertation. This conference is designed to be an extension of the conversation begun in the prospectus colloquium and is not intended as a defense: its aim is to give students early feedback on the research, argument, and style of the first writing accomplished on the dissertation.

The dissertation is expected to demonstrate ability to use sources in a discriminating and original way.

Students are eligible to receive the University Dissertation Fellowship (UDF) provided that they have advanced to candidacy. Students may take the UDF in the fifth year, but they must take the fellowship no later than the sixth year. They should apply for the fellowship in the term prior to which they wish to receive it. Students may serve as teaching fellows when they are not on the UDF.

The department strongly recommends that the student apply for a UDF only after completing the first chapter conference, and that students on a UDF should have completed at least two dissertation chapters before starting the fellowship. Many students

apply for jobs in the year in which they receive the UDF, and the department urges that students apply for academic positions only when they have two chapters ready to send out to potential employers.

In short, a student making timely progress should expect to finish at least one chapter by December of the fifth year, and to complete the dissertation in the sixth year, when the submission deadline for May graduation is March 15.

Registration in the seventh year is not required for students submitting their dissertations by the October deadline (which the majority of students do). If students are unable to make the October deadline, they can petition the Graduate School for extended registration. The petition, delivered first to the History DGS, will explain the particular circumstances that have prevented completion of the dissertation within the normal timetable and offer a specific plan that describes how the dissertation will be completed in the seventh year. Only students who have completed the first chapter conference will be considered for extended registration.

Combined Ph.D. Programs

HISTORY AND AFRICAN AMERICAN STUDIES

The Department of History also offers, in conjunction with African American Studies, a combined Ph.D. in History and African American Studies. For further details, see African American Studies.

HISTORY AND RENAISSANCE STUDIES

The Department of History also offers, in conjunction with the Renaissance Studies program, a combined Ph.D. in History and Renaissance Studies. For further details, see Renaissance Studies.

Master's Degrees

M.Phil. Students who have completed all requirements for admission to candidacy for the Ph.D. may receive the M.Phil. degree. Additionally, students in History are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may qualify for the M.A. degree upon completion of a minimum of six graduate term courses at Yale, of which two must have earned Honors grades and the other four courses must average High Pass overall. Students must also pass an examination in one foreign language. A student in the American Studies program who wishes to obtain an M.A. in History, rather than an M.A. in American Studies, must include in the courses completed at least two research seminars in the History department.

Master's Degree Program For this terminal master's degree, students must pass six term courses, four of which must be in History; substantial written work must be submitted in conjunction with at least two of these courses, and Honors grades are expected in two courses, with a High Pass average overall. All students in this program must pass an examination in one foreign language. Financial aid is not available for this program.

Program materials are available upon request from the Director of Graduate Studies, Department of History, Yale University, PO Box 208324, New Haven CT 06520-8324.

Courses

HIST 507a^U/CLSS 645a^U, Numismatics William Metcalf

An introduction to the history of ancient coinage and the modern methodology of numismatic study. Brief consideration of the Greek background is followed by detailed treatment of the Roman republic and empire. Prerequisite: proficiency in Greek and Latin. TH 1:30–3:20

HIST 508a/CLSS 840a, The Greek World in Transition, Fourth to Third Century B.C. Joseph Manning

The seminar investigates the Mediterranean states during the period ca. 400–200 B.C., that is, across the traditional “Classical/Hellenistic” historical divide. The primary states we are concerned with are the Greek city-states (both individual states and *koina*) and the Ptolemaic empire, although we also look from time to time at other Hellenistic kingdoms. Among our goals is to compare the public economies across this period and in different regions of the Mediterranean. Emphasis is on comparison. Our goal is to examine Greek states in transition from the point of view of their economies, political organization and political economic thought, and culture, broadly defined, as well as to assess the Greek institutional impact on new areas such as the eastern and southern Hellenistic states. Emphasis on research methods and source criticism. T 1:30–3:20

HIST 510a^U/LATN 727a^U, Tacitus and Pliny John Matthews

The culture of the Flavio-Trajanic period as seen through readings in the historical works of Tacitus and the letters of the younger Pliny, with special emphasis on the personal connections between them, and on the social background and literary formation of the two writers. M 1:30–3:20

HIST 516b^U, Thucydides and the Peloponnesian War Donald Kagan

A study of the great war between Athens and Sparta that transformed the world of the Greek city-states, and the brilliant historian and political thinker who described it. T 1:30–3:20

HIST 517b/CLSS 884b, The Thirty Tyrants Donald Kagan

Reading and discussion. A study of the regime of the thirty in Athens, 404–403 B.C. Ancient Greek and French, German, or Italian required. TH 2:30–4:20

HIST 518a^U, The Spartan Hegemony Donald Kagan

A history of Greece during the period 404–362 B.C. The focus is on the relationship between domestic constitutions and politics and diplomacy and war. T 2:30–4:20

HIST 531b/NELC 534b/RLST 659b, Seminar: The Making of Monasticism

Bentley Layton

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. By permission of instructor. T 3:30–5:20

HIST 535a^U/JDST 761a^U/RLST 773a^U, History of the Jews to the Reformation

Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire, with the main focus on the formative period of classical rabbinic Judaism and on the symbiotic relationship among Jews, Christians, and Muslims. An overview of Jewish society and culture in its biblical, rabbinic, and medieval settings. TTH 11:35–12:50

HIST 542b, Law in Medieval Europe Anders Winroth

This seminar explores the creation in the twelfth and thirteenth centuries of a sophisticated system of law, the European Common Law (*ius commune*). All late medieval and much modern legislation is based on this legal system. The course focuses on its roots in the Roman law of Emperor Justinian and in ecclesiastical legislation. We also study the influence of the *ius commune* on national and local medieval law. The emphasis is on using law in historical research and on learning the necessary technical skills. M 1:30–3:20

HIST 550a, Topics in Medieval Social History Paul Freedman

Aspects of the social history of the Middle Ages. The bonds holding together societies with weak states and frequent local wars. Topics include the peasantry, definitions of noble status, the growth of towns, gender, the church in society. Attention is given to both the material conditions and mental constructs of Europe between about 1000 and 1500. Reading or research seminar. T 1:30–3:20

HIST 555a^U/RLST 651a^U, Jesus to Muhammad: Ancient Christianity to the Rise of Islam Stephen Davis

The rise of Christianity and the development of Western culture into the early Middle Ages, including the creation of Christian orthodoxy; religious, political, social, gender, literary, and theological history of Christian religion in many forms. MW 10:30–11:20

HIST 560b, Society and the Supernatural in Early Modern Europe Carlos Eire

Readings in primary texts from the period 1500–1700 which focus on definitions of the relationship between the natural and supernatural realms, both Catholic and Protestant. Among the topics to be covered: mystical ecstasy, visions, apparitions, miracles, and demonic possession. All assigned readings in English translation. T 1:30–3:20

HIST 569a/RLST 678a, Readings in Reformation History: Calvin and Calvinism

Carlos Eire, Bruce Gordon

Readings and discussion. T 2:30–4:20

HIST 602a, Microhistories Keith Wrightson

Research seminar. The first weeks are devoted to reading and discussing a number of outstanding microhistorical studies of individuals, families, communities, incidents, and processes, principally (though not exclusively) drawn from the literature on the early modern period. Particular attention is paid to questions of sources and their use. Thereafter members of the class undertake individual microhistorical studies on subjects of their choice and present work-in-progress papers to the seminar. W 9:25–11:15

HIST 606a, Britain: Modernity and Empire Steven Pincus

Why and in what ways did Britain become the paradigmatic modern nation? This research seminar introduces students to a variety of approaches to the study of modernization and to a range of questions about the coming of modernity in Britain. Topics may include the emergence of the novel, the origins of the British Empire, England's economic transformation, the development of representative politics, the emergence of the bourgeois public sphere, secularization, among others. The course emphasizes methodological as well as substantive questions. The course is appropriate for historians of any period or area, as well as for graduate students in related disciplines. T 9:25–11:15

HIST 611b/PLSC 781b, Emergence and Divergence of Britain Steven Pincus

Britain by the middle of the nineteenth century was a military and economic superpower. Yet in the sixteenth century England and the rest of the British Isles were at best in the middle ranks of European kingdoms and states by almost any measure. This course utilizes a variety of methods in exploring why this happened and is therefore appropriate for political scientists, sociologists, and economists interested in exploring historical methods, as well as for humanists interested in learning from the social sciences. W 1:30–3:20

HIST 627b, Readings in British Identity since 1800 Stuart Semmel

This course explores recent historical writings in British national identity. A significant number of readings consider the imperial dimension of modern British history, but other topics include race, postcolonial immigration and multiculturalism, the “four nations” (England, Scotland, Wales, Ireland), and European integration. W 9:25–11:15

HIST 635b, Readings in Modern French History John Merriman

Readings and discussion of recent work on the social, political, economic, and cultural history of modern France. M 7–8:50

HIST 642a, Paris and London: Metropolitan Trajectories, 1850–Present

John Merriman, Jay Winter

Reading and discussion seminar. Topics include the impact of large-scale economic transformation; popular protest; migration and mobility; social geography; city and country; the world of work and leisure; the experience of war; images and representation of the city; and the successes and failures of urban planning. M 7–8:50

HIST 647b/INRL 642b, Reconciling Capitalism and Democracy: America and Europe, 1890–1950 Adam Tooze

How to reconcile the imperatives of emerging democratic politics with the dynamics of modern global capitalism was a question with which societies on both sides of the Atlantic wrestled between 1890 and 1950. In Europe and the United States, progressive liberals, social democrats, and modern authoritarian movements of various types offered competing visions of capitalist modernity. This course traces this struggle to devise a new economic and political order at both a domestic and an international level, from the battles over the gold standard, free trade, and mass migration at the turn of the century to the successful capitalist stabilization of the 1950s. W 9:25–11:15

HIST 658a/INRL 656a, Germany and the Crisis of Interwar Europe Adam Tooze

This course discusses the response of German intellectuals to the “crisis of interwar Europe.” It pivots around the two central figures of Martin Heidegger and Carl Schmitt, their influences, students, and associates. In relation to these two figures we read other leading theorists writing in, or about, the period, including Weber, Lukacs, Spengler, Marcuse, Franz Neumann, Adorno, Horkheimer, and Arendt. The course samples both original texts and sections of the vast gallery of historical writing about these figures. German is not required. W 1:30–3:20

HIST 666a, Russian History to 1725 Paul Bushkovitch

The major phases of Russian history from the tenth century, covering the major historiographical controversies and sources. Russian or German helpful but not required. W 1:30–3:20

HIST 676b, Research Topics in Twentieth-Century Russian History

Laura Engelstein

This seminar explores a variety of research avenues in the history of twentieth-century Russia, crossing the boundary of 1917. Readings sample innovative works of scholarship on selected themes. Students with knowledge of Russian are encouraged to develop research projects using primary sources. Students without Russian may develop analytic topics and bibliographies for minor fields. M 1:30–3:20

HIST 698a/E&RS 642a, Religious Liberty in American and French Experience

Rita Hernon-Bélot

Each year this course focuses on the specialty of the visiting professor from the École des Hautes Études en Sciences Sociales (France). This course aims to offer an historical investigation on the long run, from early modern to modern, with a final focus on current issues, in a time when historical nationally bound legacies have to face global challenges. The path has been far more twisted for France, where pluralism is not rooted in society and culture but has been enforced by the state. The course addresses not only the comparison between the two patterns, but the way they have been competing and maybe still are. It also takes into account the many different means of interrelationships and exchanges, among them the sharp and influential analysis of friendly visitors like Jefferson or Tocqueville. It stresses the invaluable contribution American historiography brought to that field by reminding the French of the complex relationship between religion and politics, and above all between religion and democracy.

HIST 700a/AMST 700a, Introduction to the Historiography of the United States

Stephen Pitti

Readings and discussion of scholarly work on U.S. history from the settlement era to the present. Members of the department faculty visit the class on a rotating basis. MW 9–10:15

HIST 703a/AMST 803a, Research in Early National America Joanne Freeman

A research seminar focused on the early national period of American history, broadly defined. Early weeks familiarize students with sources from the period and discuss research and writing strategies. Students produce a publishable article founded on primary materials. T 1:30–3:20

HIST 718a/INRL 622a, Social Movements in Comparative Perspective

Becky Conekin

In this seminar we explore post-WWII social movements and their legacies across Western Europe and the U.S. Examining both the actuality and symbolic character of these movements in contemporary history, we analyze the political, social, and cultural meanings of protest and its impact on class, generational, gender, and racial relations in Western Europe and North America. In addition, if students have specific interests in Eastern European and/or Latin American countries, they may bring these into the discussion and write on them in a comparative perspective in their final paper. We discuss different national histories and discourses about identity, while exploring the varied geographies of the Cold War. We then move to a more thematic approach focusing on, for example, civil rights, antiwar and student protests, and countercultural politics. We conclude with a brief look at the social movements that developed out of the 1960s. T 9:25–11:15

HIST 720b/AMST 705b/RLST 705b, Readings in Religion and American History, 1600–2000

Harry Stout, Kathryn Lofton

This seminar explores intersections of religion and society in American history from the colonial period to the present as well as methodological problems important to their study. M 1:30–3:20

HIST 722b/AFAM 757b/AMST 722b, Research Seminar in Nineteenth-Century American History

David Blight

Some class sessions focus on matters of craft: research techniques, styles of writing narrative and analysis; judging scholarly work; and philosophical dimensions of doing history in the early twenty-first century. Primary focus of the course is for each student to complete his/her own major research paper. Students in any field of American history are welcome. W 3:30–5:20

HIST 724b/AMST 767b, Research Seminar in U.S. Urban History

Mary Lui

Students conduct archival research to write an original article-length essay on any aspect of U.S. urban history in any century. The first half of the seminar consists of weekly readings discussions while the latter half consists of article workshop meetings focused on student writing. T 9:25–11:15

HIST 726b/AMST 798b, The Culture of the Gilded Age

Cynthia Russett

This course uses fiction and nonfiction to look at some of the major concerns of late nineteenth-century America, including political corruption, wealth and poverty, social reform, and the situation of women and minorities. Authors include Edward Bellamy, William Graham Sumner, Jane Addams, W.E.B. DuBois, and Charlotte Perkins Gilman. W 2:30–4:20

HIST 733b/AMST 738b, Readings in Western and Frontier History

John Mack Faragher

An introduction to recent work on the history of North American frontiers and the shifting region of the American West. Critical consideration of readings, participation in discussion, and completion of short weekly writing assignments and a term project. W 9:25–11:15

HIST 735b/AFAM 706b/AMST 714b, Readings in Twentieth-Century U.S. History

Glenda Gilmore

Recent trends in American political history from the 1890s, with an emphasis on the social analysis of mass politics and reform. TH 3:30–5:20

HIST 736a/AFAM 709a/AMST 709a/WGSS 736a, Research in Twentieth-Century**United States Political and Social History** Glenda Gilmore

Projects chosen from post-Civil War period, with emphasis on twentieth-century social and political history, broadly defined. Research seminar. TH 3:30–5:20

HIST 744a/AMST 786a/WGSS 744a, Readings in the History of Gender

Joanne Meyerowitz

Selected topics in women's and gender history with emphasis on U.S. history. Themes include changing conceptions of sex, gender, womanhood, manhood, femininity, and masculinity; the language of gender as a constitutive part of various social hierarchies; class, racial/ethnic, regional, and national differences; and gendered participation in religion, labor, politics, war, and social reform movements. Readings, writing assignments, and classroom discussions address recent historical literature, historiographic trends and debates, and theoretical and methodological approaches. W 2:30–4:20

HIST 752b/AMST 741b, Indians and Empires Ned Blackhawk

This course explores recent scholarship on Indian-imperial relations throughout North American colonial spheres from roughly 1500 to 1900. It examines indigenous responses to Spanish, Dutch, French, English, and lastly American and Canadian colonialisms and interrogates commonplace periodization, geographic, and conceptual approaches to American historiography. It concludes with an examination of American Indian political history, contextualizing it within larger assessments of Indian-imperial and Indian-state relations. M 9:25–11:15

HIST 757a/AMST 775a, Culture in U.S. International and Transnational Histories

Seth Fein

Reading seminar that crosses disciplinary, national, and historiographical borders to explore the history of the United States outside the United States and the history of other nations within the United States (mainly since 1900). Work focuses on comparing methods, using theory, doing research, writing history. Themes include empire, imperialism, and postcolonialism; Americanization, globalization, and mass culture; nationalism, nationality, and transnationalism. M 7–8:50

HIST 758b/AMST 777b, Research Seminar in U.S. International and Transnational**Histories** Seth Fein

Emphasizes interdisciplinary methods and cultural analysis for research and writing about the history of the United States outside the United States and the history of other nations within the United States. Term project is a publishable, article-length essay. M 7–8:50

HIST 763b/AMST 649b, Readings in Latina/o History Stephen Pitti

A reading of the historical works that focus on Latino communities in the United States. We focus particular attention on Mexican American, Puerto Rican, and Cuban American

communities, and we look at topics such as racial identity, border conflict, 1960s activism, patterns of residency and migration, transnationality and citizenship, labor struggles and class formation, and gender and sexuality. Readings bring together scholarship from several disciplines and emphasize both the critical importance of this developing field and its contemporary challenges. M 7–8:50

HIST 770b/AMST 770b/WGSS 750b, Research in Gender and Sexuality

George Chauncey

Students conduct research in primary sources and write original monographic essays on the history of gender and sexuality. Readings include key theoretical works as well as journal articles that might serve as models for student research projects. T 1:30–3:20

HIST 799b/AMST 799b, The American Century, 1941–1961

Jean-Christophe Agnew

Seminar is designed to introduce students to recent work in the intellectual and cultural history of the United States in the years between the New Deal and the New Frontier. Secondary readings highlight current directions in historiography and new models of inquiry as well as the range of research opportunities available, while class assignments and discussions focus for the most part on the different ways in which the period and its documentary sources—including literature, film, and painting—can be interpreted and taught. The seminar aims to suggest the richness and coherence of this period as a subject for intellectual and cultural historians—especially for those wishing to pursue a research topic in this area—and as an occasion to explore and exemplify the possibilities of interdisciplinary teaching. T 1:30–3:20

HIST 805a, Social and Cultural History of Colonial Latin America Stuart Schwartz
Introduction to the basic themes and literatures of colonial history with emphasis on changing methods and approaches in Latin American, European, and U.S. scholarship. M 1:30–3:20

HIST 812b/WGSS 752b, Race, Nation, and Imperialism in Modern Latin America

Lillian Guerra

Focus on works exploring the relationship between interpretations of race, nation, and modernity in Latin American societies deeply affected by direct and indirect forms of U.S. imperialism. Topics covered include blackness, whiteness, and mestizaje as discursive constructions and political ideals in comparative processes of nation-building. Reading knowledge of Spanish is desirable. T 3:30–5:20

HIST 820b, Problems in Modern Mexican History: People, State, and Nation in Historical Motion Gilbert Joseph

Focusing on the relationship between forms of the state and grassroots political culture, the course examines prevailing trends and controversies in historical writing on Mexico, with special attention given to the Mexican Revolution and its legacies. F 1:30–3:20

HIST 829a/NELC 830a, From Medina to Constantinople: The Middle East, 600–1517 Adel Allouche

An examination of the shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1238. 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. TH 1:30–3:20

HIST 832b, Modern Middle East Historiography and Research Abbas Amanat

This course examines the state of scholarship, research methods, and analysis with special reference to the modern Middle East. It covers historiographical debates, impact of social sciences, cultural studies, and Orientalism as well as archives and manuscript sources, research projects, and historical styles. TH 3:30–5:20

HIST 847a/AFST 947a/WGSS 739a, Women and Gender in African History

Michael Mahoney

Examination of both the particularities of the historical experiences of African women and the ways that gender has been defined in an African context. Context covers pre-colonial, colonial, and postcolonial periods. Topics include masculinity, sexuality, and the representation of African women. T 1:30–3:20

HIST 849a/AFST 849a, Agrarian History of Africa Robert Harms

This course examines changes in African rural life from pre-colonial times to the present. Issues to be examined include land use systems, rural modes of production, gender roles, markets and trade, the impact of colonialism, cash cropping, rural-urban migration, and development schemes. T 9:25–11:15

HIST 856b, Histories and Fiction in Early China Annping Chin

The course explores writings from early China, where the line between facts and fiction is often blurred. Readings in Chinese include selections from the *Hanfeizi*, Sima Qian's *Shiji*, and Liu Xiang's *Lienü zhuan* and *Shuoyuan*. M 3:30–5:20

HIST 858b, Readings in Qing Documents: Cross Border Trade Peter Perdue

Discussion of primary source documents for the Qing period (1636–1911), designed to prepare students for writing research papers and dissertations on late imperial Chinese history. Includes a variety of texts, such as memorials, gazetteers, literary and political essays, visual materials, and discussion of bibliographical techniques, archives, and online sources. Prerequisite: one year of classical Chinese. W 3:30–5:20

HIST 862a, Documents of the Tang, Song, and Yuan Dynasties Valerie Hansen

A survey of the historical genres of pre-modern China: the Dynastic histories, other chronicles, gazetteers, literati notes, and Buddhist and Daoist canons. How to determine what different information these sources contain for research topics in different fields. Prerequisite: at least one term of classical Chinese. W 9:25–11:15

HIST 867b, Social History of the Chinese Silk Routes Valerie Hansen

An introduction to artifacts and documents excavated from the most important sites on the Northern and Southern Silk Routes in China, including Niya, Kizil, Turfan, and Dunhuang. All assigned readings in English, but given sufficient student interest, a separate section can be formed for those wishing to read documents in classical Chinese from Turfan and Dunhuang. W 9:25–11:15

HIST 887a, Research Seminar in Japanese History: Redefining Japan

Fabian Drixler

In the first third of this seminar, we read a number of outstanding books and articles to inform and inspire our own research agenda. In the middle third, we familiarize ourselves with different types of sources available for the study of Japan's early modern and modern history. The final third is devoted to individual research projects, which are honed through several cycles of presentations, drafts, and peer review. This year, the course focuses on periods of regime change and national redefinition: the unification and reorientation of Japan during the Bakumatsu-Meiji transition; and the transition from empire and pan-Asianism to the island-nation of the early post-WWII years. These periods have been chosen for their intrinsic interest, but also to open the course to students who do not read Japanese, since there is an abundance of sources in other languages for both periods. M 3:30–5:20

HIST 893a, Subaltern Studies Mridu Rai

This class seeks to introduce students, broadly, to the historiography of South Asia and, more specifically, to debates about dominance, resistance, and writing about both, in the context of colonialism, nationalism, and "postcoloniality." As such, the course is structured around an assessment of the Subaltern Studies project, one of the most influential recent interventions in South Asian history and politics. W 3:30–5:20

HIST 908a^U/HSHM 652a^U, Medicine and Colonialism in Modern Asia

Nandini Bhattacharya

This seminar explores the history of modern medicine in colonial Asia, including South Asia (India, Sri Lanka, Bangladesh, Pakistan) and southeast and east Asia (Malay Straits, Philippines, Sumatra, Hong Kong). It examines western medical institutions and practices such as colonial medical services; hospitals; town planning and urbanization; the theories and construction of diseases of the tropics such as tropical neurasthenia; colonial discourse on race and disease; and the implementation of international health programs in tropical countries in the twentieth century. T 1:30–3:20

HIST 909b^U/HSHM 651b^U, Race, Disease, and Medical Geography in the British Empire Nandini Bhattacharya

This seminar examines the histories of colonization, settlement, race, and habitation in the British Empire from the eighteenth to the twentieth century. We study discourses of climate and medical geography in the eighteenth century; race and miscegenation in the British Empire in the nineteenth century; British debates concerning acclimatization and settlement in the tropical colonies; European concerns about racial degeneration; and ecologies of tropical diseases. T 3:30–5:20

HIST 910a^U/HSHM 648a^U, Health and Medicine in Modern Britain, 1850–1990

Nandini Bhattacharya

This lecture course surveys the development of modern medical institutions and practice in the context of economic, political, and social change in modern Britain. It examines the impact of industrialization, urbanization, and demography effects on the practice and institutions of sanitation and preventive medicine; changing relationships between doctors and patients and between individuals and medical institutions such as hospitals and asylums; and the emergence of scientific medicine, bacteriology, and parasitology.

Topics include the relationship between late Victorian science and eugenic theories of degeneration; the impact of the two World Wars on British medicine and surgery; and the establishment of the National Health Service in postwar Britain. MW 11:35–12:25

HIST 911b^U/HSHM 649b^U, State Medicine in Colonial India, 1850–1947

Nandini Bhattacharya

This lecture course examines the infrastructure of public health and western medical institutions in colonial India, and focuses on Indian responses to colonial medical policies; the ideological and political influences in health policy; the institutionalization of western medicine and sanitary ideals; and the implementation and responses to western ideals of public health in a colonial society. Topics include colonial governance and the question of health; the institutionalization of the Indian Medical Service; public health training in medical colleges; the emergence of tropical medicine; epidemic control of plague and cholera; medicine and religion; and Gandhi and the critique of western civilization. TTH 10:30–11:20

HIST 913a^U/HSHM 639a^U, American Medicine and the Cold War Naomi Rogers

Examination of the social, cultural, and political history of American medicine, focusing on the period 1945–1960. Topics include the defeat of national health insurance; racism in health care, including “separate but equal” hospital policy; patient activism especially among mental health and leprosy inmates; the role of gender in defining medical professionalism and family health; rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. M 1:30–3:20

HIST 914a^U/AMST 879a^U/HSHM 634a^U, Media and Medicine in Modern America

John Harley Warner, Gretchen Berland

An exploration of the relationships among medicine, health, and the media in the United States from 1870 through the present. Focus on newspapers, magazines, professional journals, advertising, exhibitions, radio, film, television, and the Internet; and on interactions among researchers, health professions, medical and public health institutions, journalists, advocacy organizations, the state, industry, and the public. Topics include 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. TTH 10:30–11:20

HIST 915a/HSHM 741a, Science and Religion: A Historical Perspective

Ivano Dal Prete

This course provides a historical perspective on the relationship between science and religion. It analyzes their complex intertwining from antiquity to modern Europe and America, with particular emphasis on: Latin and Islamic middle ages, Renaissance astrology and cosmology, chronology and the geological sciences, embryology and evolutionism. W 1:30–3:20

HIST 917b/HSHM 742b, Life Sciences in Early Modern Europe Ivano Dal Prete

This course explores the multifaceted world of medical and biological research between the Renaissance and the end of the eighteenth century. Emphasis is placed on the role

of medical knowledge in the scientific revolution, the development of microscopy and instrument-making, and social and cultural issues raised by debates on animal and human generation. TH 1:30–3:20

HIST 921a/HSBM 710a, Methods for the Social Studies of Science, Technology, and Medicine Paola Bertucci

Exploration of the methods and debates in the social studies of science, technology, and medicine. This course covers the history of the field and its current intellectual, social, and political positioning. It emphasizes the debates on constructivism and relativism, and provides critical tools to address the relationships among science, technology, medicine, and society. W 9:25–11:15

HIST 930a/HSBM 701a, Problems in the History of Medicine John Harley Warner
An examination of the variety of approaches to the social and cultural history of medicine. Readings are drawn from recent literature in the field, sampling writings on health care, illness experiences, public health, and medical cultures in Europe, the Americas, Africa, and Asia from antiquity to the twentieth century. Topics include the role of gender, class, ethnicity, race, religion, and region in the experience of health care and sickness; the intersection of lay and professional understandings of the body; and the role of the marketplace in shaping professional identities and patient expectations. T 1:30–3:20

HIST 931b/HSBM 702b, Problems in the History of Science Paola Bertucci
Study of secondary literature, recent and older, in this history of the physical and life sciences from the Renaissance to the early twentieth century. Students acquire familiarity with the development of science in general and of its major branches, including its content, instruments and methods, and social-institutional settings, and an acquaintance with various approaches that historians have followed in interpreting these events. W 2:30–4:20

HIST 938a/HSBM 676a/LAW 20441, The Engineering and Ownership of Life
Daniel Kevles

This seminar explores the history of intellectual innovation and intellectual property protection in living matter. Focusing on the United States in world context, it examines arrangements outside the patent system as well as within it. Topics include agriculture, medicine, biotechnology, and law. May be taken as a reading or research course. W 3:30–5:20

HIST 939b^U/AMST 882b^U/HSBM 677b^U, Genetics, Reproduction, and Society
Daniel Kevles

A history of modern biology, especially evolution, genetics, and molecular biology, within its social, economic, legal, and cultural context. Topics include eugenics and sterilization, the Scopes trial, contraception and abortion, new reproductive technologies, medical genetics, the Human Genome Project, and human cloning. MW 11:35–12:25

HIST 940b/HSBM 919b/WGSS 732b, Research in Twentieth-Century U.S. Health, Medicine, and the Body Naomi Rogers

Research seminar in twentieth-century U.S. health, medicine, and the body, with

primary focus on each student completing her/his own major research paper. Projects chosen from post-Civil War period, with emphasis on the twentieth century. Class sessions also explore research techniques, writing styles, and the interrogation of sources. T 9:25–11:15

HIST 945b^U/HSHM 635b^U, Science, Arms, and the State Daniel Kevles

A history of chemical, nuclear, and biological weapons in the twentieth century that focuses on the integration in the United States of national security policy making, scientific research, and military innovation, including its consequences for the scientific community, the civilian economy, public attitudes toward weapons of mass destruction, and political movements to control them. T 7–8:50

HIST 965a/ANTH 541a/F&ES 80054a/PLSC 779a, Agrarian Societies: Culture, Society, History, and Development Kalyanakrishnan Sivaramakrishnan, Peter Perdue, James Scott

An interdisciplinary examination of agrarian societies, contemporary and historical, Western and non-Western. Major analytical perspectives from anthropology, economics, history, political science, and environmental studies are used to develop a meaning-centered and historically grounded account of the transformations of rural society. Team-taught. TH 1:30–5:20

HIST 980a/INRL 652a, Genocide in History and Theory Benedict Kiernan

Comparative research and analysis of genocidal occurrences from ancient times to the present; theories and case studies; an inter-regional, interdisciplinary perspective. Readings and discussion, guest speakers, research paper. TH 1:30–3:20

HIST 981a, The Body in Modern Warfare Bruno Cabanes

Covering the period between the 1850s and the Iraq War, this seminar examines modern warfare as a bodily experience. We consider the question of gender, the impact of violence on the bodies and spirits of both soldiers and civilians, the experience of mass death and the mourning process, and the veterans' homecomings, especially the reception of those severely wounded or mutilated by war. T 1:30–3:20

HIST 984b, Yellow: The History of Wartime Mental Illness and the Evolution of Combat Health Care Policy Bruno Cabanes, Deane Aikins

This research seminar explores the evolving historical consequences of exposure to extreme combat stress and the medical and psychiatric treatment and policies that have been created as a response. Perspectives on a service member's mental health are traced from World War I and displays of "cowardice," WWII "shellshock," PTSD in the Vietnam generation, Gulf War Syndrome in Gulf War I veterans, and the current health care status of veterans from Operation Iraqi Freedom/Operation Enduring Freedom, including the occurrence of Military Sexual Trauma. The transition in medical to psychiatric conceptualizations of the treatments of combat stress are discussed as well as the development of veterans' benefits and related health care issues (i.e., should combat PTSD be meritorious of the Purple Heart?). Class format includes weekly lectures as well as presentations from care providers, policy makers, and veterans. Student are evaluated on class participation and two writing assignments over the course of the semester. W 2:30–4:20

HIST 985b/MGT 984b/, Studies in Grand Strategy, Part I John Gaddis,
Charles Hill, Paul Kennedy

This two-term course begins in January with readings in classical works from Sun Tzu to Clausewitz to Kissinger. Students identify principles of strategy and examine the extent to which these were or were not applied in historical case studies from the Peloponnesian War to the post-Cold War period. During the summer students undertake research projects or internships designed to apply resulting insights to the detailed analysis of a particular strategic problem or aspect of strategy. Written reports are presented and critically examined early in the fall term. Students must take both terms, fulfill the summer research/internship, and attend additional lectures to be scheduled throughout the spring and fall terms. Admission is by competitive application only; forms are available at International Security Studies. M 3:30–5:20

HIST 985a/MGT 984a/, Studies in Grand Strategy, Part II John Gaddis,
Charles Hill, Paul Kennedy

Part II of the two-term linked seminar offered during the calendar year 2009. Research seminar. M 3:30–5:20

HIST 990a, Historical Writing Beverly Gage

A workshop-oriented research seminar designed to introduce students to the craft of writing history. Topics include editorial writing, narrative history, journal submissions, book proposals, and varied approaches to structure and style, in addition to questions of historical methodology, evidence, and argument. W 2:30–4:20

HIST 994a/b, Oral Exam Tutorial
Tutorial

HIST 995a/b, Prospectus
Tutorial

HIST 998a/b, Directed Readings

Offered by permission of instructor and DGS to meet special requirements not covered by regular courses.

HIST 999a/b, Directed Research

Offered by arrangement with instructor and permission of DGS to meet special requirements.

HISTORY OF ART

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Director of Graduate Studies

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Associate Professor Lillian Tseng

Assistant Professors John Conner, Milette Gaifman, Jacqueline Jung, Kishwar Rizvi, Tamara Sears, Sebastian Zeidler

Lecturers Theresa Fairbanks, Jennifer Farrell, Karen Foster, Imogen Hart, Laurence Kanter, Barbara Mundy, Margaret Olin, David Sensabaugh

Fields of Study

Fields include Greek and Roman; medieval and Byzantine; Renaissance; Early Modern; eighteenth-, nineteenth-, and twentieth-century European; Modern Architecture; African; African American; American; American Decorative Arts; British; Pre-Columbian; Islamic; Chinese; Japanese; South Asian; and Film.

Special Requirements for the Ph.D. Degree

Students in the history of Western art must pass examinations in German and one other language pertinent to their field of study. One examination must be passed during the first year of study, the other not later than the beginning of the third term. Students of non-Western art must qualify in two languages selected by agreement with the adviser and the DGS. They have an extra year in which to do so. During the first two years of study, students normally take thirteen term courses. Normally by January 20 of the second year, students submit a qualifying paper that should demonstrate the candidate's ability successfully to complete a Ph.D. dissertation in art history. During the fall term of the third year, students are expected to take the qualifying examination. Candidates must demonstrate knowledge of their field and related areas, as well as a good grounding in method and bibliography. By the end of the second term of the third year, students are expected to have established a dissertation topic. A prospectus outlining the topic must be approved by a committee at a colloquium by the end of the third year. Students are admitted to candidacy for the Ph.D. upon completion of all pre-dissertation requirements, including the prospectus and qualifying examination. Admission to candidacy must take place by the end of the third year.

The faculty considers teaching to be an important part of the professional preparation of graduate students. Students are required to do four terms of teaching. This requirement is fulfilled in the second and third years. They receive a total of one course credit as teaching fellows when they lead a discussion section. Students may also serve as a graduate research assistant at either the Yale University Art Gallery or the Center for British Art. This can be accepted in lieu of one or two terms of teaching, but students may accept a graduate research assistant position at any time after the end of their first year. Application for these R.A. positions is competitive.

Combined Ph.D. Programs

HISTORY OF ART AND AFRICAN AMERICAN STUDIES

The Department of the History of Art offers, in conjunction with the Program in African American Studies, a combined Ph.D. in History of Art and African American Studies. Students in the combined-degree program will take three core courses in African American Studies as part of the required twelve courses and are subject to the language requirement for the Ph.D. in History of Art. The dissertation prospectus and the dissertation itself must be approved by both History of Art and African American Studies. For further details, see African American Studies.

HISTORY OF ART AND FILM STUDIES

The Department of the History of Art offers, in conjunction with Film Studies, a combined Ph.D. in the History of Art and Film Studies. Students are required to meet all departmental requirements, but many courses may count toward completing both degrees at the discretion of the directors of graduate studies in History of Art and Film Studies. For further details, see Film Studies.

HISTORY OF ART AND RENAISSANCE STUDIES

The Department of the History of Art also offers, in conjunction with the Renaissance Studies Program, a combined Ph.D. in the History of Art and Renaissance Studies. For further details, see Renaissance Studies.

The Center for the Study of American Art and Material Culture

The Center for the Study of American Art and Material Culture provides a programmatic link among the Yale faculty, museum professionals, and graduate students who maintain a scholarly interest in the study, analysis, and interpretation of American art and material culture. It brings together colleagues from a variety of disciplines—from History of Art and American Studies to Anthropology, Archaeological Studies, and Geology and Geophysics—and from some of Yale's remarkable museum collections from the Art Gallery and Peabody Museum to Beinecke Library. Center activities will focus upon one particular theme each year and will include hosting one or more visiting American Art and Material Culture Fellows to teach a course each term and interact with Yale colleagues; weekly lunch meetings in which a member makes a short presentation centered on an artifact or group of artifacts followed by lively discussion about methodology, interpretation, and context; and an annual three-day Yale–Smithsonian Seminar on Material Culture.

Master's Degrees

M.Phil. See Degree Requirements. Additionally, students in the History of Art are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) This degree is awarded after the satisfactory completion of one year of course work (six term courses) and after evidence of proficiency in one required foreign language. The student normally petitions for the degree at the time of registration in the fall of the second year.

Program materials are available upon request to the Director of Graduate Studies, Department of the History of Art, Yale University, 56 High Street, PO Box 208272, New Haven CT 06520-8272.

Courses

HSAR 500a, Critical Approaches to the History of Art Robert Nelson

This seminar for first-year students, and open only to them, offers an introductory survey of the historiography and methodology of the discipline. Students engage with a wide range of texts written by art historians, artists, critics, and theorists whose work is significant for the contemporary study of art history. M 1:30–3:20

HSAR 506a or b, The Teaching of the History of Art

By arrangement with faculty. History of Art graduate students only.

HSAR 512a or b, Directed Research

By arrangement with faculty.

HSAR 514a or b, Graduate Research Assistantship

HSAR 559b/CLSS 832b, Envisioning the “Other” in Greek Art Milette Gaifman

The notion of the “other,” which saw its great rise with the emergence of structural anthropology, has by now become a well-established concept in the social sciences and humanities. In ancient Greek culture the “other” has been ascribed to groups such as non-Greeks (e.g., Persians), non-citizens (e.g., slaves, women), the elderly, or the Greeks of the very deep past. The course explores how different social groups were portrayed in Greek art, in a variety of media (vase paintings, freestanding sculpture, reliefs) and how the distinction and tension between the “self” and the “other” were negotiated visually. Looking at the case of Greece of the Archaic and Classical periods, the seminar considers the ways in which visual culture was constitutive of social norms and ideologies. Readings combine art-historical and archaeological accounts of ancient Greek monuments and objects, primary texts (e.g., Herodotos, Pausanias), as well as theoretical discussions on the notion of the “other” and the agency of art in society. W 10:30–12:20

HSAR 570a/ARCG 749a/CLSS 846a, Becoming Hadrian: Autobiography and Art in the Second Century A.D. Diana Kleiner

Marguerite Yourcenar’s famed fictional *Memoirs of Hadrian* serves as the starting point for an exploration of Hadrian and the art he commissioned in Rome and abroad. Hadrian’s passion for life, quest after peace, romantic wanderlust, veneration of Greek culture, and

craving for love, along with his acceptance of death's inexorableness, led him to commission some of Rome's greatest monuments. The emperor's flair for leadership and talent as an amateur architect inform student projects on the sculpture, mosaics, and buildings of the age, among them the portraiture of Hadrian's lover Antinous, the Pantheon, and Hadrian's Wall in Britain. Special attention is paid to Hadrian's Villa at Tivoli, an empire unto itself where Hadrian's autobiography was fully realized. Qualified undergraduates who have taken Roman Art: Empire, Identity, and Society and/or Roman Architecture may be admitted with permission of the instructor. T 1:30–3:20

HSAR 576b/FREN 820b/CPLT 733b, The Age of the Cathedral R. Howard Bloch

A study of the culture and architectural monuments of the High Middle Ages with accompanying historical and literary works. Emphasis on Saint-Denis, Notre-Dame, Chartres. Readings include Abelard, Suger, Rutebeuf, Saint Bernard, Joinville, Thibaut de Champagne, Guibert de Nogent, William of Saint-Thierry, Aelred of Rivaux, the "Miracles de Notre Dame de Chartres," "La Queste del Saint Graal." Discussion of romanesque and gothic, the rise of communes, urban and economic renewal, intellectual life of twelfth- and thirteenth-century Paris, trades and guilds, the economics and industry of cathedral building, sculpture, and stained glass, Crusade against the Albigensians and in the Middle East, sainthood and kingship, expansion of the royal domain, the growth of the judicial state and parliament, monasticism, mysticism, relics, the ancillary architectural arts—tapestry and textiles, liturgical objects and garments, metalwork, woodwork, iron work—and the fate of such objects after the Revolution of 1789 and restoration in the nineteenth century. W 3:30–5:20

HSAR 579a, Modernism and the Middle East Kishwar Rizvi

This course studies the concepts that inform the making and reception of modern architecture in the Middle East. In the Islamic world, new fundamentalisms and shifting religious trends have created an environment in which each country must renegotiate its past and reconsider its collective future. Whether by suppressing their Islamic roots, as in the case of republican Turkey, or through reinventing them, as in the case of post-Revolution Iran, such countries must constantly transform their national image. It is through public works, such as architecture and planning, that they convey their political and religious ideology. This course examines the debates and theories of modern architectural production that have informed the discourse on Islamic architecture by situating cases of colonial and nationalist architecture in the context of their particular social and religious history. T 1:30–3:20

HSAR 583b/MDVL 556b, Empathy and Mimesis in Medieval Art Jacqueline Jung

At least since the publication of Erwin Panofsky's essay "Imago Pietatis" (1924), scholars have discerned in medieval art not only the capacity but also the intention to create emotional connections with viewers through a process of *Einfühlung*—a feeling-one's-way into a depicted scene. The issue of empathetic engagement has indeed become central to medieval art history over the last two decades, with the widespread embrace of reception theory in our discipline. Incorporating both literary texts (such as devotional treatises and saints' lives) and works of visual art in various media—from Byzantine icons to life-sized sculptures to public spectacles involving living bodies—and examining them

through the lens of both medieval and modern theories of response, this exploratory seminar invites participants to find new ways to deepen and nuance our understanding of the relation between mimetic forms and empathetic attitudes. Art historians with specializations outside the Middle Ages as well as medievalists from other fields are welcome to join. Reading knowledge of German, French, and Latin is strongly encouraged but not required. TH 1:30–3:20

HSAR 597a, Word and Image in Byzantium Robert Nelson

Word and image studies are a burgeoning field of art history and now have their own journal. This course looks generally at that literature and focuses on the Middle Ages and the Byzantine Empire to consider the nature of words combined with images. Topics of interest are *ekphrasis* or the description of a work of art, inscriptions around works of art, and especially manuscript illumination, an area of sustained interest of Anglo-American scholars and historically the most popular subject of scholarship on Byzantine art. More attention has been paid lately to the image or icon, and this work needs to be integrated with a reconsideration of the nature of written and oral discourse. W 1:30–3:20

HSAR 599b, Byzantium and Italy Robert Nelson

According to Vasari, the rude, crude art that we call Byzantine was surpassed by Cimabue and Giotto. This paradigm that persisted for centuries was challenged in the twentieth century by Byzantinists, who argued the superiority of their art, while others contended that both cultures were part of a larger medieval art of the Mediterranean. These perspectives, however, devote little attention to the uses that Italian artists and larger societies made of the foreign and ignore the impact of Italians in the Eastern Mediterranean. Topics include the creation of public space, spolia, palace architecture, aristocratic dress, kingship, and icon and the rise of panel painting in Italy. General theoretical issues at play are the power of icons, cultural identity, cultural interaction, the social status of the foreign, and European colonialism before its expansion in the sixteenth century. T 1:30–3:20

HSAR 631b, Collaboration in Italian Renaissance Art Laurence Kanter

Workshop collaborations became normative in early fourteenth-century Siena and Florence, where numerous commissions were shared between otherwise independent studios. In the fifteenth century this practice was elevated to a highly efficient standard and operated on many different models. This course investigates the changing paradigm of collaboration in this period, beginning with the work of Masaccio and Masolino in the Brancacci Chapel (1425–26) and concluding with the production of Andrea del Sarto and his satellites in the first three decades of the sixteenth century, with a special focus on the particular case of Botticelli and his workshop and on the interaction of painters with sculptors and with artists working in other media (embroidery, engraving, intarsia, etc.). M 1:30–3:20

HSAR 641a, Europe 1400 Christopher Wood

The seminar approaches a range of material and problems in late fourteenth- and early fifteenth-century Netherlandish, French, Italian, and German art. The course is museum-based as much as possible. The focal point of the seminar is the exhibition at the Metropolitan Museum of the *Belles Heures* of the Duc de Berry, and accordingly the course deals intensively with manuscript painting as well as panel painting. But research projects on

a wider range of topics are encouraged, including the emergence of the artist as author; time and the historical imagination as figured in art; humanistic and antiquarian culture ca. 1400; the impact of replication technologies; machines, automata, the moving image; the artwork in relational webs, for example votive transactions, pilgrimages, or the theater of relics; interaction between two-dimensional and three-dimensional art; art and the distinctions between sacred and profane, public and private. W 3:30–5:20

HSAR 648b, Vienna and Berlin Timothy Barringer, Christopher Wood

The seminar focuses on the life, the art, and the buildings of two cities. Berlin was a small and remote provincial capital that expanded dramatically over the course of a few decades into a nineteenth-century metropolis. Vienna, an ancient Roman settlement with a distinguished medieval and early modern history, refashioned itself as a modern imperial city in parallel with Berlin. The course studies this most dynamic phase of the two cities' histories, from the later eighteenth century into the twentieth century. The seminar culminates with an excursion to both cities. On site, students deliver oral presentations on monuments, collections, works, buildings, or neighborhoods. Topics include the development of major institutions of early modern and modern European art from the aristocratic Wunderkammer to the picture galleries and museums of the eighteenth and nineteenth centuries and on to the art academies and anti-academies of modernism (Wiener Secession, Bauhaus); the relationship of the built environment to economic, social, and political developments; public decorative schemes versus the mobile artwork; the competing claims to proprietorship of artworks; the role of art in the public life in the modern city; the figuration of modernity in painting and sculpture. More generally the course and trip provide an introduction to the monuments, collections, and urban fabric of these two cities. W 1:30–3:20

HSAR 652b, Documenting the World Kishwar Rizvi

This seminar explores the significance of the documentary survey in Europe and the Middle East. Writing the history of the world can only be undertaken from a particular ideological point of view; for example, although medieval illustrated manuscripts, such as the *Compendium of History of Rashid al-dim* (1304) and the *Travels of John Mandeville* (ca. 1371), were concerned with situating the reader within the context of religious and political authority, during the eighteenth century the attempt was made to document the world through scientific explorations of race, religion, and geography, as exemplified by the magnum opus *Ceremonies and Customs of the World Religions*, by Bernard and Picart (1727–31). This seminar studies original and facsimile copies of manuscripts at Yale libraries. T 10:30–12:20

HSAR 683b^U/WGSS 777b, Art and Feminism Carol Armstrong

This seminar considers past, present, and future relations between art-making and the history of feminist thought. Though most of what we address on both fronts is by women, the seminar is focused neither on the question of the woman artist per se (that is just one of its topics), nor on self-described feminist art practice (another of its topics). Instead, it considers different kinds of relation between art-making and feminist contributions to the history of thought about art, art history and aesthetics, gender and sexuality, subjectivity and the other, the nature and culture of the human body, concepts

of the optical and the haptic, text and image, phenomenology and film theory, and so on. It consists of two meetings each on the following topics: the problem of the woman artist and author; intersections between the history of art, art criticism, and feminist thought; feminist essentialisms; art and feminist responses to psychoanalysis; art, concepts of the gaze, and feminist film theory; feminist curatorial practice. Writers and artists to be considered include Virginia Woolf, Linda Nochlin, Lucy Lippard, Luce Irigaray, Julia Kristeva, Laura Mulvey, Sally Potter, Judy Chicago, Mary Kelly, Eva Hesse, Louise Bourgeois, Catherine de Zegher, and Connie Butler. We also address questions such as contributions by men to feminism, and where from here? It is possible that the seminar may include some collaboration with the Museum of Modern Art. Artists are welcome, as are serious undergraduates. T 1:30–3:20

HSAR 687a/CPLT 840a/FILM 840a/GMAN 652a^U/RUSS 712a, Moscow/Berlin:

Leftist Avant-Gardes and Interwar Modernism Katerina Clark, Katie Trumpener
From 1918 to the mid-1930s, Moscow and Berlin were both central gathering points for left-wing modernists. Each city developed its own modes of modernism, yet in sustained dialogue, given massive Russian emigration to Berlin after 1918, the Weimar obsession with early Soviet aesthetics (and cinema), intellectuals traveling in both directions, and the large-scale emigration of German leftists to the Soviet Union after 1933. The course ends by considering the shaping influence of Soviet intellectuals (and German emigrants returning from Moscow) on East Berlin “late modernism” of the 1940s and ’50s. Centered on literature and film, the course also considers a wide array of art forms (including painting, photography, architecture, music, and aesthetic theory). Works by modernists such as Eisenstein, Pudovkin, Vertov, Kosinzev, Trauberg, Shklovsky, El Lissitzky, Rodchenko, Malevich, Shostakovich, Tretiakov, Babel, Lukacs, Moholy-Nagy, Benjamin, Brecht, Richter, Beckmann, Schwitters, Grosz, Heartfield, Döblin, Ruttman, van der Rohe, Eisler, Busch. Texts are available in English translation; knowledge of Russian and/or German very helpful. At the first meeting, students help shape the final syllabus. W 1:30–3:20

HSAR 709a, Sound Studies John Connor

How does sound become an object for history? For philosophy? For art? In recent decades an explosion of scholarly work has made sound studies an essential part of cultural and aesthetic history. We examine crucial dimensions of the critical field: the phenomenology and structure of the soundscape (Shafer, Chion, Adorno), models of technological history (Kittler, Gitelman, Wurtzler), philosophies of sound in the arts (Henry, Kahn, Labelle), the study of “listening cultures” (Thompson, Corbin, Picker), sound and film (Altman, Lastra), and taping (Hayles, Warhol, *The Conversation*). TH 1:30–3:20

HSAR 713b/FILM 808b, The Movement of Images: Modern Cinema and the

Museum Thomas Elsaesser

Over the past two decades, the cinema has redefined itself in several ways: as a photographic medium, as popular entertainment, and as a significant public sphere. But it has also entered the museum and gallery spaces: classic directors like Renoir and Hitchcock are granted museum retrospectives, and contemporary filmmakers receive commissions for new work, or curate shows that cast a fresh light on film, its pre-histories, alternative

histories, and post-histories. This might signal that the cinema has finally come of age as *the* art form of the twentieth century, and thus has earned the right to enter into the traditional institutions of patronage, artistic heritage, and cultural patrimony. Or does this move into the museum merely confirm the “death” of cinema, and is it even predicated on the cinema’s demise, making it ready to be preserved and even embalmed? How complementary or contradictory are the “black box” and the “white cube” in such a new arrangement of space, spectator, and *dispositif*? The course looks at some of the major exhibitions and retrospectives devoted to “the moving image” from the mid-1990s to the present, and asks what theoretical shifts, perspective corrections, and critical readjustments accompany these displacements, on the side of cinema studies, as well as on the part of art history. W 1:30–3:20

HSAR 725a/AMST 735a/ARCG 725a, An Introduction to American Material Culture

Edward Cooke

The field of material culture has drawn from a number of different disciplines and scholarly traditions. Through readings and applications of methodologies ranging from structuralism and semiotics to Marxist criticism and cultural studies, this seminar provides a solid foundation for the interpretation of artifacts. W 1:30–3:20

HSAR 726a/CPLT 903a/FILM 625a^U, Media and the Logic of Repetition Francesco

Casetti

An analysis of such common practices as adaptation, remake, prequel, sequel, quotation that operate in film, above all, but in fiction, television, painting, and in every art. Examples are taken from various media, as repetition is examined from the point of view of semiotics (Barthes, Eco), cultural history (Benjamin), and philosophy (Deleuze). T 1:30–3:20

HSAR 731b/JDST 692b/REL 836b/RLST 798b, Witnessing, Remembrance,

Commemoration Margaret Olin

Memory and its expressions structure and inform many aspects of contemporary visual culture. This seminar pursues readings about memory and witnessing chosen from the works of such writers as Sigmund Freud, Albert Camus, Frances Yates, Maurice Halbwachs, Michel de Certeau, and the authors of the Book of Genesis, as well as writings about commemoration by James Young and Pierre Nora, among others. Discussions apply these readings to the study of witnessing and memorializing as artistic practices, and examine visual realizations of such works, including some monuments and memorials near campus and videos in the Fortunoff archive. Student projects center on theory or on special cases of commemoration, ritual, memorial practice, and monuments, whether built, written, aural, electronic, or played out on the streets. TH 2:30–4:20

HSAR 733a/AMST 724a, Abstract Expressionism Alexander Nemerov

The study of Abstract Expressionism is not what it once was. Previously considered a centerpiece of modernist art history, the work of Jackson Pollock, Willem de Kooning, Helen Frankenthaler, Franz Kline, and other painters has been somewhat subordinated in the last ten years to the study of more recent art. Abstract Expressionism and Post-Painterly Abstraction are now arguably two of the many mid-twentieth-century cultural forms that require almost an archaeological approach to excavate. In this seminar we review critical

approaches to this art—starting with Clement Greenberg and Harold Rosenberg and moving on to recent scholars such as T. J. Clark, Tom Crow, Serge Guilbaut, Caroline Jones, and Michael Leja—before trying to determine (or, better, develop) new models for understanding these works from ca. 1935 to 1965. T 1:30–3:20

HSAR 744a, Aztec Art and Architecture Barbara Mundy

An examination of works of art and architecture created in central Mexico in the fifteenth and sixteenth centuries by the people history has dubbed the Aztecs, but who called themselves the Culhua-Mexica. Particular attention is paid to the capital city of Tenochtitlan, one of the largest cities in the world in the sixteenth century, where ecological and political imperatives gave shape to the urban form, architecture, and programs of public monuments. The course emphasizes the use of primary sources (ethnohistorical accounts, archaeological data, and literature) in interpreting works of Aztec art as well as the methodological challenges that writing Aztec art history poses to the discipline. M 3:30–5:20

HSAR 778b^U/AFAM 728b^U/AFST 778b^U, From West Africa to the Black Americas:

The Black Atlantic Visual Tradition Robert Thompson

Art, music, and dance in the history of key classical civilizations south of the Sahara—Mali, Asante, Dahomey, Yoruba, Ejagham, Kongon—and their impact on the rise of New World art and music. TTH 11:35–12:50

HSAR 779a^U/AFAM 729a^U, New York Mambo: Microcosm of Black Creativity

Robert Thompson

Art, music, and dance in the history of key classical civilizations of the world of New York mambo and salsa. Emphasis on Palmieri, Cortijo, Roena, Harlow, and Colon. Examination of parallel traditions, such as New York Haitian art, Dominican meringue, reggae and rastas of Jamaican Brooklyn, and the New York school of Brazilian Capoeira. TTH 11:35–12:50

HSAR 781a/AFAM 739a/AFST 781a, Problem and Theory in Afro-Atlantic

Architecture I: Africa Robert Thompson

The seminar addresses a new frontier—rebuilding the inner cities. This refers to Latino and mainland black cities within the cities of America. Accordingly, the course focuses on major roots of Latino and black traditional architecture. Topics include the architecture of Djenné, Berber art and architecture, Mauritanian sites, the monumental stone architecture of Zimbabwe, the sacred architecture of Ethiopia, and Muslim-influenced architecture from Rabat to Zanzibar. Then comes a case-by-case examination of some of the sites of African influence on the architecture of the Americas—the Puerto Rican *casita*; the southern verandah; the round-houses of New York, Virginia, North Carolina, Mexico, Panama, and Columbia; Ganvie, the Venice of West Africa, and its mirror image among the tidal stilt architectures of blacks of the Choco area in Pacific Columbia. TH 3:30–5:20

HSAR 781b/AFAM 739b/AFST 781b, Problem and Theory in Afro-Atlantic

Architecture II: The Black Americas Robert Thompson

A continuation of HSAR 781a. TH 3:30–5:20

HSAR 794b, Chinese Painting under the Mongols, 1260–1368 David Sensabaugh

The period corresponding to Mongol rule in China has been interpreted as a major turning point in the history of Chinese painting. Painters are seen as having turned from an objective tradition to a subjective one. It has been described as a revolution in painting. In this seminar we will explore this understanding of Yuan dynasty painting through an examination of major painters and attributions, raising issues of what constitutes Yuan painting. Was the Yuan period truly a major turning point in the history of painting in China? TH 3:30–5:20

HSAR 795a, Architecture and Ritual in Southern Asia Tamara Sears

This seminar explores various cross-cultural and interdisciplinary approaches for understanding both how ritual engages the built environment, and how sacred spaces actively shape devotional and haptic experience. Among the issues we consider are the relationships between visibility and spatiality, oral performance and architectural imagery, and the interface between past and present histories. Although primarily focused on the Indian subcontinent, the seminar is methodologically and theoretically driven. It incorporates weekly readings drawn both from other world areas (i.e., East Asia, the Americas, Europe, and Africa) and from other academic disciplines (i.e., performance studies, religious studies, anthropology, and social archaeology) in order to assess the utility of different approaches to sacred architecture. Students are encouraged to incorporate methods and frameworks developed in the seminar into a final research paper on a topic of their choice. TH 1:30–3:20

HSAR 808a, The Phoenix Hall of Byodoin Mimi Yiengpruksawan

A graduate-level seminar that critically examines the Amida Hall, or Phoenix Hall, built in 1053 on the grounds of the villa of Fujiwara Yorimichi. The building is one of the most celebrated cultural productions of Japan, and much has been written about it. And yet the circumstances of its design, and the anomalous nature of its format and iconography, raise many important questions about its construction and reception. I have published extensively (and occasionally controversially) about the Phoenix Hall; there is also a massive amount of material on the building in English, Japanese, and Chinese secondary sources. W 3:30–5:20

HISTORY OF SCIENCE AND MEDICINE

The Graduate Program in the History of Science and Medicine is a semi-autonomous graduate track within the Department of History. The program's students are awarded degrees in History, with a concentration in the History of Science and Medicine.

207 Hall of Graduate Studies, 432.1365

www.info.med.yale.edu/hshm/

M.A., M.Phil., Ph.D.

Chair

Frank Snowden

Director of Graduate Studies

Daniel Kevles

Faculty Paola Bertucci (*History*), Mariola Espinosa (*History of Medicine*), Daniel Kevles (*History*), David Musto (*Child Study Center*), Naomi Rogers (*History of Medicine; Women's, Gender & Sexuality Studies*), Frank Snowden (*History*), Bruno Strasser (*History of Medicine*), William Summers (*Molecular Biophysics & Biochemistry*), Frank Turner (*History*), John Harley Warner (*History of Medicine; History*)

Affiliated Faculty Toby Appel (*Librarian for Medical History*), Ivano Dal Prete (*History*), Robert Gordon (*Geology & Geophysics; Applied Mechanics*), Veronika Grimm (*Classics*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Ann Hanson (*Classics*), Bettyann Kevles (*History*), Jennifer Klein (*History*), Michael McBride (*Chemistry*), Joanne Meyerowitz (*History*), Jill North (*Philosophy*), Sherwin Nuland (*Surgery*), Franklyn Prochaska (*History*), Kevin Repp (*Curator, Modern European Books & Manuscripts, Beinecke Library*), Cynthia Russett (*History*), Gordon Shepherd (*Neuroscience*), Rebecca Tannenbaum (*History*)

Fields of Study

All subjects and periods in the history of science and history of medicine, especially the modern era. Special fields represented include American science and medicine; disease, therapeutics, psychiatry, drug abuse, and public health; physics; science and national security; science and law, science and religion, life sciences, human genetics, eugenics, molecular biology, biotechnology, microbiology, intellectual property, gender, race, and science/medicine; bioethics and medical research.

Special Admissions Requirements

Applicants should have a strong undergraduate background in history and in a science relevant to the direction of their graduate interests. These requirements will be applied with flexibility, and outstanding performance in any field pertinent to the program will be taken into consideration.

Special Requirements for the Ph.D. Degree

Either French and German or two languages relevant to the student's research interests and approved by the director of graduate studies of the program. Students may fulfill the requirement either by passing an approved language course for credit or by passing a language test administered by the program faculty.

Students will ordinarily take twelve term courses during the first two years. All students will normally take the two-term core seminar sequence HSHM 701a/702b or equivalents, HSHM 710b, four additional graduate seminars in history of science or medicine, and at least one graduate course in a field of history outside of science or medicine. The remaining courses can be taken in history of medicine or science, history, science, or any other field of demonstrated special relevance to the student's scholarly objectives. Two of the twelve courses must be graduate research seminars in the History of Science and Medicine.

During the first two years of study, students must achieve Honors in at least two courses in the first year and Honors in at least four courses by the end of the second year, with a High Pass average overall. If a student does not meet this standard by the end of the first or second year, the relevant members of the department will consult and promptly advise the student whether the student will be allowed to register for the fall of the following academic year.

Students who enter having previously completed graduate work may obtain some credit toward the completion of the total course requirement, the amount being contingent on the extent and nature of the previous work and its fit with their intended course of study at Yale.

All students are expected, prior to entering on their dissertation work, to develop a broad general knowledge of the discipline. This knowledge may be acquired through a combination of course work taken at Yale or elsewhere, regular participation in the Program colloquia and workshops, and preparation for the qualifying oral examination.

Students will normally spend the summer following their second year preparing for the oral qualifying examination, which will be taken in the third year, preferably during the first half of it.

The qualifying examination will cover four areas of chosen concentration:

- 1 & 2. two fields in the history of science and/or history of medicine;
3. a field in an area of history outside of medicine and/or science;
4. a field of special interest, the content and boundaries to be established with the adviser for the field. The student may elect to do a second field in history outside of history of science or medicine; or a field in one of the sciences; or a field in a subject such as bioethics, health policy, public health, medical anthropology, medical sociology, science and law, science and national security, science and religion, science and culture, biotechnology, gender, science and medicine; race, science and medicine, or cultural studies.

During their first year, all students will be advised by the director of graduate studies. Students are encouraged to discuss their interests and program of study with other members of the faculty. At the beginning of the second year, each student is to obtain an adviser who will provide guidance in selecting courses and preparing for the qualifying examination. The adviser may also offer help with the development of ideas for the

dissertation, but students are free to choose someone else as the dissertation supervisor when the time comes to do so.

Students are encouraged to begin thinking about their dissertation topics during the second year. They are required to prepare a dissertation prospectus as soon as possible following the qualifying examination and to defend the prospectus orally before being admitted to full candidacy for the doctoral degree. Ordinarily the dissertation prospectus is held in the second term of the third year, with advancement to candidacy before the start of the fourth year.

Teaching is an important part of the professional preparation of graduate students in History of Science and Medicine. Students will teach, usually in the third and fourth years of study. Students are also encouraged to participate in the programs to develop teaching skills offered by the Graduate School.

In the fourth or fifth year, and preferably no later than the fall term of the fifth year, students are required to submit a chapter of the dissertation (not necessarily the first chapter) to the dissertation committee. This chapter will then be discussed with the student by members of the committee, preferably in a colloquium, to give the student additional advice and counsel on the progress of the dissertation. This conference is designed to be an extension of the conversation begun in the prospectus colloquium and is not intended as a defense; its aim is to give students early feedback on the research, argument, and style of the first writing accomplished on the dissertation.

M.D./Ph.D. and J.D./Ph.D. Joint-Degree Programs

Students may pursue a doctorate in History of Science and Medicine jointly with a degree in Medicine or Law. Standard graduate financial support is provided for the doctoral phase of work toward such a joint degree. Candidates for the joint degree in Law must apply for admission to both the Law School and the Graduate School. Information about the joint degree program with Medicine can be obtained from the Web site of the Yale Medical Scientist Training Program Office in the School of Medicine (<http://info.med.yale.edu/mdphd/phd/index.html>) and from the Web site of the History of Medicine and Science (www.med.yale.edu/histmed).

Master's Degrees

M.Phil. and M.A. (en route to the Ph.D.) See Degree Requirements.

Master's Degree Program The terminal M.A. program is designed particularly for those who plan to combine teaching or scholarship in these fields with a professional career in medicine or science. Students who enroll in the terminal master's degree program leading to the M.A. are expected to complete six term courses during two terms of study, to fulfill one foreign language requirement, and to submit an acceptable master's paper. Course work must include the graduate seminar HSHM 701a/702b and one additional graduate seminar in history of science or medicine. The remaining courses are to be chosen in consultation with the director of graduate studies.

For more information about the History of Science and Medicine program and admission to the Graduate School, see www.info.med.yale.edu/hshm/ and www.yale.edu/graduateschool/admissions/; or write to Barbara McKay (barbara.mckay@yale.edu).

Courses

[HSHM 631b^U, *The Cultures of Western Medicine: A Historical Introduction*]

HSHM 634a^U/AMST 879a^U/HIST 914a^U, *Media and Medicine in Modern America*

John Harley Warner, Gretchen Berland

An exploration of the relationships among medicine, health, and the media in the United States from 1870 through the present. Focus on newspapers, magazines, professional journals, advertising, exhibitions, radio, film, television, and the Internet; and on interactions among researchers, health professions, medical and public health institutions, journalists, advocacy organizations, the state, industry, and the public. Topics include 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. TTH 10:30–11:20

HSHM 635b^U/HIST 945b^U, *Science, Arms, and the State* Daniel Kevles

A history of chemical, nuclear, and biological weapons in the twentieth century that focuses on the integration in the United States of national security policy making, scientific research, and military innovation, including its consequences for the scientific community, the civilian economy, public attitudes toward weapons of mass destruction, and political movements to control them. T 7–8:50

HSHM 639a^U/HIST 913a^U, *American Medicine and the Cold War* Naomi Rogers

Examination of the social, cultural, and political history of American medicine, focusing on the period 1945–1960. Topics include the defeat of national health insurance; racism in health care, including “separate but equal” hospital policy; patient activism especially among mental health and leprosy inmates; the role of gender in defining medical professionalism and family health; rise of atomic medicine; McCarthyism in medicine; and the polio vaccine trials and the making of science journalism. M 1:30–3:20

[HSHM 640a^U, *Molecules, Life, and Disease in the Twentieth Century*]

HSHM 647b^U, *Medicine and Public Health in Latin America, 1820–2000*

Mariola Espinosa

Survey 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 in the countries of the region. Themes include medicine’s role in the production and reproduction of race and ethnicity, the treatment of indigenous medical traditions, the sources and consequences of international disease-control efforts, and persisting inequalities in health and health care. TTH 11:35–12:25

HSHM 648a^U/HIST 910a^U, *Health and Medicine in Modern Britain, 1850–1990*

Nandini Bhattacharya

This lecture course surveys the development of modern medical institutions and practice in the context of economic, political, and social change in modern Britain. It examines the impact of industrialization, urbanization, and demography effects on the practice and institutions of sanitation and preventive medicine; changing relationships between doctors and patients and between individuals and medical institutions such as hospitals

and asylums; and the emergence of scientific medicine, bacteriology, and parasitology. Topics include the relationship between late Victorian science and eugenic theories of degeneration; the impact of the two World Wars on British medicine and surgery; and the establishment of the National Health Service in postwar Britain. MW 11:35–12:25

HSHM 649b^U/HIST 911b^U, State Medicine in Colonial India, 1850–1947

Nandini Bhattacharya

This lecture course examines the infrastructure of public health and western medical institutions in colonial India, and focuses on Indian responses to colonial medical policies; the ideological and political influences in health policy; the institutionalization of western medicine and sanitary ideals; and the implementation and responses to western ideals of public health in a colonial society. Topics include colonial governance and the question of health; the institutionalization of the Indian Medical Service; public health training in medical colleges; the emergence of tropical medicine; epidemic control of plague and cholera; medicine and religion; and Gandhi and the critique of western civilization. TTH 10:30–11:20

HSHM 650a^U/NELC 871a^U, Ancient Egyptian Medicine Hans-Werner Fischer-Elfert

Development of medical thought, disease theory, and surgical technique in ancient Egypt from early pharaonic times until the Graeco-Roman periods. Close reading of texts in translation and secondary literature. M 3:30–5:30

HSHM 651b^U/HIST 909b^U, Race, Disease, and Medical Geography in the British

Empire Nandini Bhattacharya

This seminar examines the histories of colonization, settlement, race, and habitation in the British Empire from the eighteenth to the twentieth century. We study discourses of climate and medical geography in the eighteenth century; race and miscegenation in the British Empire in the nineteenth century; British debates concerning acclimatization and settlement in the tropical colonies; European concerns about racial degeneration; and ecologies of tropical diseases. T 3:30–5:20

HSHM 652a^U/HIST 908a^U, Medicine and Colonialism in Modern Asia

Nandini Bhattacharya

This seminar explores the history of modern medicine in colonial Asia, including South Asia (India, Sri Lanka, Bangladesh, Pakistan) and southeast and east Asia (Malay Straits, Philippines, Sumatra, Hong Kong). It examines western medical institutions and practices such as colonial medical services; hospitals; town planning and urbanization; the theories and construction of diseases of the tropics such as tropical neurasthenia; colonial discourse on race and disease; and the implementation of international health programs in tropical countries in the twentieth century. T 1:30–3:20

[HSHM 670b^U, Magic Bullets and Wonder Pills]

HSHM 676a/HIST 938a/LAW 20441, The Engineering and Ownership of Life

Daniel Kevles

This seminar explores the history of intellectual innovation and intellectual property protection in living matter. Focusing on the United States in world context, it examines arrangements outside the patent system as well as within it. Topics include agriculture,

medicine, biotechnology, and law. May be taken as a reading or research course.
W 3:30–5:20

HSHM 677b^U/AMST 882b^U/HIST 939b^U, Genetics, Reproduction, and Society

Daniel Kevles

A history of modern biology, especially evolution, genetics, and molecular biology, within its social, economic, legal, and cultural context. Topics include eugenics and sterilization, the Scopes trial, contraception and abortion, new reproductive technologies, medical genetics, the Human Genome Project, and human cloning. MW 11:35–12:25

[HSHM 680b^U, History of Chinese Science]

HSHM 701a/HIST 930a, Problems in the History of Medicine John Harley Warner

An examination of the variety of approaches to the social and cultural history of medicine. Readings are drawn from recent literature in the field, sampling writings on health care, illness experiences, public health, and medical cultures in Europe, the Americas, Africa, and Asia from antiquity to the twentieth century. Topics include the role of gender, class, ethnicity, race, religion, and region in the experience of health care and sickness; the intersection of lay and professional understandings of the body; and the role of the marketplace in shaping professional identities and patient expectations. T 1:30–3:20

HSHM 702b/HIST 931b, Problems in the History of Science Paola Bertucci

Study of secondary literature, recent and older, in the history of the physical and life sciences from the Renaissance to the early twentieth century. Students acquire familiarity with the development of science in general and of its major branches, including its content, instruments and methods, and social-institutional settings, and an acquaintance with various approaches that historians have followed in interpreting these events. W 2:30–4:20

[HSHM 706a, Collecting Nature]

HSHM 710a/HIST 921a, Methods for the Social Studies of Science, Technology, and Medicine Paola Bertucci

Exploration of the methods and debates in the social studies of science, technology, and medicine. This course covers the history of the field and its current intellectual, social, and political positioning. It emphasizes the debates on constructivism and relativism, and provides critical tools to address the relationships among science, technology, medicine, and society. W 9:25–11:15

[HSHM 715a, Science and Travel: Collections, Explorations, and Networks]

HSHM 730a, Disease and Medicine in the Caribbean, 1492–2000

Mariola Espinosa

Readings on the interactions of medicine and disease with the social, economic, cultural, political, and military histories of the Caribbean region from 1492 to the present. Topics include the Columbian exchange and demographic collapse; the connections between race, slavery, and disease; the role of disease in the loss and gain of empire; the influence of U.S. public health policies; and the Cuban health care system since the Revolution. TH 1:30–3:20

[HSHM 736b, Health Politics, Body Politics]

[HSHM 740b, The Cultures of American Medicine]

HSHM 741a/HIST 915a, Science and Religion: A Historical Perspective

Ivano Dal Prete

This course provides a historical perspective on the relationship between science and religion. It analyzes their complex intertwining from antiquity to modern Europe and America, with particular emphasis on Latin and Islamic middle ages, Renaissance astrology and cosmology, chronology and the geological sciences, embryology and evolutionism. W 1:30–3:20

HSHM 742b/HIST 917b, Life Sciences in Early Modern Europe Ivano Dal Prete

This course explores the multifaceted world of medical and biological research between the Renaissance and the end of the eighteenth century. Emphasis is placed on the role of medical knowledge in the scientific revolution, the development of microscopy and instrument-making, and social and cultural issues raised by debates on animal and human generation. TH 1:30–3:20

HSHM 914a or b, Research Tutorial I

By arrangement with faculty.

HSHM 915a or b, Research Tutorial II

By arrangement with faculty.

HSHM 919b/HIST 940b/WGSS 732b, Research in Twentieth-Century U.S. Health, Medicine, and the Body Naomi Rogers

Research seminar in twentieth-century U.S. health, medicine, and the body, with primary focus on each student completing her/his own major research paper. Projects chosen from post-Civil War period, with emphasis on the twentieth century. Class sessions also explore research techniques, writing styles, and the interrogation of sources. T 9:25–11:15

HSHM 920a or b, Independent Reading

By arrangement with faculty.

HSHM 930a or b, Independent Research

By arrangement with faculty.

IMMUNOBIOLOGY

The Anlyan Center (TAC) S555, 785.3857

<http://info.med.yale.edu/immuno/>

Ph.D. (M.S., M.Phil. en route)

Chair

Richard Flavell

Director of Graduate Studies

Alfred Bothwell (TAC S641B, 785.4020, alfred.bothwell@yale.edu)

Director of Graduate Admissions

Susan Kaech (TAC 641B, 737-2423, susan.kaech@yale.edu,

Contact Barbara Giamattei with questions.

Student Services Officer

Barbara Giamattei (TAC S555, 785.3857, barbara.giamattei@yale.edu)

Professors Jeffrey Bender (*Internal Medicine*), Alfred Bothwell, Joseph Craft (*Internal Medicine*), Peter Cresswell, Jack Elias (*Internal Medicine*), Richard Flavell, Kevan Herald, Paula Kavathas (*Laboratory Medicine*), Ruslan Medzhitov, Eric Meffre, Jordan Pober, Nancy Ruddle (*Epidemiology & Public Health*), David Schatz, Mark Shlomchik (*Laboratory Medicine*), Robert Tigelaar (*Dermatology*)

Associate Professors Akiko Iwasaki, Susan Kaech, David Rothstein (*Internal Medicine*), Warren Shlomchik (*Internal Medicine*), Bing Su

Assistant Professors Tian Chi, Carla Rothlin

Fields of Study

The Immunobiology Graduate Program is designed to prepare students for independent careers in research and teaching in immunology or related disciplines. The educational program emphasizes interdisciplinary training and collaborative and interactive research, an approach based on the idea that solving difficult problems requires the integration of individuals with common goals but differing expertise. Graduate students are diverse in their interests and ethnic backgrounds, and more than 50 percent are women.

Research Areas

Research focuses on the molecular, cellular, and genetic underpinnings of immune system function and development, on host-pathogen interactions, and on a variety of autoimmune disorders. These research interests break down into six major themes, spanning almost all aspects of the immune system and its role in disease prevention.

Lymphocyte development A central focus of research is to understand the molecular events underlying the development of B and T lymphocytes. Areas of major interest include the receptors and signals that control lymphocyte lineage commitment, cell maturation, cell proliferation, and cell death; the establishment of the proper environments for lymphocyte development; mechanisms that regulate the state of chromatin during

lymphocyte development; and the mechanisms by which antibody and T cell receptor genes are assembled and diversified.

Mounting an immune response An effective immune response requires the coordinated action of numerous cell types. A critical first step is the activation of cells of the innate immune system, including monocytes, macrophages, dendritic cells, and neutrophils; and the receptors and signaling molecules that control this process are under intensive study. The mechanism by which cells take up, process, and present antigen is a major interest, as is the recognition of this antigen by T cell receptors on T lymphocytes. Cytoplasmic signal transduction molecules, nuclear transcription factors, and mechanisms controlling gene expression are all under study.

Regulating the immune response The immune response is tightly regulated through the interaction of cell surface receptors with secreted cytokines and with one another, and the mechanisms by which these interactions exert their regulatory influences are studied in several laboratories. Another major interest is in learning how specialized cells or anatomic locations, such as vascular endothelial cells or the epidermis, regulate and direct the immune response.

Consequences of an immune response Apart from the obvious consequence of the elimination of an invading organism, an appropriate immune response results in immunological memory and large numbers of activated lymphocytes, which must be eliminated. The mechanisms controlling immunological memory, tolerance, and apoptosis, as well as those leading to autoimmunity, are a major interest of many faculty. Diabetes, multiple sclerosis, lupus, and rheumatoid arthritis are just some of the autoimmune diseases under study. Much of this work takes place in the context of the new Section of Human and Translational Immunology.

Infectious disease and the host-pathogen interaction A major interest is the study of infectious organisms – bacterial, viral, and parasitic – and the immune response to them. A great deal of effort is directed toward understanding the strategies used by infectious agents to avoid the immune system. HIV, HBV (hepatitis B virus), herpes simplex virus, parvoviruses, *Candida albicans*, *Borrelia burgdorferi* (the causative agent of Lyme disease), *Leishmania*, *Streptococcus pneumoniae*, and *Legionella pneumophila* are all under study.

Structural analysis of immune system receptors and effectors There is a growing interest in using structural approaches to understand the function of key molecules of the immune response. For example, a major effort is devoted toward understanding how the Toll-like receptors, despite their similarity in extracellular-ligand recognition regions, are able to specifically recognize such a wide variety of pathogen-associated molecular patterns (PAMPS). Another effort is aimed at understanding the mechanism of APOBEC enzymes in controlling viruses such as HIV.

Facilities

More than thirty laboratories are actively involved in research in immunology. Many share immediately adjoining or nearby laboratory space on the top three floors of the Anlyan Center (TAC), and four faculty are funded by the Howard Hughes Medical Institute. The Department of Immunobiology provides one of the largest, highest-ranked

integrated training programs in immunology in the country, led by a faculty with a reputation for excellence in research. The Department of Immunobiology maintains a wide variety of major equipment, and Dr. Richard Flavell, chair of the department, oversees a very active transgenic mouse/ES cell/knockout facility to which members of the department have access.

Program Entry

Most students enter the Immunobiology graduate program through the Immunology track of the Program in Biological and Biomedical Sciences (BBS). Other types of students enter from the M.D./Ph.D. program (see below), the MRSP (see below), or another BBS track, with approval of the Immunobiology DGS and the faculty adviser.

The faculty and students of the BBS program are organized into interest-based tracks. Immunobiology, being one of eight tracks, encourages individualized attention to maximize scientific interactions. There is complete freedom to work with any of the 260 faculty members affiliated within any of the tracks and to take courses offered by any of the BBS departments or programs. Students are encouraged to supplement core courses in molecular and cellular immunology with additional courses selected from the wide range available in cell biology, molecular biology, developmental biology, biochemistry, genetics, pharmacology, molecular medicine, neurobiology, and bioinformatics. Research seminars and informal interactions with other graduate students, postdoctoral fellows, and faculty also form an important part of graduate education.

The section of Human Translational Immunology (HTI) is a new program administered by the Immunobiology department and located in the Amistad Building. Its mission is to accelerate the application of new developments in the field of immunology to the treatment of human diseases. HTI faculty study the immunologic aspects of a very broad range of human diseases, encompassing investigations in the fields of cancer; transplantation of solid organs and stem cells; autoimmune diseases; and neurologic disease.

The Medical Research Scholars Program (MRSP) is open to students who have already been accepted into the BBS program. A separate application is also required, and is to be submitted to the BBS. A total of eight students each year (four first-years and four second-years) will be enrolled as Medical Research Scholars. They remain in their BBS tracks or departments but participate in the additional MRSP curriculum. The program bridges barriers between traditional predoctoral and medical training by providing Yale Ph.D. students with both medically oriented course work and a mentored clinical experience. This combination of medical knowledge and face-to-face interaction with patients and their doctors provides a new perspective to Ph.D. students and enhances the rigorous training in basic science already provided.

Admission Requirements In addition to meeting general BBS requirements, applicants are expected to have a firm foundation in the biological and physical sciences. It is preferred that students have taken courses in biology, organic chemistry, biochemistry, genetics, cell biology, physics, and mathematics. Actual course requirements, however, are not fixed, and students with outstanding records in any area of the biological sciences may qualify for admission. There are no specific grade requirements for prior course work, but a strong performance in basic science courses is of great importance

for admission. In special cases, the Medical College Admission Test (MCAT) may be substituted.

Special Requirements for the Ph.D. Degree

Students are required to take seven courses for a grade in the Yale Graduate School.

Required graded courses for first- and second-year students are:

IBIO 530a, Biology of the Immune System (Students have the option of passing out of 530 by taking the final exam from the previous year.)

IBIO 531b, Advanced Immunology

Two Immunobiology seminar courses are also required for second-year students and beyond. They are listed under the following numbers: IBIO 536, IBIO 537, IBIO 538, IBIO 539. Immunobiology seminars can be audited if a student has grades in seven other science courses and has taken an IBIO seminar course for a grade. To accommodate the growth of the graduate program, we have expanded the number of Immunology seminar courses offered from one course per year to three courses every two years.

All first- and second-year BBS Immunology students must take:

IBIO 600a, Introduction to Research, *taught every fall, credit-only course*

IBIO 601b, Fundamentals of Research, *taught every other spring, credit-only course*

Additional courses are determined based on the individual needs of the student, and include courses in biochemistry, cell biology, genetics, molecular biology of prokaryotes, molecular biology of eukaryotes, animal viruses, the structure of nucleic acids and proteins, microbiology, and disease mechanisms. Students choose courses after consulting the director of graduate studies and the thesis adviser.

Honors The Graduate School uses grades of Honors, High Pass, Pass, or Fail. Students are required to earn a grade of Honors in at least two courses in the first two years, and are expected to maintain a High Pass average. There is no foreign language requirement.

Teaching Students are required to serve as TA (teaching assistant) for two terms before the end of their sixth term.

Early in their fourth term, students make a thirty-minute presentation to the section of their proposed research and initial results. Thereafter, they meet with their prospectus committee, which assigns four or five broad areas of biology and immunology that are of particular relevance to the proposed research and on which the student will be examined in the prospectus exam. During the next several months, students prepare a formal research proposal (in NIH grant format) concerning the proposed thesis research and study for the exam. The exam is oral, and covers all aspects of immunology generally, with a focus on the assigned areas mentioned above. The student is also questioned on aspects of the thesis proposal.

Requirements for admission to candidacy, which usually takes place after six terms of residence, are (1) completion of course requirements and teaching requirements; (2) completion of the prospectus examination; and (3) certification of the student's research abilities by vote of the faculty upon recommendation from the student's thesis committee.

Progress in thesis research in the third and later years is monitored carefully by the student's thesis committee (composed of the adviser and three or four other faculty). All students are required to have two meetings with their thesis committee annually, to provide an update on progress and an opportunity for the committee to provide feedback and suggestions.

M.D./Ph.D. Students Majoring in Immunobiology

Required Seven courses for a grade. Out of the seven courses the following are mandatory:

1. IBIO 530a, Biology of the Immune System (Students have the option of passing out of 530 by taking the final exam from the previous year.)
2. IBIO 531b, Advanced Immunology
3. Two Immunobiology seminar courses: IBIO 536a, 537a, 538a, 539a (Seminars can be audited if a student has grades in seven other courses and has taken one seminar course already.)

Also required *Two grades of Honors*: Yale University graduate courses taken for a grade at the School of Medicine may be counted toward the Honors fulfillment and the seven total required courses. Verification must be provided to the DGS. *One semester of teaching*: Previously taught courses in the School of Medicine may count toward this requirement. To request credit for previous teaching experience, a note from the course director describing the teaching experience (duration of the teaching experience, frequency of class meetings, number of students taught, materials covered, dates, and for whom) should be provided to the Immunobiology DGS.

M.D./Ph.D. students are not required to take IBIO 600a, Introduction to Research, but may if they wish.

IBIO 601b, Fundamentals of Research [Ethics]. A note from the DGS of the M.D./Ph.D. program must be forwarded to the Immunobiology DGS stating that the student has taken IBIO 601b, Fundamentals of Research, or its equivalent in the School of Medicine. *Include dates, titles, and faculty*. If the student has not taken 601b or the equivalent, then registration in this class is required.

Biannual committee meetings Each student is required by the Immunobiology section to have a committee meeting every six months. Departmental Research in Progress talks can count. The committee supervisor will then prepare a letter to the DGS summarizing the student's progress.

Master's Degrees

M.S. (en route to the Ph.D.) Students who complete at least one year of resident graduate study at Yale with the quality of work judged satisfactory by the Section of Immunobiology faculty may petition for the award of the M.S. degree. At the present time "satisfactory" is defined as having completed five graduate courses with an average grade of High Pass. Students must petition through the Registrar's Office of the Graduate School.

M.Phil. (en route to the Ph.D.) Following successful completion of the prospectus examination, the student will be entitled to the M.Phil. degree. Once all course work and departmental requirements have been met, the student will advance to candidacy and be A.B.D. ("all but dissertation"). At that point the student will normally focus on research and the writing of the dissertation.

The Web site at <http://info.med.yale.edu/bbs/> offers complete information on the BBS, Biological and Biomedical Sciences Program and the more than 200 participating faculty.

Courses

For a complete listing of immunology-related courses, visit <http://info.med.yale.edu/bbs/>

IBIO 530a/MCDB 530a^U, Biology of the Immune System Akiko Iwasaki

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Human diseases including allergy, autoimmunity, immunodeficiency, HIV/AIDS. MWF 9:25–10:15

IBIO 531b, Advanced Immunology Tian Chi and staff

The historical development and central paradigms of key areas in immunology. The course attempts to develop a clear understanding of how these paradigms were established experimentally. Landmark studies are discussed to determine how the conclusions were obtained and why they were important at the time they were done. Lecture and discussion format; readings of primary research papers and review articles. Prerequisite: IBIO 530a or equivalent. Enrollment limited to fifteen. MW 4–6

IBIO 538b, Advanced Immunology Seminar: B Cell Development David Schatz,

Eric Meffre, Mark Shlomchik

TH 4

IBIO 600a, Introduction to Research Alfred Bothwell and staff

Introduction to the research interests of the faculty. Required for all first-year Immunology students. Pass/Fail. TH 5

IBIO 601b, Fundamentals of Research. Alfred Bothwell and staff

Seminar discussing proper conduct of research. Required for first- and second-year Immunobiology students.

IBIO 603b/GENE 603b, Teaching in the Science Education Outreach Program

(SEOP) Paula Kavathas

TAs, along with volunteers, teach three projects in genetics to seventh-graders in two or three New Haven schools. In addition, TAs take a short course on teaching and serve as science judges. Dates and times to be determined. For more details visit www.seop.yale.edu. For teaching credit.

INTERNATIONAL AND DEVELOPMENT ECONOMICS

Economic Growth Center

www.yale.edu/ide/

27 Hillhouse, 432.3610

M.A.

Director

Michael Boozer

The Department of Economics offers a one-year program of study in International and Development Economics, leading to the Master of Arts degree. IDE students are diverse in terms of their nationalities and their career paths. Many of our students now come directly from their undergraduate school or a few years of work experience, although we do not exclude any candidate on the basis of work experience or country of origin. After completion of the program, IDE students have gone into various paths, including working in research for academic and non-academic agencies such as the World Bank, the United Nations, and the Poverty Action Lab. A few have gone on to further academic work such as law school and to Ph.D. programs in economics, environmental sciences, and political science. Many students have returned to their home countries to work for their government or for funding agencies there.

Some students entering the program are required to complete the summer program in English and Mathematics for Economists offered by Yale University. This requirement may be waived for applicants demonstrating exceptional training in economic analysis and a good command of English. The Graduate Record Examination (GRE) and the Test of English as a Foreign Language (TOEFL) examinations are also required. The TOEFL requirement is waived only for applicants who will have received a degree, prior to matriculation at Yale, from a college or university where English is the primary language of instruction.

Yale fellowship funds are not available for the IDE program, and we require certification of the necessary funding prior to enrollment.

The course program requires the completion of eight term courses, five of which make up the core elements of the IDE program and these are required; the remaining three are graduate electives. The required courses are Microeconomics; Macroeconomics; Econometrics; International Economics; and Economic Development. These required courses are designed to provide a rigorous understanding of the economic theory necessary for economic policy analysis.

An option of a second year of nondegree elective study is available to qualified students. The Development Studies Certificate offered through the MacMillan Center, for example, could be completed during this time.

A joint program option for study with the School of Forestry & Environmental Studies is also available. Application to the School of F&ES must be made simultaneously with the application to the IDE program. Admission to this joint program is determined by the participating professional school and must be obtained prior to beginning the program. Joint-degree students earn the Master of Arts degree in IDE and the Master of Environmental Studies degree.

Prospective applicants are encouraged to visit the IDE program Web site at www.yale.edu/ide. Program materials are available upon request to Louise Danishevsky, Senior Administrative Assistant, International and Development Economics Program, Yale University, PO Box 208269, New Haven CT 06520-8269; e-mail, ide@yale.edu.

INTERNATIONAL RELATIONS

The MacMillan Center
210 Luce Hall, 34 Hillhouse, 432.3418
www.yale.edu/macmillan/iac/maininternational.htm
M.A.

Chair

Julia Adams

Associate Chair and Director of Graduate Studies

Cheryl Doss (223 Luce Hall, 432.9395, cheryl.doss@yale.edu)

Professors Julia Adams (*Sociology*), Abbas Amanat (*History*), Ivo Banac (*History*), Michele Barry (*Medicine*), Seyla Benhabib (*Political Science*), Frank Bia (*Medicine*), David Blight (*History*), Paul Bracken (*Management*), Elizabeth Bradley (*Public Health*), Garry Brewer (*Forestry & Environmental Studies; School of Management*), William Burch, Jr. (*Forestry & Environmental Studies*), Paul Bushkovitch (*History*), David Cameron (*Political Science*), Amy Chua (*Law*), Deborah Davis (*Sociology*), Michael Dove (*Forestry & Environmental Studies; Anthropology*), Eduardo Engel (*Economics*), Laura Engelstein (*History*), J. Joseph Errington (*Anthropology*), Daniel Esty (*Forestry & Environmental Studies; Law*), Robert Evenson (*Emeritus, Economics*), Owen Fiss (*Law*), Paul Freedman (*History*), Ute Frevert (*History*), John Gaddis (*History*), Timothy Guinnane (*Economics*), Koichi Hamada (*Economics*), Valerie Hansen (*History*), Robert Harms (*History*), Paula Hyman (*History*), Gilbert Joseph (*History*), Donald Kagan (*History*), Stathis Kalyvas (*Political Science*), Dean Karlan (*Economics*), Stephen Kellert (*Forestry & Environmental Studies*), William Kelly (*Anthropology*), Paul Kennedy (*History*), Daniel Kevles (*History*), Benedict Kiernan (*History*), Harold Koh (*Law*), Theodore Marmor (*Management*), Enrique Mayer (*Anthropology*), Robert Mendelsohn (*Forestry & Environmental Studies*), John Merriman (*History*), William Nordhaus (*Economics*), Sharon Oster (*Management*), Thomas Pogge (*Philosophy*), Sally Promey (*ISM, American Studies, Religious Studies*), Douglas Rae (*School of Management; Political Science*), Gustav Ranis (*Emeritus, Economics*), W. Michael Reisman (*Law*), John Roemer (*Political Science*), Susan Rose-Ackerman (*Political Science; Law*), Frances McCall Rosenbluth (*Political Science*), K. Geert Rouwenhorst (*Management*), Bruce Russett (*Political Science*), Nicholas Sambanis (*Political Science*), Lamin Sanneh (*Divinity; History*), T. Paul Schultz (*Economics*), Stuart Schwartz (*History*), James Scott (*Political Science*), Martin Shubik (*Management*), Helen Siu (*Anthropology*), Stephen Skowronek (*Political Science*), Frank Snowden (*History*), Timothy Snyder (*History*), Jonathan Spence (*History*), T. N. Srinivasan (*Economics*), Peter Swenson (*Political Science*), Ivan Szelenyi (*Sociology*), Adam Tooze (*History*), Frank Turner (*History*), Christopher Udry (*Economics*), John Wargo (*Forestry & Environmental Studies*), Laura Wexler (*American Studies; Women's, Gender & Sexuality Studies*), Jay Winter (*History*)

Associate Professors Michael Auslin (*History*), Marian Chertow (*Forestry & Environmental Studies*), Thad Dunning (*Political Science*), Keller Easterling (*Architecture*), Pierre Landry (*Political Science*), Ellen Lust (*Political Science*), Michael Mahoney (*History*), Jennifer Prah Ruger (*Public Health*), Steven Stoll (*History*)

Assistant Professors Christopher Blattman (*Political Science*), Patrick Cohrs (*History*), Keith Darden (*Political Science*), Beverly Gage (*History*), Michael Gasper (*History*), Kari Hartwig (*Epidemiology & Public Health*), Susan Hyde (*Political Science*), Kaveh Khoshnood (*Epidemiology & Public Health*), Nikolay Marinov (*Political Science*), Michael McGovern (*Anthropology*), Hala Kh. Nassar (*Near Eastern Languages & Civilizations*), Mridu Rai (*History*), Vivek Sharma (*Political Science*), Hong Wang (*Epidemiology & Public Health*)

Senior Lecturer Andrea Bubula (*International Affairs*), Cheryl Doss (*International Affairs; Economics*)

Lecturers Michael Boozer (*Economics*), Pia Rebello Britto (*International Affairs; Child Study Center*), Sachin Chaturvedi (*International Affairs*), Becky Conekin (*History; International Affairs*), Seth Fein (*History*), Stuart Gottlieb (*International Affairs*), Alison Holmes (*International Affairs*), Debbie Humphries (*Epidemiology & Public Health*), Allison Kingsley (*Political Science; International Affairs*), Matthew Kocher (*Political Science*), Jean Krasno (*Political Science*), Beth Daponte Osborne (*Management*), Nancy Ruther (*Political Science*), Noah Salomon (*Middle East Studies*), David Siroky (*International Affairs*), Maximilian Terhalle (*Political Science*), Robin Theurkauf (*Political Science*)

Adjunct and Visiting Professors Mine Eder (*Visiting, Middle East Studies*), Jolyon Howorth (*Visiting, Political Science; International Affairs*), Marwan Khawaja (*Visiting, Middle East Studies*), Christian Leuprecht (*Visiting, International Affairs*), Fernando Limongi (*Visiting, Political Science; Latin American Studies*), Marcus Andre Melo (*Visiting, International Affairs*), Patricia Pessar (*Adjunct; Anthropology; American Studies*)

The International Affairs Council (IAC) was founded in 1995 to nurture degree programs, scholarship, and outreach with a strong interdisciplinary and policy-oriented international focus. The programmatic interests of the council focus on development policy, security studies, and the teaching of international issues.

The IAC administers the Master's Degree in International Relations. The fifty to sixty students in this program combine fundamental training in core disciplines of international relations with an individualized concentration that has relevance to current international issues.

Fields of Study

The two-year program is designed to combine breadth of knowledge of the basic disciplines of international relations with depth of specialization in a particular academic discipline, geographic area, specialized functional issue, and/or professional field. It is designed primarily for students seeking an M.A. degree before beginning a career in international affairs but also supports students interested in going on for a Ph.D. in economics, history, or political science. Joint degrees are offered with the School of Management, Yale Law School, the School of Forestry & Environmental Studies, and the School of Public Health.

Special Admissions Requirements

Applicants must take the GRE General Test; students whose native language is not English and who did not earn their undergraduate degree at an English-language university must take the Test of English as a Foreign Language (TOEFL) or the International English Language Testing System (IELTS). The minimum score on the TOEFL is 610 on the paper-based test, 253 on the computer-based test, or 102 on the Internet-based test. Entering students must have taken introductory courses in microeconomics and macroeconomics prior to matriculation.

Special Requirements for the Master's Degree

The M.A. in International Relations requires two years of graduate study at Yale. To complete the degree, students must take sixteen courses that fulfill the core and concentration requirements, demonstrate proficiency in a modern language, satisfy a research requirement, complete a summer internship or project, and maintain the grade average specified below.

CORE

The substantive core consists of seven graduate-level courses: two history courses (one regional and one comparative international); two in political science (one in comparative politics and one in international relations theory); two in economics (one economic analysis and one international economic analysis); and the foundations course in international relations (see course description below for INRL 700a, required in the first term). Each term, a list of courses meeting these requirements is available from the IR registrar.

CONCENTRATION

Beyond the core courses, each student must identify and demonstrate the academic integrity of a coherent set of courses as a proposed concentration for approval by the director of graduate studies (DGS). The concentrations require a minimum of eight courses in the fields selected. Some of the courses may be cross-listed in two or more departments. Students are able to develop concentrations based on a topical, regional, or disciplinary focus, or a combination of a topical and regional focus. Sample concentrations are available from the International Relations Web site.

LANGUAGE REQUIREMENT

Three years of college-level language study or its equivalent in language mastery is required to graduate. This competence must be demonstrated through successful completion of course work or by passing a proficiency examination. International students who completed secondary school or a university degree in a language other than English will be considered to have met the language requirement. Students may study language as part of their Yale program; a maximum of two of the sixteen course credits for the two-year program may be in languages. Students pursuing joint-degree programs are encouraged to fulfill all language requirements before beginning the program; they cannot count language courses toward their degree requirements.

SUMMER INTERNSHIP REQUIREMENT

All students enrolled in the IR program are required to use the summer between the first and second years of the program to further their professional or academic education. It is expected that this requirement be fulfilled by obtaining experience through employment or an internship. The requirement may also be fulfilled by completing language study, other relevant course work, or independent research on an approved topic.

Each first-year student must file a form with the director of the Office of Career and Alumni Services before June 1 stating the nature of his or her summer internship or approved alternative. Where questions exist as to whether the proposed summer activity satisfies the requirement, the director of Career and Alumni Services will consult with the DGS of the IR program.

RESEARCH REQUIREMENT

Students are required to demonstrate that they have completed a major research paper, either through their course work or an independent study project. Students must submit the paper to the DGS for final approval.

EXPECTATION OF ACADEMIC PERFORMANCE

M.A. candidates are required to achieve at least two grades of Honors, and their remaining grades must average to at least High Pass. (To have a High Pass average, any grade of Pass must be offset with an additional grade of Honors beyond the required two.) Students are expected to complete eight graduate term courses in their first year, earning at least one Honors, with a High Pass average in the remaining courses. At the end of the first year, students who do not have at least a High Pass average in eight graduate term courses will not be allowed to continue in the program.

Special Requirements for the Joint-Degree Programs

Joint-degree candidates must fulfill all of the requirements of both programs in which they are enrolled before receiving either degree. Joint-degree candidates are required to fulfill the core and concentration requirements of the IR program. An overlap of two courses is allowed between the core and concentration, with a maximum of two additional courses credited toward both degrees. Joint-degree students must take at least twelve graduate-level courses in Arts and Sciences departments or in professional schools other than the one granting the joint degree. Under no circumstances will students be allowed an IR concentration in the functional area in which they will be receiving a joint degree.

Applicants to the joint-degree programs must apply separately, by the appropriate deadline, to the Graduate School for the IR program and to the professional school involved. Decisions on admissions and fellowship support are made independently by each school. Students are encouraged to apply to both programs simultaneously. They may also apply during their first year at Yale to the second program for a joint degree. If accepted into the new program, they must receive approval for credit allocation upon registration from both degree programs.

Graduate Certificates of Concentration

For information on the Certificate of Concentration in Development Studies or the Certificate of Concentration in International Security Studies, see the section on the International Affairs Council under Non-Degree-Granting Programs, Centers, and Research Institutes in this bulletin.

For more information, visit www.yale.edu/macmillan/iac/maininternational.htm, e-mail international.relations@yale.edu, write to International Relations, Yale University, PO Box 208206, New Haven CT 06520-8206, or call 203.432.3418.

Courses

INRL 505a^U, Iran in International Relations since 1979: IR Theory and Practice

Maximilian Terhalle

Iran's international relations since 1979, with consideration of regional dynamics. Domestic politics that affect the foreign policy of the Islamic Republic. W 3:30-5:20

INRL 514b^U/ARCH 926b^U, Globalization Space: Global Infrastructure and Extrastatecraft Keller Easterling

Global infrastructures and spatial products as a medium of transnational politics. Case studies travel around the world to, for instance, a resort in the DPRK, golf courses in China, IT campuses in South Asia, high-speed rail in Saudi Arabia, cable/satellite networks in Africa, and automated ports. As materializations of capital these spaces index labor and resources while also possessing cunning political dispositions and parastate functions. MW 10:30-11:20, 1 HTBA

INRL 524b/HPA 599b/PHIL 705b/PLSC 594b, Global Health Ethics, Politics, and Economics Thomas Pogge, Jennifer Ruger

Billions lack access to basic medical care, and global health inequalities are wide and growing. Such radical disparities cast doubt on the justice of supranational institutional arrangements (such as the TRIPS Agreement) and also pose ethical challenges for the global health community, especially international and domestic health and development institutions. Seeking to illuminate the normative issues involved, this course features a series of distinguished visitors, including academics as well as a few important representatives of international organizations, politics, foundations, NGOs, and relevant industries. M 1:30-3:20

INRL 525a^U, Global Health Research: Methodological and Ethical Considerations

Kaveh Khoshnood

Recognizing the political, economic, social, and cultural factors that influence health, this course is designed to prepare graduate and advanced undergraduate students to develop their own short-term global health research proposals to be conducted in resource-constrained settings. Quantitative, qualitative, and mixed-method approaches, the ethical aspects of conducting research in resource-constrained settings, and the process of obtaining human subjects' approval are among topics discussed. While this class is designed for those with little or no prior independent research experience and those who have not previously taken a course on research methods, a course on statistics (as a prerequisite or taken concurrently) or permission of the instructor is required.

F 9:25-11:15

INRL 528b^U, Strategic Topics in Global Health Elizabeth Bradley, Leslie Curry,
Michael Skonieczny

This course defines and applies a set of core principles regarding development and implementation of grand strategy and problem solving in global health. Students understand and apply principles of grand strategy and strategic problem solving, which are taught at both a conceptual and a practical level as applied to common problems in global health. Students develop expertise in political and policy analysis as well as organizational theory and leadership skills that are central to addressing global health issues in low- and middle-income countries. W 3:30–5:30

INRL 534b^U, Development of the International Human Rights Regime
Robin Theurkauf

This seminar explores the development of the human rights regime from the first appearance of the laws of war in Grotius, through the Hague conventions of 1899 and 1907, the Nuremberg Tribunal, the Universal Declaration of Human Rights, and the Covenant on Civil and Political Rights. The course concludes with an examination of the events leading to the formation of the Yugoslav and Rwanda Tribunals and the creation of the International Criminal Court. We also consider some notable missteps such as the Kellogg-Briand Pact, the Terrorism Convention of 1937, and some of the proposals of the U.N. International Law Commission. The focus is on questions relating to the politics of human rights law, the effect of the Cold War on the human rights regime, the rise of the NGO community, and the role of the great power states. M 3:30–5:20

INRL 539^U, The Political Economy of Civil War and Terror Christopher Blattman

In this seminar we examine the economic tools and logic that can be applied to the study of conflict and terror. Topics include the prevalence of civil war in the world; the logic of government repression and terrorist attacks; the long-term consequences of war, violence, and terror. TH 9:25–11:15

INRL 540b^U, Conflict and Cooperation in the Caucasus, Balkans, and Eastern Europe
David Siroky

This course is designed to acquaint interested students with politics in the Caucasus, the Balkans, and Eastern Europe, especially but not exclusively after the Cold War, and with a substantive focus largely on questions of ethnic conflict and civil war. W 1:30–3:20

INRL 541b, Presidentialism and the Comparative Study of Legislatures
Fernando Limongi

Presidential systems are not all alike. The legislative power held by the president and congressional-standing rules—both of which differ by country— affect and define the legislative role in the political system. This course explores the differences between the U.S. system and the one most commonly adopted in Latin American countries.

INRL 549b/E&RS 652b, The European Union's Contemporary Challenges Staff

Each year, this course addresses a different set of issues facing the EU. Recent issues have included trade policy, regulation policy, building European monetary power, international trade policy and the WTO, and science, precaution, and policy making. The course is taught by the EU fellow visiting the MacMillan Center. HTBA

INRL 551b, The Politics of Institutional Choice Fernando Limongi

When creating constitutions, countries define their basic institutional design, making decisions regarding the form of government and electoral laws. The course examines three constitution-making episodes (the Portuguese, the Spanish, and the Brazilian) to understand why and how these choices were made. HTBA

INRL 555a/PLSC 685a, Theories in International Relations Nikolay Marinov

This course provides an introduction to the major concepts and theories in the field of international relations. By the end of the course, students should be familiar with some of the major debates in the field, and be comfortable using IR concepts and theories to understand and explain events in international politics. The course is a reading-intensive seminar, and the weekly meetings are structured around student-led presentations and discussions of the assigned readings for the week. The student presentations should provide a brief overview of the main arguments of the readings and raise questions for group discussion. All students should prepare to participate in the group discussion by preparing discussion notes, which are turned in at the end of each session of class. There are approximately 150–200 pages of required reading per week. M 3:30–5:20

INRL 560a/ECON 544a, Economic Analysis Cheryl Doss

Introduces IR students to more advanced concepts in economics. Course emphasizes reading and evaluating the economic content of articles on a wide range of topics, including consumer behavior, firm behavior, comparisons of welfare, labor markets, capital markets, and cost-benefit analysis. These articles represent research from both developed and developing economies. Prerequisite: Principles of Microeconomics. MW 9–10:15

INRL 565a, The Comparative Political Economy of Latin America

Marcus Andre Melo

This course applies theoretical tools of comparative political economy to investigate the functioning of political institutions, political systems and the policy-making process, and their effect on public policies and economic performance, with special focus on Latin America. A country's political institutions, together with the features of specific policy issues, are key determinants of the characteristics of public policies. The purpose of this course thus is not to analyze the details of any specific policy adopted by a particular country, but rather to explain the common characteristics that systematically permeate those policies. HTBA

INRL 575a, Trade, Innovation, and Agriculture Technology in South Asia

Sachin Chaturvedi

This course analyzes innovation and technology dynamics, focusing on the South Asian agriculture sector. Along with basic notions in innovation analysis, the course covers the historical perspective on the innovation process, its institutional linkages, and its impact on the economy. We also look at the external connections of these processes, their role in globalization, and their links with foreign direct investment and international trade flows. HTBA

INRL 582a^U, Contemporary Political Economy of Turkey and the Middle East

Mine Eder

Examination of current problems and prospects faced by Turkey and the Middle East economies. Exploration of the links between state building, economic development, and

democratization in the region. Comparative discussion of how Turkey diverges from other Middle East economies. T 1:30–3:20

INRL 585a/NELC 507a^U, Modern Arab Thought Hala Nassar

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.

TH 2:30–4:20

INRL 592a/PLSC 662a^U/MGT 586a, Strategy, Technology, and War Paul Bracken

The interrelationship of strategy, foreign policy, and technology has shaped international relations from Napoleon to the global information grid. Transformations arise 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. MW 11:35–12:50

INRL 594a, Environmental Security, Demographic Change, and Non-Conventional Threats Christian Leuprecht

Nonconventional threats to national and international security concern the environment, demographic change and migration, resource scarcity, urbanization, food, energy, health, and disease. This seminar is designed to provide students with a conceptual, theoretical, and empirical grounding in debates and matters concerning security in this nonconventional context. Empirical observations are embedded in theoretical discussions about the role of the state, forms of state intervention, social and political theory, as well as an understanding of the relationship between complex social systems. TH 9:25–11:15

INRL 595a/PLSC 736a, Formal Models of Comparative Politics Thad Dunning

We discuss and dissect recent models of the political regime type, political transitions, the separation of powers in democracies, and other topics. The goal is to become better consumers and critics of models, as well as to learn technique through discussion of leading exemplars. A previous course in game theory is recommended. HTBA

INRL 610b, Topics in Modern Middle East Studies Noah Salomon

This course is intended for students who plan to obtain the Graduate Certificate of Concentration in Modern Middle East Studies. A major requirement of the course is attendance at weekly brown bag seminars hosted by the Council on Middle East Studies, which include speakers from a variety of academic disciplines and other backgrounds addressing political, economic, social, cultural, and historical issues across the Middle East/North Africa region. Students attend the presentations and separate discussion sections, and fulfill writing assignments. W 12–1:20, 1 HTBA

INRL 622a/HIST 718a, Social Movements in Comparative Perspective

Becky Conekin

In this seminar we explore post-WWII social movements and their legacies across Western Europe and the U.S. Examining both the actuality and symbolic character of these movements in contemporary history, we analyze the political, social, and cultural meanings of protest and its impact on class, generational, gender, and racial relations in Western Europe and North America. In addition, if students have specific interests in Eastern

European and/or Latin American countries, they may bring these into the discussion and write on them in a comparative perspective in their final paper. We discuss different national histories and discourses about identity, while exploring the varied geographies of the Cold War. We then move to a more thematic approach focusing on, for example, civil rights, antiwar and student protests, and countercultural politics. We conclude with a brief look at the social movements that developed out of the 1960s. T 9:25–11:15

INRL 635a^U, UK-U.S. Relations Post Cold War Alison Holmes

The United Kingdom is often described as the “closest ally” of the United States. This graduate-level seminar explores the historical roots and modern interpretations of this statement through student discussion/presentations and course assignments. The goal is to trace the roots of what are often identified as “common values” while contrasting them with contemporary transatlantic issues. The material ranges from international relations theory and comparative government to practical discussions of politics, diplomacy, and business. It also attempts to examine the British assertion of the UK as a “bridge” or “pivot point” between the U.S. and the rest of Europe. TH 1:30–3:20

INRL 640a, Democracy Promotion: Theory and Practice Susan Hyde

Why has democracy promotion become a major component of foreign policy? Do attempts to promote democracy by states and international organizations have the intended effects? Most developed democracies and international organizations such as the European Union, the United Nations, and the Organization of American States now actively promote the development of democratic political institutions in other states. The course examines the methods used to promote democracy, justifications for the use of democracy promotion as foreign policy, the variety of actors who engage in democracy promotion, and the relationship between domestic and international actors in democratization, and it concludes with practical evaluation of the effectiveness of various efforts to promote democracy. Students write a proposal to encourage or strengthen democracy in a specific country, taking into account the state of the art in democracy promotion as well as the major challenges presented by the social, economic, and historical characteristics of the country. T 3:30–5:20

INRL 642b/HIST 647b, Reconciling Capitalism and Democracy: America and Europe, 1890–1950 Adam Tooze

How can the imperatives of emerging democratic politics be reconciled with the dynamics of modern global capitalism? This was a question with which societies on both sides of the Atlantic wrestled between 1890 and 1950. The restructuring of industrial production, the operation of the global financial system, unprecedented migration and international trade created tensions that had to be resolved within political systems that were becoming open as never before to mass political pressure. In Europe and the United States, progressive liberals, social democrats, and modern authoritarian movements of various types offered competing visions of capitalist modernity. This course traces this struggle to devise a new economic and political order at both a domestic and an international level, from the battles over the gold standard, free trade, and mass migration at the turn of the century to the successful capitalist stabilization of the 1950s. T 3:30–5:20

INRL 652a/HIST 980a, Genocide: History and Theory Benedict Kiernan

Comparative research and analysis of genocidal occurrences from ancient times to the present; theories and case studies; an interregional, interdisciplinary perspective. Readings and discussion, guest speakers, research paper. TH 1:30–3:20

INRL 654b, Violence: State and Society Matthew Kocher

This course examines violence that occurs mainly within the territory of sovereign states. We focus on violence as an object of study in its own right. For the most part, we look at violence as a dependent variable, though in some instances it functioned as an independent variable, a mechanism, or an equilibrium. We ask why violence happens, how it “works” or fails to work, why it takes place in some locations and not others, why violence take specific forms (e.g., insurgency, terrorism, mass killing), what explains its magnitude (the number of victims), and what explains targeting (the type or identity of victims). Special attention to connecting theoretical literatures in the social sciences with policy-relevant debates in government and nongovernmental service. W 1:30–3:20

INRL 656a/HIST 658a, Germany and the Crisis of Interwar Europe Adam Tooze

This course discusses the response of German intellectuals to the “crisis of interwar Europe.” It pivots around the two central figures of Martin Heidegger and Carl Schmitt, their influences, students, and associates. In relation to these two figures we read other leading theorists writing in, or about, the period including Weber, Lukacs, Spengler, Marcuse, Franz Neumann, Adorno, Horkheimer, and Arendt. The course samples both original texts and sections of the vast gallery of historical writing about these figures. German is not required. W 1:30–3:20

INRL 659b, International Economics Andrea Bubula

This international economics course is designed for students in the M.A. program in International Relations. It covers trade and international economics, with an emphasis on policy issues. Students are expected to have a basic understanding of micro- and macroeconomics before enrolling in this course. HTBA

INRL 680a^U/F&ES 80075a/MGT 697a/ PLSC 727a^U, Capitalism: Success, Crisis, and Reform Douglas Rae

Examination of capitalism as it functions in practice, with extensive use of business cases. The role of capitalism in generating wealth and innovation unprecedented in history. Negative consequences of capitalist development such as radical inequality, disruption of the natural environment, and intermittent social crises. MW 1:30–2:20, 1 HTBA

INRL 700a, The Foundations and Evolution of the International System

Jolyon Howorth

Study of core concepts in the international system including theories and traditions; systemic structures; actors in international politics; anarchy, conflict, and cooperation; deterrence, coercion, and war; and emphasis on case studies viewed from the perspective of the policy maker. The course focuses on alternative approaches to each topic and case study and aims to enhance skills in research, writing, and presentation. For first-year International Relations M.A. candidates only. T 1:30–3:20

INRL 707b, Emerging Markets Allison Kingsley

Integrating finance theories with those from law, economics, and political science, this course critically assesses emerging markets with specific attention paid to market structures, sovereign risks, and financial crises. Students gain knowledge of major theoretical and empirical issues in emerging markets and become conversant in risk analytics, market statistics, and evolving geopolitics. TH 9:25–11:15

INRL 713b, Critical Issues in Development Policy Pia Rebello Britto

The focus of the course is on national policy development. Students are exposed to the relationship among international agencies, international development frameworks, human rights instruments, and national governments in formulating national social and public policies with respect to economic and social development. The course uses early childhood, an epoch of human development, as an example to study national policy making. A policy laboratory methodology is employed to demonstrate application of policy development knowledge learned in class to a real-world setting. Selected students are offered the opportunity to travel, during spring break, to a developing country to observe and participate in policy development meetings with high-level policy makers and international development partners. TH 3:30–5:20

INRL 720a, Central Issues in American Foreign Policy Stuart Gottlieb

Examination of 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. Special focus on the most current challenges in American foreign policy, 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. Attendance at INTS 376a lectures required. W 3:30–5:20

INRL 725b, Terrorism and Counterterrorism Stuart Gottlieb

Examination of the origins and evolution of modern terrorism, and strategies employed to confront and combat terrorism. Assessment of a wide variety of terrorist organizations, and the multidimensional causes of terrorist violence past and present. Analysis of the strengths and weaknesses of various counterterrorism strategies, from the point of view of efficacy as well as ethics, with a particular focus on ways in which the threat of global terrorism might impact the healthy functioning of democratic states. Attendance at INTS 373b lectures required. W 3:30–5:20

INRL 730a^U, The United Nations and the Maintenance of International Security

Jean Krasno

Consideration of the role of the U.N. in preventive diplomacy, using force for peace keeping, peace enforcement, and peace building, with consideration of the evolution of the U.N. and its role in a post-Cold War international system. For IR students and IS/PLSC undergraduates only. W 1:30–3:20

INRL 743a, The Political Economy of Foreign Investment Allison Kingsley

The emergence of functioning capital markets and the ability to access global capital are threshold issues for economic growth and political development in emerging markets.

Integrating political science theories with readings from the law, economics, and finance literatures, this course critically assesses public and private foreign investment. Focus is on whether investment decisions and deal performance are primarily a function of the investor's endowments, the investment's characteristics, or the state of global liquidity. In particular, investment decisions are analyzed through two competing paradigms with the use of large-N evidence and relevant case studies from emerging markets, such as Egypt, Kazakhstan, Turkey, Brazil, Mexico, Russia. TH 1:30–3:20

INRL 760a, Policy Workshop Stuart Gottlieb

One-term workshop in which small teams choose (with instructor approval) a specific global policy issue/challenge to be analyzed from a variety of perspectives (government, NGO, private sector) and levels (national, regional, international) showing all sides of the policy-making and implementation process. What are the best policy options? How were they determined? What are the obstacles to their implementation? What more can be done to help develop realistic solutions? Teams ultimately address these and other questions in a policy white paper, and a “brown bag” oral presentation offered through the International Affairs Council. Designed for second-year International Relations M.A. students. Other students may be admitted with instructor approval. M 1:30–3:20

INRL 900a or b, Directed Reading

By arrangement with faculty.

INVESTIGATIVE MEDICINE

Department of Medicine

Edward S. Harkness Building (ESH), basement 18–19, 785.6842

<http://info.med.yale.edu/invmed/>

Ph.D.

Director of Graduate Studies

Joseph Craft (invmed@info.med.yale.edu)

Deputy Director

Eugene Shapiro

Professors Karen Anderson (*Pharmacology*), Henry Binder (*Internal Medicine; Cellular & Molecular Physiology*), Joseph Craft (*Internal Medicine; Immunobiology*), David Fiellin (*Internal Medicine*), Thomas Gill (*Internal Medicine; Epidemiology; Investigative Medicine*), Fred Gorelick (*Internal Medicine; Cell Biology*), Jeffrey Gruen (*Pediatrics; Genetics; Investigative Medicine*), Harlan Krumholz (*Internal Medicine; Epidemiology; Investigative Medicine*), Eugene Shapiro (*Pediatrics; Epidemiology; Investigative Medicine*), George Tellides (*Surgery; Investigative Medicine*), Mary Tinetti (*Internal Medicine; Epidemiology; Investigative Medicine*)

Fields of Study

The Investigative Medicine program offers a special training pathway for highly select physicians in clinical departments who are interested in careers in clinical research. The program is designed to develop a broad knowledge base, analytical skills, creative thinking, and the hands-on experience demanded of clinical researchers devoted to disease-oriented and patient-oriented investigation. The program provides the student with individualized experience encompassing formal course work and practical experience, under the supervision and mentorship of a senior faculty member.

Students will enter the program with a broad range of experience and interests. Students can undertake thesis work in a variety of disciplines. These include:

1. Evaluating risk factors and interventions for disease using modern concepts in quantitative methods and clinical study design.
2. Investigating the biochemical, physiologic, and genetic basis of disease in the setting of a Clinical Research Center.
3. Exploring the molecular basis of a disease from the laboratory standpoint.

Special Admissions Requirements

The Investigative Medicine program is designed for students with an M.D. or D.O. degree. To be eligible for admission, applicants must have completed two or more years of postgraduate clinical training and be eligible to practice in the U.S. Prospective students who are already in a residency or subspecialty clinical fellowship program at Yale may apply to the Investigative Medicine program anytime during the first two years of that training (approximate). Application to the program may be made concurrently with application for residency or fellowship training in a clinical department at the Yale

School of Medicine. Special arrangements will be made for a deferred acceptance by the Graduate School.

The most important criteria for selection into the program are commitment to rigorous training in clinical investigation and evidence of high academic achievement in undergraduate and medical school courses, and on scores from the USMLE.

Special Requirements for the Ph.D. Degree

The minimum overall course requirements for the doctorate program are nine (9) courses. Full-time course work will extend for twelve months, starting in July. The majority of the course requirements are to be completed by the end of the first year of study. Electives are often taken in the second year, with the expectation that they be completed by the end of the second year. To be eligible to take the comprehensive qualifying examination, students must achieve the grade of Honors in two courses (one course if a full-year course), have a minimum grade average of High Pass, and have completed a minimum of six courses. When requirements are met (typically by December 31 of the second year), students submit their thesis proposal and undertake the comprehensive qualifying examination. In order to be admitted to candidacy, students must pass both the written and oral comprehensive qualifying examinations and submit a thesis prospectus which has been approved by their qualifying committee. The remaining degree requirements include completion of the dissertation project, writing of the dissertation, and its oral defense. It is expected that most students will complete the program in three to five years. There is no foreign language requirement. The required curriculum for each program of study is as follows:

COURSE REQUIREMENTS FOR LABORATORY-BASED PATIENT-ORIENTED RESEARCH

IMED 625, Principles of Clinical Research
 IMED 630, Ethical and Practical Issues in Clinical Investigation
 IMED 635, Directed Reading in Investigative Medicine
 IMED 645, Introduction to Biostatistics in Clinical Investigation
 IMED 655, Writing Your First Grant Proposal
 IMED 680, Topics in Human Investigation
 CBIO 601, Molecular and Cellular Basis of Human Disease (spring and fall)
 CB&B 740, Clinical and Translational Informatics
 Elective (1)

COURSE REQUIREMENTS FOR CLINICALLY BASED PATIENT-ORIENTED RESEARCH

IMED 630, Ethical and Practical Issues in Clinical Investigation
 IMED 635, Directed Reading in Investigative Medicine
 IMED 655, Writing Your First Grant
 IMED 660, Methods in Clinical Research (summer)
 IMED 661, Methods in Clinical Research (fall)
 IMED 662, Methods in Clinical Research (spring)
 IMED 680, Topics in Human Investigation
 Electives (2)

Courses

IMED 625a, Principles of Clinical Research Eugene Shapiro

The purpose of this intensive two-week course is to provide an overview of the objectives, research strategies, and methods of conducting patient-oriented research. Topics include competing objectives of clinical research, principles of observational studies, principles of clinical trials, principles of meta-analysis, interpretation of diagnostic tests, prognostic studies, causal inference, qualitative research methods, and decision analysis. Sessions generally combine a lecture on the topic with discussion of articles that are distributed in advance of the sessions. Consent of instructor required. Two weeks, July 27–August 7, 2009. MTWTHF 2–4

IMED 630a, Ethical and Practical Issues in Clinical Investigation Henry Binder

This term-long course addresses topics that are central to the conduct of clinical investigation, including ethics of clinical investigation, scientific fraud, technology transfer, and interfacing with the pharmaceutical industry. Practical sessions include scientific presentations and teaching, NIH peer review process, journal peer review process, and career development models of academia. This course provides guidelines and a framework for the clinical investigator to obtain funding for, conduct, and present a clinical study. Format consists of didactic presentation followed by discussion. Consent of instructor required. T 3:30–5

IMED 635a or b, Directed Reading in Investigative Medicine Joseph Craft

An independent study course for first-year students in the Investigative Medicine program. Topics are chosen by the student, and reading lists are provided by faculty for weekly meetings to discuss articles. Six sessions are required; dates/times by arrangement. Consent of instructor required.

IMED 645a, Introduction to Biostatistics in Clinical Investigation Henry Binder

This course provides an introduction to statistical concepts and techniques commonly encountered in medical research. Previous course work in statistics or experience with statistical packages is not a requirement. Topics to be discussed include study design, probability, comparing sample means and proportions, survival analysis, and sample size/power calculations. The computer lab incorporates lecture content into practical application by introducing the statistical software package SPSS to describe and analyze data. Consent of instructor required. Two weeks, July 13–24, 2009. MTWTHF 8:30–11:15

IMED 650a, Seminars in Clinical Investigation Eugene Shapiro

In this term-long course a range of topics is covered in the format of an interactive seminar. Topics include detailed evaluation of study designs (cohort studies, case-control studies, and clinical trials), development and validation of indices, review of approaches to methodology and issues related to implementation of the methodology (assuring quality of the data, qualitative research methods, estimation of sample size and statistical power), and introduction to finding sources to fund grant proposals. The format for most of the seminars consists of a didactic presentation followed by intensive discussion of research articles and research protocols. Students lead the discussion in the critical analysis and evaluation of the articles. Attendance and active participation are required. Consent of instructor required. W 2–4

IMED 655b, Writing Your First Grant Proposal Eugene Shapiro

In this term-long course, students gain intensive, practical experience in evaluating and preparing grant proposals, including introduction to NIH study section format. The course gives new clinical investigators the essential tools to design and to initiate their own proposals for obtaining grants to do research and to develop their own careers. The course is limited to students who plan to submit grant proposals (usually for either a K-23 or a K-08 grant). Attendance and active participation are required. Consent of instructor required. W 2–4

IMED 660c, Methods in Clinical Research, Part I Eugene Shapiro**IMED 661a, Methods in Clinical Research, Part II** Eugene Shapiro**IMED 662b, Methods in Clinical Research, Part III** Eugene Shapiro

This year-long course, presented by the Robert Wood Johnson Clinical Scholars Program, presents in depth the methodologies used in patient-oriented research, including methods in biostatistics, clinical epidemiology, health services research, community-based research, and health policy. Consent of instructor required.

IMED 680b, Topics in Human Investigation Joseph Craft, Karen Anderson

This course teaches students about the process through which novel therapeutics are designed, clinically tested, and approved for human use. It is divided into two main components, with the first devoted to moving a chemical agent from the bench to the clinic, and the second to outlining the objectives and methods of conducting clinical trials according to the FDA approval process. The first component describes aspects of structure-based drug design and offers insight into how the drug discovery process is conducted in the pharmaceutical industry. The format includes background lectures with discussions, labs, and computer tutorials. The background lectures include a historical perspective on drug discovery, the current paradigm, and important considerations for future success. The second component of the course provides students with knowledge of the basic tools of clinical investigation and how new drugs are tested in humans. A series of lectures and discussions provide an overview of the objectives, research strategies, and methods of conducting patient-oriented research, with a focus upon design of trials to test therapeutics. Each student is required to participate (as an observer) in an HIC review, in addition to active participation in class. Consent of instructor required.

W 2–4

ITALIAN LANGUAGE AND LITERATURE

82–90 Wall Street, 432.0595

www.yale.edu/italian/

M.A., M.Phil., Ph.D.

Chair

Millicent Marcus

Director of Graduate Studies

Giuseppe Mazzotta (82–90 Wall, Rm 404, 432.0598)

Professors Millicent Marcus, Giuseppe Mazzotta

Assistant Professors Angela Capodivacca, Erin Larkin (*Visiting* [Sp]), David Lummus

Senior Lectur II and Language Program Director Risa Sodi

Visiting faculty from other universities are regularly invited to teach courses in the department.

Fields of Study

The Italian department brings together several disciplines for the study of the Italian language and its literature. Although the primary emphasis is on a knowledge of the subject throughout the major historical periods, the department welcomes applicants who seek to integrate their interests in Italian with wider methodological concerns and discourses, such as history, rhetoric and critical theories, comparison with other literatures, the figurative arts, religious and philosophical studies, medieval, Renaissance, and modern studies, and the contemporary state of Italian writing. Interdepartmental work is therefore encouraged and students are accordingly given considerable freedom in planning their individual curriculum, once they have acquired a broad general knowledge of the field through course work and supplementary independent study.

Special Admissions Requirements

The department recognizes that good preparation in Italian literature is unusual at the college level and so suggests that applicants begin as soon as possible to acquire a broad general knowledge of the field through outside reading. At the end of the first and second years, students' progress is analyzed in an evaluative colloquium. Applicants who have had little or no experience in Italy are generally urged to do some work abroad during the course of their graduate program. For all students of Italian, a reading knowledge of Latin is essential. This may be acquired during the course of the first year, but applicants are reminded that it is difficult to schedule beginning language courses in addition to a normal graduate program. Students are advised to acquire proficiency in the languages required for the doctoral program before matriculation.

Special Requirements for the Ph.D. Degree

Candidates must demonstrate a reading knowledge of a second Romance language,

Latin, and a non-Romance language (German recommended). The Latin examination must be passed, usually before the beginning of the third term of study, and all language requirements must be fulfilled before the Ph.D. qualifying examination. Students are required to take two years of course work (as a rule sixteen courses), including two graduate-level term courses outside the Italian department. After consultation with the DGS, students who join the graduate program with an M.A. in hand may have up to four courses waived. The comprehensive qualifying examination must take place during the third year of residence. It is designed to demonstrate the student's mastery of the language and acquaintance with the literature. The examination, which is both written and oral, will be devised in consultation with members of the department. In the term following the qualifying examination, the student will discuss, in a session with the departmental faculty, a prospectus describing the subject and aims of the dissertation. Students are admitted to candidacy for the Ph.D. upon completion of all predissertation requirements, including the prospectus. Admission to candidacy normally occurs by the end of the sixth term.

Teaching is considered to be an important component of the doctoral program in Italian. Students will be appointed as teaching fellows in the third and fourth years of study. Guidance in teaching is provided by the faculty of the department and specifically by the director of language instruction.

Combined Ph.D. Programs

ITALIAN AND FILM STUDIES

The Department of Italian also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in Italian and Film Studies. For further details, see Film Studies. Applicants to the joint program must indicate on their application that they are applying both to Film Studies and to Italian. All documentation within the application should include this information.

ITALIAN AND RENAISSANCE STUDIES

The Department of Italian also offers, in conjunction with the Renaissance Studies Program, a combined Ph.D. in Italian and Renaissance Studies.

Master's Degrees

Only candidates for the Ph.D. degree will be admitted to the program, but the department will, upon request, offer the M.A. and the M.Phil. degrees to students who have completed the general Graduate School requirements for those degrees (see Degree Requirements). Additionally, students in Italian are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

Program materials are available upon request to the Director of Graduate Studies, Italian Language and Literature, Yale University, PO Box 208311, New Haven CT 06520-8311.

Courses

ITAL 560a/CPLT 708a, Age of Disenchantment Giuseppe Mazzotta

This course focuses on the literary debates, theological arguments, and scientific shifts taking place between the Council of Ferrara-Florence (1437) and the Council of Trent and beyond, by reading key texts by Valla, Cusa, Pulci, Luther, Erasmus, Ariosto, Campanella, Bruno, Galileo, and Bellarmino. It examines issues such as the crisis of belief, the authority of the past, the emergence of freedom, new aesthetics, and the effort to create a new theological language for modern times. In English. T 3:30–5:20

ITAL 595b/FILM 732b, Cinematic Neorealism Millicent Marcus

The course considers the complex relationship between the theory and practice of Italian cinematic neorealism. We screen a film weekly and analyze it in the context of an evolving theoretical paradigm, beginning with Rossellini's *Open City* (1945) and *Paisà* (1946), and flashing back to the proto-neorealist *Ossessione* (Visconti, 1942). We devote a great deal of attention to De Sica's contributions to neorealism, including *Shoeshine* (1946), *Bicycle Thief* (1948), *Miracle in Milan* (1951), and *Umberto D* (1952), in addition to De Santis's *Bitter Rice* and Visconti's *La terra trema* (1948). The course also includes a study of the movement's afterlife in *Bellissima* (Visconti, 1951), and the recent revisitations of neorealism in *Iceberg* (Nichetti, 1989) and *Celluloide* (Lizzani, 1996), before concluding with Gianni Amelio's *Stolen Children* (1992), which has been hailed as the harbinger of a realist revival in the 1990s. In English. W 3:30–5:20, screening SU 7

ITAL 600a,b/RNST 500a,b, Introduction to Renaissance Studies David Quint [F], Bruce Gordon, John Rogers [Sp]

An introduction to the major texts, issues, bibliography, and methods in the interdisciplinary study of the Renaissance. Emphasis in the first term on Italy and in the second on northern Europe. T 9:25–11:15 [F], W 1:30–3:20 [Sp]

ITAL 655b, Medieval and Early Modern Mythography David Lummus

This course traces the diverse modes of interpretation of classical myth from late antiquity to early modern Italy. We analyze the changing approaches of Christian modernity to pagan antiquity, from the thinkers of early Christianity through the Middle Ages to Boccaccio's *Genealogy of the Gentile Gods* and the Italian mythographers of the fifteenth and sixteenth centuries. The course addresses issues of poetics, exegesis, translation, historiography, and temporality. The authors addressed include Cicero, Varro, Ovid, Prudentius, Augustine, Fulgentius, Isidore of Seville, Arnulf of Orleans, John of Garland, Giovanni del Virgilio, Pierre Bersuire, Giovanni Boccaccio, Natale Conti, Giglio Gregorio Giraldi, and Vincenzo Cartari. T 2:30–4:20

ITAL 691 a/b, Directed Reading Giuseppe Mazzotta

ITAL 715a, The Ethics of Storytelling: Boccaccio's Fiction David Lummus

An in-depth study of Boccaccio's fiction including the early *questioni d'amore*, the *Elegia di Madonna Fiammetta*, the *Decameron*, and the *Corbaccio*. We address the development of a philosophy of storytelling in Boccaccio's prose works. Although the *Decameron* has earned its importance as a foundational text, by reading it in the context of other related prose works we can understand more fully the relationship between literature and lived

experience implied by Boccaccio's fictions. We also address key critical issues such as Boccaccio's ideas about nature, ethics, politics, gender, authority, religious and civic institutions, as well as broader theoretical issues such as reader response, gendered discourse, literature as philosophy, and narratology. Each text is read and discussed in Italian, as we pay close attention to linguistic, stylistic, and rhetorical developments in Boccaccio's prose. We also consider examples of major (present and past) currents in Boccaccio studies alongside the primary texts. In Italian. TH 2:30–4:20

ITAL 765b, Futurismo/Futurismi Erin Larkin

This course explores — exactly a century after the publication of the first Futurist manifesto in 1909 — the innovation and legacy of the Italian avant-garde movement. Texts include the famous manifestos, as well as the poetry, novels, films, paintings, and sculptures of various protagonists of the movement. A distinct feature of the course is to give attention not only to the many forms of expression of *Futurismo*, but also to the plurality of “voices” within the movement (*Futurismi*). In Italian. TH 3:30–5:20

ITAL 780a, *Il romanzo del novecento* Millicent Marcus

No literary form is better suited to gauging the convulsive changes wrought by Italy's entrance into modernity than the novel. Infinitely permeable to the forces of historical circumstances, the novel will counter these external forces with its own version of the evolving Italian subject in all its personal richness and complexity. We study the development of this literary genre throughout the course of the twentieth century and, in the process, adopt a variety of approaches, including, but not limited to, semiotics, psychoanalysis, narratology, gender, ideological criticism, and *la questione della lingua*. In Italian. W 3:30–5:20

LINGUISTICS

370 Temple, Rm 204, 432.2450

M.A., M.Phil., Ph.D.

Chair

Stephen Anderson

Director of Graduate Studies

Maria Piñango (370 Temple, 432.4145, maria.pinango@yale.edu)

Professors Stephen Anderson, Carol Fowler (*Adjunct*), Robert Frank, Roberta Frank, Laurence Horn, Stanley Insler, Frank Keil, Rhea Paul, Zoltán Szabó, Raffaella Zanuttini

Associate Professors Darya Kavitskaya, Maria Piñango

Assistant Professors Claire Bower, Ashwini Deo, Gaja Jarosz, Jelena Krivokapić

Lecturers Thomas Leu, Einar Mencl, Tamina Stephenson, Matthew Wolf

Director, African Language Program Ann Biersteker

Supporting faculty in other departments J. Joseph Errington (*Anthropology*), William Hallo (*Near Eastern Languages & Civilizations*)

Fields of Study

Fields include linguistic theory (phonology, morphology, syntax, semantics, pragmatics), experimental phonetics, brain and language, language and cognition, historical linguistics, and African linguistics.

Special Requirements for the Ph.D. Degree

PROGRAM VISION

Linguistics at Yale has a long and storied history in traditional approaches to the study of language. Today the department takes a distinctively integrative and interdisciplinary approach in investigating the systems of knowledge that make up our linguistic competence. We are convinced that an understanding of the human language faculty will arise only through the mutually informing relationship between formally explicit theories and insights from wide-ranging descriptive and experimental work. Thus at Yale theoretical inquiry grounded in introspection proceeds in partnership with historical and comparative studies, fieldwork, experimental investigations of normal and impaired language processing, cognitive neuroscience, laboratory phonetic analysis, and computational and mathematical modeling. Students in the Ph.D. program are exposed to these methodological approaches, while receiving firm grounding in the traditional domains of linguistics. Ph.D. students participate in research in phonetics, phonology, morphology, syntax, semantics, pragmatics, and historical linguistics, and explore data from a wide variety of languages, both well studied and less well documented, with particular faculty expertise in the Slavic, Romance, Australian, and Indo-Aryan languages.

Course work requirements The conception of linguistics embraced by the Yale Ph.D. program requires that students receive training that is both deep in its coverage of areas of linguistic inquiry and broad in the range of methodological approaches to which students are exposed. The course work requirements are designed to accomplish these dual goals.

Years one and two. During their first four terms, students must complete a minimum of fourteen term courses at the graduate level. These courses must include an eight-course core, together with a set of three courses exposing students to a range of methodologies in linguistic research.

The core consists of the following courses:

LING 512, Historical Linguistics	LING 553, Syntax 1
LING 520, Phonetics	LING 580, Morphology
LING 532, Phonology 1	LING 654, Syntax 2
LING 535, Phonology 2	LING 663, Semantics

For the methodology requirement, students must take at least three of the following set of courses:

LING 541, Language and Computation
 LING 601, Experimental Linguistics
 LING 624, Formal Foundations for Linguistic Theory
 LING 641, Field Methods

Students will typically enroll in these courses even if they have had similar course work elsewhere. During these initial two years of course work, students must receive at least three grades of H (= Honors). Three or more grades of P or F during this period are grounds for dismissal from the Ph.D. program.

Years three and four. During the third and fourth years, students are expected to enroll in one seminar course for credit each term. Students should use such seminars as opportunities both for exploring new research areas and, especially, for pushing current research interests in novel directions.

PROGRAM REQUIREMENTS

In addition to course work, students will also focus on the creative side of academic life by undertaking independent research. This work serves the multiple functions of promoting students' intellectual growth, strengthening their working relationships with faculty members, and providing a yardstick by which progress toward the degree can be measured.

1. *Portfolio and special field exam.* During the first two years of the graduate program, students must complete a portfolio of three research papers, one each in the areas of syntax, phonology, and either semantics or historical linguistics. These papers, which should demonstrate a student's ability to conduct independent research in linguistics, will typically consist of revised versions of term papers students have written. The first two of these must be submitted by September 15 of the student's second year. It is the expectation of the faculty that students will make any necessary revisions of papers written during the first year during the summer between the first and second

years in the program, so as to prepare two of these for submission by this deadline. The third paper must be submitted no later than the end of the first week of May in the second year. The entire departmental faculty will evaluate these papers soon after they are submitted. They may be approved or rejected, or the student may be asked to carry out further revisions prior to resubmission.

During the second year, students will, in consultation with their advisers, choose a subfield of linguistics of particular interest to them and prepare an annotated bibliography approximately twenty pages in length. After completing that bibliography, the student will complete an essay exam composed by his or her adviser and returned by the student two days later. The deadline for completion of this special field exam is the end of the first week of May in the second year. The special field exam, like the portfolio papers, will be read and evaluated by the entire departmental faculty.

At the conclusion of the second year, the director of graduate studies will transmit an assessment of each student's progress as determined by the faculty on the basis of performance in classwork, the portfolio papers, and the special field exam.

2. *Qualifying papers.* By the end of the third year of graduate study, students will present two substantial research papers of publishable quality in different areas of linguistics. Satisfaction of this requirement includes the submission of a written version of the paper to be followed by an oral presentation to the department (typically at a Friday Linguist Lunch). Alternatively, one of the two papers can be presented at a professional conference, provided at least one member of the department faculty is in attendance.
3. *Prospectus.* By the end of the seventh term, students will present a dissertation prospectus to the faculty. The prospectus should lay out clearly the student's proposed dissertation topic. It should stress the importance of the topic, present the core idea of the proposed work together with its promise and viability, and demonstrate how this work fits into past research in the area. The document should be ten to twenty pages (single spaced) in length. After the document is submitted, the prospectus must be defended orally in front of the faculty. Upon successful completion of the prospectus defense, students advance to Ph.D. candidacy.
4. *Dissertation.* By the end of the eighth term, students must complete and have approved by their committee a chapter of the dissertation, together with a detailed outline of the dissertation and a comprehensive bibliography. Once this requirement is completed, students are eligible for a University Dissertation Fellowship, which will support them in their fifth year of graduate study. Students are expected to complete their dissertations by the end of the fifth year. At least one month prior to the dissertation filing date, the completed dissertation must be orally defended in front of the dissertation committee consisting of at least three faculty members, two of whom must be members of the Linguistics department. Committee members must be given the completed dissertation no less than two weeks prior to the date of the defense.

LANGUAGE REQUIREMENT

Students who do not take LING 641, Field Methods must pursue the study of at least one language as approved by the DGS outside of the Germanic, Romance, Balto-Slavic, and Greek branches of the Indo-European family, either through a course on the structure of the language or through three terms of language study at Yale or elsewhere.

TEACHING FELLOW/RESEARCH ASSISTANT REQUIREMENTS

The faculty regard teaching experience as an integral part of the graduate training program in Linguistics. All students are required to serve as Teaching Fellows for a minimum of two terms, usually beginning in the first term of the third year. In addition, students must complete two additional terms of assistantship. These may be either as a Teaching Fellow, or through participation in externally supported, supervised research as a Research Fellow. Research assistantships may be provided by the Linguistics faculty and by various Yale and Yale-affiliated units. Before accepting a research assistantship in fulfillment of this requirement, students must receive approval from the director of graduate studies. To be approved, a research assistantship must meet the following criteria:

1. It must be supervised by a Linguistics department faculty member or a faculty member from an affiliated unit, such as Haskins Laboratories or the Yale School of Medicine.
2. It must provide research experience that complements the student's academic plan of study.
3. It must provide at least ten hours of experience per week.

If an approved research assistantship is accepted that does not provide a stipend equal to the standard departmental stipend, a University Fellowship will be provided to augment the stipend so as to bring it up to the departmental standard.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.A. (en route to the Ph.D.) Students in the doctoral program who successfully complete the course work, examinations, and work samples required by the end of the second year of graduate study (see above) may petition for the M.A. degree.

Program materials are available upon request to the Department of Linguistics, Yale University, PO Box 208366, New Haven CT 06520-8366.

*Courses***LING 500a/ENGL 500a, Introduction to Old English Language and Literature**

Roberta Frank

The essentials of the language, some prose readings, and close study of several poems: *Caedmon's Hymn*, *The Dream of the Rood*, *The Battle of Maldon*, *The Wife's Lament*, *The Wanderer*, and *The Seafarer*. MW 9–10:15

LING 501b/ENGL 501b, *Beowulf* and the Northern Heroic Tradition Roberta Frank

A close reading of the poem *Beowulf*, with some attention to shorter heroic poems. W 9:25–11:15

[LING 502a, Advanced Old English]**LING 510b^U, Introduction to Linguistics** Darya Kaviskaya

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 relations of linguistics to psychology, logic, and other disciplines. TTH 11:35–12:50

LING 512a^U, Historical Linguistics Stanley Insler

Types of change that a language undergoes in the course of 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. MW 1–2:15

LING 515^U, Elementary Sanskrit Ashwini Deo [F], David Mellins [Sp]

Careful study of Sanskrit grammar both in its historical development and as the synchronic systems attested in classical Sanskrit. Comparisons with other Indo-European languages. Close reading of later Sanskrit texts. MWF 9:25–10:15

LING 516a^U, Beginning Hittite Stanley Insler

Introduction to the Hittite language. Explanation of grammar, with readings in transcription from old, middle, and new Hittite texts representing different literary genres. No knowledge of cuneiform is necessary, but familiarity with an inflected language (Latin, Greek, German, Russian) is essential. T 2:30–4:20

LING 517a^U, Language and Mind Maria Piñango

Knowledge of language as a component of the mind: mental grammars, the nature and subdivisions of linguistic knowledge in connection to 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. TTH 11:35–12:50

LING 520b^U, General Phonetics Matthew Wolf

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. TTH 9–10:15

[LING 530a^U, Evolution of Language]

LING 532a^U, Introduction to Phonological Analysis Matthew Wolf

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. TTH 11:35–12:50

LING 535b^U, Phonological Theory Matthew Wolf

Topics in the architecture of a theory of sound structure. Levels of representation; classical phonological rules and their interaction. Ordering paradoxes; cyclicity and Lexical Phonology. Motivations for replacing a system of rules with a system of constraints. Optimality theory: constraint types and their interactions. Correspondence theory. Opacity and stratal OT. Prerequisite: LING 532 or permission of instructor. TTH 4–5:15

LING 540b^U/PSYC 506b, Computational Models in Cognitive Science Robert Frank

Introduction to connectionist, symbolic, and statistical techniques used in computational modeling of language, learning, and reasoning. Students implement models, but no extensive programming background is assumed. Prerequisite: one course in cognitive science or permission of instructor. MW 1–2:15

[LING 541a^U, Language and Computation]**[LING 546b^U, Language, Sex, and Gender]****LING 553a^U, Syntax I** Raffaella Zanuttini

An introduction to the syntax (sentence structure) of natural language. Introduction to generative syntactic theory and key theoretical concepts. Syntactic description and argumentation. Topics include phrase structure, transformations, and the role of the lexicon. TTH 1–2:15

LING 580b^U, Morphology Maria Piñango

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 532 and LING 553, or permission of instructor. MW 11:35–12:50

[LING 590a^U, Topics in the History of Linguistics: The Linguistic Wars]**LING 593a^U, Historical Morphology****LING 602b^U, Comparative Old Germanic****LING 612b^U, Linguistic Change** Stephen Anderson

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. MW 2:30–3:45

[LING 614b^U, Structure of Yorùbá]**LING 622b^U, Topics in Phonetics: TBA****LING 624a^U, Formal Foundations of Linguistic Theories** Robert Frank

Mathematical methods in linguistics. Topics include set theory, logic and formal systems, model theory, lambda calculus, formal language theory, elementary statistics, and probability. No prerequisites. MW 11:35–12:50

LING 630b^U, Techniques for the Investigation of Brain and Language Einar Mencl

The first section of this course is focused on obtaining a basic understanding of neuro-imaging data acquisition and analysis techniques, primarily MRI, with application to the study of language. Technique subareas include MRI acquisition; preprocessing; single- and multi-subject data analysis; visualization; and network analysis. Classes pair lecture presentation and in-class interactive demonstrations with relevant datasets. The second section focuses on selected readings in the study of language using these techniques. Topic areas include speech production and perception, reading, and dyslexia. Readings are primarily drawn from journal articles in the field in general, but also from within Haskins Laboratories, allowing access and hands-on analysis and exploration of existing datasets. Prerequisite: LING 510. T 9:25–11:15

LING 631b^U, Neurolinguistics Maria Piñango

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. MW 2:30–3:45

[LING 632a^U, Universals of Language]

[LING 636b^U, Articulatory Phonology]

LING 640a^U, Topics in Phonology: Inputs and Bases in Phonological Derivations

Matthew Wolf

Theories of the nature (in particular the morphological nature) of the inputs to phonological derivations. Uniqueness of the underlying forms of morphological elements; simultaneous vs. incremental views of the construction of complex words. Relations of similarity and dissimilarity within paradigms and their characterization. TH 9:25–11:15

[LING 641b^U, Field Methods]

LING 642b^U, Topics in Phonology: The Indigenous Languages of Australia

Erich Round

Seminar on variation in phonology and at the interfaces of phonology with phonetics and morphology. Readings cover formal theories of cross-linguistic variation (typology), lexically conditioned variation, and free variation. Major themes include the formal characterization of grammatical variation, the relationship between the grammar and lexicon, and the role of frequency in phonological theory. M 1:30–3:20

[LING 643a^U, Topics in Phonology]

LING 644b^U, Topics in Phonology: Opacity Darya Kavitskaya

Phonological opacity in the world's languages. Typology of opaque interactions, theoretical approaches to opacity, the relation of opacity and morphology. TH 9:25–11:15

LING 649a^U/SLAV 771a^U, Introduction to the Slavic Languages**LING 649b^U, Structures of Romance Languages: Rumantsch**

[LING 651b^U, Learnability and Development]

LING 654b^U, Syntax II Robert Frank

Recent developments in syntactic theory: government and binding, principles and parameters, and minimalist frameworks. In-depth examination of the basic modules of grammar (lexicon, X-bar theory, theta-theory, case theory, movement theory). Comparison and critical evaluation of specific syntactic analyses. MW 9–10:15

[LING 655b^U, Subjects]

LING 656a^U, Grammatical Relations Laurence Horn

Descriptive and theoretical approaches to grammatical relations (subject, object, etc.) and their roles in syntax, argument structure, and universal grammar. Comparison of diverse models: traditional approaches, case grammar, relational grammar, lexical-functional

grammar, GB and its developments. Grammatical relations and thematic roles (theta-roles). Grammatical relations in typological and historical perspectives. Prerequisite: LING 653 or permission of instructor. M 2:30–3:45

LING 660a^U, Topics in Syntax: The Architecture of Grammar Robert Frank,
Thomas Leu

Much work in syntactic theory has been concerned with the components of grammar and their relationship. This course explores recent perspectives on this question stemming from work in the Minimalist paradigm. There is a particular focus on the interplay between syntactic computation and the systems of morphology, phonology, semantics, and the lexicon. Prerequisite: Syntax II or permission of instructor. T 9:25–11:15

LING 661b^U, Topics in Syntax: English and Its Kin Raffaella Zanuttini

Examination of similarities and differences in the syntactic properties of English and other Germanic languages (like Icelandic, Swedish, and German), and what they tell us about the limits of syntactic variation. Empirical domain includes nonstandard varieties of English spoken in the U.S. and in the UK. Topics under investigation: transitive expletives, object shift, stylistic fronting, inversion. Prerequisites: two courses in syntax or permission of instructor. F 9:25–11:15

LING 662a^U, Topics in Syntax: The Syntax-Semantic Interface Maria Piñango

Exploration of the psychological reality of specific proposals regarding how syntactic structure and semantic structure come together (e.g., how meaning is derived from sentence organization). These proposals are examined through an experimental psycholinguistic (real-time parsing) and neurolinguistic (lesion studies and neuroimaging) perspectives. Specific phenomena to be evaluated include anaphora resolution, control, and argument and event structure. W 1:30–3:20

LING 663a^U, Introduction to Semantics Ashwini Deo

Focus as the expression of information structural prominence in natural language discourse. Semantic and pragmatic properties of focus and its phonological, lexical, and word-order correlates. Treatment of focus-sensitive and scalar particles (“only,” “even,” “too,” “almost,” et al.) in dynamic models of meaning. Parallels with the semantics of questions. Prerequisite: a course in semantics or permission of instructor. MW 9–10:15

[**LING 664b^U, Semantic Theory**]

LING 670a^U, Topics in Semantics: Conventional Implicature Laurence Horn

Conventional implicatures as semantic but truth-conditionally vacuous aspects of meaning. Discourse particles, expressives, politeness markers, “free” datives. Multidimensional theories of meaning and their relation to syntactic structure, compositional semantics, and pragmatics. T 2:30–4:20

LING 671a^U, Topics in Semantics: Change in Tense-Aspect Categories Ashwini Deo

The cross-linguistic meaning of tense and aspect morphology. Semantic accounts of aspectual categories such as the progressive, the imperfective, and the perfect and tense categories like the past and the future. Evaluation of descriptive and empirical accounts from the grammaticalization and typology literature as informed by formal

semantic research on tense/aspect categories. Prerequisites: LING 512 and LING 663.
TH 2:30–4:20

LING 672b/PHIL 712b, Topics in Semantics: Speech and Attitude Reports

Tamina Stephenson

This seminar deals with the semantics of speech and attitude reports, to include such topics as modality, belief and knowledge reports, *de se* attitudes, attitudes with subjective content, factive presuppositions, and/or other areas of current interest. It is intended for graduate students in linguistics and philosophy with some background in semantics and/or philosophy of language. W 1:30–3:20

LING 675b^U, Pragmatics Laurence Horn

Context-dependent aspects of meaning and inference. Speech act theory, presupposition, implicature. Role of pragmatics in the lexicon and in meaning change. The semantics-pragmatics distinction from different perspectives; the position of pragmatics in linguistic theory. TTH 2:30–3:45

LING 680a^U, Topics in Morphology: Agreement Stephen Anderson

Survey of agreement and concord phenomena in the languages of the world. Connections between agreement and pronominal clitics. Discussion of theories of the implementation of agreement relations in the syntax and of the realization of agreement morphology. Prerequisites: one course each in syntax and phonology, and the introductory course in morphology (LING 580) or permission of instructor. M 1:30–3:20

[LING 690b^U, Negation and Polarity]

[LING 710b, Predication]

[LING 760b, Seminar in Information Structure]

[INDC 771b, Middle Indic: Pali and Prakrit]

[INDC 772, Research in Old Indian Epics]

LING 830a or b, Directed Research in Linguistics

By arrangement with faculty.

LING 831a or b, Directed Research in Phonetics

By arrangement with faculty.

LING 840a or b, Directed Research in Phonology

By arrangement with faculty.

LING 850a or b, Directed Research in Grammar

By arrangement with faculty.

LING 860a or b, Directed Research in Semantics

By arrangement with faculty.

MANAGEMENT

135 Prospect, 432.5957

www.yale.edu/graduateschool/academics/management.html

M.A., M.Phil., Ph.D.

Dean

Sharon Oster

Director of Graduate Studies

Subrata Sen (52 Hillhouse, Rm 221, 432.6028, subrata.sen@yale.edu)

Professors Rick Antle, Nicholas Barberis, James Baron, Paul Bracken, Garry Brewer, Zhiwu Chen, Judith Chevalier, Ravi Dhar, Jonathan Feinstein, William Goetzmann, Gary Gorton, Jonathan Ingersoll, Edward Kaplan, Lode Li, Theodore Marmor, Andrew Metrick, Barry Nalebuff, Sharon Oster, Benjamin Polak, Douglas Rae, K. Geert Rouwenhorst, Peter Schott, Fiona Scott-Morton, Martin Shubik, Olav Sorenson, Matthew Spiegel, K. Sudhir, Shyam Sunder, Arthur Swersey, Jacob Thomas, Victor Vroom

Associate Professors Keith Chen, Martijn Cremers, Shane Frederick, Jonathan Koppell, Erin Mansur, Dina Mayzlin, Nathan Novemsky, Amy Wrzesniewski

Participating Faculty from the School of Management Victoria Brescoll, Daylian Cain, Arthur Campbell, Rodrigo Canales, James Choi, Erica Dawson, Merle Ederhof, Constanca Esteves-Sorenson, Stanley Garstka, Roger Ibbotson, Lisa Kahn, Sang-Hyun Kim, Kalin Kolev, Donald Lee, Elisa Long, B. Cade Massey, Mushfiq Mobarak, Antti Petajisto, Oliver Rutz, Jiwoong Shin, Joseph Simmons, Heather Tookes, Hongjun Yan, X. Frank Zhang

Fields of Study

Current fields include Accounting, Financial Economics, and Marketing. Other applied management fields may be added in subsequent years.

Special Admissions Requirements

The GRE General Test or the GMAT Test is required by the Graduate School. Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL).

Special Requirements for the Ph.D. Degree

Admission to candidacy will be based on the requirements of the Graduate School, which include the submission of a prospectus, duly approved by the faculty. Students must maintain a satisfactory grade record in the first year to remain in the program. Students shall, in addition, fulfill the requirements stated below. The process of admission to candidacy will include a faculty review of the student's entire academic record once all requirements have been successfully completed, and must be concluded by the end of the third year.

CORE REQUIREMENTS

Two core courses are required of each student, General Economic Theory: Microeconomics, and Policy Modeling. During the first two years in the program, each student is required to complete a two-course sequence in empirical methods and a two-course sequence in one of the social sciences. Both of these sequences are usually taken during the first year. In addition, each student must prepare an original paper during his or her first summer and submit it to the faculty at the beginning of the third term in residence. Further, a second-year research paper must be submitted to the faculty by November 1 of the fifth term in residence.

IN-DEPTH REQUIREMENT

The in-depth requirement consists of five courses selected by the student with the consent of the area faculty and the DGS. This in-depth study is designed to focus on a particular research paradigm and to prepare the student for the dissertation. In addition, a qualifying examination prepared by the area faculty must be passed. Currently offered in-depth areas are Accounting, Financial Economics, and Marketing.

BREADTH REQUIREMENT

The breadth requirement consists of one course that is outside of the student's depth area. The breadth course is selected by the student with the consent of the area faculty and the DGS.

COURSE REQUIREMENT

Each student must complete a total of fourteen courses, achieving a grade of Honors in at least two courses and a High Pass average in the other twelve courses.

TEACHING

Teaching is considered to be an important part of the doctoral program in Management. The program expects students to serve as teaching fellows, beginning in the spring term of the first year and continuing through the fourth year of study.

Master's Degrees

M.Phil. A student who is admitted to candidacy will be eligible to receive the M.Phil. upon the recommendation of the program's faculty and the approval of the Graduate School.

M.A. (en route to the Ph.D.) A student who completes the fourteen required courses with a High Pass average and the first-year paper will be eligible for the M.A. degree upon the recommendation of the program's faculty and the approval of the Graduate School.

Program materials are available upon request to the Director of Graduate Studies, Management, Yale University, PO Box 208200, New Haven CT 06520-8200. For information on the M.B.A. degree, please contact the admissions office at the School of Management.

Courses

MGMT 701a, Seminar in Accounting Research II Jacob Thomas, Rick Antle

Study of analytical modeling techniques in accounting research that covers topics such as performance measurement for incentives, the consequences of asymmetric information in economic relationships and the role of accounting therein, information sharing within and across firms, and the pricing of related-party transactions.

MGMT 704b, Seminar in Accounting Research IV Jacob Thomas, Rick Antle

Study of empirical accounting research that covers topics such as relation between accounting information and stock prices, analyst forecasts, taxes, and incentives to manage accounting information.

MGMT 703a, Experimental Economics Shyam Sunder

This term-long seminar introduces participants to experimental methods in economics research and conducts a survey of experimental results. Depending on the interests of the participants, we cover topics from auctions, asset markets, game theory, monetary theory, public goods, corporate finance, market microstructure, institutional economics, and so on. The seminar participants are expected to design and conduct their own experiment, make class presentations, and write a term paper. Enrollment limited. Permission of instructor required.

MGMT 710a, Mathematical Models for Management Susana Mondschein

Students learn how to formulate and solve optimization problems. Topics covered include linear and integer programming, nonlinear optimization, dynamic programming, and Markov processes. Many real problems from various areas in manufacturing, service operations, finance, marketing, and health care are covered.

MGMT 740a/ECON 670a, Financial Economics I Zhiwu Chen

Current issues in theoretical financial economics addressed through the study of current papers. Focuses on the development of the problem-solving skills essential for research in this area. T 2:30–5:20

MGMT 741b/ECON 671b, Financial Economics II Jonathan Ingersoll

Continuation of MGMT 741b/ECON 671b.

MGMT 742b, Corporate Finance and Market Microstructure Matthew Spiegel

This course covers recent journal articles in the area of corporate finance and market microstructure. Topics from corporate finance include optimal debt levels, bankruptcy, security design, initial public offerings, and mergers and acquisitions. The half of the course on market microstructure covers inventory models, trading with asymmetric information in the presence of strategic and competitive traders, the social welfare impact of informed trading, bid-ask spreads, information disclosure, and the optimal design of a stock exchange.

MGMT 745a, Financial Behavior Nicholas Barberis

Much of modern financial economics works with models in which agents are rational, in that they maximize expected utility and use Bayes's law to update their beliefs. Behavioral finance is a large and active field, which studies models in which some agents are less than

fully rational. Such models have two building blocks: limits to arbitrage, which make it difficult for rational traders to undo the dislocations caused by less rational traders; and psychology, which catalogues the kinds of deviations from full rationality we might expect to see. We discuss these two topics, and then consider a number of applications: asset pricing (the aggregate stock market and the cross-section of average returns); individual trading behavior; and corporate finance (security issuance, corporate investment, and mergers).

MGMT 746b, Topics in Financial Intermediation Gary Gordon, Andrew Metrick

An elective Ph.D. course covering theoretical and empirical research on the broad range of financial intermediation, including banks and banking, as well as other forms of intermediation, such as reinsurance, stock exchange specializations, securitization, and institutional investing. Topics covered include liquidity, the role of money markets, the effects of intermediation capital on asset pricing, financial crises, banking panics, delegated portfolio management, financial market regulation, central banking, and the role of financial intermediation in economic development. Prerequisites: MGMT 740a, Financial Economics I, and MGMT 741b, Financial Economics II. Students should be third- or fourth-year graduate students, interested in financial economics, and capable of both theoretical and empirical work. Permission of instructor required.

MGMT 751b, Seminar in Marketing I Jiwoong Shin

Current issues in marketing related to product planning, pricing, advertising, promotion, sales force management, channels of distribution, and marketing strategy are addressed through the study of state-of-the-art papers.

MGMT 752a and b, Marketing Workshop Nathan Novemsky

MGMT 754a/PSYC 554a, Behavioral Decision Making II Ravi Dhar,

Nathan Novemsky, Joseph Simmons

This seminar examines research on the psychology of judgment including judgments of probability, risk, happiness, and liking. We focus on identifying factors that influence various judgments and compare them to the factors that individuals want and expect to drive their judgments. Topics of discussion include heuristics and biases, confidence and calibration, issues of well-being including predictions and experiences, regret and counterfactuals, and other topics. The goal of the seminar is threefold: to foster a critical appreciation of existing research on individual judgment, to develop the students' skills in identifying and testing interesting research ideas, and to explore research opportunities for adding to that knowledge. Students generally enroll from a variety of disciplines, including cognitive and social psychology, behavioral economics, finance, marketing, political science, medicine, and public health. T 4:10–7:10

MGMT 756b, Empirical Methods in Marketing K. Sudhir

This course introduces students to structural models of demand and supply dynamics, market entry, and product positioning through a mix of lectures and detailed discussions of specific papers. Emphasis on implementing models using software such as Matlab and Gauss through structured homework assignments.

MGMT 758b, Golden Eggs and Russian Roulette: Rational Choice in an Uncertain World Shane Frederick, Daniel Read

All serious choices involve outcomes that are uncertain or delayed, or both. Thus, rational choice requires procedures for both incorporating risk and trading off costs and benefits occurring at different times. We explore the history of thought on these topics, and discuss the dominant prescriptive models (which aim to describe what decision makers should do) and descriptive models (which aim to describe what decision makers actually do). We incorporate perspectives from economics, decision theory, finance, and psychology, and engage long-standing philosophical debates about rational choice. Topics include discount rates, the discounted utility model, self-control, hyperbolic discounting, intergenerational choice, expected value, expected utility, risk aversion, loss aversion, insurance, gambling, decision analysis, prospect theory, ambiguity, subjective probability, and “neuroeconomics.”

MGMT 780a and b, Ph.D. Student Research Workshop Subrata Sen

MGMT 781a and b, Accounting/Finance Workshop Hongjun Yan

MGMT 782-01a and b, Doctoral Student Pre-Workshop Seminar/Accounting
Subrata Sen

MGMT 782-02a and b, Doctoral Student Pre-Workshop Seminar/Financial Economics Subrata Sen

MGMT 782-03a and b, Doctoral Student Pre-Workshop Seminar/Marketing
Subrata Sen

MGMT 791a or b, Independent Reading and Research

By arrangement with individual faculty.

MGMT 792a or b, Predissertation Research

By arrangement with individual faculty.

MATHEMATICS

10 Hillhouse, 432.4172

www.math.yale.edu/

M.S., M.Phil., Ph.D.

Chair

Mikhail Kapranov

Director of Graduate Studies

Igor Frenkel

Professors Donald Brown (*Economics*), Andrew Casson, Ronald Coifman, Michael Frame (*Adjunct*), Igor Frenkel, Howard Garland, Roger Howe, Peter Jones, Ravindran Kannan (*Computer Science*), Mikhail Kapranov, Bruce Kleiner, Alexander Lubotzky (*Adjunct*), Gregory Margulis, Yair Minsky, Vincent Moncrief (*Physics*), Steven Orszag, David Pollard (*Statistics*), Vladimir Rokhlin (*Computer Science*), Gregg Zuckerman

Gibbs Assistant Professors Jayadev Athreya, Ian Biringer, Dennis Borisov, Nicoleta Corina Calinescu, Tullia Dymarz, Matt Feiszli, Marketa Havlickova, Jaejeong Lee, Dapeng Zhan

Fields of Study

Fields include real analysis, complex analysis, functional analysis, classical and modern harmonic analysis; linear and nonlinear partial differential equations; dynamical systems and ergodic theory; geometric analysis; kleinian groups, low dimensional topology and geometry; differential geometry; finite and infinite groups; geometric group theory; finite and infinite dimensional Lie algebras, Lie groups, and discrete subgroups; representation theory; automorphic forms, L-functions; algebraic number theory and algebraic geometry; mathematical physics, relativity; numerical analysis; combinatorics and discrete mathematics.

Special Requirements for the Ph.D. Degree

All students are required to: (1) complete eight term courses at the graduate level, at least two with Honors grades; (2) demonstrate a reading knowledge of two of the following languages: French, German, or Russian; (3) pass qualifying examinations on their general mathematical knowledge; (4) submit a dissertation prospectus; (5) participate in the instruction of undergraduates; (6) be in residence for at least three years; and (7) complete a dissertation that clearly advances understanding of the subject it considers. The normal time for completion of the Ph.D. program is four years. Requirement (1) normally includes basic courses in algebra, analysis, and topology; these should be taken during the first year. The first language examination must be completed by the beginning of the third year of study, the second no later than the end of that year. A sequence of three qualifying examinations (algebra and number theory, real and complex analysis, topology) is offered each term, at intervals of about one month. All qualifying examinations must be taken by the end of the third term. The thesis is expected to be independent work, done under the guidance of an adviser. This adviser should be contacted

not long after the student passes the qualifying examinations. A student is admitted to candidacy after completing requirements (1)–(6) and obtaining an adviser.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study.

Master's Degrees

M.Phil. In addition to the Graduate School requirements, a student must undertake a reading program of at least two terms' duration in a specific significant area of mathematics under the supervision of a faculty adviser and demonstrate a command of the material studied during the reading period at a level sufficient for teaching and research.

M.S. A student must complete six term courses with at least one Honors grade, pass one language examination, perform adequately on the general qualifying examination, and be in residence at least one year.

Note that the M.Phil. and M.S. degrees are conferred only en route to the Ph.D.; there is no separate master's program in Mathematics.

Program materials are available upon request to the Director of Graduate Studies, Mathematics Department, Yale University, PO Box 208283, New Haven CT 06520-8283.

Courses

MATH 500a^U, Modern Algebra I Corina Calinescu

MW 2:30–3:45

MATH 501b^U, Modern Algebra II Dennis Borisov

TTH 2:30–3:45

MATH 515b^U, Intermediate Complex Analysis Gregory Margulis

MW 2:30–3:45

MATH 520a^U, Measure Theory and Integration Howard Garland

TTH 1–2:15

MATH 525b^U, Introduction to Functional Analysis Yair Minsky

MWF 11:35–12:25

MATH 530a, Mathematical Economics Donald Brown

HTBA

MATH 544a, Introduction to Algebraic Topology I Andrew Casson

TTH 2:30–3:45

MATH 545b, Introduction to Algebraic Topology II

[**MATH 553a^U, Introduction to Representation Theory**]

[**MATH 835b, Differential Geometry**]

[**MATH 845a^U, Introduction to Algebraic Geometry**]

MECHANICAL ENGINEERING

Dunham Laboratory, 432.4250

M.Eng., M.S., M.Phil., Ph.D.

Chair

Mitchell Smooke

Director of Graduate Studies

Alessandro Gomez

Professors David Bercovici, Ira Bernstein (*Emeritus*), Boa-Teh Chu (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, Robert Gordon, Shun-Ichiro Karato, Amable Liñan-Martinez (*Adjunct*), Marshall Long, Daniel Rosner, Ronald Smith, Mitchell Smooke, Forman Williams (*Adjunct*)

Associate Professors Jerzy Blawdziewicz, Corey O'Hern, Ainissa Ramirez, Jan Schroers, Udo Schwarz

Assistant Professors Aaron Dollar, Eric Dufresne, John Morrell, Nicholas Ouellette, Hong Tang

Lecturers Beth Anne Bennett, Arthur McClung, Kailasnath Purushothaman

FIELDS OF STUDY

Fluids and thermal sciences Dynamics and stability of drops and bubbles; dynamics of thin liquid films; macroscopic and particle-scale dynamics of emulsions, foams, and colloidal suspensions; electrospray theory and characterization; electrical propulsion applications; combustion and flames; computational methods for fluid dynamics and reacting flows; turbulence; particle tracking in fluid mechanics; laser diagnostics of reacting and nonreacting flows.

Soft matter/complex fluids Jamming and slow dynamics in gels, glasses, and granular materials; mechanical properties of soft and biological materials; dynamics of macromolecules. Several faculty in Mechanical Engineering are also affiliated with the Integrated Graduate Program in Physical and Engineering Biology (<http://www.peb.yale.edu>).

Material science Characterization of crystallization and other phase transformations; studies of thin films; MEMS; smart materials such as shape memory alloys, amorphous metals, and nanomaterials including nanocomposites; NEMS; nano-imprinting; classical and quantum optomechanics; atomic-scale investigations of surface interactions and properties; classical and quantum nanomechanics; and nanotribology.

Robotics/mechatronics Machine and mechanism design; dynamics and control; robotic grasping and manipulation; human-machine interface; rehabilitation robotics; haptics; electromechanical energy conversion; biomechanics of human movement; human-powered vehicles.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science.

MEDIEVAL STUDIES

53 Wall, Rm 310, 432.0672

www.yale.edu/medieval/

M.A., M.Phil., Ph.D.

Chair

Robert Nelson

Professors R. Howard Bloch, Gerhard Böwering, Carlos Eire, Margot Fassler, Roberta Frank, Paul Freedman, Harvey Goldblatt, Beatrice Gruendler, Dimitri Gutas, Valerie Hansen, Bentley Layton, Ivan Marcus, Dale Martin, John Matthews, Giuseppe Mazzotta, María Rosa Menocal, Alastair Minnis, Robert Nelson, Denys Turner, Anders Winroth

Associate Professor Jessica Brantley

Assistant Professors Ian Cornelius, Jay Fisher, Jacqueline Jung, Óscar Martín, Youval Rotman

Lecturers Adel Allouche, Annemarie Carr, Marcia Colish, Walter Goffart, Jaime Lara, Susanne Roberts, Yechiel Schur, Barbara Shailor, William Whobrey

Fields of Study

Fields in this interdisciplinary program include history, history of art, history of music, religious studies, languages and literatures, linguistics, and philosophy.

Special Admissions Requirements

The General Test of the GRE is required. A writing sample of ten to twenty pages should be included with the application.

Special Requirements for the Ph.D. Degree

Languages required are Latin, French, and German. Latin may be replaced with Arabic or Hebrew when appropriate. Proficiency in Latin, Arabic, and Hebrew is tested with an examination administered and evaluated by the department during the first term. Proficiency in French and German is demonstrated by passing the departmental examinations and should be achieved by the third term. Students will design their programs in close contact with the director of graduate studies. During the first two years students take fourteen term courses, and must receive an Honors grade in at least four term courses the first year. Students take an oral examination, usually in the fifth term, on a set of three topics worked out in consultation with the director of graduate studies. Then, having nurtured a topic of particular interest, the student submits a dissertation prospectus that must be approved by the end of the third year. Upon completion of all predissertation requirements, including the prospectus, students are admitted to candidacy for the Ph.D. degree. What remains, then, is the writing, submission, and approval of the dissertation during the final two years.

Students in Medieval Studies participate in the Teaching Fellows Program in the third and fourth years.

Master's Degrees

M.Phil. See Degree Requirements. In addition, the program offers an M.Phil. in Medieval Studies for students enrolled in the Ph.D. programs of relevant humanities departments. Requirements for this degree are (1) six courses in the medieval area from departments other than that in which the student is enrolled (two of these will normally be the Medieval Studies interdisciplinary seminar and either a course in research methodology [HIST 540 or NELC 850] or in Latin or Arabic Paleography); (2) proficiency in Latin, Arabic, or Hebrew as tested by an examination administered and evaluated by the department; and (3) an oral examination. These requirements are in addition to those in force in the student's home department. The M.Phil. in Medieval Studies thus requires a year of study in addition to the five years required by the student's home department. Fellowships that provide support for this extra year are available from the Graduate School; application forms may be obtained from the program in Medieval Studies.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program may qualify for the M.A. degree upon satisfactory completion of the first year. Minimum requirements include a High Pass average in courses and passing the Latin examination.

Terminal Master's Degree Program For this terminal master's degree students must take at least seven term courses with a general average of High Pass and with at least one term course of Honors. Two languages are required: Latin and either French or German. No thesis is required.

Courses

MDVL 550a or b, Directed Reading

By arrangement with faculty.

MDVL 554a/MUSI 831a, Chant and Liturgy in the Latin Middle Ages: Introduction to the Sources Margot Fassler

This interdisciplinary course is designed for scholars, performers, and liturgists. Focus is on manuscripts from the twelfth century, and from centers of major musical, liturgical, and exegetical importance: the Abbey of St. Victor in Paris; the liturgical use of Hirsau around Mainz; the Holy Sepulchre in Jerusalem; and liturgical change in the region and around Winchester from the early eleventh through the late twelfth century. Students should have graduate- or professional-level expertise in one of the following: music, liturgics, Latin, manuscript study, medieval history, biblical study, theology, or art history. TH 2:30–4:20

MDVL 556b/HSAR 583b, Empathy and Mimesis in Medieval Art Jacqueline Jung

At least since the publication of Erwin Panofsky's essay "Imago Pietatis" (1924), scholars have discerned in medieval art not only the capacity but also the intention to create emotional connections with viewers through a process of *Einführung*—a feeling-one's-way into a depicted scene. The issue of empathetic engagement has indeed become central to medieval art history over the last two decades, with the widespread embrace of reception theory in our discipline. Yet although practitioners of this strain of literary criticism have long recognized the impact a work's formal structure and rhetorical style have on a

reader's capacity to identify with and respond to characters, interpreters of medieval art, often immersed in narrow areas of specialization, tend to elide the range of empathetic possibilities images elicit, and to overlook, above all, the role that an image's relative resemblance to the visible world plays in sparking internal identification. Incorporating both literary texts (such as devotional treatises and saints' lives) and works of visual art in various media—from Byzantine icons to life-sized sculptures to public spectacles involving living bodies—and examining them through the lens of both medieval and modern theories of response, this exploratory seminar invites participants to find new ways to deepen and nuance our understanding of the relation between mimetic forms and empathetic attitudes. Art historians with specializations outside the Middle Ages as well as medievalists from other fields are welcome to join. Reading knowledge of German, French, and Latin is strongly encouraged but not required. TH 1:30–3:20

MICROBIOLOGY

Boyer Center for Molecular Medicine, 295 Congress Ave., BCMM 336B, 737-2404
info.med.yale.edu/micropath/index.html
 M.Phil., Ph.D.

Director of Graduate Studies

Craig Roy

Student Services Officer

Darlene Smith

Professors Serap Aksoy (*Epidemiology & Public Health*), Sidney Altman (*Molecular, Cellular & Developmental Biology*), Michael Cappello (*Pediatrics*), Yung-chi Cheng (*Pharmacology*), Daniel DiMaio (*Genetics*), Erol Fikrig (*Internal Medicine*), Durland Fish (*Epidemiology & Public Health*), Jorge Galán (*Microbial Pathogenesis*), Nigel Grindley (*Molecular Biophysics & Biochemistry*), Margaret Hostetter (*Pediatrics*), K. Brooks Low (*Therapeutic Radiology*), Diane McMahon-Pratt (*Epidemiology & Public Health*), I. George Miller (*Pediatrics*), John Rose (*Pathology*), Craig Roy (*Microbial Pathogenesis*), Nancy Ruddle (*Epidemiology & Public Health*), Clifford Slayman (*Cellular & Molecular Physiology*), Dieter Söll (*Molecular Biophysics & Biochemistry*), William Summers (*Therapeutic Radiology*), Joann Sweasy (*Therapeutic Radiology*), Peter Tattersall (*Laboratory Medicine*), Elisabetta Ullu (*Internal Medicine*)

Associate Professors Susan Baserga (*Therapeutic Radiology*), S. P. Dinesh-Kumar (*Molecular, Cellular & Developmental Biology*), Christine Jacobs-Wagner (*Molecular, Cellular & Developmental Biology*), Barbara Kazmierczak (*Internal Medicine*), Walther Mothes (*Microbial Pathogenesis*), Christian Tschudi (*Epidemiology & Public Health; Internal Medicine*), Paul Turner (*Ecology & Evolutionary Biology*), Richard Sutton (*Internal Medicine*), Sandra Wolin (*Cell Biology; Molecular Biophysics & Biochemistry*), Liangbiao Zheng (*Epidemiology & Public Health*)

Assistant Professors Hervé Agaisse (*Microbial Pathogenesis*), Akiko Iwasaki (*Epidemiology & Public Health*), Susan Kaech (*Immunobiology*), Priti Kumar (*Internal Medicine*), Brett Lindenbach (*Microbial Pathogenesis*), John MacMicking (*Microbial Pathogenesis*), Robert Means (*Pathology*), Melinda Pettigrew (*Epidemiology & Public Health*), Michael Robek (*Pathology*)

Fields of Study

The Graduate Program in Microbiology is a multidepartmental, interdisciplinary Ph.D. program in training and research in the study of microorganisms and their effects on their hosts. The faculty of the program share the view that understanding the biology of microorganisms requires a multidisciplinary approach; therefore, the Microbiology graduate program emphasizes the need for strong multidisciplinary training. The program is designed to provide individualized education in modern microbiology and to prepare students for independent careers in research and teaching. Students can specialize in various areas, including bacteriology, virology, microbe-host interactions, microbial pathogenesis, cell biology and immunobiology of microbial infections, microbial genetics and physiology, parasitology, and microbial ecology and evolution.

Special Admissions Requirements

To enter the Ph.D. program, students apply to the Microbiology track within the inter-departmental graduate program in the Biological and Biomedical Sciences. An undergraduate major in biology, biophysics, biochemistry, microbiology, or molecular biology is recommended; the GRE General Test or MCAT is required.

Special Requirements for the Ph.D. Degree

Course work generally occupies the first two years of study. Each student, together with a faculty committee, outlines a course of study tailored to the individual's background and career goals. A program of course work may include general microbiology, virology, parasitology, and/or microbial genetics, as well as complementary courses in such areas as epidemiology, cell biology, immunology, biochemistry, genetics, ecology, vector biology, and statistics. The program also sponsors journal clubs and seminars in microbiology and related areas. All students participate in three laboratory rotations (MBIO 670a and b), with different faculty members, in their area of interest. Laboratory rotations ensure that students quickly become familiar with the variety of research opportunities available in the program. An individualized qualifying exam on topics selected by each student, in consultation with the faculty, is given before the end of the second year. Students then undertake an original research project under the direct supervision of a faculty member. In the third year, students organize their thesis committee and prepare a dissertation prospectus, which is submitted to the Graduate School after approval by their committee. The student is then admitted to candidacy. Upon completion of the student's research project, the Ph.D. requirements conclude with the writing of a dissertation and its oral defense.

An important aspect of graduate training in microbiology is the acquisition of teaching skills through participation in courses appropriate for the student's scientific interests. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school levels. Ph.D. students are expected to participate in two terms (or the equivalent) of teaching. Students are not permitted to teach during their first year.

Master's Degree

M.Phil. See Degree Requirements. Although the program does not formally offer a master's degree, students who have been admitted to candidacy qualify for an M.Phil.

Program materials are available upon request from Darlene Smith in the Microbiology Graduate Program, Section of Microbial Pathogenesis, BCMM 336B, Yale University, New Haven CT 06536.

Courses

[MBIO 642a/EMD 642a/GENE 642a/MCDB 642a, Roles of Microorganisms in the Living World]

MBIO 670a,b, Laboratory Rotation Joann Sweasy

Rotation in three laboratories. Required for all first-year graduate students.

MBIO 680a/EMD 680a, Molecular and Cellular Processes of Parasitic Eukaryotes

Diane McMahon-Pratt, Christian Tschudi

An introductory graduate-level topic-based course in modern parasitology: for each topic there is an introductory lecture followed by a journal club-like discussion session of relevant papers selected from the literature. This course provides an introduction to basic biological concepts of parasitic eukaryotes causing diseases in humans. Topics include strategies used by parasitic eukaryotes to establish infections in the host and approaches to disease control, through either chemotherapy, vaccines, or genomics. In addition, emphasis is placed on evaluating the quality and limitation of scientific publications and developing skills in scientific communication. Permission of instructor is required.

MBIO 684b/EMD 684b, Advanced Topics in Molecular Parasitology

Diane McMahon-Pratt, Christian Tschudi

An advanced graduate-level seminar course in modern parasitology. The class is focused on the reading and critical evaluation of papers from the current literature selected by the students in cellular and molecular mechanisms of parasitism. Prerequisites: EMD 680a is highly recommended; permission of the instructor. F 12–1:30

MBIO 685a, Molecular Mechanisms of Microbial Pathogenesis Jorge Galán,

Craig Roy, Walther Mothes, John MacMicking, Hervé Agaisse, Brett Lindenbach

The course focuses on current topics related to host-pathogen interactions. Each week a lecture is given on the topic, followed by student presentations of seminal papers in the field. All participants are required to present a paper. TF 10–11:30

[MBIO 700a, Seminal Papers on the Foundations of Modern Microbiology]**MBIO 701a,b, Research in Progress** Craig Roy

All students, beginning in their third year, are required to present their research once a year at the Graduate Student Research in Progress, held on Mondays at 2 p.m. These presentations are intended to give each student practice in presenting his or her own work before a sympathetic but critical audience and to familiarize the faculty with the research. M 2

MBIO 702a,b, Microbiology Seminar Series Craig Roy

All students are required to attend all Microbiology seminars scheduled throughout the academic year. Microbiologists from around the world are invited to describe their research. TH 4

[MBIO 703b, Evasion of Host Defenses by Viruses, Bacteria, and Eukaryotic Parasites]**[MBIO 734a/MB&B 734a/GENE 734a, Molecular Biology of Animal Viruses]**

MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

301 Josiah Willard Gibbs Laboratories, 432.5662

www.mbb.yale.edu/

M.S., M.Phil., Ph.D.

Chair

Patrick Sung

Director of Graduate Studies

Mark Solomon (301 JWG, 432.5662, nessie.stewart@yale.edu)

Professors Susan Baserga, Ronald Breaker (*Molecular, Cellular & Developmental Biology*), Gary Brudvig (*Chemistry*), Donald Crothers (*Emeritus, Chemistry*), Daniel DiMaio (*Genetics; Therapeutic Radiology*), Donald Engelman, Alan Garen, Mark Gerstein, Nigel Grindley, Mark Hochstrasser, William Konigsberg, Peter Lengyel (*Emeritus*), J. Patrick Loria (*Chemistry*), I. George Miller (*Pediatric Infectious Diseases; Epidemiology & Public Health*), Peter Moore (*Chemistry*), Thomas Pollard (*Molecular, Cellular & Developmental Biology*), Anna Pyle, Lynne Regan, David Schatz (*Immunobiology*), Robert Shulman (*Emeritus*), Dieter Söll, Mark Solomon, Joan Steitz, Thomas Steitz, Scott Strobel, William Summers (*Therapeutic Radiology*), Patrick Sung, Kenneth Williams (*Adjunct; Research*), Sandra Wolin (*Cell Biology*)

Associate Professors Enrique De La Cruz, Michael Koelle, Anthony Koleske, Andrew Miranker, Vinzenz Unger

Assistant Professors Thomas Biederer, Yorgo Modis, Elizabeth Rhoades, Christian Schlieker, Hongwei Wang, Yong Xiong

Fields of Study

The principal objective of members of the department is to understand living systems at the molecular level. Laboratories in MB&B focus on a diverse collection of problems in biology. Some specialize in the study of DNA dynamics, including replication, recombination, transposition, and/or functional genomics. Others focus on transcriptional regulation, from individual transcription factors to the control of lymphocyte activation, the interferon response, and organismal development. Other groups study RNA catalysis, RNA-protein interactions, and ribonucleoproteins including spliceosomes and the ribosome. Additionally there are those that emphasize protein folding and design, transmembrane signaling, and control of the cell cycle. Structural and computational biology is a strong component of many of these research efforts.

Special Admissions Requirements

Courses in introductory biology, general chemistry, organic chemistry, physical chemistry, mathematics through differential equations, and one year of physics with calculus are required for admission. Biochemistry is strongly recommended. Applicants must take the GRE General Test, which is preferred, or the MCAT.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences.

Special Requirements for the Ph.D. Degree

All first-year students (except M.D./Ph.D.) perform three laboratory rotations (MB&B 650, Lab Rotation for First-Year Students). All students are required to take, for credit, seven one-term science courses. To obtain the desired breadth and depth of education, students are strongly encouraged to take (or to have taken the equivalent of) the core graduate courses offered by the department in biochemistry, molecular genetics, and structural biology (MB&B 705a, 720a, 721b, 730a, 743b). Additional courses, chosen from within MB&B or from related graduate programs, should form a coherent background for the general area in which the student expects to do dissertation research. All students also attend MB&B 676b, Responsible Conduct of Research. Students with an extensive background in biochemistry or biophysics are permitted to substitute advanced courses for the introductory courses. There is no foreign language requirement. The student's research committee (see below) makes the final decision concerning the number and selection of courses required of each student. All students are required to assist in teaching two terms as a TF-2 during their graduate careers, usually during the second and third years. The student selects a research adviser by the end of the second term of residence. At that time two additional faculty members are chosen to form a research committee, with the total committee including at least two members of MB&B. Students are required to meet with this committee in the spring of years two and three, and in both the fall and spring of subsequent years. The qualifying examination, usually taken in the fall of the second year, is an oral defense of two short written research proposals, one in the same area as the student's thesis research and one in a different area; the three-member oral examination committee usually includes at least one of the two members of the research committee excluding the thesis adviser. Requirements for admission to candidacy, which usually takes place after four terms of residence, include (1) completion of course requirements; (2) completion of the qualifying examination; (3) certification of the student's research abilities by vote of the faculty upon recommendation from the student's research committee; and (4) submission of a brief prospectus of the proposed thesis research. Completion of the teaching requirement is not required for admission to candidacy. Once final drafts of the thesis chapters have been approved by the research committee, the student presents a dissertation seminar to the entire department, and only afterward may the thesis be submitted. Students must have written at least one first-author paper that is submitted, in press, or published by the time of the thesis seminar.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study; see Degree Requirements. Students must also maintain an overall High Pass average. Student progress toward these goals is reviewed at the ends of the first and second terms.

M.D./Ph.D. Students

M.D./Ph.D. students must satisfy the requirements listed above for the Ph.D. with the following modifications: Laboratory rotations are not required but are available. Assisting in teaching of one lecture course is required. With DGS approval, some courses taken toward the M.D. degree can be counted toward the seven courses required for the

Ph.D. provided that the course carries a graduate course number, and that the student has registered for it as a graduate course. M.D./Ph.D. students should still take MB&B 720a, 721b, 730a, and 743b.

Master's Degree

M.Phil. See Degree Requirements. Awarded only to students admitted to candidacy who are continuing for the Ph.D. Students need not have completed their teaching requirement to receive the M.Phil. Students are not admitted for this degree.

M.S. May be awarded to a student who is in good standing upon completion of at least two terms of graduate study and who will not continue in the Ph.D. program. A student must receive grades of Pass or higher in at least five courses approved by the DGS as counting toward a graduate degree, exclusive of seminars or research. A student must also meet the Graduate School's Honors requirement for the Ph.D. program and maintain a High Pass average.

M.S. (for industrial affiliates) Scientists working in industry may attend courses and conduct research projects leading to the M.S. degree. Information may be obtained from the director of graduate studies.

More detailed program materials are available upon request to the Director of Graduate Admissions, Department of Molecular Biophysics and Biochemistry, Yale University, PO Box 208114, New Haven CT 06520-8114.

Courses

MB&B 500a^U/MCDB 500a^U, Biochemistry L. Nicholas Ornston, Ronald Breaker, Donald Engelman

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. MWF 9:25–10:15

MB&B 517a2/ENAS 517a/PHYS 517a2, Methods and Logic in Interdisciplinary

Research Eric Dufresne, Enrique de la Cruz, Thierry Emonet, Paul Forscher, Christine Jacobs-Wagner, Michael Levene, Simon Mochrie, Corey O'Hern, Lynne Regan, Elizabeth Rhoades, Corey Wilson

This half-term IGPPEB class is intended to introduce students to integrated approaches to research. Each session is led by faculty with complementary expertise and discusses papers that use different approaches to the same topic (for example, physical and biological or experiment and theory). Counts as 0.5 credit toward MB&B graduate course requirements. TH 7–8:50

MB&B 520a1, Boot Camp Biology Lynne Regan, Mark Hochstrasser, Anthony Koleske, Thomas Pollard

An intensive introduction to biological nomenclature, systems, processes, and techniques for graduate students with previous backgrounds in non-biological fields including physics, engineering, and computer science who wish to perform graduate research in the biological sciences. Counts as 0.5 credit toward MB&B graduate course requirements.

HTBA

MB&B 523a/ENAS 541a/PHYS 523a, Biological Physics Simon Mochrie

An introduction to the physics of several important biological phenomena, including molecular motors, protein folding, bacterial locomotion, and allostery. The material and approach are positioned at the interface of the physical and biological sciences. TTH 2:30–3:45

MB&B 545b^U, Methods and Logic in Molecular Biology Anthony Koleske,

Nigel Grindley, Mark Hochstrasser, Dieter Söll

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. Open only to MB&B students pursuing the B.S./M.S. degree. TH 7–8:50

MB&B 591b/ENAS 991b/PHYS 991b, Integrated Workshop Corey Wilson

This required course for students in IGPPEB involves hands-on laboratory modules with students working in pairs. A biology student is paired with a physics or engineering student; a computation/theory student is paired with an experimental student. The modules are devised so that a range of skills are acquired, and students learn from each other.

MB&B 600a^U, Principles of Biochemistry I Michael Koelle, Thomas Biederer

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. TTH 11:35–12:50

MB&B 601b^U, Principles of Biochemistry II Scott Strobel, Patrick Sung

A continuation of MB&B 600a 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. TTH 11:35–12:50

MB&B 602a/CBIO 602a/MCDB 602a, Molecular Cell Biology Sandra Wolin,

Craig Crews, Thomas Pollard, and faculty

A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. MW 1:45–3

MB&B 625a^U/GENE 625a/MCDB 625a^U, Basic Concepts of Genetic Analysis

Tian Xu, Antonio Giraldez, Tae-Hoon Kim, Michael Koelle, Richard Lifton, Shirleen Roeder

The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. MW 11:35–12:50

MB&B 630b/MCDB 630b, Biochemical and Biophysical Approaches in Molecular and Cellular Biology Thomas Pollard, Enrique De La Cruz, and staff

This graduate course introduces the theory and application of biochemical and biophysical methods to study the structure and function of biological macromolecules. The

course considers the basic physical chemistry required in cellular and molecular biology but does not require a previous course in physical chemistry. One class per week is a lecture introducing a topic. The second class is a discussion of one or two research papers utilizing those methods. Does not count for graduate course credit for MB&B graduate students. TTH 2:30–3:45

MB&B 635a^U/ENAS 518a, Mathematical Methods in Biophysics Elizabeth Rhoades, Corey O'Hern, Yong Xiong

Applied mathematical methods relevant to analysis and interpretation of biophysical and biochemical data are covered. Students apply these methods (statistics and error analysis, differential equations, linear algebra, and Fourier transforms) to analyze data from research groups in MB&B. Prerequisites: MATH 120 (or equivalent) and MB&B 600a (or equivalent) or permission of instructors. MWF 10:30–11:20

MB&B 650, Lab Rotation for First-Year Students Mark Solomon

Required for all first-year MB&B graduate students. Credit for full year only.

MB&B 676b, Responsible Conduct of Research Thomas Biederer and staff

Designed for students who are beginning to do scientific research. The course seeks to describe some of the basic features of life in contemporary research and some of the personal and professional issues that researchers encounter in their work. Approximately six sessions, run in a seminar/discussion format. Required for all first-year MB&B graduate students. F 3

MB&B 705a^U/GENE 705a/MCDB 505a, Molecular Genetics of Prokaryotes

Nigel Grindley

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. Prerequisites: previous or concurrent introductory courses in genetics and biochemistry. MW 11:35–12:50

MB&B 710b4/C&MP 710b, Electron Cryo-Microscopy for Protein Structure

Determination Fred Sigworth, Hongwei Wang

Understanding cellular function requires structural and biochemical studies at an ever-increasing level of complexity. The course is an introduction to the concepts and applications of high-resolution electron cryo-microscopy. This rapidly emerging new technique is the only method that allows biological macromolecules to be studied at all levels of resolution from cellular organization to near atomic detail. Counts as 0.5 credit toward MB&B graduate course requirements. TTH 9–10:15

MB&B 720a^U, Macromolecular Structure and Biophysical Analysis

Andrew Miranker, Anna Pyle, Yong Xiong

An in-depth analysis of macromolecular structure 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: physical chemistry (may be taken concurrently) and biochemistry. TTH 11:35–12:50

MB&B 721b^U, Macromolecular Interactions and Dynamic Properties Anna Pyle,

Donald Engelman, Elizabeth Rhoades, Hongwei Wang

This course examines dynamic properties of macromolecules, their interactions, catalytic activities, and methods for analyzing their behavior. Topics include macromolecular folding, binding interfaces, ligand interactions, and the properties of membrane proteins, enzymes, ribozymes, and molecular motors. These areas are presented together with modern methods for analysis of macromolecular associations and dynamic properties. Prerequisites: biochemistry, physical chemistry, and MB&B 720a or permission of the instructor. MW 11:35–12:50

MB&B 730a, Methods and Logic in Molecular Biology Mark Solomon,

Anthony Koleske, Lynne Regan

This course examines fundamental concepts in molecular biology through intense critical analysis of the primary literature. The objective is to develop primary literature reading and critical thinking skills. Required of and open only to first-year graduate students in MB&B. TTH 5–8

[MB&B 734a/MBIO 734a/GENE 734a, Molecular Biology of Animal Viruses]**MB&B 743b^U/GENE 743b/MCDB 743b, Advanced Eukaryotic Molecular Biology**

Mark Hochstrasser, Anthony Koleske, Patrick Sung

Selected topics in transcriptional control, regulation of chromatin structure, mRNA processing, mRNA stability, RNA interference, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, somatic hypermutation. Prerequisite: biochemistry or permission of the instructor. TTH 11:35–12:50

MB&B 749a^U/GENE 749a, Medical Impact of Basic Science Joan Steitz,

Mark Hochstrasser, Lynne Regan, David Schatz, and staff

Consideration of examples of recent discoveries in basic science that have elucidated the molecular origins of disease or that have suggested new therapies for disease. Emphasis is placed on the fundamental principles on which these advances rely. Reading is from the primary scientific and medical literature, with emphasis on developing the ability to read this literature critically. Aimed primarily at undergraduates. Prerequisite: biochemistry or permission of the instructor. May not be taken by MB&B B.S./MS. students for graduate course credit. MW 1–2:15

MB&B 750a2, Biological Membranes Thomas Biederer, Donald Engelman

Biological membranes and their resident proteins are essential for cellular function; yet comparatively little is known about their structure and dynamics. This class provides an introduction to the biochemistry and biophysics of lipids, lipid bilayers, and lipid-derived second messengers. In addition, structural as well as functional aspects of the different classes of membrane proteins are discussed along with an outline of experimental approaches used to achieve an understanding of membrane protein structure and function at a molecular level. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisite: biochemistry. MW 9–10:15

MB&B 752b^U/CB&B 752b/CPSC 752b^U/MCDB 752b^U, Bioinformatics: Practical**Application of Simulation and Data Mining** Mark Gerstein

Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine learning approaches for data integration. Prerequisites: MB&B 301b and MATH 115a or b, or permission of the instructor. MW 1–2:15

MB&B 760b3, Principles of Macromolecular Crystallography Yorgo Modis, Yong Xiong, and staff

Rigorous introduction to the principles of macromolecular crystallography, aimed at students who are planning to carry out structural studies involving X-ray crystallography or who want to obtain in-depth knowledge for critical analysis of published crystal structures. Counts as 0.5 credit toward MB&B graduate course requirements. Prerequisites: physical chemistry and biochemistry. TTH 9–10:15

[MB&B 761b4, X-ray Crystallography Workshop]**[MB&B 765b^U, Enzyme Mechanisms]****MB&B 800a, Advanced Topics in Molecular Medicine** Susan Baserga, William Konigsberg, and staff

This seminar, which covers topics in the molecular mechanisms of disease, illustrates timely issues in areas such as protein chemistry and enzymology, intermediary metabolism, nucleic acid biochemistry, gene expression, and virology. M.D. and M.D./Ph.D. students only. Prerequisite: biochemistry (may be taken concurrently). M 11–1

MB&B 900a or 901b, Reading Course in Biophysics Mark Solomon

Directed reading course in biophysics. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B.

MB&B 902a or 903b, Reading Course in Molecular Genetics Mark Solomon

Directed reading course in molecular genetics. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B.

MB&B 904a or 905b, Reading Course in Biochemistry Mark Solomon

Directed reading course in biochemistry. Term paper required. By arrangement with faculty. Open only to graduate students in MB&B.

The following course is for students in the joint B.S./M.S. program with Yale College:

MB&B 570a or MB&B 571b, Intensive Research for B.S./M.S. Candidates

Michael Koelle, Mark Solomon

MOLECULAR, CELLULAR, AND DEVELOPMENTAL BIOLOGY

Kline Biology Tower, 432.3538
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 M.S., Ph.D.

Chair

Thomas Pollard

Director of Graduate Studies

Frank Slack (936 KBT, 432.3492, frank.slack@yale.edu)

Professors Sidney Altman, Ronald Breaker, John Carlson, Lynn Cooley (*Genetics*), Craig Crews, Stephen Dellaporta, Xing-Wang Deng, Paul Forscher, Mark Hochstrasser (*Molecular Biophysics & Biochemistry*), Vivian Irish, Douglas Kankel, Michael Kashgarian (*Pathology*), Haig Keshishian, Perry Miller (*Anesthesiology*), Mark Mooseker, Jon Morrow (*Pathology*), Timothy Nelson, L. Nicholas Ornston, Thomas Pollard, Shirleen Roeder, Joel Rosenbaum, Alanna Schepartz (*Chemistry*), Hugh Taylor (*Obstetrics/Gynecology*), Robert Wyman

Associate Professors Scott Holley, Christine Jacobs-Wagner, Frank Slack, Elke Stein, David Wells, Weimin Zhong

Assistant Professors Thierry Emonet, Martín García-Castro, Valerie Horsley

Fields of Study

Research in genetics and molecular biology encompasses studies of catalytic RNAs, cell cycle regulation, chromosome segregation, genetic recombination, mutation, transposons, and oncogenes. Research topics in cellular and developmental biology include structure of the cell cytoskeleton, molecular motors, chemical biology, cell surface receptors, protein transport, hormone action, mammalian transcription factors, microRNAs, and the regulation of cell proliferation and differentiation. Research in neurobiology focuses on sensory signal transduction, animal color vision, growth cone motility, neural differentiation, synaptogenesis, and the formation of topographic maps. A Special Program in Plant Sciences provides research and training in the molecular genetics of flowering, the developmental biology of leaves, the physiology of hormone action, sex determination, and the cellular and molecular biology of photomorphogenesis. Because of the breadth of the department, students are provided with unique opportunities for interdisciplinary studies.

To enter the Ph.D. program, students apply to the Molecular Cell Biology, Genetics, and Development (MCGD) track within the interdepartmental graduate program in the Biological and Biomedical Sciences (BBS).

Special Admissions Requirements

Applicants should have obtained training in the structure, development, and physiology of organisms; the structure, biochemistry, and physiology of cells; genetics; elementary

calculus; elementary physics; inorganic and organic chemistry; statistics or advanced mathematics. Lack of some prerequisites can be made up in the first year of graduate study. Students having different science training, such as degrees in chemistry, physics, or engineering, are encouraged to apply. In addition to the GRE General test, a Subject Test is recommended, preferably in Biology, or in Biochemistry, Cell and Molecular Biology.

Special Requirements for the Ph.D. Degree

Each student is expected to take at least three courses, in addition to MCDB 900/901 (First-Year Introduction to Research). With the help of a faculty committee, each student will plan a specific program that includes appropriate courses, seminars, laboratory rotations, and independent reading fitted to individual needs and career goals. There is no foreign language requirement. Late in the third term of study, the student meets with a faculty committee to decide on a preliminary topic for dissertation work and to define the research areas in which he or she is expected to demonstrate competence. By the end of the second year, each student prepares a dissertation prospectus outlining the research proposed for the Ph.D. The student is admitted to candidacy for the Ph.D. when (1) the prospectus is accepted by a dissertation committee of faculty members, (2) the committee is satisfied that the student has demonstrated competence in the areas necessary to conduct the proposed work, and (3) the other requirements indicated above are fulfilled. The student should complete the requirements for admission to candidacy no later than the end of the second year of study. Following admission to candidacy, each student is required to meet with his/her thesis advisory committee at least once a year. The remaining requirements include completion of the dissertation research, presentation and defense of the dissertation, and submission of acceptable copies of the dissertation to the Graduate School and to the Kline Science Library. All students are required to teach in two one-term courses during their Ph.D. study, but not during the first year of graduate study. Requirements for M.D./Ph.D. students are the same as for Ph.D. students, except that a single term of teaching is required.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see Course and Honors Requirements under Policies and Regulations).

Master's Degree

M.S. (en route to the Ph.D.) The minimum requirements for award of the Master of Science Degree are (1) two academic years registered and in residence full time in the graduate program; (2) satisfactory completion of the first two years of study and research leading to the Ph.D.; this requirement may be met either (a) by completing a minimum of five courses with an average grade of High Pass and at least one Honors grade, in addition to satisfactory performance in MCDB 900/901, or (b) by (i) successfully completing at least three courses with an average grade of High Pass and at least one Honors grade, (ii) satisfactory performance in MCDB 900/901, and (iii) passing the prospectus examination; (3) recommendation by the department for award of the degree, subject

to final review and approval by the appropriate degree committee. No courses that were taken prior to matriculation in the graduate program, or in Yale College, or in summer programs may be applied toward these requirements.

Prospective applicants are encouraged to visit the BBS Web site (info.med.yale.edu/bbs), MCGD Track.

Courses

MCDB 500a^U/MB&B 500a^U, Biochemistry L. Nicholas Ornston, Ronald Breaker, Donald Engelman

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. MWF 9:25–10:15

MCDB 505a/GENE 705a/MB&B 705a^U, Molecular Genetics of Prokaryotes

Nigel Grindley

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. MW 11:35–12:50

MCDB 530a^U/IBIO 530a, Biology of the Immune System Akiko Iwasaki and staff

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens. Human diseases including allergy, autoimmunity, immunodeficiency, HIV/AIDS. MWF 9:25–10:15

MCDB 550a^U/C&MP 550a^U/ENAS 550a^U, Physiological Systems Emile Boulpaep, W. Mark Saltzman

The course develops a foundation in human physiology by examining the homeostasis of vital parameters within the body, and the biophysical properties of cells, tissues, and organs. Basic concepts in cell and membrane physiology are synthesized through exploring the function of skeletal, smooth, and cardiac muscle. The physical basis of blood flow, mechanisms of vascular exchange, cardiac performance, and regulation of overall circulatory function are discussed. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology examines the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are discussed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The biology of nerve cells is addressed with emphasis on synaptic transmission and simple neuronal circuits within the central nervous system. The special senses are considered in the framework of sensory transduction. Weekly discussion sections provide a forum for in-depth exploration of topics. Graduate students evaluate research findings through literature review and weekly meetings with the instructor. MWF 9:25–10:15

[MCDB 551a^U, Experimental Strategies in Molecular Cell Biology]

[MCDB 555a^U, Molecular Basis of Development]

MCDB 560b^U/C&MP 560b^U/ENAS 570b^U, Cellular and Molecular Physiology:**Molecular Machines in Human Disease** Emile Boulpaep, Fred Sigworth

This course focuses on understanding the processes that transfer molecules across membranes at the cellular, molecular, biophysical, and physiologic levels. Students learn about the different classes of molecular machines that mediate membrane transport, generate electrical currents, or perform mechanical displacement. Emphasis is placed on the relationship between the molecular structures of membrane proteins and their individual functions. The interactions among transport proteins in determining the physiologic behaviors of cells and tissues are also stressed. Molecular motors are introduced and their mechanical relationship to cell function is explored. Students read papers from the scientific literature that establish the connections between mutations in genes encoding membrane proteins and a wide variety of human genetic diseases. MWF 9:25–10:15

[MCDB 561b^U, Systems Modeling in Biology]**MCDB 570b^U, Biotechnology** Kenneth Nelson, Joseph Wolenski, Ronald Breaker, Xing-Wang Deng

The principles and applications of cellular, molecular, and chemical techniques that advance biotechnology. Topics include the most recent tools and strategies used by government agencies, industrial labs, and academic research to adapt biological and chemical compounds as medical treatments, as industrial agents, or for the further study of biological systems. MW 11:35–12:50

MCDB 602a/CBIO 602a/MB&B 602a, Molecular Cell Biology Sandra Wolin, Thomas Pollard, Craig Crews, and faculty

A comprehensive introduction to the molecular and mechanistic aspects of cell biology for graduate students in all programs. Emphasizes fundamental issues of cellular organization, regulation, biogenesis, and function at the molecular level. MW 1:45–3

MCDB 603a/CBIO 603a, Seminar in Molecular Cell Biology Sandra Wolin, Thomas Pollard, Craig Crews, and faculty

A graduate-level seminar course in modern cell biology. The class is devoted to the reading and critical evaluation of classical and current papers. The topics are coordinated with the MCDB 602a lecture schedule. Thus, concurrent or previous enrollment in MCDB 602a is required. TH 9–11

MCDB 625a^U/GENE 625a/MB&B 625a^U, Basic Concepts of Genetic Analysis

Tian Xu, Antonio Giraldez, Tae-Hoon Kim, Michael Koelle, Richard Lifton, Shirleen Roeder

The universal principles of genetic analysis in eukaryotes are discussed in lectures. Students also read a small selection of primary papers illustrating the very best of genetic analysis and dissect them in detail in the discussion sections. While other Yale graduate molecular genetics courses emphasize molecular biology, this course focuses on the concepts and logic underlying modern genetic analysis. MW 11:35–12:50

MCDB 630b/MB&B 630b, Biochemical and Biophysical Approaches in Molecular and Cellular Biology Thomas Pollard and staff

This graduate course introduces the theory and application of biochemical and biophysical methods to study the structure and function of biological macromolecules. The course

considers the basic physical chemistry required in cellular and molecular biology but does not require a previous course in physical chemistry. One class per week is a lecture introducing a topic. The second class is a discussion of one or two research papers utilizing those methods. TTH 2:30–3:45

[MCDB 642a/EMD 642a/GENE 642a/MBIO 642a, Roles of Microorganisms in the Living World]

MCDB 660a, Structure, Function, and Development of Vascular Plants

Graeme Berlyn

Morphogenesis and adaptation of vascular plants considered from seed formation and germination to maturity. Physiological and developmental processes associated with structural changes in response to environment discussed from both a phylogenetic and an adaptive point of view. MW 4–5:20

MCDB 670b, Advanced Seminar in Biochemistry and Genetics Sidney Altman,

Ronald Breaker, Stephen Dellaporta, Frank Slack

New aspects of the molecular biology of RNA, ribonucleoproteins, and prions. Topics include the localization and function of RNA and ribonucleoproteins; the role of RNA in dosage compensation, chromosome silencing, and gene regulation; novel ribozymes and RNA technology; prions. Discussion; involvement and attendance are required. TTH 2:30–3:45

MCDB 675b^U, Advances in Plant Molecular Biology Vivian Irish

Discussion and critical new aspects of the molecular biology of RNA, ribonucleoproteins, and prions. Topics include the localization and function evaluation of selected research papers emphasizing recent advances in plant molecular biology. Topics to be covered include molecular genetic approaches to dissecting signaling events, pattern formation, epigenetic control of plant growth and plant biotechnology, focusing on higher plants and model plant systems. M 7–8:50

MCDB 677b/GENE 777b, Mechanisms of Development Valerie Reinke and faculty

An advanced course on the mechanisms of animal development focusing on the genetic specification of cell organization and identity during embryogenesis and somatic differentiation. The use of evolutionarily conserved signaling pathways to carry out developmental decisions in a range of animals is highlighted. Course work includes student presentations, critical analysis of primary literature, and a research proposal term paper. M 9–10:15, F 2:30–3:45

MCDB 720a^U/NBIO 720a/NSCI 720a, Neurobiology Haig Keshishian, Paul Forscher

Examination of 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. MWF 11:35–12:25

MCDB 721La^U, Laboratory for Neurobiology Haig Keshishian, Robert Wyman

Optional laboratory. Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy. T or W 1:30–6

MCDB 730b^U, Cell Biology of the Neuron Elke Stein and staff

A comprehensive introduction to neuronal cell biology. Basic principles of cell biology reviewed in the context of the developing nervous system. Membrane trafficking, receptor mechanisms, neurotrophin signaling, neuronal cytoskeleton, axon guidance, and synapse formation and maintenance are discussed. Prerequisite: one course in cell biology. HTBA

MCDB 735b/NSCI 504b, Seminar in Brain Development and Plasticity

Weimin Zhong, Elke Stein

Weekly seminars and discussion sessions to explore recent advances in our understanding of brain development and plasticity, including neuronal determination, axon guidance, synaptogenesis, and developmental plasticity. MW 2:30–3:45

MCDB 743b/GENE 743b/MB&B 743b^U, Advanced Eukaryotic Molecular Biology

Mark Hochstrasser, Anthony Koleske, Patrick Sung

Selected topics in transcriptional control, regulation of chromatin structure, mRNA processing, mRNA stability, RNA interference, translation, protein degradation, DNA replication, DNA repair, site-specific DNA recombination, somatic hypermutation. Prerequisite: biochemistry or permission of the instructor. TTH 11:35–12:50

MCDB 750a/CB&B 750a, Core Topics in Biomedical Informatics Perry Miller and staff

Introduction to common unifying themes that serve as the foundation for different areas of biomedical informatics, including clinical, neuro-, and genome informatics. The course is designed for students with significant computer experience and course work who plan to build computational tools for use in bioscience research. Emphasis is on understanding basic principles underlying informatics approaches to biomedical data modeling, interoperability among biomedical databases and software tools, standardized biomedical vocabularies and ontologies, modeling of biological systems, and other topics of interest. The course involves lectures, class discussions, student presentations, and computer programming assignments. Prerequisites: previous computer programming experience and permission of the instructor. HTBA

MCDB 752b^U/CB&B 752b/CPSC 752b^U/MB&B 752b^U, Bioinformatics: Practical

Application of Simulation and Data Mining Mark Gerstein

Bioinformatics encompasses the analysis of gene sequences, macromolecular structures, and functional genomics data on a large scale. It represents a major practical application for modern techniques in data mining and simulation. Specific topics to be covered include sequence alignment, large-scale processing, next-generation sequencing data, comparative genomics, phylogenetics, biological database design, geometric analysis of protein structure, molecular-dynamics simulation, biological networks, normalization of microarray data, mining of functional genomics data sets, and machine learning approaches for data integration. Prerequisites: MB&B 301b and MATH 115a or b, or permission of the instructor. MW 1–2:15

MCDB 861b^u, Global Problems of Population Growth Robert Wyman,

Fabian Drixler

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. TTH 2:30–3:45

MCDB 900a/CBIO 900a/GENE 900a, First-Year Introduction to Research

Frank Slack and faculty

Lab rotations, grant writing, and ethics for Molecular Cell Biology, Genetics, and Development track students.

MCDB 901b/CBIO 901b/GENE 901b, First-Year Introduction to Research

Karin Reinisch, Matthew State

Lab rotations and ethics for Molecular Cell Biology, Genetics, and Development track students. TH 4:15–5:15

MCDB 950a and 951b, Second-Year Research

By arrangement with faculty.

The following courses are required for students in the joint B.S./M.S. program with Yale College:

MCDB 585b, Research in MCDB for B.S./M.S. Candidates

A two-credit course taken in the third-to-last term (typically the second term of the junior year). At the start of this course, each student forms a committee composed of his or her adviser and two faculty members that meets to discuss the research project. At the end of this course, students complete a detailed prospectus describing their thesis project and the work completed thus far. The committee evaluates an oral and written presentation of this prospectus; the evaluation determines whether the student may continue in the combined program.

MCDB 595, Intensive Research in MCDB for B.S./M.S. Candidates

A four-credit, yearlong course (two credits each term) that is similar to MCDB 495 and is taken during the senior year. During this course, students give an oral presentation describing their work. At the end of the course, a 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 other requirements, the student is awarded the combined B.S./M.S. degree.

MUSIC

469 College, 432.2985
www.yale.edu/yalemus/
 M.A., M.Phil., Ph.D.

Chair

Daniel Harrison

Director of Graduate Studies

James Hepokoski (469 College, 432.2985, dgs.music@yale.edu)

Professors Richard Cohn (*on leave* [Sp]), Margot Fassler [F], Michael Friedmann (*Adjunct*), Daniel Harrison, James Hepokoski, Richard Lalli (*Adjunct*), Patrick McCreless, Ellen Rosand, Michael Veal (*on leave* [F]), Craig Wright (*on leave* [Sp])

Associate Professors Kathryn Alexander (*Adjunct*), David Cohen (*Visiting* [F]), Ian Quinn, Sarah Weiss

Assistant Professors Seth Brodsky, Brian Kane, Michael Klingbeil (*Adjunct*), Gundula Kreuzer, Ève Poudrier

Fields of Study

Fields include music theory and music history. (Students interested in performance or composition should apply to the Yale School of Music.)

Special Admissions Requirements

Previous training in music theory or music history is required. Samples of the applicant's previous work such as extended papers, advanced exercises, and analyses must be submitted. The GRE General Test is required by the Graduate School. Applicants whose native language is not English must take the Test of English as a Foreign Language (TOEFL).

Special Requirements for the Ph.D. Degree

Two years of course work, comprising a minimum of fourteen courses. Eleven are graduate seminars within the Department of Music; one is Readings for Qualifying Examination, normally taken during the final term of course work. With DGS approval, the remaining two may be graduate seminars, or non-introductory undergraduate courses, in other departments or schools within the University. A student must receive four Honors grades in departmental seminars in order to proceed to the qualifying examination, administered at the beginning of the third year. Reading proficiency in two languages — German and either French or Italian — is demonstrated by examinations (with dictionary access) offered at the beginning of each term. Third-year students attend a weekly prospectus/dissertation seminar. Approval of the dissertation prospectus admits a student to candidacy, provided that all other requirements are met. Only students admitted to candidacy can continue into the fourth year of study.

The faculty considers teaching to be essential to the professional preparation of graduate students in Music. Students in Music participate in the Teaching Fellows Program in their third and fourth years.

Combined Ph.D. Program: Music and Renaissance Studies

The Department of Music offers, in conjunction with the Renaissance Studies program, a combined Ph.D. in Music and Renaissance Studies. For further details, see Renaissance Studies.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.A. (en route to the Ph.D.) Students enrolled in the Ph.D. program qualify for the M.A. degree upon the successful completion of eight courses, at least six of which are seminars given in the department, along with the passing of an examination in one foreign language. Of the six departmental seminars, at least two grades must be Honors; the remaining six grades must average High Pass.

Terminal Master's Degree Program The department offers admission to a small number of students in a terminal M.A. program. Candidates must pass eight term courses achieving an average of High Pass and at least one Honors, complete a special project, and pass an examination in one foreign language.

Courses

MUSI 535b^U, Reich and Glass: From Minimalism to Mainstream Ian Quinn

This course sketches the history of musical minimalism as it developed from an avant-garde "resistance" movement to a position of aesthetic dominance. This history is exemplified by a comparative study of its two central figures, Steve Reich and Philip Glass (both b. 1936), paying special attention to the development of their individual styles and to their shifting positions in musical culture. In-depth analytical studies of the music are complemented by engagements with primary and secondary source readings.

M 1:30–3:20

MUSI 541a^U, Handel in Italy Ellen Rosand

Handel's Italian works approached from the perspectives of biography, patronage, compositional process, and performance practice. W 9:25–11:15

MUSI 549a^U, Schenkerian Analysis Ève Poudrier

Voice-leading structures in tonal music. A practical investigation of concepts and tools applied to works from the Western classical canon, from small-scale structures to entire pieces or movements. Further applications to non-canonical repertoires such as early music and popular music; the interaction of analysis, listening, and performance.

T 1:30–3:20

MUSI 586a^U, The Art of Notation Juraj Kos

Analysis of historical notational systems, including ancient, medieval, common practice period, and twentieth-century graphic notations. Students develop unique systems

for representing music using analog and digital technologies. Not for graduate seminar credit in music. W 9:25–11:15

MUSI 612a/b, Practicum in Composition Kathryn Alexander

Project-oriented studies in music composition, either acoustic or technological. HTBA

MUSI 721a, Theory and Aesthetics pre-1600 David Cohen

Key authors and texts of western music theory from Greek antiquity to ca. 1600. Speculative and practical theory, including medieval and Renaissance theories concerning the modes, techniques of polyphony, and tuning. Broader intellectual and pedagogical contexts, e.g., Pythagoreanism and Platonism, Aristotelian logic and natural science and medieval scholasticism, and Renaissance Humanism with its emphasis on rhetoric. All assigned readings are in English. In-class discussion; oral presentations; one term paper. W 2:30–4:20

MUSI 722b, Theory and Aesthetics 1600–1800 Robert Holzer

A survey of major writings on music from the seventeenth and eighteenth centuries and the scholarly literature about them. Special emphasis is placed on the relationship between musical thought and practice of the period. W 9:35–11:15

MUSI 825b, Orpheus and Opera Ellen Rosand

As a character for whom singing was not only natural but essential to his being and to his actions, Orpheus serves as a lens through which to view the aesthetics of opera at different times and places. The course considers operatic settings of the Orpheus myth from the seventeenth through the twentieth century, including works by such composers as Monteverdi, Gluck, Haydn, Offenbach, Milhaud, Krenek, and Birtwistle. TH 9:25–11:15

MUSI 831a/MDVL 554a, Chant and Liturgy in the Latin Middle Ages: Introduction to the Sources Margot Fassler

This interdisciplinary course is designed for scholars, performers, and liturgists. Focus is on manuscripts from the twelfth century, and from centers of major musical, liturgical, and exegetical importance: the Abbey of St. Victor in Paris; the liturgical use of Hirsau around Mainz; the Holy Sepulchre in Jerusalem; and liturgical change in the region and around Winchester from the early eleventh through the late twelfth century. Students should have graduate- or professional-level expertise in one of the following: music, liturgics, Latin, manuscript study, medieval history, biblical study, theology, or art history. TH 2:30–4:20

MUSI 845a, American Musical Genres James Hepokoski

Contrasting genres of music as participants in the broader tensions and discourse networks of American culture in the first several decades of the twentieth century. Specific topics include Ives; the rise and dissemination of blues in the 1920s and 1930s; Kern, Porter, and American musical theater. Individualized work with Yale's music resources (Charles Ives Papers, Cole Porter Collection, Collection of Historical Sound Recordings). Exploration of paradigms for music analysis and cultural interpretation; genre recognition; recurring but flexible structural formats; intertextual dialogues within repertory families; sound recordings and films as primary sources. Reading- and listening-intensive; individual research projects and papers. M 1:30–3:20

MUSI 857a, Music in Nazi Germany Gundula Kreuzer

An exploration of musical life under a totalitarian regime. The quest for “Germanness” in music and the Nazis’ ill-fated attempts at policing musical aesthetics and compositional styles. Ideological, political, and administrative dimensions of these attempts; their influences on such composers as Egk, Hartmann, Hindemith, and Orff, as well as on jazz and “entertainment music”; the reception of canonic masters; and consequences for performance and scholarship at large, during the Third Reich and after. TH 9:25–11:15

MUSI 863b, Composing, 1990–2010 Seth Brodsky

How do musical texts of the last two decades help us to engage the cultural position of the living composer, as author of musical works and heir of the “literate tradition?” This seminar explores transformations in musical composition between 1990 and 2010, concentrating on a threefold discourse of nodes, narratives, and networks. Examination of individual works in three-year increments; comparative analysis of contemporaneous cultural and aesthetic theory. Collaborative creation of an interactive database modeling the recent history of musical composition with the most sophisticated and flexible Web 2.0 technologies available. T 9:25–11:15

MUSI 871b, Readings in Ethnomusicology Sarah Weiss

Ethnomusicology occupies the intellectual space reaching from anthropology through music history. Ethnomusicologists draw on methodologies and paradigms from each of these fields in their research, analysis, and writing traditions. Originally a product of colonialism, ethnomusicology is now one ancestor, among many, to world tourism, globalization, and the discourses on postmodernity, postcoloniality, and identity politics. Using ethnographies as our primary resource, in this course we adopt a contextual and historiographic approach to understanding the major trends in the development of the field. T 2:30–4:20

MUSI 910b, Contemporary Tonality: Theory and Analysis Daniel Harrison

Research seminar focusing on music-theoretical issues and problems posed by tonal music written after the “emancipation of the dissonance.” Previous theories and modes of explanation are examined, critiqued, and engaged experimentally in musical analysis involving the works of composers such as Hindemith, Shostakovich, Milhaud, Martin, Barber, and Britten. Creative adaptation and modification of previous theory (as well as new construction) are tested in order to accommodate conditions of tonality after the common-practice era. F 9:25–11:15

MUSI 917a, Musical Rhetoric, Musical Gesture Patrick McCreless

Traditionally invoked by music scholars as fall-back terms when structural concepts seem inadequate, *rhetoric* and *gesture* have recently been put to productive use in a wide range of historical, critical, and analytical endeavors. After surveying relevant literature, students develop individual projects, appropriating the concepts of musical rhetoric and musical gesture to illuminate musical repertoire of their choice. T 9:25–11:15

MUSI 935a, Nineteenth-Century Chromaticism Richard Cohn

Development of chromatic harmony across the long nineteenth century. Chromaticism as a supplement to and extension of 7-gamut diatonic tonality. Concepts, terms, and

geometries to model pan-triadic syntax within the 12-gamut independently of diatonism. Compositional strategies for switching between 7- and 12-gamut contexts. Focus on Schubert, Chopin, Liszt, Brahms, Wagner, and post-Wagnerians. Weekly analytic assignments, take-home exam. F 9:25–11:15

MUSI 937b, Acousmatic Sound Brian Kane

Acousmatic sound – “a sound that one hears without seeing the causes behind it” – has become an important component in discourses on film, the voice, and *musique concrète*. Although these discourses rarely engage one another, interdisciplinary consideration of them encourages a conception of acousmatic sound that is broader than its typical definitions and applications. After first addressing the major texts and concepts in the field (including texts by Abbate, Cavarero, Chion, Dolar, and Schaeffer) the seminar critically assesses materials, both music-historical and musico-philosophical, in order to develop a cultural and critical history of acousmatic sound. W 1:30–3:20

MUSI 997b, Readings for Qualifying Examination Gundula Kreuzer

M 9:25–11:15

MUSI 998a, Prospectus Workshop Gundula Kreuzer

TH 2:30–4:20

MUSI 999b, Dissertation Colloquium Gundula Kreuzer

W 9:25–11:15

NEAR EASTERN LANGUAGES AND CIVILIZATIONS

314 Hall of Graduate Studies, 432.2944

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M.A., M.Phil., Ph.D.

Chair

Benjamin Foster (*Acting*)

Director of Graduate Studies

Bentley Layton (*Acting*)

Professors John Darnell (*on leave*), Hans-Werner Fischer-Elfert (*Visiting*), Benjamin Foster, Eckart Frahm (*on leave*), Beatrice Gruendler, Dimitri Gutas (*on leave* [Sp]), Bentley Layton, Ariel Shisha-Halevy (*Visiting*), Harvey Weiss

Assistant Professors Colleen Manassa (*on leave*), Hala Kh. Nassar

Lecturers Adel Allouche, Karen Foster, Kathryn Slanski

Senior Lector II Ayala Dvoretzky

Senior Lector Fereshteh Amanat-Kowssar

Lectors Sarab al-Ani, Muhammad Aziz, Elitzur Bar-Asher (*Visiting*), Shiri Goren (*on leave* [F]), Ghassan Husseinali, Shady Nasser

Fields of Study

Fields include Arabic and Islamic studies (also with interdisciplinary minor), Greco-Arabic studies, Assyriology, and Egyptology.

Special Admissions Requirements

Applicants should state their specific field of study and intended specialization. Evidence of a reading knowledge of both French and German is required of all students. Proficiency in one of these languages is normally prerequisite for admission and deficiency in the second language must be rectified before admission to a second year of study. Proficiency will be certified by passing a departmental examination upon registration at Yale. Students admitted with only one of the two required languages or who fail the departmental examination are expected to enroll in an appropriate full-year course given by the French or German department at Yale. Completion of such a course with a grade of A or B will be accepted as fulfilling the proficiency requirement in either language; exceptions, for instance, for native speakers of French or German, may be made by the department upon recommendation of the director of graduate studies.

*Special Requirements for the Ph.D. Degree***COURSE WORK**

The department normally requires three full years of course work, four year courses or eight term courses per year being considered a full load. This may be reduced to two years in cases of exceptional background in Near Eastern languages. Normal progress in course

work is considered to be consistent achievement of grades of High Pass or better, and at least four term courses or two year courses with Honors per year.

SPECIAL LANGUAGE AND COURSE REQUIREMENTS

Course work should be planned to meet two departmental general standards: core languages for the primary fields of study, and minimum competence in a secondary field. The core languages in each of the major fields of study are as follows: *Arabic and Islamic Studies*: Arabic, Persian (Farsi) or Syriac or Greek; *Assyriology*: Sumerian and Akkadian; *Egyptology*: Egyptian and at least four terms of Demotic or Coptic. Minimum competence in a secondary field of study is defined as follows: at least two terms of a Near Eastern language to be evaluated either by examination or with a course grade of High Pass or better, or at least two terms of nonlanguage courses outside the area of specialization. A minimum grade of High Pass in these courses will be considered successful fulfillment of this requirement.

In Arabic and Islamic Studies, the minimum competence can be extended to an interdisciplinary course of study in a minor field. Minors may include six to eight term courses in the following departments and programs: Anthropology, Comparative Literature, French, German Studies, Greek and Classics, History, History of Science and Medicine, Italian, Judaic Studies, Linguistics, Medieval Studies, Philosophy, Political Science and Sociology, Religious Studies, Spanish and Portuguese, or others, by permission of the director of graduate studies. Students in all programs of the department will be expected to declare their choice of a secondary language or area, or a minor field, by their third term of study.

EXAMINATIONS AND THE DISSERTATION

The comprehensive examination is normally taken at the end of the third year of study or, where advanced standing has been granted, at the end of the second year, but in no case later than September of the academic year following the last year of the student's required course work. The scope of the examination will be determined by the director of graduate studies in consultation with the student and department member(s) in whose area the student's studies are concentrated. The examination will consist of written and oral portions and will cover no fewer than five and no more than six areas. In the case of the program in Arabic and Islamic Studies with an interdisciplinary minor, the written portion will consist of two language examinations and one subject in the minor field, and the oral of two subjects in Arabic studies and one in the minor field. The written examinations will be set by the individual faculty members responsible for particular areas of study, but the oral portion will be conducted by the full staff of the department. The dissertation proposal is normally submitted one month following the completion of the qualifying examination. Successful completion of the comprehensive examination and submission of an acceptable prospectus will qualify the student for admission to candidacy for the Ph.D. degree. After completion of the dissertation, the candidate may receive a final examination concerned primarily with the defense of the thesis.

Master's Degrees

M.Phil. See Degree Requirements. Additionally, students in Near Eastern Languages and Civilizations are eligible to pursue a supplemental M.Phil. degree in Medieval

Studies. For further details, see Medieval Studies. In addition to the Graduate School requirements, the dissertation prospectus must have been accepted.

Terminal M.A. Applicants who do not enroll in the Ph.D. program may pursue a Master of Arts degree. Students enrolled in the M.A. program should complete a minimum of twelve term courses with at least two term grades of Honors and an average of High Pass in the remaining courses, and will be required to submit a master's thesis no later than April 1 of the fourth term of study. No financial aid is available. Students enrolled in the Ph.D. program are also eligible for this degree by meeting the same requirements. Because of the thesis requirement, the Graduate School procedure of automatic petitions for the M.A. degree is not available to students in Near Eastern Languages and Civilizations.

Program materials are available upon request from the Director of Graduate Studies, Department of Near Eastern Languages and Civilizations, Yale University, PO Box 208236, New Haven CT 06520-8236.

Courses

AKKD 501^U, Elementary Akkadian Benjamin Foster

MW 11–12, F 9:30–10:20

[AKKD 502b^U, Intermediate Akkadian]

[AKKD 503, Advanced Akkadian]

[AKKD 504b, Second-Millennium Legal and Archival Texts]

[AKKD 505a, Historical and Archival Texts from Assyria]

[AKKD 506b, Selected Mesopotamian Texts: Bilingual]

AKKD 508b, Akkadian Literature: Atrahasis Kathryn Slanski

HTBA

AKKD 545a, Neo-Babylonian Texts: Administrative and Archival Records

Elizabeth Payne

This course focuses on the administrative and archival texts from the Neo-Babylonian period (ca. 626–520 B.C.). It progresses thematically through the corpus, introducing the orthography and language of this period, while also discussing the socio-economic and cultural context of the genres of the texts studied. When possible, the original tablets are read in class. Prerequisite: AKKD 501. HTBA

ARBC 501^U, Elementary Modern Standard Arabic Ghassan Husseinali [501-1],

Muhammad Aziz [501-2], Shady Nasser [501-3], Muhammad Aziz [501-4],

Sarab al-Ani [501-5]

Develops a basic knowledge of modern standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the development of reading and writing skills.

501-1: MTWTHF 9:25–10:15, 1 HTBA

501-2: MTWTHF 10:30–11:20, 1 HTBA

501-3: MTWTHF 11:35–12:25, 1 HTBA

501-4: MTWTHF 1:30–2:20, 1 HTBA

501-5: MTWTHF 3:30–4:20, 1 HTBA

[ARBC 502^U, Spoken Modern Standard Arabic]

ARBC 503^U, Intermediate Modern Standard Arabic Sarab al-Ani [503-1, 503-3],
Shadi Nasser [503-2]

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 501.

503-1: MTWTHF 9:25–10:15

503-2: MTWTHF 10:30–11:20

503-3: MTWTHF 2:30–3:20

ARBC 504^U, Advanced Modern Standard Arabic Muhammad Aziz

Focus on improving the listening, writing, and speaking skills of students who already have a substantial background in the study of modern standard Arabic. Prerequisite: ARBC 503 or permission of the instructor. MWF 11:35–12:25, 1 HTBA

ARBC 505a^U/b^U, Arabic Seminar Dimitri Gutas [F], Beatrice Gruendler [Sp]

Study and interpretation of classical Arabic texts for advanced students. Prerequisite: ARBC 504 or permission of the instructor. T 3:30–5:20

ARBC 506a, Modern Arabic Seminar Hala Nassar

HTBA

[ARBC 507^U, Advanced Media Arabic]**[ARBC 508^U, Arabic Grammar in Historical Context]**

ARBC 510^U, Intermediate Classical Arabic Matteo Di Giovanni

HTBA

[ARBC 513b^U, Layla and Majnun]

ARBC 812b, Abbasid Poetry in Context Beatrice Gruendler

Readings of *akhbâr* collections by literary historians and critics such as al-Sûlî, Ibn al-Mu'tazz, Ibn al-Jarrâh, and al-Isbahânî, with discussion of the nature and dynamics of literary *akhbâr*, the roles and agendas of their author-compilers, and the social significance of the poetry. W 2:30–4:20

EGYP 501^U, Introduction to Classical Hieroglyphic Egyptian Julia Hsieh

An 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. TTH 9–10:15

[EGYP 502a^U, Intermediate Egyptian I: Literary Texts]**[EGYP 503b^U, Intermediate Egyptian II: Historical Texts]**

EGYP 510^U, Biblical Coptic: Elementary Course Kevin Wilkinson

TTH 9–10:15

[EGYP 512a, Egyptian Monastic Literature in Coptic]

EGYP 513a/RLST 660a, Research Seminar on the Monastic Federation of Shenoute

Bentley Layton

Exploration of Shenoute's Canons, Book 4, in Coptic. M 1:30–3:20

[EGYP 514b^U, Introduction to Gnostic Texts in Coptic]**EGYP 536b, Egyptian Medical Texts** Hans-Werner Fischer-Elfert

TH 1:30–3:20

EGYP 537a, Egyptian Magical Texts Hans-Werner Fischer-Elfert

TH 1:30–3:20

[EGYP 540a, Ancient Egyptian Epistolography]

[EGYP 550b, Introduction to Demotic]

[EGYP 566a, Late Period Historical Texts: Napatan Historical Inscriptions]

EGYP 571a, Diachronics of Egyptian Grammar Ariel Shisha-Halevy

WF 4–5:15

[EGYP 578a, The Egyptian Netherworld Books]

[EGYP 590b, Coffin Texts]

[EGYP 591b, Ancient Egyptian Love Poetry]

HEBR 501^U, Elementary Modern Hebrew Orna Goldman [F], Ayala Dvoretzky [Sp]

[501-1], Orna Goldman [501-2]

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. No previous knowledge required.

501-1: MTWTHF 1:30–2:20

501-2: MTWTHF 9:25–10:15

HEBR 502^U, Intermediate Modern Hebrew Ayala Dvoretzky [502-1],

Orna Goldman [F], Shiri Goren [Sp] [502-2]

Review and continuation of grammatical study leading to a deeper comprehension of style and usage. Focus on selected readings, writing, comprehension, and speaking skills. Prerequisite: HEBR 501^U or equivalent.

502-1: MW 11:35–12:50, 1 HTBA

502-2: TTH 4–5:15, 1 HTBA

[HEBR 503b, Advanced Modern Hebrew: Israeli Society]

HEBR 504a^U, Introduction to Modern Israeli Literature Ayala Dvoretzky

Reading, discussion, and analysis of short stories, poetry, and magazine articles representative of contemporary Israeli culture, with attention to different styles. Conducted in Hebrew. Prerequisite: HEBR 502^U or equivalent. MW 1–2:15

HEBR 505b, Contemporary Israeli Society in Film Shiri Goren

Examination of major themes in Israeli society through film, with emphasis on language study. Topics include migration, gender and sexuality, Jewish/Israeli identity, and private

and collective memory. Readings in Hebrew and English provide a socio-historical background and bases for class discussion. Prerequisite: HEBR 140b or permission of instructor. TTH 2:30–3:45

[HEBR 506b^U, Dynamics of Israeli Culture (in Hebrew)]

[HEBR 507b, Medieval Commentaries on the Pentateuch]

[HEBR 508a, Reading Medieval Hebrew Texts]

HEBR 509b, Reading Academic Texts in Modern Hebrew Orna Goldman

Reading of academic texts in modern Hebrew, for students with a strong background in Hebrew. Discussion of grammar and stylistics, with special concentration on the development of accuracy and fluency. Prerequisite: permission of instructor. Conducted in Hebrew. TTH 1–2:15

[HEBR 514b, Commentaries on the Song of Songs]

[HEBR 515b, Medieval Hebrew Texts]

[MESO 531, Beginning Sumerian]

MESO 533, Advanced Sumerian Benjamin Foster

W 2:30–4:20

[MESO 543a, Neo-Assyrian History]

[MESO 544b, Mesopotamian Scholarly Texts]

MESO 559a or b, Directed Readings: Assyriology

[MESO 572a or b, Prophecy in Mesopotamia]

[NELC 501a, Mesopotamian History of the Late Period]

[NELC 502a, Mesopotamian History and Culture of the Sumerians]

NELC 502b^U, World of Homer Karen Foster

Interdisciplinary study of the artistic, literacy, and cultural worlds of Homer's *Iliad* and *Odyssey*, beginning in the Bronze Age of the Trojan War heroes and ending with the Homeric legacy in Western civilization. Topics include Homeric myth and reality; new archaeological evidence, the emergence of Greek art and thought, and Mediterranean and Near Eastern interconnections. MW 2:30–3:45

[NELC 503a^U, Art of Ancient Palaces]

[NELC 504b^U, Art of the Ancient Near East and Aegean]

NELC 504a, Mesopotamian History of the Old Babylonian Period Benjamin Foster

M 2:30–4:20

NELC 505b, Mesopotamian History 1550–850 B.C.E. Benjamin Foster

M 2:30–4:20

[NELC 506, History of Assyria]

NELC 507a^U/INRL 585a, Modern Arab Thought Hala Nassar

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.

TH 2:30–4:20

[NELC 508a, Ancient Painting and Mosaics]

[NELC 509b^U, The Age of Akhenaton]

[NELC 513a, Readings in Egyptian History]

NELC 514a, Buried Cities: Thera, Pompeii, and Herculaneum Karen Foster

Study of three ancient cities buried by volcanic eruptions—Thera in ca. 1530 B.C. and Pompeii and Herculaneum in A.D. 79—with emphasis on their architecture, wall paintings, and small finds in cultural and historical context. MW 2:30–3:45

[NELC 515b, The Bible in Its Ancient Near Eastern Setting]

[NELC 516b^U, Mythology of the Ancient Near East]

[NELC 517b, Ancient Polytheisms]

[NELC 519a^U, Religion and Politics in the Ancient Near East]

[NELC 524b^U, Egyptian Literature through the Ages]

[NELC 527^U, Structure of Modern Turkish]

NELC 534b^U/HIST 531b/RLST 659b^U, Seminar: The Making of Monasticism

Bentley Layton

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. By permission of the instructor. T 3:30–5:20

[NELC 551b^U, East Meets West: Drama and Theater in the Arab World]

[NELC 552a^U, Gender and Nationalism in Arab Women's Writing]

NELC 553b^U, Introducing Palestine: Literary Survey Hala Nassar

A survey of genres in Palestinian literature. Themes include resistance, occupation, exile, diaspora, gender and sexuality, and authoritarian and patriarchal relations. Readings in translation. T 3:30–5:20

NELC 554b^U, Israeli Identity and Culture: 1948 to the Present Shiri Goren

Introduction to contemporary culture and representations of Israeli society. Themes of national and personal identity formation, gender, Zionism and post-Zionism, the writings of women, Israeli-Palestinian relations, Russian immigrants, and Jews of North African origin. The course is conducted in English. Permission of instructor required.

TTH 11:35–12:50

[NELC 555a, Classical Arabic Literature in Translation]

NELC 556a, Classics: The Arabic-Islamic World Beatrice Gruendler

Survey of salient works from the literary tradition of the Arabic-Islamic world (West Asia, North Africa, and Muslim Spain). Arabic in language, this tradition engages the preceding cultures of Late Antiquity in an unbroken textual conversation, carried on by authors of diverse ethnic provenance and religious affiliation. Readings from both prose and poetry, with attention to the socio-historical and literary backgrounds of the texts, the agendas authors pursued, and the characters they portrayed. TTH 1–2:15

[NELC 563b, From Pictograph to Pixel: Changing Ways of Human Communication]**NELC 566b, Prehistory of Nubia** Maria Gatto

F 2:30–4:20

[NELC 580a, Settlement Archaeology in Egypt]**[NELC 587b^U, Environmental History of the Near East]****NELC 588a^U / ANTH 773a^U / ARCG 773a^U, Civilizations and Collapse** Harvey Weiss

Collapse documented in the archaeological and early historical records of the Old and New Worlds, including Mesopotamia, Mesoamerica, the Andes, and Europe. Analysis of politico-economic vulnerabilities, resiliencies, and adaptations in the face of abrupt climate change, anthropogenic environmental degradation, resource depletion, “barbarian” incursions, or class conflict. TH 9:25–11:15

NELC 589b^U / ANTH 763b^U / ARCG 763b^U, Archaeologies of Empire Harvey Weiss

Comparative study of origins, structures, efficiencies, and limitations of imperialism, ancient and modern, in the Old and New World, from Akkad to “Indochine,” and from Wari to Aztec. The contrast between ancient and modern imperialisms examined from the perspectives of nineteenth- and twentieth-century archaeology and political economy. TH 2:30–4:20

[NELC 590b^U, Identity in Modern Turkey]**[NELC 726a^U, History of Christianity in the Ancient World: Jesus to Augustine]****[NELC 736b, The Manichaean World Religion]****NELC 829a, History of the Arabic Language** Beatrice Gruendler

The development of the Arabic language from the earliest epigraphic evidence through the formation of the classical ‘Arabiyya and further, to Middle Arabic and Neo-Arabic. Readings of textual specimens and survey of secondary literature. TH 2:30–4:20

NELC 830a / HIST 829a, From Medina to Constantinople: The Middle East,

600–1517 Adel Allouche

An examination of the shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1238. 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. TH 1:30–3:20

[NELC 844b, Arabic Textual Criticism and Editorial Technique]

[NELC 845a, Seminar in Arabic Philosophy: Plato's *Laws* in Arabic]

[NELC 846a, Seminar in the Philosophy of Avicenna: Theory of the Soul, Prophecy, Mysticism]

NELC 849a or b, Directed Readings: Arabic Dimitri Gutas [F],
Beatrice Gruendler [Sp]

NELC 850a, Introduction to Arabic and Islamic Studies Dimitri Gutas

Comprehensive survey of the various subjects treated in Arabic and Islamic studies, with representative readings from each. Detailed investigation into the methods and techniques of scholarship in the field, with emphasis on acquiring familiarity with the bibliographical and other research tools. W 2:30–4:20

NELC 851b, Introduction to Modern Middle Eastern Studies Hala Nassar

Survey of debates in the modern and contemporary Arab world concerning 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. TH 2:30–4:20

NELC 871a^U/HSHM 650a^U, Ancient Egyptian Medicine Hans-Werner Fischer-Elfert
Development of medical thought, disease theory, and surgical technique in ancient Egypt from early pharaonic times until the Graeco-Roman periods. Close reading of texts in translation and secondary literature. M 3:30–5:30

NELC 872b^U, Magic in Ancient Egypt Hans-Werner Fischer-Elfert

Examination of magical practice in ancient Egypt, including definitions of magic, magical techniques, and applications of magic. M 3:30–5:30

PERS 501^U, Elementary Persian (Farsi) Fereshteh Amanat-Kowssar

An introduction to modern Persian, with emphasis on grammar and syntax as well as writing and reading simple prose. Both literary and classical Persian are taught in the second term. MTWTHF 9:25–10:15

PERS 502^U, Intermediate Persian (Farsi) Fereshteh Amanat-Kowssar

Detailed analysis of Persian usage and syntax through the study of modern and classical texts in prose and poetry. Readings from newspapers, textbooks, historical writings, travelogues, classical and modern literature. MTWTHF 10:30–11:20

[PERS 503b, Persian Seminar: Identity and Change]

PERS 504b, Thematic Survey of Modern Persian Literature

Fereshteh Amanat-Kowssar

MW 11:35–12:50

PERS 589a or b, Directed Readings: Persian Fereshteh Amanat-Kowssar

[SMTC 501a, Introduction to Comparative Semitics]

SMTC 502a, Linguistic Topics in Akkadian Elitzur Bar-Asher

This course concentrates on the Akkadian language from a linguistic point of view, examining a variety of linguistic questions, both of historical and theoretical linguistics.

HTBA

SMTC 520b, Introduction to Ugaritic Elitzur Bar-Asher

An introduction to the grammar of the language of the ancient city of Ugarit. HTBA

[SMTC 521, Elementary Syriac]

SMTC 523a, Intermediate Syriac: Selected Readings Elitzur Bar-Asher

This course builds on SMTC 521, Elementary Syriac. It concentrates on the study of advanced Syriac prose composition, and philosophical and exegetical texts. HTBA

SMTC 524b, Intermediate Syriac: Poetic Texts Elitzur Bar-Asher

This course builds on SMTC 521, Elementary Syriac, and SMTC 523a, Intermediate Syriac. It concentrates on selections of poetry texts. HTBA

[SMTC 531a, Aramaic Survey I: First Millennium B.C.E.]

[SMTC 532b^U, Aramaic Survey II: The Common Era]

[SMTC 533a, Biblical, Egyptian, and Targumic Aramaic]

[SMTC 534b, Introduction to Babylonian Aramaic]

SMTC 535a, Readings in Babylonian Aramaic Texts Elitzur Bar-Asher

This course builds on SMTC 534b. We read different texts from all sources of Jewish Babylonian Aramaic, with concentration on a variety of linguistic topics. HTBA

TKSH 501^U, Elementary Turkish Staff

Development of a basic knowledge of modern Turkish, with emphasis on grammatical analysis, vocabulary acquisition, and the training of reading and writing skills. MTWTHF 10:30–11:20

TKSH 502^U, Intermediate Turkish Staff

Continued study of modern Turkish, with emphasis on advanced syntax, vocabulary acquisition, and the beginnings of free oral and written expression. Prerequisite: TKSH 501 or permission of the instructor. TTH 11:35–12:50

[TKSH 505a^U, Structure of Modern Turkish]

*Additional Course of Interest***LING 516a, Beginning Hittite** Stanley Insler

Introduction to the Hittite language. Explanation of grammar, with readings in transcription from old, middle, and new Hittite texts representing different literary genres. No knowledge of cuneiform is necessary, but familiarity with an inflected language (Latin, Greek, German, Russian) is essential. T 2:30–4:20

NEUROBIOLOGY

C303 Sterling Hall of Medicine, 785.4323

<http://info.med.yale.edu/neurobio/>

M.S., M.Phil., Ph.D.

Chair

Pasko Rakic

Director of Graduate Studies

Michael Crair (SHM B301, 785.5768, michael.crair@yale.edu)

Director of Medical Studies

Michael Schwartz (SHM C327B, 785.4324, michael.schwartz@yale.edu)

Professors Amy Arnsten, Marvin Chun, Pietro De Camilli, Nihal de Lanerolle, Joel Gelernter, Charles Greer, Tamas Horvath, Jeffery Kocsis, Robert LaMotte, Csaba Leranth, Paul Lombroso, David McCormick, Godfrey Pearlson, Marina Picciotto, Pasko Rakic, Joseph Santos-Sacchi, Gordon Shepherd, Stephen Strittmatter, Xiao-Jing Wang, Stephen Waxman

Associate Professors Meenakshi Alreja, Hal Blumenfeld, Charles Bruce, Michael Crair, Sabrina Diano, Ralph DiLeone, Murat Gunel, Elizabeth Jonas, Anthony Koleske, Mark Laubach, Daeyeol Lee, Vincent Pieribone, Michael Schwartz, Nenad Sestan, Ning Tian, Flora Vaccarino, Christopher van Dyck, Mark Yeckel

Assistant Professors Stacy Castner, Chiang-shan Ray Li, Angeliki Louvi, James Mazer, Justus Verhagen, Graham Williams

Fields of Study

Fields include the development, neuronal organization, and function of the mammalian central nervous system. The range of methods includes molecular-genetic and cellular neurobiology, neuroanatomy, biochemistry, neuropharmacology, computational modeling, neurophysiology, neuroimaging and behavior. An integrative, multidisciplinary approach is encouraged.

Special Requirements for the Ph.D. Degree

COURSE REQUIREMENTS

Six courses are required, and students must obtain a grade of Honors in two of these courses and maintain an HP average. Required courses are Principles of Neuroscience (NBIO 501a), Neurobiology (NBIO 720a), and Structural and Functional Organization of the Human Nervous System (NBIO 500b). Three more elective graduate-level courses are required. In addition to these six science courses, students must also take the Bioethics course.

LABORATORY ROTATIONS

Two rotations are required; typically completed in the first year. Rotations outside the Neuroscience track will count toward this requirement upon approval of the Neuroscience track directors.

TEACHING REQUIREMENTS

An important aspect of graduate training in Neurobiology is the acquisition of teaching skills through participation in courses appropriate for the student's scientific interests. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses at the undergraduate, graduate, and medical school levels. Ph.D. students are required to serve as Teaching Fellows (TF) for two terms. First-year students may not serve as a TF without written permission from the Neuroscience track directors. It is recommended that one term of teaching should be completed by the end of the third year, and both requirements be completed by the end of the fourth year.

Specifically, it is recommended that the first requirement be met by teaching in either Principles of Neuroscience (NBIO 501a), Neurobiology (NBIO 720a), Brain and Thought (CGSC 201a), or Structural and Functional Organization of the Human Nervous System (NBIO 500b). The second course may be chosen from the list of neuroscience-related courses in the Graduate School of Arts and Sciences bulletin, or from the INP Bioethics course. A course not directly related to neuroscience must have the approval of the DGS.

QUALIFYING EXAM

Ph.D. students must complete their qualifying exam before the end of their second year as a graduate student. The student must choose four faculty members to read with; it is strongly encouraged that these faculty represent interests spanning from molecular to systems/cognitive neuroscience. The student and faculty should devise a reading list of about fifteen papers on a defined topic. They should meet regularly (at least three or four meetings) to discuss the papers in depth. For the written exam, the student is given two questions from each faculty member. The student has three hours to write an answer to one of the two questions for each faculty member, i.e., a twelve-hour written exam spread over two days. The exam is performed on a laptop observing the honor system and is proctored by the DGS. The student may refer to the papers and his/her notes but not to the Internet. The answers are distributed to the faculty, and several days later an oral exam is held to further evaluate the student's knowledge. A fifth faculty member (a reader) chosen by the student may also be present at the oral exam, along with the DGS. If the student fails the qualifying exam, he/she may have one more attempt at passage; this must be completed within one term of taking the original exam.

PROSPECTUS

Ph.D. students must complete and submit their dissertation prospectus (also called thesis proposal) by the end of the third year as a graduate student. The guidelines are as follows:

1. The student should discuss with his/her mentor an appropriate topic and research plan for the thesis proposal, as well as discuss likely names of faculty to serve on the thesis committee.
2. The student should write a proposal of approximately ten pages (similar to an NRSA application). This should include (a) the hypothesis to be addressed, (b) a few pages of background and significance, (c) preliminary data to demonstrate feasibility, and (d) a research plan including strategies in case proposed experiments fail. It is highly recommended that the thesis include a core of conservative experiments,

i.e., very feasible, well-controlled studies. High-risk/high-payoff studies should only be included as “halo” research; i.e., if these fail, the student should still be able to graduate.

3. The mentor should approve the thesis proposal.
4. The student should distribute the proposal to his/her thesis committee members at least several days before the thesis committee meeting, and optimally discuss the proposal with each member individually prior to the meeting to ensure that there are no major problems. The thesis committee is required to have four members: the mentor and three other faculty, with at least one of those three faculty with a primary appointment outside the Neurobiology department. Faculty outside of Yale can be included if they can attend on a regular basis. Non-Yale faculty are often best included as a fifth member, so that a meeting can officially be held in their absence if needed. One member of the thesis committee (not the mentor) is appointed chair.
5. The student meets with the thesis committee to approve the thesis proposal. It is at this time that the proposal is often modified, for instance by the suggestion of an additional control experiment. Goals should be realistic and in the interest of the student completing his/her degree in a timely manner. The finalized approved protocol is then provided to the Neurobiology business office, where the registrar will complete the paperwork for advancement to candidacy and send it to the Graduate School. As this must be completed before September 1, students should convene the thesis committee meetings prior to August 1.

The student is required to meet with his/her thesis committee on a yearly basis to update progress and problems. A one-page summary of this meeting, written by the mentor and signed by the student, the chair of the thesis committee, and the DGS, should also be given to the business office to reside in the student's file.

ADMISSION TO CANDIDACY

Ph.D. students are required to have been admitted to candidacy by the end of the third year as a graduate student. Generally, the submission of the thesis prospectus is the final requirement for admission to candidacy, and paperwork for both is submitted to the Graduate School at the same time.

OTHER REQUIREMENTS

All graduate students who are admitted to candidacy are required to have an annual thesis committee meeting. All graduate students are required to give a student research presentation annually (a brief INP rotation talk early in the graduate career, followed by a longer Neurobiology Student Research Talk as the student's research advances). All students are expected to attend rotation/student research talks.

THESIS DEFENSE

There are several parts to the thesis defense: (1) The student gives the thesis document to the thesis committee with sufficient time for them to read this large document. (2) The student defends the thesis in front of the thesis committee. It is expected that small changes will be made before submitting the final document to the Graduate School. If substantial changes are needed, the public defense must be delayed. (3) The student

gives the public defense, a one-hour seminar summarizing the research and open to the community. The seminar follows successful defense before the committee. These can be several days apart, but should not be more than a week apart without permission of the DGS.

Special Requirements for the M.D./Ph.D.

COURSE REQUIREMENTS

Five courses are required; students must obtain a grade of Honors in two of these courses, and this must be achieved in the first two years of the combined program. Required courses are Principles of Neuroscience (NBIO 501a) and Structural and Functional Organization of the Human Nervous System (NBIO 500b). Three more elective graduate-level courses are required. The following courses taken during the first two years of medical school will count toward the student's elective requirements in the Neurobiology program, provided the student has registered to receive a graduate grade in the course: CBIO 502, CBIO 601, GENE 500b, MB&B 800a, Physiology 500. In the case of students accepted into the M.D./Ph.D. program during their first year of medical school, a letter from the faculty member in charge of the first-year course indicating the grade achieved in the course is required and an official transcript from the School of Medicine must be submitted to the Graduate School.

LABORATORY ROTATIONS

Two rotations are required; rotations in another department/program will count toward this requirement upon approval of the Neuroscience track directors.

TEACHING REQUIREMENTS

M.D./Ph.D. students are required to serve as Teaching Fellows (TF) for one term; two terms are preferred. Previous teaching (as TF) in the histology labs or courses in MCDB does count toward this requirement as long as the student has taught while enrolled at Yale as an M.D./Ph.D. student.

QUALIFYING EXAM

M.D./Ph.D. students must complete their qualifying exam before the end of their first year as an affiliated graduate student. Thus, if the student affiliates at the customary 2½-year point (beginning of the spring term of the third year of matriculation at Yale), he/she must complete the examination before registering for the spring term of the fourth year at Yale.

PROSPECTUS

M.D./Ph.D. students must complete and submit their dissertation prospectus (i.e., thesis proposal) by the end of the second year as an affiliated graduate student. Thus, if the student affiliates at the customary 2½-year point, he/she must submit the approved prospectus before registering for the spring term of the fifth year (at the beginning of year 3 as an affiliated graduate student).

Please note that every dissertation prospectus must be approved by the thesis committee.

ADMISSION TO CANDIDACY

M.D./Ph.D. students are required to have been admitted to candidacy by the end of the second year as an affiliated graduate student. Generally, the submission of the dissertation prospectus is the final requirement for admission to candidacy, and paperwork for both is submitted to the Graduate School at the same time.

OTHER REQUIREMENTS

All graduate students who are admitted to candidacy are required to have an annual thesis committee meeting. All graduate students are required to give a student research presentation annually (a brief INP rotation talk early in the graduate career, followed by a longer Neurobiology Student Research Talk as the student's research advances). All students are expected to attend rotation/student research talks.

Affiliation requirement A copy of the student's application to the M.D./Ph.D. program, a copy of the student's current transcript, and notation of rotations completed must be submitted to the Neurobiology program business office. The DGS must have this information in hand before the official M.D./Ph.D. student affiliation form can be approved. The Neurobiology program business office requests that copies of transcripts for all affiliated M.D./Ph.D. students be forwarded when they are received by the M.D./Ph.D. office.

TIMELINE

Year one M.D./Ph.D. students complete courses in the School of Medicine and register for selected courses in the Graduate School. Most who identify Neuroscience as their probable Ph.D. field will take the required course, Principles of Neuroscience, in the fall term. This is the recommended timing. M.D./Ph.D. students should take NBIO 500b in the spring for graduate school credit/grade. Other electives as listed above may be taken for graduate school credit to fulfill our requirements, and indeed, it is recommended that this be done. Two laboratory rotations should be completed in the summer. The DGS's of both the Neurobiology program and the INP may be of assistance in identifying appropriate laboratories based on the student's interests.

Year two Courses in the School of Medicine are typically taken. Part 1 of the Boards is taken.

Year three By January of the third year, a thesis lab should be identified and all paperwork should be completed (affiliation form completed and copy of student's academic record including application transferred to the Neurobiology business office). Student's stipend is supplemented by PI/PI's primary department at time of affiliation.

Year four The Qualifying Examination must be completed within one year of laboratory/program affiliation. Registration for the following term will be denied if this requirement is not fulfilled in a timely manner. Typically this will be fulfilled before the spring term of the fourth year.

Year five The dissertation prospectus must be approved and submitted to the Graduate School by the end of the second year of laboratory/PI affiliation. Typically, this is by the end of the fall term of year five. Registration for the following term will be denied

if this requirement is not fulfilled in a timely manner. The Thesis Committee approves the prospectus, and required paperwork is then delivered to the Neurobiology program business office by the student. The Neurobiology program business office will then complete the Admission to Candidacy paperwork and submit it to the Graduate School. The prospectus must be submitted to the Graduate School at least six months before the dissertation is submitted.

Year six Typically an M.D./Ph.D. student will complete and defend his/her dissertation at the end of the fall term or the beginning of the spring term. We require that M.D./Ph.D. students defend their dissertations before returning to fulfill the remaining School of Medicine requirements.

Year seven Student completes all remaining requirements and graduates in May.

While this is considered a guideline for a typical M.D./Ph.D. student, we recognize that not every student will follow this path. Any digression from this timeline must be discussed and approved by the DGS, with appropriate notes to the student's file and copies to the M.D./Ph.D. office. Continued participation in the Neurobiology program is subject to the satisfactory completion of requirements in a timely fashion. If any question arises about the satisfactory progress of a student, and the qualifying examination committee or the thesis committee cannot agree on an appropriate resolution, then the Neurobiology faculty will meet to determine a course of action.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations. Awarded only to students who are continuing for the Ph.D. degree. Students are not admitted for this degree.

Terminal M.S. Awarded only to students who are not continuing for the Ph.D. degree but who have successfully completed one year of the doctoral program (i.e., passing of at least four courses, including two Honors grades, and two successful laboratory rotations). Students are not admitted for this degree.

Program materials are available upon request to the Director of Graduate Studies, Department of Neurobiology, Yale University, PO Box 208001, New Haven CT 06520-8001.

Courses

NBIO 500b/NSCI 510b, Structural and Functional Organization of the Human

Nervous System Michael Schwartz, Pasko Rakic, and staff

An integrative overview of the structure and function of the human brain as it pertains to major neurological and psychiatric disorders. Neuroanatomy, neurophysiology, and clinical correlations are interrelated to provide essential background in the neurosciences. Lectures in neurocytology and neuroanatomy survey neuronal organization in the human brain, with emphasis on long fiber tracts related to clinical neurology. This course is offered to graduate and M.D./Ph.D. students only and cannot be audited. Weekly three-hour laboratory sessions devoted to neuroanatomy in which students dissect the human brain and examine histological sections in close collaboration with faculty members.

Lectures in neurophysiology cover various aspects of neural function at the cellular level, with a strong emphasis on the mammalian nervous system. Clinical correlations consist of five sessions given by one or two faculty members representing both basic and clinical sciences. These sessions relate neurological symptoms to cellular processes in various diseases of the brain. Variable class schedule; contact course instructors. This course is offered to graduate and M.D./Ph.D. students only and cannot be audited.

NBIO 501a/NSCI 501a, Principles of Neuroscience Marina Picciotto, Mark Yeckel
General neuroscience seminar: lectures, readings, and discussion of selected topics in neuroscience. Emphasis is on how approaches at the molecular, cellular, physiological, and organismal levels can lead to understanding of neuronal and brain function.
WF 3:15–4:45

NBIO 502a, Structure and Function of Neocortex Faculty
This course covers anatomical, biochemical, and physiological organization of selected sensory, motor, and association regions of cortex. Sample topics discussed include development, evolution of multiple representations, columnar organization, and plasticity of neocortex. Hours arranged with individual instructors.

NBIO 507b/NSCI 507b, Cellular and Molecular Mechanisms of Neurological Disease
Dhasakumar Navaratnam, Stephen Strittmatter, Stephen Waxman
Focuses on those diseases (Alzheimer's, Parkinson's, ALS, and other neurodegenerative diseases, Triplet Repeat induced diseases, multiple sclerosis, epilepsy, etc.) in which modern neuroscience has advanced mechanistic explanations for clinical conditions. The course highlights recent molecular, electrophysiological, and imaging experiments in parsing disease mechanisms. The application of pathophysiologic understanding to therapeutics is considered. Web casts of the lectures and Internet-based interactive tutorials are also available. The course extends a twelve-lecture course, Neurobiologic Mechanisms of Disease, offered in the spring of 2009. The course can be taken for credit or audited. Those wishing credit will be graded on a 30-minute Internet-based final exam and a term paper. TTH 4–5

NBIO 509b/NSCI 539b, Synaptic Organization of the Nervous System
Gordon Shepherd, Anne Williamson, Michael Hines
An integrative introduction to the principles underlying the organization of neural systems. The focus is on the best-understood systems, including spinal cord, olfactory bulb, retina, cerebellum, thalamus, basal ganglia, and cerebral cortex. Students integrate experimental findings from anatomy, electrophysiology, and neuropharmacology with computational models at the cellular and circuit level to understand the neural basis of behavior.

NBIO 510a, Introduction to Methods in Cellular and Molecular Neurobiology
Faculty
Firsthand insight into various techniques and approaches used in neuroscience. Light microscopic techniques include various metallic impregnation methods, autoradiography, anterograde and retrograde axonal transport methods, hybridoma and recombinant DNA technology, deoxyglucose metabolic method, fluorescent and immunocytochemical

methods. Electron microscopy encompasses transmission, electronmicroscopic auto-radiography, and immuno-peroxidase methodology. Choice of techniques and hours to be arranged with individual faculty or staff members of the Department of Neurobiology.

NBIO 511, Introduction to Techniques Used in Electrophysiological Analysis at the Cellular Level Faculty

Includes practical training in in vivo and in vitro nervous system preparations, extra-cellular and intracellular recordings, sensory stimulation, dye injections, and selected neuropharmacological procedures. Choice of techniques and hours to be arranged with individual faculty of the Department of Neurobiology.

NBIO 524b/NSCI 514b, Neurodevelopment and Neuropsychiatric Disorders

Flora Vaccarino, Michael Crair

This course discusses basic concepts concerning the development of the central nervous system. We focus on the mechanisms that regulate progenitor cell proliferation, the acquisition of regional and cellular identity, neuronal migration, axon guidance, cell death, and activity-dependent mechanisms of neural circuit formation. Information drawn from these basic developmental mechanisms is used to discuss the newest emerging ideas about the pathogenesis of neuropsychiatric disorders such as autism, Tourette's syndrome, depression, and other affective disorders.

[NBIO 535b/NSCI 535b, History of Modern Neuroscience]

[NBIO 570a, Cellular and Network Dynamics of Sensory and Motor Functions]

[NBIO 590a, Sensory Neuroethology: Bats and Owls, Electric Fish, and Beyond]

[NBIO 595a/NSCI 595a, Seminar in Visuomotor Neurophysiology]

NBIO 602, Topics in Cortical Development and Evolution Pasko Rakic

This advanced tutorial course involves extensive reading, discussion, and pilot experiments on the topic.

NBIO 610b/C&MP 620b, Fundamentals in Neurophysiology Vincent Pieribone, Fred Sigworth

This course is designed for students who wish to gain a theoretical and practical knowledge of modern neurophysiology. Graduate students specializing in neurophysiology and non-neurophysiology are encouraged to attend, as the course begins at a very basic level and progresses to more complicated topics. Topics include properties of ion channels, firing properties of neurons, synaptic transmission, and neurophysiology methodology.

NBIO 720a/MCDB 720a^U/NSCI 720a, Neurobiology Haig Keshishian,

Paul Forscher

Examination of the excitability of the nerve cell membrane provides a starting point for the study of molecular, cellular, and intracellular mechanisms underlying the generation and control of behavior. MWF 11:35–12:25

NEUROSCIENCE

L-200 Sterling Hall of Medicine, 785.5932

M.S., M.Phil., Ph.D.

Directors of Graduate Studies

Haig Keshishian (Molecular, Cellular & Developmental Biology)

(KBT 640, 432.3478, haig.keshishian@yale.edu)

Charles Greer (Neurosurgery; Neurobiology)

(FMB 412, 785.4034, charles.greer@yale.edu)

Professors George Aghajanian (*Psychiatry; Pharmacology*), Amy Arnsten (*Neurobiology; Psychology*), John Carlson (*Molecular, Cellular & Developmental Biology*), Marvin Chun (*Psychology*), Lawrence Cohen (*Cellular & Molecular Physiology*), R. Todd Constable (*Diagnostic Radiology; Biomedical Engineering; Neurosurgery*), Pietro De Camilli (*Cell Biology*), Nihal de Lanerolle (*Neurosurgery; Neurobiology*), Ronald Duman (*Psychiatry; Pharmacology*), Barbara Ehrlich (*Pharmacology; Cellular & Molecular Physiology*), Paul Forscher (*Molecular, Cellular & Developmental Biology*), Charles Greer (*Neurosurgery; Neurobiology*), Tamas Horvath (*Comparative Medicine; Neurobiology*), James Howe (*Pharmacology*), Marcia Johnson (*Psychology; Psychiatry*), Leonard Kaczmarek (*Pharmacology; Cellular & Molecular Physiology*), Haig Keshishian (*Molecular, Cellular & Developmental Biology*), Kenneth Kidd (*Genetics; Ecology & Evolutionary Biology; Psychiatry*), Jeffery Kocsis (*Neurology; Neurobiology*), Robert LaMotte (*Anesthesiology; Neurobiology*), Paul Lombroso (*Child Study Center; Neurobiology*), Laura Manuelidis (*Neuropathology*), Gregory McCarthy (*Psychology*), David McCormick (*Neurobiology*), Mark Mooseker (*Molecular, Cellular & Developmental Biology; Cell Biology; Pathology*), Angus Nairn (*Psychiatry; Pharmacology*), Marina Picciotto (*Psychiatry; Pharmacology; Neurobiology*), Pasko Rakic (*Neurobiology*), George Richerson (*Neurology; Cellular & Molecular Physiology*), Robert Roth (*Psychiatry; Pharmacology*), Gary Rudnick (*Pharmacology*), W. Mark Saltzman (*Chemical Engineering; Biomedical Engineering; Cellular & Molecular Physiology*), Joseph Santos-Sacchi (*Surgery; Neurobiology*), Gordon Shepherd (*Neurobiology*), Robert Sherwin (*Internal Medicine*), Frederick Sigworth (*Cellular & Molecular Physiology; Biomedical Engineering*), Stephen Strittmatter (*Neurology; Neurobiology*), Christopher van Dyck (*Psychiatry; Neurobiology*), Allan Wagner (*Psychology*), Xiao-Jing Wang (*Neurobiology*), Stephen Waxman (*Neurology; Pharmacology; Neurobiology*), Robert Wyman (*Molecular, Cellular & Developmental Biology*), Tian Xu (*Genetics*), Steven Zucker (*Computer Science; Electrical Engineering; Biomedical Engineering*)

Associate Professors Meenakshi Alreja (*Psychiatry; Neurobiology*), Thomas Biederer (*Molecular Biophysics & Biochemistry*), Hilary Blumberg (*Psychiatry; Diagnostic Radiology; Child Study Center*), Hal Blumenfeld (*Neurology; Neurobiology*), Angélique Bordey (*Neurosurgery; Cellular & Molecular Physiology*), Charles Bruce (*Neurobiology*), Michael Crair (*Neurobiology*), Sabrina Diano (*Obstetrics, Gynecology & Reproductive Services; Neurobiology*), Ralph DiLeone (*Psychiatry; Neurobiology*), Karyn Frick (*Psychology*), Michael Koelle (*Molecular Biophysics & Biochemistry*), Anthony Koleske (*Molecular Biophysics & Biochemistry; Neurobiology*), Daeyeol Lee (*Neurobiology*), Kevin

Pelphrey (*Child Study Center*), Vincent Pieribone (*Cellular & Molecular Physiology, Neurobiology*), Maria Mercedes Piñango (*Linguistics*), Michael Schwartz (*Neurobiology*), Nenad Sestan (*Neurobiology*), Dana Small (*Psychiatry*), Matthew State (*Child Study Center; Genetics*), Elke Stein (*Molecular, Cellular & Developmental Biology; Cell Biology*), Jane Taylor (*Psychiatry; Psychology*), Ning Tian (*Ophthalmology & Visual Science; Neurobiology*), Vinzenz Unger (*Molecular Biophysics & Biochemistry*), Flora Vaccarino (*Child Study Center; Neurobiology*), David Wells (*Molecular, Cellular & Developmental Biology*), Anne Williamson (*Neurosurgery*), Mark Yeckel (*Neurobiology*), David Zenisek (*Cellular & Molecular Physiology*), Weimin Zhong (*Molecular, Cellular & Developmental Biology*)

Assistant Professors Robert Beech (*Psychiatry*), Sreeganga Chandra (*Neurology; Molecular, Cellular & Developmental Biology*), Jeremy Gray (*Psychology*), Elizabeth Jonas (*Internal Medicine; Neurobiology*), Sven-Eric Jordt (*Pharmacology*), Hür Köser (*Electrical Engineering*), Mark Laubach (*Neurobiology*), Michael Levene (*Biomedical Engineering*), Chiang-Shan Ray Li (*Psychiatry, Neurobiology*), Angeliki Louvi (*Neurosurgery; Neurobiology*), James Mazer (*Neurobiology*), Rory McCrimmon (*Internal Medicine*), Dhasakumar Navaratnam (*Neurology; Neurobiology*), Michael Nitabach (*Cellular & Molecular Physiology*), Christopher Pittenger (*Psychiatry*), Laurie Santos (*Psychology*), Samuel Sathyanesan (*Psychiatry*), Glenn Schafe (*Psychology*), James Swain (*Child Study Center*), Susumu Tomita (*Cellular & Molecular Physiology*), Yufeng Zhou (*Cellular & Molecular Physiology*)

Research Scientists Joel Black (*Neurology*), Nicholas Carnevale (*Psychology*)

Fields of Study

The Interdepartmental Neuroscience Program offers flexible but structured interdisciplinary training for independent research and teaching in neuroscience. The goal of the program is to ensure that degree candidates obtain a solid understanding of cellular and molecular neurobiology, physiology and biophysics, neural development, systems and behavior, and neural computation. In addition to course work, graduate students participate in a regular journal club, organize the Interdepartmental Neuroscience Program Seminar Series, and attend other seminar programs, named lectureships, symposia, and an annual research retreat.

Special Admissions Requirements

Applicants to the Neuroscience Program should have a B.S. or B.A. Most applicants have had course work in neuroscience, psychobiology, physiological psychology, mathematics through calculus, general physics, general biology, general chemistry, organic chemistry, biochemistry, computer science, or engineering. Deficiencies in these areas can be corrected through appropriate course work in the first year of residence. Laboratory research experience is desirable but is not a formal requirement. Scores for the GRE (General Test required; Subject Test recommended) or MCAT, three letters of recommendation, transcripts of undergraduate grades, and a statement of interest must accompany the application.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental graduate Program in the Biological and Biomedical Sciences (BBS).

Special Requirements for the Ph.D. Degree

Each entering student is assigned a faculty advisory committee to provide guidance. This committee is responsible for establishing the student's course of study and for monitoring his or her progress. This committee will be subsequently modified to include faculty with expertise in the student's emerging area of interest. Although each student's precise course requirements are set individually to take account of background and educational goals, the course of study is based on a model curriculum beginning with four core courses (Principles of Neuroscience, Neurobiology, Bioethics in Neuroscience, and Structural and Functional Organization of the Human Nervous System) designed to ensure broad competence in modern neuroscience. Students are also required to complete at least three additional courses from a broad set of neuroscience-related courses. The Graduate School uses grades of Honors, High Pass, Pass, and Fail and requires two term grades of Honors during the first two years of study. Students are expected to maintain at least a High Pass average. A series of at least two laboratory rotations during the first year of the program also ensures that degree candidates obtain a solid background in systems, cellular, and molecular approaches to neuroscience. Admission to candidacy requires passing a qualifying examination normally given during the second year, and submission of a dissertation prospectus (NIH grant format) before the end of the third year. In accordance with the expectations of the BBS program, Ph.D. students are expected to participate in two terms (or the equivalent) of teaching. Thesis committee meetings are required annually. Also required is the completion and satisfactory defense of the thesis.

Requirements for M.D./Ph.D. students are the same as for Ph.D. students with the following differences: five courses are required (Principles of Neuroscience and Structural and Functional Organization of the Human Nervous System, and three elective graduate-level courses). M.D./Ph.D. students are required to serve for one term as teaching assistants; however, two terms of teaching are preferred.

Master's Degrees

M.Phil. See Degree Requirements.

Terminal M.S. Awarded only to students who are not continuing for the Ph.D. degree but who have successfully completed one year of the doctoral program. The minimum requirement for this is a passing grade in at least four courses, including two Honors grades, and two successful laboratory rotations. Students are not admitted for this degree.

Program materials are available upon request to the Director of Graduate Studies, Neuroscience, Yale University, PO Box 208074, New Haven CT 06520-8074.

Courses

NSCI 501a/NBIO 501a, Principles of Neuroscience Marina Picciotto, Mark Yeckel
General neuroscience seminar: lectures, readings, and discussion of selected topics in

neuroscience. Emphasis is on how approaches at the molecular, cellular, physiological, and organismal levels can lead to understanding of neuronal and brain function.
WF 3:15–4:45

[NSCI 502b/MCDB 730b, Cell Biology of the Neuron]

NSCI 504b/MCDB 735b, Seminar in Brain Development and Plasticity

Weimin Zhong, Elke Stein

Weekly seminars (Monday) and discussion sessions (Wednesday) to explore recent advances in our understanding of brain development and plasticity, including neuronal determination, axon guidance, synaptogenesis, and developmental plasticity.
MW 2:30–3:45

NSCI 507b, Cellular and Molecular Mechanisms of Neurological Disease

Dhasakumar Navaratnam, Stephen Strittmatter, Stephen Waxman

Focuses on those diseases (Alzheimer's, Parkinson's, ALS, and other neurodegenerative diseases, triplet repeat induced diseases, multiple sclerosis, epilepsy, etc.) in which modern neuroscience has advanced mechanistic explanations for clinical conditions. The course highlights recent molecular, electrophysiological, and imaging experiments in parsing disease mechanisms. The application of pathophysiologic understanding to therapeutics is considered. Contact instructor for first class date and time.

NSCI 510b/NBIO 500b, Structural and Functional Organization of the Human

Nervous System Michael Schwartz, Pasko Rakic

An integrative overview of the structure and function of the human brain as it pertains to major neurological and psychiatric disorders. Neuroanatomy, neurophysiology, and clinical correlations are interrelated to provide essential background in the neurosciences. Lectures in neurocytology and neuroanatomy survey neuronal organization in the human brain, with emphasis on long fiber tracts related to clinical neurology. Weekly three-hour laboratory sessions devoted to neuroanatomy in which students dissect the human brain and examine histological sections in close collaboration with faculty members. Lectures in neurophysiology cover various aspects of neural function at the cellular level, with a strong emphasis on the mammalian nervous system. Clinical correlations consist of five sessions given by one or two faculty members representing both basic and clinical sciences. These sessions relate neurological symptoms to cellular processes in various diseases of the brain. Variable class schedule; contact course instructors. This course is offered to graduate and M.D./Ph.D. students only and cannot be audited.

NSCI 519a/b, Tutorial

By arrangement with faculty and approval of DGS.

NSCI 521a/PHAR 521a, Neuroimaging in Neuropsychiatry I: Imaging

Methods Kelly Cosgrove, Hilary Blumberg, Julie Staley

Neuroimaging methodologies including Positron Emission Tomography (PET); Single Photon Emission Computed Tomography (SPECT); Magnetic Resonance Imaging (MRI); functional Magnetic Resonance Imaging (fMRI); Magnetic Resonance Spectroscopy (MRS); and gene array imaging (GAI) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for routine

clinical diagnosis, for assessment of drug efficacy; for determination of psychotropic drug occupancy, and for the study of pathophysiological mechanisms underlying neurologic and psychiatric disorders. This course is designed to provide an overview of the theory and current state of development of the different neuroimaging modalities. A second course, offered in the spring, focuses on applications. W 9–10:30

NSCI 521b/PHAR 521b, Neuroimaging in Neuropsychiatry II: Clinical Applications

Hilary Blumberg, Kelly Cosgrove, Julie Staley

Neuroimaging methodologies including Positron Emission Tomography (PET); Single Photon Emission Computed Tomography (SPECT); structural Magnetic Resonance Imaging (sMRI); functional Magnetic Resonance Imaging (fMRI); Diffusion Tensor Imaging (DTI) and Magnetic Resonance Spectroscopy (MRS) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for assessment of drug efficacy, for determination of psychotropic drug occupancy and for the study of pathophysiological mechanisms underlying neuropsychiatric disorders. This course is designed to provide an overview of the application of state-of-the-art neuroimaging methods to research in neuropsychiatric disorders. It is recommended for PGY I–VI, Child Psychiatry Fellows, Interdepartmental Neuroscience students, and trainees in pharmacology, neurology, neurosurgery, psychiatry, psychology, and radiology.

[NSCI 535b/NBIO 535b, History of Modern Neuroscience]

NSCI 539b/NBIO 509b, Synaptic Organization of the Nervous System

Gordon Shepherd, Anne Williamson, Michael Hines

An integrative introduction to the principles underlying the organization of neural systems. The focus is on the best-understood systems, including spinal cord, olfactory bulb, retina, cerebellum, thalamus, basal ganglia, and cerebral cortex. Students integrate experimental findings from anatomy, electrophysiology, and neuropharmacology with computational models at the cellular and circuit level to understand the neural basis of behavior. Contact instructors directly for first class date and time.

NSCI 580b, Bioethics in Neuroscience Charles Greer

This course is an introduction to ethics and ethical decision making in the neurosciences. Format for the course is an informal discussion. Each week we are joined by members of the Yale faculty and community who can share their experiences and expertise as it relates to the topic of the week. This course is mandatory for first-year graduate students in the Interdepartmental Neuroscience Program (INP). Grading is Satisfactory/Unsatisfactory and is based on attendance/participation, weekly reaction papers, and a final term paper. TH 4–5:30

[NSCI 595a/NBIO 595a, Seminar in Visuomotor Neurophysiology]

NSCI 612b/ENAS 812b, Molecular Transport and Intervention in the Brain

Mark Saltzman, Richard Carson

This course is a graduate-level seminar on mechanisms and rates of movement of molecules in the brain and the design of novel drug delivery systems. Topics include mathematical methods for modeling diffusion and flow processes, diffusion in the brain interstitium, fluid flows in the brain and spinal cord, the blood-brain barrier,

microdialysis measurements, controlled release systems, microfluidic approaches for drug delivery. Weekly readings are assigned from neuroscience and engineering texts; current papers from the literature are used to guide discussion each week. HTBA

[NSCI 648b/PSYC 648b, Cellular Analysis of Learning and Memory: Vertebrate Model Systems]

NSCI 720a/MCDB 720au/NBIO 720a, Neurobiology Haig Keshishian,
Paul Forscher

Examination of the excitability of the nerve cell membrane provides a starting point for the study of molecular, cellular and intracellular mechanisms underlying the generation and control of behavior. MWF 11:35–12:25

The following course is also of particular value to students in Neuroscience:

MCDB 721La^U, Laboratory for Neurobiology Haig Keshishian, Robert Wyman

NURSING

100 Church Street South, 785.2393
<http://nursing.yale.edu/Academics/PhD/>
 M.Phil., Ph.D.

Dean

Margaret Grey

Director of Graduate Studies

Nancy Reynolds (737.2313, nancy.reynolds@yale.edu)

Professors Jane Dixon, Marjorie Funk, Margaret Grey, Holly Kennedy, M. Tish Knobf, Ruth McCorkle, Nancy Redeker, Nancy Reynolds, Lawrence Scahill, Ann Williams

Associate Professors Sally Cohen, Barbara Guthrie, Leslie Neal-Boylan, Lois Sadler, Sandra Talley, Meredith Wallace, Robin Whittemore

Assistant Professors Angelina Chambers, Joanne Iennaco, Sheila Molony, Linda Pellico, Jacquelyn Taylor

Fields of Study

Fields include chronic illness (diabetes, cardiovascular disease, cancer, HIV/AIDS); self- and family management; maternal and child health; policy and politics of health care; health equity and care of vulnerable populations; acute and critical care; children with mental health disorders; end-of-life and palliative care; environmental health; gerontology and long-term care; and school- and community-based interventions.

Special Admissions Requirements

Applicants should have a master's degree in nursing, or the equivalent, including previous course work in statistics and graduate-level course work in research methods. The Graduate Record Examination (GRE) General Test is required. The Test of English as a Foreign Language (TOEFL) is required of all applicants for whom English is a second language. Samples of written work (e.g., published article, thesis, literature review) and a curriculum vitae are required. Qualified applicants will be invited for an interview with a member of the doctoral faculty.

Special Requirements for the Ph.D. Degree

COURSE WORK

Completion of twelve core courses and six cognates in the student's area of specialization (including one advanced analysis course) is required.

The grading system includes Honors, High Pass, Pass, and Fail. Students must maintain a High Pass average and achieve a grade of Honors in at least two core courses to remain in good standing. High Pass is required in all core courses in the first year for a student to be eligible to take the Preliminary Examination. After the first year, no more than one grade of Pass in a core course will be permitted. A grade of Pass or better is required for all cognates, including the required advanced analysis course.

GRADUATE RESEARCH ASSISTANT AND TEACHING FELLOW EXPERIENCE

During the first two years of the program, students are Graduate Research Assistants with faculty mentors and participate in the mentor's ongoing research.

Two terms of a Teaching Fellowship Program are required. Teaching Fellows assist with the teaching of larger master's-level courses, typically during their third year of doctoral study.

EXAMINATIONS

Successful completion of three examinations is required.

1. The Preliminary Examination is taken in June after the first year of course work has been completed. A grade of High Pass or better in each core course is required. The Preliminary Examination is intended to allow the student to demonstrate mastery of doctoral course work. This written examination is taken over two consecutive days. Passing the Preliminary Examination is a prerequisite for continuing in the second year of doctoral study.
2. The Qualifying Examination typically takes place during the third year of study, and preferably by the end of the fifth term, when required course work is completed. The student prepares a comprehensive dissertation proposal containing a statement of the problem to be studied, conceptual framework, critical review of relevant literature, design, methods, and plan for analysis. The oral Qualifying Examination typically lasts 1 to 1.5 hours. The student gives a 15-minute formal presentation of the proposed study and answers questions regarding the research and related topics. Successful completion of the Qualifying Examination is required for candidacy for the doctoral degree.
3. The Final Oral Examination is based on the dissertation. The dissertation is intended to demonstrate that the student is competent in the chosen area of study and has conducted independent research. The Final Oral Examination typically lasts 1.5 to 2 hours. The student gives a 15- to 20-minute formal presentation of the dissertation and answers questions. Successful completion of the Final Oral Examination is required before the Ph.D. can be awarded.

Master's Degree

M.Phil. (en route to the Ph.D.) This degree will be granted to Ph.D. students who successfully complete two years of course work, but do not progress to the dissertation stage. To be awarded the M.Phil. degree, students need to complete all core courses, six cognates (may include independent study with faculty), and two years of Graduate Research Assistant experience, and must pass the Preliminary Examination. This degree is normally granted only to students who are withdrawing from the Ph.D. program.

Terminal Master's Degree For information on the terminal master's degree offered by the Yale School of Nursing (Master of Science in Nursing), visit the School's Web site, <http://nursing.yale.edu/>, or contact Frank A. Grosso, Assistant Dean for Student Affairs and Registrar, Yale School of Nursing, at frank.grosso@yale.edu.

Courses

NURS 901a, Quantitative Methods for Nursing Research Jane Dixon

This advanced course in quantitative research methods provides an opportunity to evaluate various research designs used to investigate problems of importance to nursing and health. Emphasis is placed on the interrelationships of the clinical problem, study aims, and study design – with the goal of understanding methods decisions that are made by researchers, and how these decisions influence study validity. Required for all Ph.D. students in nursing. Open to master's students with permission of the instructor. Three hours per week.

NURS 903a, Measurement of Health Variables Jane Dixon

This course focuses on theory of measurement, and on reliability and validity of research instruments – with emphasis on interaction of conceptual, methodological, and pragmatic considerations. An integration of seminar and lecture modalities is employed. This course is required for all second-year Ph.D. students in nursing and is also open to advanced graduate students in other schools of the University. Three hours per week.

[NURS 905b, Creating Method: Issues in Nursing Research]

NURS 907, Dissertation Seminar Nancy Reynolds

This course provides the student with advanced study and direction in research leading to development of the dissertation proposal and completion of the dissertation. Students are guided in the application of fundamentals of scientific writing and criticism. Required for all Ph.D. students in nursing. 2.5 hours every other week for academic year.

NURS 909a, Philosophical Foundation of Inquiry Barbara Guthrie

The purpose of this course is to provide doctoral students with an overview and critical analysis of historical and contemporary views of knowledge development and of science, with particular emphasis on the ways these views influence approaches to nursing inquiry. Emphasis is on a critical examination of the underlying epistemological and ontological assumptions and their respective implications for diverse approaches to knowledge generation within the discipline. Required for all Ph.D. students in nursing. Three hours per week.

NURS 911, Doctoral Research Practicum Nancy Reynolds

The overall purpose of this seminar is to guide the student in acquiring an understanding of the role and responsibilities of the nurse researcher. Topics include scientific writing, peer review, components and development of a research plan, program of research and research career, funding and grantsmanship, presentation, publication, ethical considerations, collaboration, and interdisciplinary research. Required of all students for the first two years of doctoral study to coincide with their Graduate Research Assistant experience. One hour every other week.

NURS 913b, Theoretical Basis of Nursing Science Robin Whittemore

This course examines the nature of scientific knowledge and the development of the conceptual and theoretical underpinnings of nursing science. The contribution to nursing science of various approaches to knowledge synthesis and theory development is emphasized. Specific approaches to concept/theory development and analysis are examined.

Students are expected to complete a formal analysis of a concept or theory of interest to them. Required for all Ph.D. students in nursing. Three hours per week.

NURS 917, Advanced Statistics for Nursing Research Kristopher Fennie,
Marjorie Funk

This yearlong course starts with a review of basic descriptive and inferential statistics and advances to multivariate analyses most commonly used in nursing studies. The emphasis is on attaining a conceptual understanding of these statistical techniques, selecting appropriate techniques for a given clinical research problem, conducting computer-assisted data analyses, and correctly expressing the results of such analyses. The laboratory part of the course covers fundamentals of data management and statistical analysis, and proceeds to the conduct of advanced analyses. The course emphasizes using programming language in SAS; however, the menu-driven user interfaces in SAS, SPSS, n-Query, MS Excel, and MS ACCESS also are briefly covered. This course is required for all Ph.D. students in nursing, and may be elected by M.S.N. students with permission of the instructors. Three hours per week for academic year.

[NURS 921b, Seminar on Research in Care of Patients with Diabetes]

[NURS 923a, Current Issues in Cardiovascular Nursing Research]

NURS 925b, Qualitative Methods for Nursing Research Holly Kennedy, Tish Knobf
This course introduces the student to major approaches to qualitative research. Selected topics related to the design, conduct, and reporting of qualitative research are addressed. Emphasis is placed on the appropriate use of qualitative methods and differences across qualitative approaches. The course includes firsthand experience with data collection and analysis. Required for all Ph.D. students in nursing. Three hours per week.

[NURS 927b, Seminar on Research in Care of People with Cancer or at Risk for Cancer and Their Families]

NURS 929b, Ethical Conduct of Clinical Research Ann Williams

This course introduces major concepts in the ethical conduct of clinical research from the perspective of the advanced practice nurse and the nurse-researcher. National and international ethical codes for research and regulatory requirements are reviewed. Emphasis is placed on the protection of vulnerable populations and community-based research, including international research. Required for all Ph.D. students in nursing. Open to others with permission of the instructor. One hour per week.

NURS 941a, Health Policy, Leadership, and Systems (or equivalent approved by DGS) Sally Cohen

This course addresses salient issues in health policy and the challenges to linking research and clinical care with public and private policy agendas. The course covers the following topics: health care delivery systems; policy and political factors that affect access to care and its financing, delivery, and quality; challenges to evidence-based policy and the dissemination of research findings to policy and community-based leaders. It also includes theories of leadership and policy change relevant to students' research topics. Critical thinking, problem-solving skills, and research-based analysis are integrated throughout

the course. A major written assignment suitable for submission to a peer-reviewed journal (or that can be easily modified for same) is a course requirement. Prerequisite: students must pass a test based on the online Yale University School of Nursing Health Policy Module. Required for all Ph.D. students in nursing. Three hours per week.

NURS 943a, Self- and Family Management of Vulnerable Populations Gail Melkus
This course examines major conceptualizations of health and illness, vulnerability, and self- and family management in the context of health disparities, and the research supporting these conceptualizations. Emphasis is placed on the link among illness self-management, vulnerability, and related concepts such as self-efficacy and coping and the contributions of risk and protective factors to self-management. These links and associations with self-management are considered from an individual, family, and health system perspective, and socio-cultural influences on self-management are explored. Required for all Ph.D. students in nursing. Three hours per week.

NURS 943b, Methods of Intervention Development and Testing Margaret Grey
This seminar focuses on the research methods necessary for the understanding, development, and testing of interventions in the management of health and illness by self- and family management. Content includes the use of qualitative, family, and survey approaches to understand the factors associated with management of health and illness and the application of these approaches to both the individual and the family as a unit of study. The prerequisite is completion of NURS 943a, Self- and Family Management of Vulnerable Populations. Required of all Ph.D. students in nursing. Open to others by consent of the instructor. Three hours per week.

PHARMACOLOGY

B-316 Sterling Hall of Medicine, 785.7469

M.S., M.Phil., Ph.D.

Chair

Joseph Schlessinger

Director of Graduate Studies

Elias Lolis (SHM B345, 785.6721; elias.lolis@yale.edu)

Director of Medical Studies

James Howe

Professors George Aghajanian, Karen Anderson, G. Peter Beardsley, B. Stephen Bunney, Evangelo Canellakis (*Emeritus*), Yung-chi Cheng, Edward Chu, J.G. Collins, Jack Cooper (*Emeritus*), Priscilla Dannies, Ronald Duman, Barbara Ehrlich, Robert Handschumacher (*Emeritus*), James Howe, Diane Jorkasky (*Adjunct*), Leonard Kaczmarek, Nita Maihle, Angus Nairn, Marina Picciotto, William Prusoff (*Emeritus*), Sara Rockwell, Robert Roth, Gary Rudnick, Alan Sartorelli, Joseph Schlessinger, William Sessa, Stephen Waxman, Dianging (Dan) Wu

Associate Professors Anton Bennett, Michael DiGiovanna, Ya Ha, Robert Heimer, Michael Hodsdon, Irit Lax, Elias Lolis, Giuseppe Pizzorno

Assistant Professors Titus Boggon, David Calderwood, Sven-Eric Jordt, Benjamin Turk

Fields of Study

Major emphases in the department are in the areas of molecular pharmacology, mechanisms of drug action, signal transduction, structural biology, neuropharmacology, and chemotherapy.

Special Admissions Requirements

A bachelor's degree in biology, chemistry, or another science is required. Undergraduate courses should include biology, organic chemistry, physics, and calculus. GRE scores are required; a GRE Subject Test, preferably in Biology or Chemistry, is recommended.

To enter the Ph.D. program, students should apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences.

Special Requirements for the Ph.D. Degree

Because the field of pharmacology encompasses many disciplines, the department's flexible program of study toward the Ph.D. degree permits students to concentrate in areas of their particular interest. The only common courses required of all students are the basic course in pharmacology, seminars in which students present papers, and laboratory rotations that provide students with exposure to a variety of experimental approaches.

The basic requirements for admission to candidacy for the Ph.D. degree include one and one-half to two years of course work (including the basic course in pharmacology,

seminars, and laboratory rotations), during which time the Graduate School Honors requirement and an oral qualifying examination must be completed. There is no foreign language requirement. A thesis prospectus must be submitted by the end of the third year. Admission to candidacy is usually achieved by the end of the third year. A doctoral dissertation based upon original research, with an oral examination in defense of the dissertation, is required for the degree. The norm for completion of the Ph.D. program is about five years.

An important aspect of graduate training in pharmacology is the acquisition of teaching skills through the participation in courses appropriate for the student's scientific interests. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school levels. Ph.D. students are expected to participate in two terms (or the equivalent) of teaching. Students are not expected to teach during their first year.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.S. (en route to the Ph.D.) Students are eligible for the M.S. degree upon successful completion of the first three terms of the Ph.D. program. This includes one year of lab rotations and six courses. Two of the courses must be Pharmacology I and II, and a grade of High Pass (or better) is required for each course. Two grades of Honors are required for any of the six courses.

Program materials are available upon request to the Director of Graduate Studies, Department of Pharmacology, Yale University, PO Box 208066, New Haven CT 06520-8066.

Courses

PHAR 502a and b, Seminar in Pharmacology Dan Wu

A seminar given by a department faculty member on his or her area of interest to teach students how to critically evaluate papers and to improve the ability of the students to give oral presentations. TH 3–5

PHAR 504a, Pharmacology I: Interfering Selectively Elias Lolis and staff

Lectures covering pharmacokinetics and drug toxicity, modern approaches to drug discovery and development, and mechanisms of drug action in the following areas: antibiotics and anti-viral therapy, immunosuppression and anti-inflammation, anti-asthmatic and anti-allergic therapy, cancer chemotherapy and medical uses of radiation, and pain. MW 10:30–12

PHAR 504b, Pharmacology II: Maintaining and Restoring Homeostasis

Anton Bennett

The course covers the general principles of pharmacology, which include areas of drug-receptor interactions, control of second messenger systems and ion-gated channels, and the regulation of physiological systems. These concepts are integrated with examples of how drugs are used when normal physiological controls fail. Discussion groups are directed toward current and emerging topics of signaling mechanisms that

may yield novel pharmacological targets for future clinical therapies. MW 10:30–12, discussion group T 4–6

PHAR 506a and b, Methods in Pharmacological Research (Rotations) Elias Lolis
Students work in laboratories of faculty of their choice. The period spent in each laboratory is one term.

PHAR 508b, Neuropharmacology James Howe

An intensive examination of current understanding of the sites and mechanisms involved in drug action on single nerve cells and on the brain. Emphasis on basic functions and illustrative examples of their disturbance by drugs. T 2–4

PHAR 518b, Current Topics in Cancer and Viral Therapy Yung-chi Cheng,
Benjamin Turk

This course discusses current and evolving topics in cancer and viral mechanisms of disease and potential treatments. Each session is two hours in length. The lecturers present a general overview of the field as well as some of their research activities. Students are required to discuss papers on the particular topic of the day. W 2–4

PHAR 521a/NSCI 521a, Neuroimaging in Neuropsychiatry I: Imaging Methods

Julie Staley, Kelly Cosgrove

Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), Magnetic Resonance Imaging (MRI), functional Magnetic Resonance Imaging (fMRI), Magnetic Resonance Spectroscopy (MRS), and gene array imaging (GAI) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for routine clinical diagnosis, for assessment of drug efficacy, for determination of psychotropic drug occupancy, and for the study of pathophysiological mechanisms underlying neurologic and psychiatric disorders. This course is designed to provide an overview of the theory and current state of development of the different neuroimaging modalities. A second course, offered in the spring, focuses on applications. W 9–10:30

PHAR 521b/NSCI 521b, Neuroimaging in Neuropsychiatry II: Clinical Applications

Hilary Blumberg, Kelly Cosgrove, Julie Staley

Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), structural Magnetic Resonance Imaging (sMRI), functional Magnetic Resonance Imaging (fMRI), Diffusion Tensor Imaging (DTI), and Magnetic Resonance Spectroscopy (MRS) are rapidly evolving tools used to study the living human brain. Neuroimaging has unprecedented implications for assessment of drug efficacy, for determination of psychotropic drug occupancy and for the study of pathophysiological mechanisms underlying neuropsychiatric disorders. This course is designed to provide an overview of the application of state-of-the-art neuroimaging methods to research in neuropsychiatric disorders. It is recommended for PGY I–VI, Child Psychiatry Fellows, Interdepartmental Neuroscience students, and trainees in pharmacology, neurology, neurosurgery, psychiatry, psychology, and radiology.

PHILOSOPHY

Connecticut Hall, 432.1665

www.yale.edu/philos/

M.A., M.Phil., Ph.D.

Chair

Michael Della Rocca

Director of Graduate Studies

Karsten Harries [F] (107 Connecticut Hall, 432.1682, karsten.harries@yale.edu)

Zoltán Szabó [Sp] (107 Connecticut Hall, 432.1682, zoltan.szabo@yale.edu)

Professors George Bealer, Seyla Benhabib, Susanne Bobzien, Jules Coleman, Stephen Darwall, Michael Della Rocca, Keith DeRose, Tamar Gendler, John Hare, Karsten Harries, Verity Harte, Laurence Horn, Shelly Kagan, Thomas Pogge, Scott Shapiro, Sun-Joo Shin, Steven Smith, Jonathan Vogel, (*Visiting* [F]), Zoltán Szabó, Kenneth Winkler

Associate Professor Katalin Balog

Assistant Professors Matt Evans (*Visiting* [Sp]), Jonathan Gilmore, Joshua Knobe, Jill North, Barbara Sattler, Matthew Smith, Bruno Whittle

Lecturers David Larsen, Michael Morgan, Raul Saucedo

Fields of Study

Fields include most of the major areas of philosophy. Please see the Philosophy Web site (www.yale.edu/philos/) for the departmental statement.

Special Requirements for the Ph.D. Degree

In the first two years all students must complete a total of twelve term courses. Graduate courses are grouped: (1) metaphysics, theory of knowledge, philosophy of science; (2) ethics, aesthetics, philosophy of religion, political philosophy, and theory of value; (3) history of philosophy. No more than six and no fewer than two courses may be taken in each group. A course in logic must also be taken, although on the basis of previous work a student may petition to have this requirement waived. Two qualifying papers must be submitted, one in history, the other in another distribution area; normally the first of these papers will be submitted by mid-September, the second by December, of a student's third year. It is expected that these papers will be more substantial and professional than an ordinary term paper. Students must demonstrate competence in at least one of the following languages: French, German, Greek, or Latin, normally by the end of the second year. Students in Philosophy will teach in the third and fourth years. They must have teaching experience in at least two distribution areas. Approval of the dissertation prospectus is expected before the end of the sixth term. Upon completion of all predissertation requirements, including the prospectus, students are admitted to candidacy for the Ph.D. Admission to candidacy must take place by the end of the third year of study. The norm for completion of the Ph.D. degree is five to six years.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.A. (en route to the Ph.D.) An M.A. degree is awarded to students after completion of six term courses with an average grade of High Pass.

Please see the Philosophy Web site for information on the program (www.yale.edu/philos/).

Philosophy and Classics

Superior students, preferably with a background in Classical languages and literature, may be admitted to a joint Ph.D. program in Philosophy and Classics. For details about this program, see www.yale.edu/philos/grad.html.

Courses

PHIL 567b^U, Mathematical Logic I Sun-Joo Shin

An introduction to the metatheory of first-order logic, up to and including the completeness theorem for the first-order calculus. An introduction to the basic concepts of set theory is included. TTH 1:30–2:20

PHIL 600a^U, Aristotle on Voluntary Action, Choice, and Responsibility

Susanne Bobzien, Verity Harte

The class reads and discusses the Greek text of Aristotle's *Nicomachean Ethics*, focusing on book III, chapters 1–5, in which Aristotle sets out his theory of the voluntary, practical deliberation, choice (or intention) and responsibility, a central text of Aristotle's moral psychology and philosophy of action. W 4–5:50

PHIL 601b^U, Ancient Relativism Matt Evans

Examination of some attempts by ancient Greek philosophers to formulate, defend, and attack the view that certain truths or facts are by their very nature relative to something, someone, or sometime. Texts are drawn from Heraclitus, Plato, Aristotle, Epicurus, and Sextus, among others. W 3:30–5:20

PHIL 602a^U, Descartes Michael Della Rocca

A close examination of Descartes's views on skepticism, perception, philosophy of mind, causation, and the nature of the physical world. Consideration of writings from throughout his career as well as influential secondary literature. M 1:30–3:20

PHIL 603a^U/JDST 786a^U, Jewish Philosophy in the Twentieth Century

Michael Morgan

Examination of the major figures in the tradition of Jewish philosophy in the twentieth century. Consideration of their engagement with the Western philosophical tradition, especially in Europe (Hermann Cohen, Martin Buber, Franz Rosenzweig) and in postwar America (Emil Fackenheim, Abraham Joshua Heschel, and Joseph Soloveitchik). The impact of the Six Day War and the Nazi Holocaust on American Jewish thinkers (Richard Rubenstein, Irving Greenberg, Eliezer Berkovits). T 9:25–11:15

PHIL 604b^U, History and Critique of Semiotics David Larsen

Meaning is derived from raw phenomena, relayed through interpersonal communication, and variously engaged in the work of art. And yet it is said to have one vehicle: the sign. This seminar is on the conveyance of meaning in all its aspects, combining an introduction to contemporary semiotic theory with a historical survey of semiotic thought, and experimenting with their uses in contemporary humanistic inquiry. W 3:30–5:20

PHIL 606b^U, Kant's Transcendental Idealism Thomas Pogge

This seminar engages in a close reading of the central parts of Kant's most famous work, the *Critique of Pure Reason*. We read only the second edition of this text in the new translation by Guyer and Wood. T 7–8:50

PHIL 607a/CPLT 784a^U/GMAN 647a^U, Adorno's Aesthetic Theory Rainer Nägele

Close reading of Adorno's *Ästhetische Theorie*. Reading knowledge in German required. TH 1:30–3:20

PHIL 625b^U, Topics in Philosophy of Mind Katalin Balog

Discussion of the explanatory gap, inverted spectrum, and conceivability arguments; different kinds of consciousness; the relationship between consciousness and attention; and physicalist and dualist accounts of consciousness. T 1:30–3:20

PHIL 626a^U, The Cognitive Science of Morality Joshua Knobe

Recent years have seen the emergence of a new field of “moral cognition” that has philosophers and psychologists working together to solve a common set of problems. The course provides an introduction to this new field, with a focus on questions about the philosophical significance of psychological findings. Topics include the role of emotion in moral judgment, the significance of character traits in virtue ethics and personality psychology, the reliability of intuitions, and the psychological processes that underlie them. T 7–8:50

PHIL 627b^U, Vagueness and the Sorites Paradox Susanne Bobzien

We study some of the main approaches to the Sorites paradox and examine what semantics (if any) can be given for vague expressions as well as what role pragmatic considerations ought to play in an account of vagueness. TH 1:30–3:20

PHIL 628a^U, Metaphysics Raul Saucedo

The seminar focuses on a few related issues concerning parts and wholes, space and time, modality, and ontological dependence. Readings are drawn from contemporary sources, including Lewis, Fine, Van Inwagen, Sider, Schaffer, and Uzquiano. W 1:30–3:20

PHIL 629b^U, Direction of Time Jill North

We focus on the following problem: How can we 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 – if the underlying laws of physics are symmetric in time? Is it possible to have a unified explanation for the different asymmetries we experience? If so, does this suggest that time itself has a direction? We also look at the probabilities required by the explanations: How should we understand these probabilities metaphysically? T 3:30–5:20

PHIL 630a^u, Definition and Essence George Bealer

We examine the nature of definition and essence, their relation to one another and to modality, whether one of these notions is definitionally prior to the others, and whether any of them must be taken as an ultimate primitive. TH 1:30–3:20

PHIL 631a^u, Personal Identity and the Self Katalin Balog

The central theme of this course is the concept of a person. We explore, among other things, if our conception of what it is to be a human being is historically conditioned and culture-relative and if our conception of ourselves is related to our knowledge and understanding of other people. A related issue to be discussed is the problem of personal identity over time; that is, what makes a person the same individual over time. Implications for ethics, psychology, and the significance of mortality are considered as well.

T 1:30–3:20

PHIL 632b^u, Stoic Logic Susanne Bobzien

The class studies and discusses the important contributions Stoic philosophers made to various areas of logic, such as speech act theory, theory of meaning, propositional logic, deductive systems, relevance and modal logics, truth theories, and semantic paradoxes.

TH 7–8:50

PHIL 633b^u, Computability and Logic Sun-Joo Shin

A technical exposition of Gödel's first and second incompleteness theorems and of some of their main consequences in proof theory and model theory, such as Lob's theorem, Tarski's undefinability of truth, provability logic, and nonstandard models of arithmetic.

T 3:30–5:20

PHIL 634a, Recent Approaches to Skepticism Jonathan Vogel

We discuss and assess contemporary approaches to the problem of skepticism about the external world, focusing especially on neo-Moorean, a priori entitlement, and inference to the best explanation accounts. T 3:30–5:20

PHIL 635b^u, The Self: East and West Katalin Balog

In this course we explore Eastern and Western philosophical approaches to the nature of the self and personal identity. Particular attention is paid to the view that commonsense concepts of the self are defective and to the role attributed to this in our psychology.

W 1:30–3:20

PHIL 636a^u, Propositions, Truth, and Paradox Bruno Whittle

We look at semantic paradoxes and ask whether, in light of these, one can give adequate accounts of propositions and of truth. Topics include varieties of possible worlds, consistent accounts of structured propositions (propositions with a sentence-like structure), and languages that contain their own truth predicates. T 1:30–3:20

PHIL 637b^u, Topics in the Philosophy of Mathematics Bruno Whittle

We focus on a variety of related topics in the philosophy of mathematics. We start with issues clustered around the notion of a set. These include the question of whether one can quantify over absolutely everything, and the question of whether there are really infinite sets of different sizes. Next we look at the significance of Gödel's Incompleteness Theorems. (Knowledge of the theorems is not presupposed.) Finally we consider

arguments designed to show that certain mathematical terms are referentially indeterminate. M 1:30–3:20

PHIL 650a^U, Biology, Evolution, and Culture Jonathan Gilmore

A broad investigation into purported evolutionary and biological explanations for such cultural phenomena as language, morals, politics, and art. F 1:30–3:20

PHIL 651b^U, Aesthetics and the Philosophy of Art Jonathan Gilmore

Advanced seminar in the philosophy of art. Topics include concepts of art; aesthetic judgment; art and morality; depiction and cognition; fictions and emotions; imagination; originality and forgery; intention and interpretation; artistic style; expression. F 1:30–3:20

PHIL 653a^U, Hobbes, Locke, Rousseau Matthew Smith

A central tradition in political theory is the social contract tradition, which theorizes how the consent of the governed justifies or legitimates political authority. This course explores the works of three of the earliest and most significant early modern proponents of this view: Thomas Hobbes, John Locke, and Jean-Jacques Rousseau. We do close readings of Hobbes's *Leviathan* and *De Cive*, Locke's *The Two Treatises of Government*, and Rousseau's *Discourse on the Origins of Inequality* and *The Social Contract*. TH 1:30–3:20

PHIL 655b^U, Normative Ethics Shelly Kagan

A systematic examination of normative ethics, the part of moral philosophy that attempts to articulate and defend the basic principles of morality. The bulk of 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). W 1:30–3:20

PHIL 656a^U/PLSC 620a^U, John Rawls on Social Justice Thomas Pogge

John Rawls is widely hailed as the most important political philosopher of the twentieth century. Focusing mainly on his *A Theory of Justice*, this seminar critically assesses his account of social justice. T 3:30–5:20

PHIL 700a/PLSC 605a, Rethinking Sovereignty: Cosmopolitanism, Rights, and Popular Constitutionalism Seyla Benhabib

Recently the “crisis” of sovereignty, the “end” of sovereignty, have been discussed in law, political science, and philosophy. Post-nationalist, cosmopolitan, as well as neo-liberal critics of sovereignty abound. This course discusses alternative models of sovereignty, ranging from democratic iterations to popular constitutionalism, and it considers the implications of these models for the definition and enforcement of rights. Readings include Hobbes, Bodin, Austin, Schmitt, Kelsen, Habermas, Waldron, Pogge, and Aleinikoff. W 1:30–3:20

PHIL 701b/PLSC 606b, From Weber to Derrida Seyla Benhabib

Topics include modernity and rationalization; science and the problem of values; the concept of public sphere; decisionism and the friend/foe distinction; Heidegger's ontology and politics; Derrida on cosmopolitanism; and Habermas and Derrida on terror

and philosophy. For political science students this course serves as their Introduction to Contemporary Theory. W 1:30–3:20

PHIL 703a, Philosophy of Language Keith DeRose

Some recent developments in the philosophy of language. Topics may include conversational implicatures, warranted assertability, conditionals, modal language, knowledge attribution, and context sensitivity. T 1:30–3:20

PHIL 704a/CPLT 698a, Hegel, Introductory Lectures on Aesthetics Karsten Harries

M 1:30–3:20

PHIL 705b/INRL 524b/HPA 599b/PLSC 594b, Global Health Ethics, Politics, and

Economics Thomas Pogge, Jennifer Ruger

Billions lack access to basic medical care, and global health inequalities are wide and growing. Such radical disparities cast doubt on the justice of supranational institutional arrangements (such as the TRIPS Agreement) and also pose ethical challenges for the global health community, especially international and domestic health and development institutions. Seeking to illuminate the normative issues involved, this course features a series of distinguished visitors, including academics as well as a few important representatives of international organizations, politics, foundations, NGOs, and relevant industries. M 1:30–3:20

PHIL 706a, First-Year Seminar George Bealer, Kenneth Winkler

Required and limited to first-year students in the Philosophy Ph.D. program. Topic varies from year to year. Preparation for graduate work. Reading, writing, and presentation skills. W 7–8:50

PHIL 707b, Work in Progress Keith DeRose, Matthew Smith

In consultation with the instructors, each student presents a significant work in progress, such as a revised version of an advanced seminar paper or a dissertation chapter. Upon completion of the writing, the student presents the work in a mock colloquium format, including a formal question-and-answer period. T 1:30–3:20

PHIL 708a/CPLT 541a, Poetics I: Theory of the Work of Literature

Benjamin Harshav

The course presents a comprehensive theory of works of literature as the highest sign-complexes in human culture. From rhythm and sound patterns through metaphor and fictional world to genre and representation, a work of literature combines elements of structure with a network of necessary and possible or contradictory constructs. The seminar develops a conceptual network for the descriptive analysis of individual works of poetry and fiction. The theory focuses on questions of fictionality and art in language, yet goes beyond linguistics and philosophy of language, on the one hand, and narratology, on the other. It is grounded in close readings of poems and narrative texts by Kafka, Eliot, Dostoevsky, and others. M 1:30–3:20

PHIL 709a/RLST 914a, Kant's Philosophy of Religion John Hare

The purpose of the course is to look at Kant's writings in the philosophy of religion. The principal readings are from Kant's *Critique of Pure Reason* (especially the Ideal and the

Canon), the *Lectures on Ethics*, *The Critique of Practical Reason* (especially the Dialectic), the *Critique of Judgment* (especially the Methodology), *Religion within the Boundaries of Mere Reason*, and *The Conflict of the Faculties*. TH 3:30–5:20

PHIL 710b/RLST 916b, Kierkegaard's Philosophy of Religion John Hare

This seminar explores a number of texts focusing on the relation between religious faith and the ethical life. We read the following texts (in whole or in part): *Either/Or*, *Fear and Trembling*, *Fragments*, *Concluding Unscientific Postscript*, *Works of Love*. M 3:30–5:20

PHIL 711a/CPLT 578a/ENGL 984a, Metapragmatics and Textual Culture

Michael Warner

An introduction to theoretical issues of textual analysis, and the difference between structuralist and metapragmatic approaches to language and culture. We review debates over performativity, the *langue/parole* distinction, indexicality and metaindexicality, and the nature of text. We then see how these traditions for analyzing the social dimensions of language infect various attempts to theorize modern forms of discourse and power—including the public sphere, concepts of genre and media, religion, and the practice of criticism itself. T 1:30–3:20

PHIL 712b/LING 672b, Topics in Semantics: Speech and Attitude Reports

Tamina Stephenson

This seminar course deals with the semantics of speech and attitude reports, to include such topics as modality, belief and knowledge reports, *de se* attitudes, attitudes with subjective content, factive presuppositions, and/or other areas of current interest. It is intended for graduate students in linguistics and philosophy with some background in semantics and/or philosophy of language. W 1:30–3:20

PHIL 713a, Action and Responsibility Gabriel Mendlow

An investigation of such central issues in the philosophy of agency as intention and intentional action, weakness of will, practical reason, and moral responsibility. Readings by contemporary philosophers. T 1:30–3:20

PHIL 750a or b, Tutorial

By arrangement with faculty.

PHYSICS

35 Sloane Physics Laboratory, 432.3607

www.yale.edu/physics/

M.S., M.Phil., Ph.D.

Chair

C. Megan Urry

Director of Graduate Studies

Witold Skiba (53C SPL, 432.3903, graduatephysics@yale.edu)

Professors Robert Adair (*Emeritus*), Charles Ahn (*Applied Physics*), Yoram Alhassid, Thomas Appelquist, Charles Bailyn (*Astronomy*), O. Keith Baker, Charles Baltay, Sean Barrett, Cornelius Beausang (*Adjunct*), William Bennett, Jr. (*Emeritus*), Hui Cao (*Applied Physics*), Richard Casten, Richard Chang (*Emeritus*), Paolo Coppi (*Astronomy*), David DeMille, Michel Devoret (*Applied Physics*), Frank Firk (*Emeritus*), Paul Fleury (*Applied Physics*), Moshe Gai (*Adjunct*), Steven Girvin, Leonid Glazman, Robert Grober (*Applied Physics*), Martin Gutzwiller (*Adjunct*), John Harris, Victor Henrich (*Applied Physics*), Arvid Herzenberg (*Emeritus*), Jay Hirshfield (*Adjunct*), Francesco Iachello, Martin Klein (*Emeritus*), Henry Kraybill (*Emeritus*), Steve Lamoreaux, William Lichten (*Emeritus*), Samuel MacDowell (*Emeritus*), William Marciano (*Adjunct*), Simon Mochrie, Vincent Moncrief, Peter Parker, Daniel Prober (*Applied Physics*), Nicholas Read, Vladimir Rokhlin (*Computer Science; Mathematics*), Jack Sandweiss, Robert Schoelkopf (*Applied Physics*), Ramamurti Shankar, Charles Sommerfield (*Emeritus*), A. Douglas Stone (*Applied Physics*), Paul Tipton, John Tully (*Chemistry*), Thomas Ullrich (*Adjunct*), C. Megan Urry, Pieter van Dokkum (*Astronomy*), John Wettlaufer (*Geology & Geophysics*), Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*), Michael Zeller

Associate Professors Jerzy Blawdziewicz (*Mechanical Engineering*), Richard Easther, Bonnie Fleming, Jack Harris, Sohrab Ismaill-Beigi (*Applied Physics*), Karyn LeHur, Daniel McKinsey, Priyamvada Natarajan (*Astronomy*), Corey O'Hern (*Mechanical Engineering*), Witold Skiba

Assistant Professors Helen Caines, Sarah Demers, Eric Dufresne (*Mechanical Engineering*), Walter Goldberger, Tobias Golling, Andreas Heinz, Daisuke Nagai, Jill North (*Philosophy*), Nikhil Padmanabhan, A. Elizabeth Rhoades (*Molecular Biophysics & Biochemistry*), Volker Werner

Fields of Study

Fields include atomic physics and quantum optics; nuclear physics; particle physics; astrophysics and cosmology; condensed matter; biological physics; quantum information physics; applied physics; and other areas in collaboration with the School of Engineering & Applied Science, and the departments of Mathematics; Chemistry; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Geology and Geophysics; and Astronomy.

Special Admissions Requirements

The prerequisites for work toward a Ph.D. degree in physics include a sound undergraduate training in physics and a good mathematical background. The GRE General Test and the Subject Test in Physics are required.

Special Requirements for the Ph.D. Degree

To complete the course requirements students are expected to take a set of nine term courses. A set of five core courses (Classical Mechanics, Electromagnetic Theory, Quantum Mechanics I and II, and Statistical Mechanics) serves to complete the student's undergraduate training in classical and quantum physics. A set of four advanced courses, including a required course in quantum field theory, provides an introduction to modern physics and research. Certain equivalent course work and successful completion of a pass-out examination may reduce the course requirement or allow substitution of elective courses for individual students. In addition, all students are required to be proficient and familiar with mathematical methods of physics (such as that necessary to master the material covered in the five core courses) and to be proficient and familiar with advanced laboratory techniques. These requirements can be met either by taking a course offered by the department or by carrying out an approved Special Investigation with individual faculty.

Students who have completed their course requirements with satisfactory grades (a grade of Honors in PHYS 990, Special Investigations, may be counted toward the Graduate School requirement of two grades of Honors), pass the qualifying examination, and submit an acceptable thesis prospectus are recommended for admission to candidacy. The qualifying examination, normally taken at the beginning of the third term (and no later than the beginning of the fifth term), is a six-hour written examination covering the five core courses and mathematical methods as described above. Students normally submit the dissertation prospectus before the end of the third year of study.

There is no foreign language requirement. Teaching experience is regarded as an integral part of the graduate training program. During their study students are expected to serve as teaching fellows, usually in the first two years. Formal association with a dissertation adviser normally begins in the fourth term after the qualifying examination has been passed and required course work has been completed. An adviser from a department other than Physics can be chosen in consultation with the director of graduate studies, provided the dissertation topic is deemed suitable for a physics Ph.D.

Master's Degrees

M.Phil. Students who have successfully advanced to candidacy qualify for the M.Phil. degree.

M.S. (en route to the Ph.D.) Students who complete the first-year graduate courses with a satisfactory record (including two Honors or four High Passes) qualify for the M.S. degree.

Program materials are available upon request to the Director of Graduate Studies, Department of Physics, Yale University, PO Box 208120, New Haven CT 06520-8120; e-mail, graduatephysics@yale.edu; Web site, www.yale.edu/physics.

Courses

PHYS 500a, Classical Mechanics Yoram Alhassid

Newtonian dynamics, Lagrangian dynamics, and Hamiltonian dynamics. Rigid bodies and Euler equations. Oscillations and eigenvalue equations. Classical chaos. Introduction to dynamics of continuous systems. TTH 11:35–12:50

PHYS 502b, Electromagnetic Theory I Walter Goldberger

Classical electromagnetic theory including boundary-value problems and applications of Maxwell equations. Macroscopic description of electric and magnetic materials. Wave propagation. MW 11:35–12:50

PHYS 504Lb, Modern Physics Measurements Steve Lamoreaux and staff

A laboratory course with experiments and data analysis in soft and hard condensed matter, nuclear and elementary particle physics. MW 1:30–4:20

PHYS 506a^U, Mathematical Methods of Physics Nicholas Read

Survey of mathematical techniques useful in physics. Includes vector and tensor analysis, group theory, complex analysis (residue calculus, method of steepest descent), differential equations and Green's functions, and selected advanced topics. MW 9–10:15

PHYS 508a, Quantum Mechanics I Francesco Iachello

The principles of quantum mechanics with application to simple systems. Canonical formalism, solutions of Schrödinger's equation, angular momentum, and spin. TTH 11:35–12:50

PHYS 512b, Statistical Physics I Nicholas Read

Review of thermodynamics, the fundamental principles of classical and quantum statistical mechanics, canonical and grand canonical ensembles, identical particles, Bose and Fermi statistics, phase transitions and critical phenomena, renormalization group, irreversible processes, fluctuations. TTH 11:35–12:50

PHYS 517a2/ENAS 517a/MB&B 517a2, Methods and Logic in Interdisciplinary

Research Eric Dufresne, Enrique de la Cruz, Thierry Emonet, Paul Forscher, Christine Jacobs-Wagner, Michael Levene, Simon Mochrie, Corey O'Hern, Lynne Regan, Elizabeth Rhoades, Corey Wilson

This half-term IGPPEB class is intended to introduce students to integrated approaches to research. Each session is led by faculty with complementary expertise and discusses papers that use different approaches to the same topic (for example, physical and biological or experiment and theory). Counts as 0.5 credit toward MB&B graduate course requirements. TH 7–8:50

PHYS 522a, Introduction to Atomic Physics David DeMille

This course is intended to develop basic theoretical tools needed to understand fundamental atomic processes. Emphasis given to applications in laser spectroscopy. Experimental techniques discussed when appropriate. MW 11:35–12:50

PHYS 523a/ENAS 541a/MB&B 523a, Biological Physics Simon Mochrie

An introduction to the physics of several important biological phenomena, including molecular motors, protein folding, bacterial locomotion, and allostery. The material

and approach are positioned at the interface of the physical and biological sciences. TTH 2:30–3:45

[PHYS 524a, **Introduction to Nuclear Physics**]

[PHYS 525b, **Quantum Physics at Femto- and Nano-Scales**]

PHYS 526b, Introduction to Elementary Particle Physics Paul Tipton

An overview of particle physics, including an introduction to the standard model, experimental techniques, symmetries, conservation laws, the quark-parton model, and open questions in particle physics. MW (F) 1–2:15

[PHYS 529b/MCDB 561b^U, **Systems Modeling in Biology**]

[PHYS 538a, **Introduction to Relativistic Astrophysics and General Relativity**]

PHYS 548a^U and 549b^U/ENAS 850a^U and 851b^U, Solid State Physics I and II Staff

A two-term sequence covering the principles underlying the electrical, thermal, magnetic, and optical properties of solids, including crystal structures, phonons, energy bands, semiconductors, Fermi surfaces, magnetic resonance, phase transitions, and superconductivity. TTH 1–2:15

PHYS 561b^U, General Relativity, Astrophysics, and Cosmology Richard Easter

An introduction to General Relativity, first developing the differential geometry needed to write down the Einstein field equations, and then exploring the consequences of Special and General Relativity in a variety of astrophysical settings. MW 2:30–3:45

PHYS 570a/ASTR 570a, High-Energy Astrophysics Eilat Glikman

A survey of current topics in high-energy astrophysics, including accreting black hole and neutron star systems in our galaxy, pulsars, active galactic nuclei and relativistic jets, gamma-ray bursts, and ultra-high-energy cosmic rays. The basic physical processes underlying the observed high-energy phenomena are also covered. HTBA

PHYS 600a/ASTR 600a^U, Cosmology Priyamvada Natarajan

A comprehensive introduction to cosmology at the graduate level. The standard paradigm for the formation, growth, and evolution of structure in the universe is covered in detail. The course does not assume prior knowledge of general relativity. HTBA

PHYS 608b, Quantum Mechanics II Francesco Iachello

Approximation methods, scattering theory, and the role of symmetries. Relativistic wave equations. Second quantized treatment of identical particles. Elementary introduction to quantized fields. TTH 9–10:15

PHYS 609a, Relativistic Field Theory I Thomas Appelquist

The fundamental principles of quantum field theory. Interacting theories and the Feynman graph expansion. Quantum electrodynamics including lowest order processes, one-loop corrections, and the elements of renormalization theory. TTH 11:35–12:50

PHYS 610b/ENAS 852b, Quantum Many-Body Theory Yoram Alhassid

Second quantization, quantum statistical mechanics, Hartree-Fock approximation, linear response theory, random phase approximation, perturbation theory and Feynman

diagrams, Landau theory of Fermi liquids, BCS theory, Hartree-Fock-Bogoliubov method. Applications to solids and finite-size systems such as quantum dots, nuclei, and nanoparticles. TTH 11:35–12:50

[PHYS 624b^U, Group Theory]

PHYS 628a, Statistical Physics II Leonid Glazman

An advanced course in statistical mechanics. Topics to be covered may include mean field theory of and fluctuations at continuous phase transitions; critical phenomena, scaling, and introduction to the renormalization group ideas; topological phase transitions; dynamic correlation functions and linear response theory; quantum phase transitions; superfluid and superconducting transitions; some cooperative phenomena in low-dimensional systems. TTH 2:30–3:45

[PHYS 630b, Relativistic Field Theory II]

[PHYS 632b, Quantum Many-Body Theory II]

[PHYS 633b/ENAS 863b, Introduction to Superconductivity]

PHYS 634a/ENAS 818a, Mesoscopic Physics I Michel Devoret

Introduction to the physics of nanoscale solid state systems which are large and disordered enough to be described in terms of simple macroscopic parameters like resistance, capacitance, and inductance, but small and cold enough that effects usually associated with microscopic particles, like quantum-mechanical coherence and/or charge quantization, dominate. Emphasis is placed on transport and noise phenomena in the normal and superconducting regimes. MW 9–10:15

Special Topics Courses

[PHYS 662b, Special Topics in Particle Physics: Beyond the Standard Model]

PHYS 667b/ENAS 860b, Special Topics in Condensed Matter Physics: Quantum Hall Effect and Conformal Field Theory Staff

Aspects of the quantum Hall effect, particularly the fractional effect, and conformal field theory, plus the connections between the two. Quantum Hall states, composite particles, quasiparticles, fractional charge, and statistics. Future applications to rotating trapped atoms. Conformal symmetry in two dimensions, applications to classical critical phenomena, [+] quantum field theory. Nonabelian quantum Hall states and the relation with conformal field theory and Chern-Simons gauge theory. Background required: statistical mechanics, and either many-body theory or quantum field theory.

[PHYS 677a, Noise Dissipation, Amplification, and Information]

[PHYS 678b, Computing for Scientific Research]

[PHYS 680a^U, The Experiments of General Relativity]

PHYS 990a and b, Special Investigations Faculty

Directed research by arrangement with individual faculty members and approved by the DGS.

PHYS 991b/ENAS 991b/MB&B 591b, Integrated Workshop Corey Wilson

This required course for students in IGPPEB involves hands-on laboratory modules with students working in pairs. A biological student is paired with a physics or engineering student; a computation/theory student is paired with an experimental student. The modules are devised so that a range of skills are acquired, and students learn from each other. HTBA

POLITICAL SCIENCE

115 Prospect, 432.5241
www.yale.edu/polisci/
 M.A., M.Phil., Ph.D.

Chair

Susan Stokes

Director of Graduate Studies

Nicholas Sambanis

Professors Bruce Ackerman, Akhil Amar (*Law*), Seyla Benhabib, Paul Bracken (*Management*), David Cameron, Bryan Garsten, Alan Gerber, Donald Green, Jacob Hacker, Stathis Kalyvas, David Mayhew, Barry Nalebuff (*Management*), Douglas Rae, John Roemer, Susan Rose-Ackerman, Frances Rosenbluth, Bruce Russett, Nicholas Sambanis, Kenneth Scheve, James Scott, Ian Shapiro, Stephen Skowronek, Steven Smith, Susan Stokes, Alec Stone Sweet, Peter Swenson, Ivan Szelenyi (*Sociology*), John Wargo (*Forestry & Environmental Studies*), Elisabeth Wood

Associate Professors Keith Darden, Thad Dunning, Gregory Huber, Pierre Landry, Ellen Lust

Assistant Professors Khalilah Brown-Dean, Christopher Blattman, John Bullock, Daniel Butler, Seok-ju Cho, Alexandre Debs, Samuel DeCanio, Ana De La O, Justin Fox, Susan Hyde, Sigrun Kahl, Hélène Landemore, Adria Lawrence, Karuna Mantena, Andrew March, Nikolay Marinov, Nuno Monteiro, Paulina Ochoa Espejo, Ato Kwanema Onoma, Eleanor Powell, Jun Saito, Vivek Sharma, Jessica Weiss

Fields of Study

Fields include contemporary theory, political philosophy, international relations, comparative politics, American politics, political economy, quantitative empirical methods, qualitative empirical methods, and formal theory.

Special Admissions Requirement

The department requires that scores from the GRE General Test accompany an application.

Special Requirements for the Ph.D. Degree

Students are required to pass sixteen term courses before the end of their fifth term in the program and to receive a grade of Honors in at least two Political Science courses. Two of the courses may be in departments other than Political Science. Students are normally expected to complete eight courses in the first year, including the required Introduction to the Study of Politics given in the fall term each year, which is graded on a Satisfactory/Unsatisfactory basis.

As part of the second year of courses, all students are required to take the two-term course in Research and Writing, which is devoted to the preparation of a manuscript based on original research on a topic of the student's choice. The course is conducted

as a seminar including all second-year students and directed by two members of the faculty.

All students must take a one-term graduate-level course in statistical methods, successful completion of which satisfies the statistics requirement. The statistics requirement, the first-year introductory course, and the second-year Research and Writing sequence will count as four of the sixteen credits needed to advance to candidacy.

Each student must demonstrate elementary reading competence in one foreign language. Such competence is usually demonstrated by taking, or having completed, two years of undergraduate course work or by examination. Alternatively the language requirement can be satisfied by successfully completing two terms of formal theory or two terms of statistical methods at the graduate level, in addition to the required course in statistical methods.

Courses are offered in six substantive fields – contemporary theory, political philosophy, international relations, comparative politics, American politics, and political economy – and three methods fields – quantitative empirical methods, qualitative empirical methods, and formal theory. The department also allows students in exceptional cases to petition for the creation of a special field of study that will be certified by successful completion of a comprehensive examination created by the field advisers. Each student must demonstrate competence in four fields by the end of the fifth term, *including at least two of the substantive fields*. Competence can be demonstrated either by passing the comprehensive examination in the field or by course work, provided that each student takes at least two comprehensive exams. For fields to be certified by course work, students are required to satisfactorily complete three courses in the field, including one in which a research paper or other independent project is presented.

In order to be admitted to candidacy for the Ph.D. degree, the student must have a prospectus approved by a dissertation director and two other members of the faculty. This must occur by no later than May 1 of the student's third year of study.

Students are admitted to candidacy by the end of the third year, but only after completion of all requirements, including the Introduction to the Study of Politics course, Research and Writing, the statistics course, the necessary field distributions and certifications, and approval of the dissertation prospectus.

Almost without exception, those who successfully complete the Ph.D. in Political Science will join the faculties of colleges and universities. For that reason, learning what is involved in teaching and gaining teaching experience are also essential and central components of graduate education. The department normally expects students to devote themselves exclusively to course work and comprehensive examinations in their first two years in the Ph.D. program. Students in Political Science typically teach in their third and fourth years.

During each year in residence, graduate students are expected to participate actively and regularly in one or more of the many research workshops run by the department. Students beyond their fourth term are required to enroll in at least one of the workshops for credit, and all workshops are graded on a Satisfactory/Unsatisfactory basis. All students are expected to present a research paper of their own at one of these workshops before the end of their fourth year. Workshop participation does not count toward the requirement of sixteen term courses.

The Graduate School offers a combined degree in Political Science and African American Studies. For details, see the entry under African American Studies in this publication. Students may also pursue a joint degree with the Law School.

Master's Degrees

M.Phil. The academic requirements for the M.Phil. degree are the same as for the Ph.D. degree except for the completion of the dissertation.

M.A. (en route to the Ph.D.) The M.A. degree is awarded upon completion of a full year of course work in the program (i.e., at least eight term courses) with an average of High Pass or better. The courses must include one each in at least three of the department's substantive fields and a graduate-level course in statistical analysis. Language requirements are the same as for the Ph.D. degree.

Program materials are available upon request to the Director of Graduate Studies, Political Science Department, Yale University, PO Box 208301, New Haven CT 06520-8301.

Courses

EMPIRICAL ANALYSIS AND RESEARCH METHODOLOGY

PLSC 500a, Statistics Alan Gerber

The goal of this course is to introduce basic statistical theory and techniques for Political Science graduate students. The first part of the course covers probability theory, and the second part is devoted to estimation and inference, including an introduction to the classic multiple linear regression framework. Although emphasis is on the development of the relevant theory and statistical concepts, a series of applications and examples is considered on a variety of political science problems, such as turnout, crime, elections, party systems. TTH 9–10:15

PLSC 503b, Quantitative Methods Thad Dunning

This course provides an extensive treatment of the linear regression model. It covers a wide array of regression techniques, including those that address problems of measurement error, reciprocal causation, and nonlinearities. Time series and pooled time-series-cross-sectional models are also covered. The aim is to make students intelligent consumers of published quantitative research and to prepare them to conduct original research in political science. The course assumes that students have command of the material covered in PLSC 500, including basic knowledge of probability and linear regression. Matrix algebra and calculus are helpful but not essential. TTH 9–10:15

PLSC 504a, Advanced Quantitative Methods Donald Green

This course provides an extensive treatment of the likelihood theory of statistical inference that underlies many of the statistical methods used in political science. After the foundational material is presented, we introduce a large variety of statistical models. These include dichotomous and polychotomous response models, models for censored and truncated data, sample selection models, duration models, and models for count data. We also cover methods for time series and pooled time-series-cross-sectional data

with an emphasis on approaches for limited dependent variables. Finally, the course introduces some basic ideas and methods from Bayesian data analysis. The aim is to make students intelligent consumers of published quantitative research and to prepare them to conduct original research in political science. The course assumes that students have command of the material covered in PLSC 500 and PLSC 503 including basic probability theory, matrix algebra, and the linear regression model. MF 9:25–11:15

PLSC 505b^U, Qualitative Field Research Adria Lawrence

In this seminar we discuss and practice qualitative field research methods. The course covers the basic techniques for collecting, interpreting, and analyzing ethnographic data, with an emphasis on the core ethnographic techniques of participant observation and in-depth interviewing. All participants carry out a local research project. Permission of the instructor required for undergraduates. T 3:30–5:20

PLSC 508b, Research Design and Causal Inference Christopher Blattman

This course is a causal inference lab. The aim is to prepare graduate students to be advanced and intelligent users or producers of statistics, with particular attention to the problem of identifying causal relationships with data. The course has two components: one, an emphasis on critical readings of applied empirical papers in political science, economics, criminology, and health; and two, presentation and discussion of a student's ongoing empirical project. Students without an empirical dissertation project are helped to develop one, including access to innovative data. The course assumes that students have command of the material covered in PLSC 500, PLSC 503, and PLSC 504 including basic probability theory, matrix algebra, the linear regression model, and maximum likelihood estimation. The topics covered depend on student interests but definitely include approaches used in observational data: matching estimators, differences-in-differences estimators, instrumental variable methods, and regression discontinuity designs. Sensitivity analysis and bounding techniques are also discussed, as are the design of quasi-experiments and the use of mixed qualitative-quantitative methods. T 1:30–3:20

PLSC 510a, Introduction to the Study of Politics Nicholas Sambanis

This course introduces students to some of the major controversies in political science. We focus on the five substantive themes that make up the Yale Initiative: Order, Conflict, and Violence; Representation and Popular Rule; Crafting and Operating Institutions; Identities, Affiliations, and Allegiances; and Distributive Politics. We divide our time between discussing readings on these subjects and conversations with different members of the faculty who specialize on them. There is also some attention to methodological controversies within the discipline. Requirements: an annotated bibliography of one of the substantive themes and a take-home final exam. W 9:25–11:15

PLSC 512b^U, Experimental Methods in Political Science Donald Green, Alan Gerber

An introduction to experimental methods as they can be used to study politics. Exploration of strengths and weaknesses of experimental and nonexperimental studies. Applications include the effects of television advertising, formation of political attitudes, and causes of voter turnout. Students participate in the design and implementation of an experiment. Knowledge of introductory statistics helpful but not required. M 3:30–5:20

PLSC 517a, Fundamentals of Modeling John Roemer

An introduction to techniques of microeconomic modeling, as applied to problems in political science. The level is that of a fairly sophisticated course in intermediate microeconomics. Topics include preferences, utility functions, Pareto efficiency, economic equilibrium, voting for public goods, Nash equilibrium, the first theorem of welfare economics, Hotelling-Downs political equilibrium, Wittman-Nash political equilibrium, Arrow's theorem and social welfare functions, equilibria in multidimensional issue spaces, and Bayesian equilibria with applications to the politics of redistribution, market and government failures, and turnout. Prerequisites are differential calculus, and/or the Political Science Math Camp. Microeconomics at the intermediate level is helpful but not mandatory. W 1:30–3:20

PLSC 518b, Fundamentals of Modeling II Seok-ju Cho

Building upon Fundamentals of Modeling I, this course offers a rigorous introduction to noncooperative game theory. The goal of this course is to help students understand the key concepts and ideas in game theory and to provide students with a road map for applying game theoretic tools to their own research. Topics include strategic form games, extensive form games, and Bayesian games, among others. Students are assumed to have mathematical knowledge at the level of the Political Science Math Camp and to have taken Fundamentals of Modeling I or its equivalent. M 7–8:50

PLSC 520b^U, Introduction to Game Theory with Political Applications Justin Fox

This course provides an overview of game theory and its applications to problems of a political nature. We start from the ground floor, assuming no prior exposure to game theory or mathematics beyond high school algebra. Students are introduced to the concepts of Nash equilibrium, time-consistency, signaling, and reputation formation. The applications covered depend in part on student interest. Possibilities include models of candidate competition, models of international conflict, models of ethnic conflict. TTH 4–5:15

PLSC 522a/SOCY 503a^U, Historical Explanation Sigrun Kahl

Provides an overview of the how-to, and the payoff, of a historical approach to the study of politics. Covers a wide range of topics, from the classics of political science and sociology up to recent comparative historical work. W 1:30–3:20

PLSC 540a&b, Research and Writing John Bullock, Nicholas Sambanis

This is a required course for all second-year students. It meets for the first six weeks of the fall term and the first six weeks of the spring term. The fall meetings are devoted to discussion of research design as well as individual student projects. The spring meetings are devoted to discussion of drafts of student papers. The work of the spring-term seminar includes criticism of the organization, arguments, data evaluation, and writing in each student's paper by the instructors and the other students. Using this criticism, and under the supervision of the instructors, each student conducts additional research, if necessary, rewrites the paper as required, and prepares a final paper representing the best work of which the student is capable. Students must submit a one-page outline of the proposed project for the first fall-term meeting and a complete draft of the paper at the first meeting in the spring. W 3:30–5:20

CONTEMPORARY THEORY

PLSC 553a/LAW 20104, Justice Bruce Ackerman

An examination of contemporary theories, together with an effort to assess their practical implications. Authors this year include Peter Singer, Richard Posner, John Rawls, Robert Nozick, Michael Walzer, Marian Young, and Roberto Unger. Topics: animal rights, the status of children and the principles of educational policy, the relation of market justice to distributive justice, the status of affirmative action. Self-scheduled examination or paper option. HTBA

PLSC 573b/LAW 21130, Theory and Practice: Seminar Bruce Ackerman

A writing seminar devoted to the exploration of the practical significance of the theories of justice considered in the fall-term course Justice, which is generally a requirement for admission into this seminar. Students with exceptional backgrounds in political philosophy may be admitted directly upon satisfying the instructor that they have in fact read and pondered the texts discussed in the fall-term course. Prerequisite: Justice (PLSC 553a), or permission of instructor. Enrollment limited. HTBA

PLSC 574a, Topics in Democratic Theory Ian Shapiro

A survey of recent work in democratic theory, aimed primarily at Ph.D. students in Political Science. The course is divided into four parts: (i) competing meanings of democracy; (ii) getting and keeping democracy; (iii) tensions between democracy and other goods (such as equality, justice, efficiency, privacy, community, and identity); and (iv) democracy and cosmopolitanism. There is some attention to classic authors such as Rousseau, Madison, Tocqueville, and Schumpeter, but our principal focus is on contemporary debates and scholarship. Readings include work by Robert Dahl, John Rawls, Michael Walzer, Susan Moller Okin, John Roemer, Adam Przeworski, Will Kymlicka, Brian Barry, Sarah Song, and the instructor. Students are expected *either* to write a review essay plus final exam, *or* to complete a research paper (topic to be agreed with the instructor no later than October 15). TH 3:30–5:20

PLSC 601b^U, Liberalism and the Politics of Empire Karuna Mantena

Examination of historical and contemporary theories about the origins, dynamics, and persistence of imperial politics, with a special focus on how liberalism has responded to the problem of empire. Classical writings of Burke, Smith, Mill, Tocqueville, and others are analyzed alongside recent work in political theory and philosophy on liberal justifications of empire, just war, and humanitarian intervention. W 9:25–11:15

PLSC 604b^U/WGSS 681b^U, European Political Thought from Weber to Derrida

Seyla Benhabib

A survey of major themes in twentieth-century continental political thought. Topics include reason and rationalization in modernity; legality, legitimacy, and sovereignty; decline of the public sphere; origins of totalitarianism; and communicative ethics and the inclusion of the “other” in the new Europe. Readings from Max Weber, the Frankfurt school, Walter Benjamin. TTH 2:30–3:20

PLSC 605a/PHIL 700a, Rethinking Sovereignty: Cosmopolitanism, Rights, and Popular Constitutionalism Seyla Benhabib

Recently the crises of sovereignty and the end of sovereignty have been discussed in law, political science, and philosophy. Post-nationalist, cosmopolitan, as well as neo-liberal critics of sovereignty abound. This course discusses alternative models of sovereignty, ranging from democratic iterations to popular constitutionalism, and considers the implications of these models for the definition and enforcement of rights. Readings include Hobbes, Bodin, Austin, Schmitt, Kelsen, Habermas, Waldron, Pogge, and Aleinikoff. W 1:30–3:20

PLSC 606b/PHIL 701b, From Weber to Derrida Seyla Benhabib

This course is to be taken in conjunction with European Political Thought (PLSC 604b). Topics include modernity and rationalization; science and the problem of values; the concept of public sphere; decisionism and the friend/foe distinction; Heidegger's ontology and politics; Derrida on cosmopolitanism; and Habermas and Derrida on terror and philosophy. For political science students this course serves as their Introduction to Contemporary Theory. W 1:30–3:20

PLSC 617b, Democracy and Deliberation Hélène Landemore

This course examines the connection between the idea of democracy and the practice of deliberation. The principal aim of the course is to go beyond the classical opposition between the proponents of an aggregative view of democracy (where the key feature of democracy is essentially majority rule, which is supposed to adjudicate between equally legitimate interests) and the proponents of "deliberative democracy," where the key feature of democracy lies in reasonable debates among free and equal citizens. The course examines theories of democracy from Aristotle to Habermas through Downs and Schumpeter. The course also addresses some broader philosophical questions, such as: What is the most compelling justification for democracy? Does democracy imply rule of the greatest number? Is representative democracy genuinely democratic? What are the characteristics of democratic deliberation? Are there limits on what can be said in democratic deliberation or constraints on who can say it? What functions do majority rule and deliberation fulfill in democratic institutions? What is "the public"? Where does it speak? TH 9:25–11:15

POLITICAL PHILOSOPHY

PLSC 565a^U/LAW 20538, Democracy and Distribution Ian Shapiro, Michael Graetz

An examination of the relations between democracy and the distribution of income and wealth, principally but not exclusively in the United States. Particular attention to the ways in which different groups, classes, and coalitions affect, and are affected by, democratic distributive politics. Attention is divided among theories of distribution, distributive instruments, and the implementation of policies affecting distribution. Substantive topics include taxes, welfare, public opinion, gender, race, affirmative action, education, and trade unions. Research paper or two review essays. M 3:30–5:20

PLSC 620a^U/PHIL 656a^U, John Rawls on Social Justice Thomas Pogge

John Rawls is widely hailed as the most important political philosopher of the twentieth century. Focusing mainly on his *A Theory of Justice*, this seminar critically assesses his account of social justice. T 3:30–5:20

INTERNATIONAL RELATIONS

PLSC 594b/HPA 599b/INRL 524b/PHIL 705b, Global Health Ethics, Politics, and Economics Thomas Pogge, Jennifer Ruger

Billions lack access to basic medical care, and global health inequalities are wide and growing. Such radical disparities cast doubt on the justice of supranational institutional arrangements (such as the TRIPS Agreement) and also pose ethical challenges for the global health community, especially international and domestic health and development institutions. Seeking to illuminate the normative issues involved, this course features a series of distinguished visitors, including academics as well as a few important representatives of international organizations, politics, foundations, NGOs, and relevant industries. M 1:30–3:20

PLSC 651b^U, The Balance of Power: Theory and Practice Nuno Monteiro

This seminar explores the role of the balance of power in the theory and practice of international relations. We cover the development of different theoretical views on the balance of power as well as the history of the international balance of power since the turn of the twentieth century. The emphasis is analytic rather than historical; we therefore focus on what the balance of power can highlight on recent, post-Cold War events and trends. By the end of the course, students should be conversant with the theoretical aspects of balance-of-power scholarship and also have a broad picture of the historical development of the rise and fall of great powers in the last hundred years. MW 4–5:15

PLSC 653a^U, Anti-Americanism in World Politics Jessica Weiss

Anti-Americanism and other varieties of anti-foreign sentiment in the developing world, with a focus on the international and domestic sources of anti-Americanism and implications for U.S. foreign policy. TH 9:25–11:15

PLSC 654a^U, International Relations Theory Nuno Monteiro

This seminar explores the main theories of international relations. By the end of the course, students should be conversant with basic IR theory and have the intellectual equipment to understand, criticize, and apply these (and other) theories of international relations. The course is also designed to provide students with an understanding of the potential and limitations of theory in the study of international politics. T 3:30–5:20

PLSC 655b^U, Nationalism and Identity Keith Darden

Exploration of the formation of national identity and the expression of nationalist sentiments through ethnic parties, autonomy movements, resistance to occupation, and warfare. Particular focus on Europe and post-Soviet Eurasia. W 3:30–5:20

PLSC 662a^U/INRL 592a/MGT 586a, Strategy, Technology, and War Paul Bracken

The interrelationship of strategy, foreign policy, and military technology since 1900. Examination of classic and modern formulations of this relationship, including new post-Cold War theories of the role of force in international affairs. Topics include multipolarity and the emergence of new competitors; developments in military technology and their impact on the balance of power and U.S. international position; proliferation of weapons of mass destruction; information warfare and the revolutionary impact of new technologies. MW 11:35–12:50

PLSC 663b^U, Domestic Politics and International Conflict Alexandre Debs

We study the relationship between domestic political institutions and war-proneness, looking at the question of the democratic peace, diversionary use of force, and so on. Basic knowledge of game theory is required. M 9:25–11:15

PLSC 668b^U, International Dimensions of Democratization Nikolay Marinov

The current wave of democratizations around the world leads us to investigate the role played by international factors such as socialization, coercion, emulation. The main question of interest is how much democratic processes can be affected from the outside. W 9:25–11:15

PLSC 671b^U, The Philosophy, History, and Sociology of International Relations

Nuno Monteiro

This seminar explores the philosophical foundations of the study of international relations, as well as the history and sociology of the discipline. Topics include the historical development of IR as a professional discipline since the interwar period, the main foundational debates that organized the field, and its sociological evolution. By the end of the course, students should have an understanding of the main meta-theoretical issues in the discipline and thus be able to enlarge their toolkit to critically engage IR scholarship. T 9:25–11:15

PLSC 678b^U, Japan and the World Jun Saito

The nature of Japan's international relations and its foreign policy. The historical development of Japan's international relations since the late Tokugawa period, WWII and its legacy, domestic institutions and foreign policy, Japan's relations with neighboring countries, the implications of these relations for the United States, and interactions between nationalism and regionalism. M 9:25–11:15

PLSC 679a, International Relations Field Seminar Keith Darden

This course examines theories of international relations and the methods used for evaluating them. The course begins with a review of different philosophies of science, surveys the main theoretical traditions in international relations, and then examines the different empirical methods that can be used to identify causation, using examples from IR. The course is designed to marry comprehensive conceptual training with the tools to do original research. Students gain practical experience in selecting a problem, developing or selecting a theory, coding and analyzing their own data, and demonstrating causation with a case study. TH 3:30–5:20

PLSC 685a/INRL 555a, Theories in International Relations Nikolay Marinov

This course provides an introduction to the major concepts and theories in the field of international relations. By the end of the course, students should be familiar with some of the major debates in the field, and be comfortable using IR concepts and theories to understand and explain events in international politics. The course is a reading-intensive seminar, and the weekly meetings are structured around student-led presentations and discussions of the assigned readings for the week. The student presentations should provide a brief overview of the main arguments of the readings and raise questions for group discussion. All students should prepare to participate in the group discussion by preparing discussion notes, which are turned in at the end of each session of class. There are approximately 150–200 pages of required reading per week. M 3:30–5:20

COMPARATIVE POLITICS

PLSC 714a, Corruption, Economic Development, and Democracy

Susan Rose-Ackerman

A seminar on the link between political and bureaucratic institutions, on the one hand, and economic development, on the other. A particular focus is the impact of corruption on development and the establishment of democratic government. Enrollment limited to fifteen. T 2:10–4

PLSC 727a^U/F&ES 80075a/INRL 680a^U/MGT 697a, Capitalism: Success, Crisis, and Reform Douglas Rae

Capitalism as a fundamental creation of the modern era. The role of capitalism in generating wealth and inequalities, disrupting the natural environment, and creating rapid social change. Major contours of capitalist institutions; important variations over time and place; critical issues of legitimacy and practice. Ideas drawn from politics, literature, business management, and popular culture. MW 1:30–2:20, 1 HTBA

PLSC 736a/INRL 595a, Formal Models of Comparative Politics Thad Dunning

We discuss and dissect recent models of the political regime type, political transitions, the separation of powers in democracies, and other topics. The goal is to become better consumers and critics of models, as well as to learn technique through discussion of leading exemplars. A previous course in game theory is recommended. W 9:25–11:15

PLSC 741b^U, Armed Groups and Violence Patterns Elisabeth Wood

In this seminar we analyze characteristics of armed organizations (state militaries, police forces, insurgent groups, secessionist movements, terrorist organizations) and the patterns of political violence they deploy. We draw on literatures in political science, history, anthropology, and sociology. TH 7–8:50

PLSC 756a^U, The European Union David Cameron

An examination of the origins, development, institutions, contemporary policy-making processes, and challenges facing the European Union. Topics include theories of European integration, the creation of a single internal market, the creation of an Economic and Monetary Union, the several enlargements, the contemporary role of the Union in economic policy, justice and home affairs, and foreign and defense policy, efforts to address the so-called democratic deficit in the Union, and the recent negotiation of a constitutional treaty. T 3:30–5:20

PLSC 765a^U, State and Society in China Jessica Weiss

This course examines state-society relations in the People's Republic of China, focusing on popular protest and social mobilization, media commercialization and the Internet, and prospects for political reform and democratization. W 7–8:50

PLSC 775b^U, Patronage and Clientelism in Democratic Systems Susan Stokes

Examines the channeling of public resources to private individuals in order to mobilize electoral support for parties and candidates, both historically, in the advanced democracies, and in today's new democracies in the developing world. TH 9:25–11:15

PLSC 777a, Comparative Politics I Elisabeth Wood

This course, the first in the yearlong introduction to the study of comparative politics for Ph.D. students in political science, examines the purpose and methodology of comparative inquiry. Designed to introduce students to the study of comparative politics and to assist students in developing research topics and strategies, the course explores key themes – the origins of political regimes, the building of nations and states, ethnicity and nationalism, collective action, the politics of welfare states, and the logic of institutional change – through the critical reading and discussion of classic and contemporary works. TH 7–8:50

PLSC 778b, Comparative Politics II Stathis Kalyvas

The second part of a two-part sequence designed to introduce graduate students to the fundamentals of comparative politics, including the major debates, topics, and methods. M 7–8:50

PLSC 779a/ANTH 541a/F&ES 80054a/HIST 965a, Agrarian Societies:

Culture, Society, History, and Development James Scott, Peter Perdue,
K. Sivaramakrishnan

An interdisciplinary examination of agrarian societies, contemporary and historical, Western and non-Western. Major analytical perspectives from anthropology, economics, history, political science, and environmental studies are used to develop a meaning-centered and historically grounded account of the transformations of rural society. Team-taught. TH 1:30–5:20

PLSC 781b/HIST 611b, The Emergence and Divergence of Britain Steven Pincus,
James Robinson

Britain by the middle of the nineteenth century was a military and economic superpower. Many of the social sciences were invented to explain the emergence of British modernity. Yet in the sixteenth century England and the rest of the British Isles were at best in the middle ranks of European kingdoms and states by almost any measure. This course seeks to explore why this happened. Because the course is jointly taught by a historian and economist/political scientist, we explore a range of answers and utilize a variety of methods. This course is appropriate for political scientists, sociologists, and economists interested in exploring historical methods, and for humanists interested in learning from the social sciences. W 1:30–3:20

PLSC 782b^u, Public Opinion in China Pierre Landry

This seminar evaluates research on public opinion in China derived from survey research conducted since the 1990s. Although China remains an authoritarian regime, a great deal of public opinion research has been accumulated, and an increasing number of datasets have been released for scholarly analysis. The seminar familiarizes students with the substantive and theoretical debates that survey-based literature has generated and exposes them to the practical use of these data sources in their own work. M 1:30–3:20

PLSC 784b^U/AFST 764b^U/ANTH 822b^U, Africa and the Disciplines

M. Kamari Clarke

An exploration of how the different academic disciplines reconceptualize the study of Africa and the ways in which the disciplines draw on each other's techniques and results in the process. W 1:30–3:20

POLITICAL ECONOMY

PLSC 712b, Comparative Political Economy Frances Rosenbluth

This seminar is designed to give graduate students a broad-gauged introduction to one of the largest and most vibrant branches of political science. We begin by examining the field's diverse theoretical underpinnings and placing political economy in the context of political science more broadly. The remainder of the course is concerned with the application of theory to practice. We examine the interaction between government and the economy in democratic and nondemocratic regimes, and in developed and developing countries. Topics include micro- and macroeconomic policy, industrial relations, the political economy of gender, and international political economy. W 9:25–11:15

PLSC 721b/ECON 792b, Political Economy of Institutions and Development

Alexandre Debs

How do political institutions affect economic outcomes? How do economic conditions determine political institutions? This course reviews recent advances in the emerging field of the political economy of institutions and development, with a focus on formal modeling and quantitative studies. We start with an introduction to the importance of institutions in affecting economic performance. Second, we review some basic models of democratic politics, focusing on the impact of economic conditions (such as inequality) on political outcomes. Third, we cover major theories of democratization, for example studying the effect of income and inequality on institutional change. Fourth, we study basic models of dictatorships, looking at the effect of nondemocratic institutions on growth and international conflict. Finally, we take a critical look at the role of institutions and consider the possibility of policy persistence despite institutional change. F 9:25–11:15

PLSC 725b/ECON 790b, Political Economy Ebonya Washington

Political competition in democracies is party competition. We develop, from the formal viewpoint, theories of party competition in democracies. We develop a theory in which parties (1) compete over several issues, not just one issue as in A. Downs; (2) are uncertain about how citizens respond to platforms; and (3) represent interest groups in the population. Applications, particularly to the theory of income distribution and tax.

HTBA

PLSC 787a^U, Japanese Politics and Political Economy Jun Saito

Examination of Japan's political institutions and the way these affect the policy-making process. Consideration also of Japan's emerging role in the world political economy.

M 9:25–11:15

AMERICAN POLITICS

PLSC 800a, Introduction to American Politics David Mayhew

An introduction to the analysis of U.S. politics. Approaches given consideration include institutional design and innovation, social capital and civil society, the state, attitudes, ideology, econometrics of elections, rational actors, formal theories of institutions, and transatlantic comparisons. Assigned authors include R. Putnam, T. Skocpol, J. Gerring, J. Zaller, D.R. Kiewiet, L. Bartels, D. Mayhew, K. Poole & H. Rosenthal, G. Cox & M. McCubbins, K. Krehbiel, E. Schickler, and A. Alesina. Students are expected to read and discuss each week's assignment and, for each of five weeks, to write a three- to five-page analytic paper that deals with a subject addressed or suggested by the reading. T 1:30–3:20

PLSC 801a^U, American Politics I: Preference, Choice, and Behavior John Bullock

This is the first part of a four-part sequence designed to introduce students to many of the fundamental research methods and topics in American politics. The course is about perspectives on 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. The focus is on understanding the political implications of these perspectives, the ways in which they complement and contradict each other, and the extent to which they are supported by data. Course work includes reading, assigned problem sets, and exams. M 1:30–3:20

PLSC 802b^U, American Politics II: Aggregation Justin Fox

This is the second part of a four-part sequence designed to introduce students to many of the fundamental research methods and topics in American politics. The course is about the basic issues of preference aggregation. Topics covered include externalities and public goods provision, social choice theory, models of electoral competition (including “median voter” [e.g., Downs and Hotelling] models, and extensions to those models that incorporate strategic challenger entry, campaign spending, heterogeneity in voter attentiveness, valence dimensions, primaries, etc.), the effects of different institutional settings (e.g., direct versus representative democracy, repeat versus one-shot elections) on choices, and decision making in committees and small groups (e.g., issues of deliberation and peer concerns). Course work includes reading, assigned problem sets, and exams. This course meets twice a week during the first half of the spring term at the times assigned to PLSC 802b and PLSC 803b. MW 1:30–3:20

PLSC 803b^U, American Politics III: Institutions Gregory Huber

This is the third part of a four-part sequence designed to introduce students to many of the fundamental research methods and topics in American politics. The course is about political institutions. Topics include the origins of political institutions, coalition formation, bargaining and decision making with agenda settings, delegation and political control (e.g., principal-agent models and their empirical applications), inter-institutional conflict (e.g., presidential versus congressional power), and the effects of elections on inter-institutional bargaining (e.g., veto bargaining before an audience). Course work includes reading, assigned problem sets, and exams. This course meets twice a week

during the second half of the spring term at the times assigned to PLSC 802b and PLSC 803b. MW 1:30–3:20

PLSC 804b^U, American Politics IV: Empirical Strategies Alan Gerber

This is the fourth part of a four-part sequence designed to introduce students to many of the fundamental research methods and topics in American politics. The course is about basic issues of empirical research. It introduces some of the most important measures used in empirical research in American politics, such as the Poole-Rosenthal measure of legislator ideology, and the most important datasets, such as the American National Election Study. Using examples from recent journals, the strengths and weaknesses of various research designs are covered, including cross-sectional studies, panel studies, natural experiments, regression discontinuity designs, lab experiments, and field experiments. Course work includes reading, assigned problem sets, and exams. F 1:30–3:20

PLSC 810b, The Politics of Public Policy Jacob Hacker

An introduction to research and theorizing in the field of public policy. It departs from a traditional policy analysis course in its emphasis on *politics*; it departs from a traditional American politics course in its emphasis on *policy*. By tracing contiguities and blind spots between these two often-isolated research traditions, the course maps out some of the most vital links between politics and policy, exploring both the policy consequences of political variation and the political consequences of policy variation. In terms of focus, the course centers on the United States in comparative perspective, emphasizing long-term policy development rather than point-in-time analyses of particular policy areas or political configurations. W 9:25–11:15

PLSC 818b^U, Political Economy of Environmental Policy Susan Rose-Ackerman

A seminar on the tensions between economic analyses of environmental problems, on the one hand, and political realities and demands, on the other. We consider the different and overlapping roles of the legislature, the executive, and the courts. The seminar also explores the role of federalism and the democratic potential of participatory policy making. The seminar focuses on the United States but brings in international cases to illustrate some of the basic problems. Prerequisite: Introductory Microeconomics plus one course with a substantive policy focus. Limited enrollment. W 1:30–3:20

PLSC 823a/AFAM 814a^U, Race and Ethnicity in American Politics

Khalilah Brown-Dean

This course is an introduction to research on race and ethnicity in American politics. Topics include 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. We discuss and debate the empirical contributions of this literature, as well as questions of theory, methodology, and research design. T 1:30–3:20

PLSC 853a^U, U.S. National Elections David Mayhew

A research seminar centering on presidential and congressional elections. Topics include electoral realignments, current presidential alignments, the electoral college, voter turnout, aggregate House election patterns, House incumbency advantage, challenger quality,

career decisions, election laws, House and Senate constituencies, campaign finance, Senate elections, and divided party control. Assigned authors include R. Erikson, E. Tufte, G. Jacobson, A. Abramowitz, M. Fiorina, R. Wolfinger, E. Ladd, G. King, J. Snyder, and B. Grofman. Students are expected to read weekly assignments and write a twenty- to thirty-page research paper. W 1:30–3:20

PLSC 842b/LAW 21046, The Constitution: Philosophy, History, and Law

Bruce Ackerman

An inquiry into the foundations of the American Constitution, at its founding and at critical moments in its historical transformation—most notably in response to the Civil War, the Great Depression, and the Civil Rights Movement. Philosophically speaking, do we still live under the Constitution founded by the Federalists, or are we inhabitants of the Second or Third or Nth Republic? Institutionally, in what ways are the patterns of modern American government similar to, and different from, those in post-Revolutionary (1787–1860) and post-Civil War (1868–1932) America? Legally, what is or was the role of constitutional law in the organization of each of these historical regimes? Through asking and answering these questions, the course tries to gain a critical perspective on the effort by the present Supreme Court to create a new constitutional regime for the twenty-first century. HTBA

RESEARCH WORKSHOPS

PLSC 919, American Politics Workshop Alan Gerber

This course meets throughout the year in conjunction with the ISPS American Politics Workshop. It serves as a forum for graduate students in American politics to discuss current research in the field as presented by outside speakers and current graduate students. Can be taken as Satisfactory/Unsatisfactory only. W 12–1:30

PLSC 920, Comparative Politics Workshop Stathis Kalyvas

A forum for the presentation of ongoing research by Yale graduate students, Yale faculty, and invited external speakers in a rigorous and critical environment. The workshop's methodological and substantive range is broad, covering the entire range of comparative politics. There are no formal presentations. Papers are read in advance by participants; a graduate student critically discusses the week's paper, the presenter responds, and discussion ensues. The workshop faculty director is Stathis Kalyvas (stathis.kalyvas@yale.edu). Detailed information can be found at www.yale.edu/cpworkshop/. Can be taken as Satisfactory/Unsatisfactory only. T 12–1:30

PLSC 921, Political Theory Workshop Seyla Benhabib

The Political Theory Workshop is an interdisciplinary forum which focuses on theoretical and philosophical approaches to the study of politics. The workshop seeks to engage with (and expose students to) a broad range of current scholarship in political theory and political philosophy, including work in the history of political thought; theoretical investigations of contemporary political phenomena; philosophical analyses of key political concepts; conceptual issues in ethics, law, and public policy; and contributions to normative political theory. The workshop features ongoing research by Yale faculty members, visiting scholars, invited guests, and advanced graduate students. Papers are distributed and read in advance, and discussions are opened by a graduate student commentator.

The workshop faculty director is Seyla Benhabib (seyla.benhabib@yale.edu). Detailed information can be found at www.yale.edu/isps/seminars/politheo/index.html/. Can be taken as Satisfactory/Unsatisfactory only.

PLSC 922, Order, Conflict, and Violence (OCV) Seminar Series Stathis Kalyvas

The OCV seminar series focuses on processes related to the emergence and breakdown of order. The key assumption is that understanding and studying these processes requires better theoretical and empirical foundations and calls for challenging existing disciplinary and methodological divides. The seminar series is, therefore, dedicated to the presentation of cutting-edge work from all social science disciplines and includes the presentation of ongoing research by Yale graduate students. The faculty director is Stathis Kalyvas (stathis.kalyvas@yale.edu) and the coordinator for 2009–2010 is Corinna Jentsch (corinna.jentsch@yale.edu). Detailed information can be found at www.yale.edu/macmillan/ocvprogram/. Can be taken as Satisfactory/Unsatisfactory only. W 6–8

PLSC 924, Leitner Political Economy Seminar Series Kenneth Scheve

The Leitner Political Economy Seminar Series engages research on the interaction between economics and politics as well as research that employs the methods of political economists to study a wide range of social phenomena. The workshop serves as a forum for graduate students and faculty to present their own work and to discuss current research in the field as presented by outside speakers, faculty, and students. The faculty director is Ken Scheve (kenneth.scheve@yale.edu). Detailed information can be found at www.yale.edu/leitner/seminars.html. Can be taken as Satisfactory/Unsatisfactory only. M 12–1:30

PLSC 926, International Relations Workshop Bruce Russett

The International Relations Workshop engages work in the fields of international security, international political economy, and international institutions. The forum attracts outside speakers, Yale faculty, and graduate students. It provides a venue to develop ideas, polish work-in-progress, or showcase completed projects. Typically, the speaker would prepare a 35- to 40-minute presentation, followed by a question-and-answer session. The workshop faculty director is Bruce Russett (bruce.russett@yale.edu). More information about the workshop can be found at www.yale.edu/polisci/info/Workshops/International_Relations_2007.html. Can be taken as Satisfactory/Unsatisfactory only. W 12–1:30

PLSC 990a&b, Directed Reading

By arrangement with individual faculty.

PSYCHOLOGY

2 Hillhouse, 432.4500
www.yale.edu/psychology/
 M.S., M.Phil., Ph.D.

Chair

Marcia Johnson (432.4545, marcia.johnson@yale.edu)

Director of Graduate Studies

Susan Nolen-Hoeksema (432.0699, susan.nolen-hoeksema@yale.edu)

Professors Woo-kyoung Ahn, Stephen Anderson (*Linguistics*), Amy Arnsten (*Neurobiology*), John Bargh, Sidney Blatt (*Psychiatry*), Paul Bloom, Thomas Brown, Kelly Brownell, Marvin Chun, Margaret Clark, Ravi Dhar (*School of Management*), John Dovidio, Carol Fowler (*Haskins Laboratories*), Robert Frank (*Linguistics*), Donald Green (*Political Science; ISPS*), Marcia Johnson, Alan Kazdin, Frank Keil, Marianne LaFrance (*Women's, Gender & Sexuality Studies*), Lawrence Marks (*Epidemiology & Public Health*), Gregory McCarthy, Susan Nolen-Hoeksema, Donald Quinlan (*Psychiatry*), Peter Salovey, Fred Volkmar (*Child Study Center*), Victor Vroom (*School of Management*), Allan Wagner, Karen Wynn

Associate Professors Karyn Frick, Elena Grigorenko (*Child Study Center*), Jeannette Ickovics (*Epidemiology & Public Health*), Joan Kaufman (*Psychiatry*), Robert Kerns (*Veterans Administration Medical Center*), Ami Klin (*Child Study Center*), Linda Mayes (*Child Study Center*), Douglas Mennin, Laurie Santos, Brian Scholl, Mary Schwab-Stone (*Child Study Center*), Jane Taylor (*Psychiatry*), Teresa Treat

Assistant Professors Maria Babyonyshev (*Linguistics*), Walter Gilliam (*Child Study Center*), Jeremy Gray, June Gruber, Julia Kim-Cohen, Jaime Napier, Nathan Novemsky (*School of Management*), Kristina Olson, Maria Piñango (*Linguistics*), Glenn Schafe

Lecturers Marc Brackett, James Charney, Nancy Close, Nelson Donegan, Carla Horwitz, David Klemanski, Kristi Lockhart, David Pantaloni, Burton Saxon, Barbara Shiller, Benjamin Toll

Fields of Study

Fields include behavioral neuroscience; clinical psychology; cognitive psychology; developmental psychology; social/personality psychology.

Special Admissions Requirement

The department requires that scores from the GRE General Test accompany an application.

Special Requirements for the Ph.D. Degree

In order to allow each student to be trained in accordance with his or her own interests and career goals, the general requirements of the department are kept to a minimum. The formal requirements are: (1) Course work selected to meet the individual's objectives with a minimum of three basic-level courses and one course in data analysis. Two of the three required basic-level courses must be in two different areas of psychology outside the student's main area of concentration. The basic-level course requirement must be completed by the end of the second year. Students must attain an Honors grade in at least two term courses by the end of the second year of study. (2) Nine units of teaching are required in years two through four. (3) Completion of a First-Year Research Paper due by May 1 of the second term. (4) Completion of a predissertation research project, to be initiated not later than the second term and completed not later than May 1 of the second year. Certification of this research project as well as performance in course work and other evidence of scholarly work at a level commensurate with doctoral study, as judged by the faculty, are necessary for continuation beyond the second year. (5) Submission of a dissertation prospectus, and a theme essay that demonstrates the candidate's comprehensive knowledge and understanding of the area of concentration. Certification of the theme essay completes the qualifying examination. (6) Approval of the dissertation by an advisory committee and the passing of an oral examination on the dissertation and its general scientific implications. The theme essay and the dissertation prospectus are completed during the third year. Students are then formally admitted to Ph.D. candidacy. There are no language requirements.

The faculty considers teaching to be an essential element of the professional preparation of graduate students in Psychology. For this reason participation in the Teaching Fellow Program is a degree requirement for all doctoral students. They are expected to serve as teaching fellows for a total of nine teaching fellow units over the course of the second through fourth years in the program. Opportunities for teaching are matched as closely as possible with students' academic interests.

Combined Ph.D. Program

A combined Ph.D. degree with African American Studies is available. Students must apply to the African American Studies department with Psychology as the secondary department. Consult departments for details.

Master's Degrees

M.Phil. The academic requirements for the M.Phil. degree are the same as for the Ph.D. degree except for the submission of a prospectus, a dissertation area review, and the completion and defense of a dissertation, which define the Ph.D.

M.S. (en route to the Ph.D.) The M.S. degree is awarded upon satisfactory completion of the second year of the program leading to the Ph.D. degree and also of the departmental predissertation research requirement.

Program materials are available online at www.yale.edu/psychology.

Courses

[PSYC 501b, Social Cognitive Development]

PSYC 502a^U, Learning Theory Allan Wagner

This course is concerned with the development of Learning Theory from its beginnings in Associationism, Behaviorism, and Darwinian revolution to its present “connectionistic,” neural-network expressions. It emphasizes the systematic implication of studies of animal learning for commenting on the theoretical representations of knowledge and the principles of behavior modification. T 1:30–3:20

PSYC 504a^U, Neurobiology of Emotion Glenn Schafe

This course focuses on the brain circuitries involved in emotion and emotional learning and memory. We begin by considering the emotion research in a historical context, then discuss progress that has been made in understanding the neurobiology of emotion in both laboratory animals and humans. F 9:25–11:15

[PSYC 505a, Stereotyping and Prejudice]

PSYC 506b/LING 540b^U, Computational Models in Cognitive Science Robert Frank

This course introduces a range of computational techniques for the modeling of cognitive processes. We explore the role of modeling in cognitive science, and the explanatory power of a number of symbolic, statistical, and neural network models in a variety of empirical domains, including language, categorization, and reasoning. MW 1–2:15

PSYC 509a, Social Cognition John Bargh

A course in contemporary social cognition theory and research, in which students fully participate in each week's class discussion of the assigned readings. The goal of the course is to bring students up to speed, not only as to the major themes and programs of research today, but also the historical roots and context of that research—in other words, why that research is being done in the first place. F 1:30–3:20

PSYC 510b^U, Thinking Woo-kyoung Ahn

A survey of psychological studies on thinking and reasoning. Topics include concepts, causal learning, inductive inferences, deductive reasoning, decision making, analogical reasoning, intelligence, problem solving, critical thinking, and creativity. TTH 9–10:15

[PSYC 511b, Cognitive Development]

PSYC 514a^U, Topics in Infant Studies Karen Wynn

This course investigates selected advanced topics in infant cognitive, social, and/or emotional development. The topic varies from year to year. Some examples: infants' concept of object, concept of number, early social cognition, and early emotional development. W 2:30–4:20

PSYC 518a, Multivariate Statistics John Dovidio

Introduction to the analysis of quantitative data from experiments—primarily the analysis of variance and contrast analyses. Some coverage of correlation and regression. Required of first-year students except with instructor's permission. MW 9–10:15

PSYC 521b^U, Multivariate Statistics with Observable Variables Jaime Napier

A survey of multivariate data techniques for analyzing the structure of data sets with several dependent variables, including multiple regression, multivariate analysis of variance, canonical correlation, and discriminant analysis. The elements of matrix algebra are introduced, as well as the computer packages needed for the analysis. Prior exposure to a course such as analysis of variance is preferred.

[PSYC 522a^U, Mapping the Human Brain]**PSYC 526a^U, Research Methods in Human Neuroscience** Gregory McCarthy

This laboratory course provides students with experience in the major methods used in human neuroscience research. The focus is on functional magnetic resonance imaging, electroencephalography, and evoked potentials. Psychophysiological techniques such as the measurement of skin conductance are also covered, but in less detail. Students acquire a firm understanding of each technique, and design experiments, acquire data, and perform analyses. The course makes extensive use of Matlab. F 12–4

[PSYC 539a, Psychopathology and Its Treatment]**PSYC 541a, Research Methods in Psychology** Alan Kazdin

Research design, methodology, and evaluation considered in the context of clinical research. Emphasis on experimental and quasi-experimental designs, threats to validation, confounding, sources of artifact and bias, alternative assessment strategies, and data evaluation methods. W 2:30–4:20

[PSYC 553a/MGMT 753a, Behavioral Decision Making I]**PSYC 554a/MGMT 754a, Behavioral Decision Making II** Ravi Dhar,

Nathan Novemsky, Joseph Simmons

This seminar examines research on the psychology of decision making, focusing on judgment. Although the normative issue of how decisions should be made is relevant, the descriptive issue of how decisions are made is the main focus of the course. Topics of discussion include judgment heuristics and biases, confidence and calibration, issues of well-being including predictions and experiences, regret and counterfactuals, and other topics. The goal of the seminar is threefold: to foster a critical appreciation of existing knowledge in behavioral decision theory, to develop the students' skills in identifying and testing interesting research ideas, and to explore research opportunities for adding to that knowledge. Students generally enroll from a variety of disciplines, including cognitive and social psychology, behavioral economics, finance, marketing, political science, medicine, and public health. T 4:10–7:10

PSYC 556b^U, Developmental Psychopathology Julia Kim-Cohen

This course provides an overview of the theoretical and empirical literature in the field of developmental psychopathology. Psychopathology is studied as a series of models of atypical development that can elucidate underlying mechanisms of stability and change. Although emphasis is placed on the causes and correlates of child and adolescent psychopathology, continuities and discontinuities in psychopathology across the lifespan are also covered. Readings include epidemiological, experimental, neurobiological, psychosocial,

and ecological perspectives. Theoretical, methodological, and clinical implications of empirical findings are discussed. T 2:30–4:20

[PSYC 557b, **Social Psychology and Relationships**]

[PSYC 572b/CMP 675b/NSCI 614b, **Neurobiology of Learning and Memory**]

[PSYC 607b^U, **Causal Thinking and Perception**]

PSYC 608b^U, Cognitive Science of Ignorance Frank Keil

Examination of how adults and children make sense of the artificial and natural world with incomplete knowledge and understanding. Topics include awareness of one's knowledge limits, mistakes in understanding, gullibility and cynicism, deference, the division of cognitive labor, knowledge management, and science literacy. M 1:30–3:20

[PSYC 610a^U, **The Modern Unconscious**]

[PSYC 611b^U, **What We Eat and Why**]

PSYC 613a^U, Mind, Brain, and Society Marvin Chun

Examines how recent advances in modern neuroscience can inform or complicate issues in society, as traditionally studied by disciplines such as psychology, philosophy, economics, political science, law, and religion. W 9:25–11:15

[PSYC 615a, **Psychology, Psychotherapy, History, Systems, and Practice**]

[PSYC 621b^U, **Cognitive Science of Pleasure**]

[PSYC 628a^U, **Social and Emotional Learning**]

[PSYC 645a, **Neuropsychology of Aging**]

[PSYC 648a^U/NSCI 648b, **Cellular Analysis of Learning and Memory: Vertebrate Model Systems**]

[PSYC 649a^U, **Topics in Syntax: Specific Language Impairment**]

[PSYC 654b^U, **Sensory Information Processing**]

PSYC 657a/CDE 505a, Social and Behavioral Influences on Health Becca Levy

This course provides students with an introduction to social and behavioral science issues that influence patterns of health and health care delivery. The focus is on the integration of biomedical, social, psychological, and behavioral factors that must be taken into consideration when public health initiatives are developed and implemented. This course emphasizes the integration of research from the social and behavioral sciences with epidemiology and biomedical sciences. T 1–2:50

[PSYC 659b^U, **Addictive Behaviors**]

PSYC 664a, Health and Aging Becca Levy

Since 1900, the number of individuals sixty-five years and older has tripled and life expectancy has increased by about thirty years. In this seminar we examine some of the health issues related to this growing segment of the population. The class discussions

address such questions as (1) How does the aging process differ between cultures? and (2) What kinds of interventions can best reduce morbidity in old age? This course integrates psychosocial and biomedical approaches to the study of aging.

[PSYC 670b^U, Personality and Individual Differences]

PSYC 684a, Introduction to Psychotherapy: Technique David Klemanski

Introduction to basic clinical skills and clinical issues. Topics for discussion include developing a therapeutic relationship, barriers to effective communication, strategies for managing resistance, and developing a professional identity. Class format includes informal discussion, assigned readings, and student case presentations. Permission of the instructor required. Enrollment limited to fifteen. HTBA

PSYC 684b, Introduction to Psychotherapy: Technique David Klemanski

The focus of this seminar is on formulating and conceptualizing psychological problems from a cognitive-behavioral perspective. Special consideration is paid to individual and cultural diversity in conceptualizing cases and planning treatment. Also discussed are ways in which cognitive-behavioral perspectives can be integrated with other theoretical orientations (e.g., interpersonal theory, experiential therapy). HTBA

PSYC 689a, Psychopathology and Diagnostic Assessment David Klemanski

Didactic practicum for first-year clinical students. Main emphasis is initial assessment. Treatment planning and evaluation of progress also covered. Students first observe and then perform initial interviews. Applicable ethics and local laws reviewed. HTBA

PSYC 690b, Ethics and Clinical Practice: Legislation and Diversity Issues

David Klemanski

Introduction to ethical and legal guidelines for clinical practice. In addition, supervision on diagnostic interview using the Structured Clinical Interview for DSM-IV is provided. HTBA

PSYC 702, Current Work in Cognition Woo-kyoung Ahn

A weekly seminar in which students, staff, and guests report on their research in cognition and information processing. T 11:35–12:50

PSYC 704, Current Work in Behavioral Neuroscience Allan Wagner

An informal student/faculty seminar in which each participant chooses, lays groundwork for, and presents some current work in behavioral neuroscience. Currently emphasizes the psychobiology of learning, but involves a variety of research approaches, designs, and methods. F 12–1:15

PSYC 708, Current Work in Developmental Psychology

A luncheon meeting of the faculty and graduate students in developmental psychology for reports of current research and discussion on topics of general interest. W 11:35–12:50

PSYC 710, Current Work in Social Psychology and Personality Marianne LaFrance

Faculty and students in personality/social psychology meet during lunchtime to hear about and discuss the work of a local or visiting speaker. M 11:35–12:50

PSYC 711, Current Work in Child Development and Social Policy Walter Gilliam,
Edward Zigler, Sandra Bishop-Josef

A series of lectures by guest speakers from academia, various levels of government, community organizations, service agencies, the business world, and the media. Speakers discuss their work and its social policy implications. Topics may include early childhood education, child care, intervention programs for children and families, education reform, mental health, child and family policies, research at the intersection of psychology and social policy, and media presentation of child and family issues, among others. F 10:35–12:25

PSYC 720, Current Work in Clinical Psychology Teresa Treat

Basic and applied current research in clinical and community psychology is presented by faculty, visiting scientists, and graduate students, and examined in terms of theory, methodology, and ethical and professional implications. TH 11:35–12:50

PSYC 721, Research Topics in Infant Cognition Karen Wynn

Investigation of various topics in infant cognition: early mechanisms for representing and reasoning about number; infants' ability to represent time; early object knowledge; foundations of intentional understanding. Permission of the instructor required. HTBA

PSYC 722, Research Topics in Food, Nutrition, and Obesity Kelly Brownell

In-depth discussion and analysis of current research topics on bulimia, anorexia nervosa, and obesity. Topics include, but are not limited to, physiology, cultural influences, treatment studies, body image, binge eating, and epidemiology. HTBA

PSYC 723a, Research Topics in Child and Adolescent Therapy

This course focuses on the development and execution of research related to child and adolescent treatment, and the factors with which clinical dysfunction and therapeutic change are associated.

PSYC 725, Research Topics in Human Neuroscience Gregory McCarthy

Discussion of current and advanced topics in the analysis and interpretation of human neuroimaging and neurophysiology. HTBA

PSYC 726, Research Topics in Mood Regulation and Mental Health

Susan Nolen-Hoeksema

We discuss a range of topics related to mood regulation and psychological disorders, including models of depression, anxiety, and related disorders. We also discuss how gender impacts vulnerability to emotional problems, and how gender-related factors may serve to protect against certain types of psychopathology. HTBA

PSYC 729, Research Topics in Language and Cognition Paul Bloom

Seminar focusing on ongoing research projects in language, cognition, and development. Permission of the instructor required. HTBA

PSYC 731, Research Topics in Cognition and Development Frank Keil

A weekly seminar discussing research topics concerning cognition and development. Primary focus on high-level cognition, including such issues as the nature of intuitive or folk theories, conceptual change, relations between word meaning and conceptual

structure, understandings of divisions of cognitive labor, and reasoning about causal patterns. HTBA

PSYC 732, Research Topics in Visual Cognitive Neuroscience Marvin Chun

Examines current research in visual cognitive neuroscience, including discussion of proposed and ongoing research projects. Topics include visual attention, perception, memory, and contextual learning. HTBA

PSYC 734, Research Topics in Anxiety Disorders Douglas Mennin

We examine current conceptualizations of anxiety disorders, with particular emphasis on generalized anxiety disorder. Topics include the utility of an emotion-regulation perspective in understanding and treating anxiety disorders. HTBA

PSYC 735, Research Topics in Thinking and Reasoning Woo-kyoung Ahn

In this lab students explore how people learn and represent concepts. Weekly discussions include proposed and ongoing research projects. Some topics include computational models of concept acquisition, levels of concepts, natural kinds and artifacts, and applications of some of the issues. HTBA

PSYC 736, Research Topics in Stereotyping and Prejudice John Dovidio

Explores the nature of prejudice in its traditional and contemporary forms. Although the emphasis is on the causes and consequences of racial bias in the United States, the dynamics of intergroup relations are considered more broadly, as well. Emphasis is on developing critical thinking, reading, and research skills to test ideas relevant to understanding and combating stereotyping, prejudice, and discrimination. HTBA

PSYC 739, Research Topics in Autism and Related Disorders Fred Volkmar,
Ami Klin

Focus on research approaches in the study of autism and related conditions including both psychological and neurobiological processes. This seminar emphasizes the importance of understanding mechanisms in the developmental psychopathology of autism and related conditions. F 9–10

PSYC 741, Research Topics in Emotion and Relationships Margaret Clark

Members of this laboratory read, discuss, and critique current theoretical and empirical articles on relationships and on emotion (especially those relevant to the functions emotions serve within relationships). In addition, ongoing research on these topics is discussed along with designs for future research. HTBA

PSYC 747, Research Topics in Affective Neuroscience Glenn Schafe

This laboratory course studies the neurobiological substrates of emotion, with particular emphasis on Pavlovian fear conditioning. We cover the current literature in fear conditioning, ranging from studies that emphasize the behavior/systems level of analysis to those that emphasize the cellular and/or molecular. HTBA

PSYC 748, Research Topics in Emotion and Cognitive Control Jeremy Gray

This course covers (1) research in emotion and cognitive control, and (2) science communication skills. For research, the emphasis is on the design, conduct, and analysis of behavioral and fMRI studies, emphasizing individual differences. Once a month, we have

a session on science communication skills, with topics chosen by students to meet their interests and needs (spoken research presentations, persuasive communication, graph design, Web design, and so on). Students may enroll in the course and attend only the science communication skills component. HTBA

PSYC 749, Research Topics in Memory Marcia Johnson

Examines current research on cognition and memory, including discussion of proposed and ongoing research projects. Topics include issues in design, analysis, and interpretation of empirical studies exploring human memory. TH 2:30–4:20

PSYC 750/C&MP 750, Research Topics in the Neurobiology of Learning and Memory

Thomas Brown

Discussion and analysis of current work on the neurobiological foundations of learning and memory systems in mammals. Informal weekly discussions span several levels of analysis, including molecular and biophysical studies, cellular and systems neurophysiology and neuro-anatomy, and contemporary behavioral neuroscience. HTBA

PSYC 751, Research Topics in Memory, Aging, and Neurobiology Karyn Frick

Weekly discussion of current work on the neurobiological basis of age-related memory dysfunction, sex differences in cognition, and other memory-related processes. Participants discuss these issues in an informal seminar format. HTBA

PSYC 766, Research Topics in Perception and Cognition Brian Scholl

Seminar-style discussion of recent research in perception and cognition, covering both recent studies from the literature and the ongoing research in the Yale Perception and Cognition Laboratory. HTBA

PSYC 767, Research Topics in Emotion, Health, and Social Behavior Peter Salovey

A forum for graduate students conducting research in the Health, Emotion, and Behavior Laboratory. HTBA

PSYC 771, Research Topics in Nonconscious Processes John Bargh

The lab group focuses on nonconscious influences of motivation, attitudes, social power, and social representations (e.g., stereotypes) as they impact on interpersonal behavior, as well as the development and maintenance of close relationships. HTBA

PSYC 775, Research Topics in Animal Cognition Laurie Santos

Investigation of various topics in animal cognition, including what nonhuman primates know about tools and foods; how nonhuman primates represent objects and number; whether nonhuman primates possess a theory of mind. Permission of the instructor required. HTBA

PSYC 777, Research Topics in Gender and Psychology Marianne LaFrance

The “Gender Lab” meets weekly to consider research being done in the department that bears on some gender-related issue. HTBA

PSYC 801, Clinical Internship (Child) Faculty

Advanced training in clinical psychology with children. Adapted to meet individual needs with location at a suitable APA-approved internship setting.

PSYC 802, Clinical Internship (Adult) Faculty

Advanced training in clinical psychology with adults. Adapted to meet individual needs with location at a suitable APA-approved internship setting.

PSYC 806, Practicum in Childhood Intervention Faculty

Advanced supervised work in settings where child and family policies are developed and/or implemented. Adapted to meet individual needs with location at suitable sites.

PSYC 808, Practicum in Child Psychology Faculty

The Yale Child Study Center offers a yearlong practicum, which includes assessment of children, psychotherapy, team meetings, supervision, and didactic experiences.

PSYC 809, Practicum in Assessment of School-Aged Children Faculty

Students gain practical experience in testing with children.

PSYC 810, Practicum in Developmental Assessment Linda Mayes

Practicum in early childhood screening and assessment of infants and toddlers at high risk for social adaptive and emotional developmental problems.

PSYC 811, Anxiety Disorders Practicum Douglas Mennin

Discussion of current topics in psychopathology and treatment of anxiety disorders. Group supervision of therapy cases involving OCD, panic, social phobia.

PSYC 812, Conduct Problem Practicum Alan Kazdin

Provides training in the diagnosis, assessment, and treatment of aggressive and antisocial children and their families. Permission of the instructor required.

PSYC 813, Eating and Weight Disorders Practicum Kelly Brownell,

Marlene Schwartz

Practical work for graduate students in clinical psychology on therapeutic interventions for eating and weight disorders. Assessment, diagnosis, and treatment are covered.

PSYC 815, Mood Disorders Practicum David Klemansky

Supervised practicum in the assessment and treatment of mood disorders, with an emphasis on cognitive-behavioral perspectives. HTBA

PSYC 816b, Practicum in Developmental Disabilities and Developmental

Assessment Fred Volkmar, Ami Klin

An introduction to approaches in developmental assessment in infants and young children (under age five years) with a range of developmental difficulties. Students observe and/or participate in developmental assessments. Students are exposed to a range of assessment instruments including developmental tests, speech-communication assessments, and psychiatric diagnostic instruments appropriate to this age group. Permission of the instructor required. HTBA

PSYC 817, Other Clinical Practica Faculty

For credit under this course number, clinical students register for practicum experiences other than those listed elsewhere in clinical psychology, so that transcripts reflect accurately the various practicum experiences completed.

PSYC 883, Practicum in Clinical Assessment Donald Quinlan

Supervised psychological assessment using measures of intellectual functioning, projective testing, and neuropsychological testing with patients.

PSYC 923, Individual Study: Theme Essay

By arrangement with faculty.

PSYC 925, Individual Tutorial

By arrangement with faculty and approval of director of graduate studies.

PSYC 930, Predissertation Research

By arrangement with faculty.

RELIGIOUS STUDIES

451 College, 432.0828

www.yale.edu/religiousstudies/

M.A., M.Phil., Ph.D.

Chair

Harry Stout

Director of Graduate Studies

Dale Martin

Professors Harold Attridge (*Divinity*), Gerhard Böwering, Jon Butler, Adela Collins (*Divinity*), John Collins (*Divinity*), John Darnell (*Visiting*), Stephen Davis, Carlos Eire, Steven Fraade, Bruce Gordon, Philip Gorski, Phyllis Granoff, Frank Griffel, John Hare (*Divinity*), Christine Hayes, Paula Hyman, Ivan Marcus, Dale Martin, Thomas Ogletree (*Divinity*), Gene Outka, Meira Polliak (*Visiting*), Ruth Purtilo (*Visiting*), Emilie Townes (*Divinity*), Denys Turner, Miroslav Volf (*Divinity*), Robert Wilson

Associate Professor Ludger Viefhues-Bailey

Assistant Professors Shannon Craigo-Snell, Kathryn Lofton

Senior Lecturers Osmund Bopearachchi (*Visiting*), Margaret Olin (*Visiting*), Koichi Shinohara

Lecturers Adel Allouche, Hugh Flick, Jr., John Grim (*Visiting*), Brian Noell, Mary Evelyn Tucker (*Visiting*)

Fields of Study

Students must enroll in one of the following fields of study: American Religious History, Asian Religions, Hebrew Bible/Old Testament, History of Ancient Christianity, Islamic Studies, Judaic Studies, New Testament, Religious Ethics, Theology, and Philosophy of Religion.

Special Admissions Requirement

The department requires the scores of the GRE General Test and previous study in areas relevant to the chosen field of study, including ancient languages where applicable.

Special Requirements for the Ph.D. Degree

Twelve term courses must be completed, in which the Graduate School Honors requirement must be met. Proficiency in two modern scholarly languages, normally French and German, must be shown, one before the end of the first year, the other before the beginning of the third; this may be done by passing an examination administered by the department, by accreditation from a Yale Summer School course designed for this purpose, or by a grade of A or B in one of Yale's intermediate language courses. Mastery of the languages needed in one's chosen field (e.g., Chinese, Hebrew, Greek, Japanese) is also required in certain fields of study. A set of four qualifying examinations is designed

for each student, following guidelines and criteria set by each field of study; these are normally completed in the third year. The dissertation prospectus must be approved by a colloquium, and the completed dissertation by a committee of readers and the departmental faculty. Upon completion of all predissertation requirements, including the prospectus, students are admitted to candidacy for the Ph.D. This is expected before the seventh term in American Religious History, Philosophy of Religion, Religious Ethics, and Theology; before the eighth term in other fields. Students begin writing their dissertation in the fourth year and normally will have finished by the end of the sixth. There is no oral examination on the dissertation.

In the Department of Religious Studies, the faculty considers learning to teach to be an important and integral component of the professional training of its graduate students. Students are therefore required to teach as teaching fellows for at least two years during their graduate programs. Such teaching normally takes place during their third and fourth years, unless other arrangements are approved by the director of graduate studies.

A combined Ph.D. degree is available with African American Studies. Consult department for details.

Master's Degrees

M.Phil. and M.A. (both en route to the Ph.D.) See Degree Requirements. Additionally, students in Religious Studies are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

Prospective students must apply in one of the ten fields of study, and when requesting information they should specify their particular field of interest. Program materials are available upon request to the Registrar, Department of Religious Studies, Yale University, PO Box 208287, New Haven CT 06520-8287.

Courses

RLST 512b/WGSS 721b, Feminist Philosophy of Religion Ludger Viefhues-Bailey, Siobhán Garrigan

An exploration of current feminist philosophy of religion. Topics include feminist epistemology and philosophy of religion, the role of desire, of practices and ritualizing in the philosophy of religion, and feminist/womanist ethics and religion. Authors: Pamela Anderson, Sandra Harding, Ellen Amour, Grace Jantzen, Julia Kristeva, Katie Cannon, Kelly Brown Douglas, Amy Hollywood, Wendy Farley, and others. TH 3:30–5:20

RLST 548b^U, Buddhism and Trade in Sri Lanka Osmund Bopearachchi

This course provides an introduction to Buddhist archaeology, art history, and architecture of South India and Sri Lanka. Emphasis on the role that trade played in the development of Buddhism and its arts. Students study material remains and texts. W 1:30–3:20

RLST 549a^U, Buddhism and Hinduism in Gandhara Osmund Bopearachchi

This course explores the development of Buddhism and Hinduism through the archaeological record. In addition to well-known sculptures and structural remains, the course

presents newly discovered material that challenges current reconstructions of the history of Buddhism and Hinduism in the region known as Gandhara. TH 9:25–11:15

RLST 555b, Topics in the Study of Tibetan Buddhism Jacob Dalton

Study of the Buddhism of Tibet. TH 2:30–4:20

RLST 557a, Medieval Indian Texts Phyllis Granoff

This is an advanced course in reading Sanskrit religious texts. T 1:30–3:20

RLST 559b, Readings in Jain Prakrit Phyllis Granoff

This is an advanced course in reading Jain Prakrit, canonical and postcanonical literature. T 1:30–3:20

RLST 568b, Ritual in Asian Religions Koichi Shinohara

In this seminar we explore the implications of recent theoretical literature on ritual for the study of ritual practices in Asia. As we read through both theoretical literature and sample studies of Asian rituals, each student studies a specific example and presents the findings to the class. M 1:30–3:20

RLST 574a, Chinese Buddhist Texts Koichi Shinohara

Close reading of selected Chinese Buddhist texts in the original. M 1:30–3:20

RLST 579a, Religious History of Central Asia and Northwest India from Darius I to Sharpur I Osmund Bopearachchi

A study of the history of religions in Central Asia and northwest India taking into account literary evidence, archaeology, plastic art, epigraphy, and numismatics. The focus is on the Indo-Greeks and Gandhara. W 1:30–3:20

RLST 580b, Recent Archaeological Discoveries and the Religions of Afghanistan and Bactria Osmund Bopearachchi

A study of new archaeological finds from Uzbekistan, Afghanistan, and Pakistan that have been made by Uzbek, Afghan, Pakistani, Russian, French, Italian, and Japanese archaeologists. These finds throw light on the complex religions of the region. Since many of the publications are in Russian, the course provides summaries in English of major discoveries. W 9:25–11:15

RLST 601b, Required Seminar for New Testament Studies and Ancient Christianity: Sacrifice Dale Martin

A required seminar for Ph.D. students in New Testament Studies and Ancient Christianity. The topic and instructor of the seminar change yearly. For spring 2010, the topic is sacrifice in the Graeco-Roman world, ancient Judaism, and early Christianity. W 4:30–6:20

RLST 606b/REL 685b, Greek Exegesis of Luke Adela Collins

We read and analyze the Greek text of Luke with attention to its relations to Mark and Matthew and its use of the Greek version of the Jewish scriptures. In addition we use the methods of textual criticism, form criticism, the history of ancient religions, redaction criticism, and literary criticism. We also consider the text in light of its cultural contexts. WF 1:30–2:50

RLST 622b/REL 691b, History and Methods of the Discipline of New Testament Studies Adela Collins

This course is taught in seminar format. Students are expected to prepare a critical review of an article, several articles, a monograph, or part of a monograph for a number of the sessions and to engage in discussion of their own reviews and those presented by the other students. HTBA

RLST 651a^U/HIST 555a^U, Jesus to Muhammed: Ancient Christianity to the Rise of Islam Stephen Davis

The rise of Christianity and the development of Western culture into the early Middle Ages, including the creation of Christian orthodoxy; religious, political, social, gender, literary, and theological history of Christian religion in many forms. MW 10:30–11:20

RLST 653b^U, Introduction to Gnostic Texts in Coptic Bentley Layton

Extensive reading in Gnostic literature in various subdialects of Coptic, mainly from Nag Hammadi. MW 9–10:15

RLST 655a, Christianity in the Second Century Bentley Layton

Philological problems in the study of the second century and its aftermath. Required of all doctoral students in New Testament Studies and Ancient Christianity. Open to others by permission of the instructor. T 3:30–5:20

RLST 659b^U/HIST 531b/NELC 534b^U, Seminar: The Making of Monasticism

Bentley Layton

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. By permission of the instructor. T 3:30–5:20

RLST 660a/EGYP 513a, Research Seminar on the Monastic Federation of Shenoute

Bentley Layton

Exploration of Shenoute's Canons, Book 4, in Coptic. M 1:30–3:20

RLST 665b^U, Patristic Greek Stephen Davis

Readings of Greek works produced in late antiquity by early Christian writers. Among the literary and theological genres to be studied: epistles, martyr narratives, biblical commentaries, hymns, theological treatises, sermons, and monastic sayings. TTH 1–2:15

RLST 678a/HIST 569a, Readings in Reformation History: Calvin and Calvinism

Carlos Eire, Bruce Gordon

Readings and discussion. T 2:30–4:20

RLST 703b/AMST 719b, Interrogating the Crisis of Islam: Seminar

Zareena Grewal

In official and unofficial discourses in the U.S., diagnoses of Islam's various "crises" are ubiquitous, and Muslim "hearts and minds" are viewed as the "other" front in the War on Terror. Since 9/11, the U.S. State Department has made the reform of Islam an explicit national interest, pouring billions of dollars into USAID projects in Muslim-majority countries, initiating curriculum development programs for madrasas in South Asia, and

establishing the Arabic Radio Sawa and the satellite TV station Al-Hurra to propagate the U.S. administration's political views as well as what it terms a "liberal" strain of Islam. Muslim Americans are also consumed by debates about the "crisis" of Islam, a crisis of religious authority in which the nature and rapidity of change in the measures of authority are felt to be too difficult to assimilate. This course maps out the various and deeply politically charged contemporary debates about the "crisis of Islam" and the question of Islamic reform through an examination of official U.S. policy, transnational pulp Islamic literature, fatwas and essays authored by internationally renowned Muslim jurists and scholars, and historical and ethnographic works that take up the category of crisis as an interpretive device. M 1:30–3:20

RLST 705b/AMST 705b/HIST 720b, Readings in Religion and American History, 1600–2000 Harry Stout, Kathryn Lofton

This seminar explores intersections of religion and society in American history from the colonial period to the present as well as methodological problems important to their study. M 1:30–3:20

RLST 706a^U, Religion and Popular Culture Kathryn Lofton

This course provides a profile in the vexing connections between religion and popular culture. Through readings, film screenings, and investigative projects, we develop a vocabulary and an analytical structure by which to interpret media objects and the religious mediations they include. Students develop a portfolio of cultural criticism through four reviews as well as a research study of a particular cultural event and its religious significations. TTH 2:30–3:45

RLST 717b^U, Islamic Theology and Philosophy Frank Griffel

A historical survey of major themes in Muslim theology and doctrine from the Qur'an to contemporary Muslim thinkers. Topics include the systematic character of Muslim thought and of the arguments given by thinkers; reason vs. revelation; the emergence of Sunnism in the tenth through eleventh centuries; the reaction of Muslim theology (from 1800) to the challenges of the West; and contemporary Muslim thought. MW 10:30–11:20

RLST 720a, Seminar on the Qur'an Gerhard Böwering

Intensive study of the Qur'an. Readings in commentaries on the Qur'an. Special emphasis on textual and hermeneutical problems. Prerequisite: reading knowledge of Arabic. By permission of the instructor. HTBA

RLST 721b, Seminar in Islamic Religious Thought Gerhard Böwering

The development of Islamic civilization in the Middle East, North Africa, Spain, Iran, and India from Muhammad through the Mongol invasions to the rise of the Ottoman, Safavid, and Timurid empires (600–1500 C.E.). Emphasis on the intellectual and religious history of the Arabs and Iranians. HTBA

RLST 723b^U, Salafiyya Movement in Islam Frank Griffel

Close study of the development of the Salafiyya movement, the widely spread modernist reform movement of Muslim intellectuals during the eighteenth and nineteenth centuries and its further development during the twentieth century that led to the emergence of Islamic fundamentalism. By permission of the instructor only. W 2:30–4:20

RLST 751b^U/JDST 728b^U, Midrash Seminar: The Theophany at Sinai Steven Fraade
The giving of the Torah to Israel as seen through rabbinic eyes. Close readings of midrashic texts. Views of revelation, tradition, interpretation, law, and commandment in their literary and historical contexts. Interpretations and interpretive strategies compared and contrasted with those of other ancient biblical exegetes (Jewish and non-Jewish). Prerequisite: reading fluency in ancient Hebrew. By permission of the instructor only. W 9:25–11:15

RLST 752a^U/JDST 727a^U, Mishnah Seminar: Tractate Sanhedrin Stephen Fraade
Study of a major early rabbinic legal text treating religious courts and their jurisprudential practice. Dual attention to the historical significance of the institutions of law represented and to the cultural significance of the rhetoric of that representation. Prerequisite: reading fluency in ancient Hebrew. By permission of the instructor only. M 9:25–11:15

RLST 757a^U/JDST 725a^U, The Dead Sea Scrolls and the History of Ancient Judaism: The Damascus Document Stephen Fraade
Study of one of the most important of the Dead Sea Scrolls. Attention to its place within the history of biblical interpretation and ancient Jewish law, the nature and rhetorical function of its textual practices, both narrative and legal, its ideological formulations, literary history, and relation to the central sectarian writings of the Qumran community. Prerequisite: reading fluency in ancient Hebrew. W 9:25–11:15

RLST 765a^U/JDST 724a^U, Female Characters in the Hebrew Bible Meira Polliack
This course focuses on complex female characters such as Tamar, Hannah, Rebecca. It explores the tension between their patriarchal depiction as marginal to male characters, on the one hand, and, on the other hand, their psychological and literary portrayal as dominant and active heroines who transcend the limited social and religious roles assigned to them in patriarchal society. TH 9:25–11:15

RLST 767b^U/JDST 726b^U, Genres of Biblical Literature and Their Interpretive History Meira Polliack
This course focuses on two major genres of biblical literature: narrative and prophecy. It introduces students to the contemporary biblical study of literary, psychological, historical, and ideational themes in the modern appreciation of these genres, while also exploring their pre-modern and medieval interpretive history. TH 9:25–11:15

RLST 770b/JDST 792b, Cultural Theories: Methodological Aspects Hizky Shoham
This course offers a close and detailed acquaintance with classic and current approaches to “culture” and “cultural studies.” Students are introduced to the different and unsettled meanings of the concept of culture, and to the variety of methods, research topics, and theoretical issues in the field. Although sociological-anthropological classics on culture are the core of the readings, the scope is also broadened to tangent disciplines such as philosophy, linguistics, literature, theater theory, and intellectual history, thus demonstrating interdisciplinary thought. Designated for graduate students from all humanities and social science disciplines, the seminar emphasizes methodological issues and equips students with effective research tools. TH 1:30–3:20

RLST 772b/JDST 760b, Rabbinics Research Seminar Christine Hayes

An in-depth survey of research debates and of methods and resources employed in the study of classical (pre-Geonic) rabbinic literature of all genres. Prerequisite: knowledge of Hebrew and Aramaic; ability to read academic Hebrew. This seminar is required of graduate students in Ancient Judaism. By permission of the instructor only. M 1:30–3:20

RLST 773a^U/HIST 535a^U/JDST 761a^U, History of the Jews to the Reformation

Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire, with the main focus on the formative period of classical rabbinic Judaism and on the symbiotic relationship among Jews, Christians, and Muslims. An overview of Jewish society and culture in its biblical, rabbinic, and medieval settings. TTH 11:35–12:50

RLST 798b/HSAR 731b/REL 836b/JDST 692b, Witnessing, Remembrance,

Commemoration Margaret Olin

The interconnecting concepts of witnessing, remembrance, and commemoration are investigated through discussions of writings chosen from the works of Sigmund Freud, the authors of the Book of Genesis, Pierre Nora, and others, as well as contemporary visual practices that engage these concerns. TH 2:30–4:20

RLST 801a, Hebrew Bible Seminar: Problems in the Book of Isaiah Robert Wilson

A close reading of selected chapters of the Hebrew text of Isaiah in order to test recent theories of the book's compositional history. M 1:30–3:20

RLST 805a/REL 654a, History of Biblical Interpretation Adela Collins,

Denys Turner

This course explores the history of the reception, interpretation, and exegesis of the Bible from the New Testament through the end of the Middle Ages. The class is conducted as a seminar and is limited to twenty students. Texts to be examined include the Deutero-Pauline literature, extra-canonical Christian literature, patristic and medieval commentaries and homilies. Topics include rival claims to Pauline authority, creative appropriations of Paul's letters in new syntheses, and rival claims to the identity of Israel. TH 3:30–5:20

RLST 808b/JDST 756b, Second Temple Seminar: Formation of Authoritative

Literature John Collins

The topic of this seminar changes yearly. This year the seminar examines the problems of determining what literature was canonical or authoritative in the Second Temple period. Prerequisite: ability to read Hebrew and Greek. W 1:30–3:20

RLST 845a/REL 830a/AFAM 779a, Metaphors of Evil Emilie Townes

This course is an examination of the ways in which metaphors and symbols function at the intersections of various forms of oppression that coalesce into lifestyles of misery to produce social patterns of domination and subordination. We consider how conversations between Christian ethics and theology as well as other disciplines help frame possible trajectories of justice and justice making. M 1:30–3:20

RLST 850b/AFAM 845b/REL 828b, What's in a Text? Samuel Huntington's *Clash of Civilizations* Emilie Townes

A detailed examination of one formative text for moral discourse to explore a thinker's ideas and how he or she states a theme, develops an argument, and is able to argue his or her case in a persuasive manner. Attention to consistency, reasoning, style, and rhetoric are also a part of the course. Finally, we consider the book in relation to the renewal of the church, its implication for ministry, and its place in enriching scholarly debate and thought. Students may repeat the course as different texts are studied. The text we consider this time is the classic text Samuel Huntington's *Clash of Civilizations*.
TH 3:30–5:20

RLST 852b/REL 778b, Agape and Special Relations Gene Outka

A study of the love commandments and the urgencies of special relations, especially the bonds among co-religionists, family members, friends, and compatriots. A focus on contemporary Christian and philosophical literature. Permission of the instructor required. HTBA

RLST 872b^U/REL 817b/F&ES 80071b, World Religions and Ecology: Asian Religions Mary Evelyn Tucker, John Grim

This course examines the various ways in which religious ideas and practices have contributed to cultural attitudes and human interactions with nature. Examples are selected from Hinduism, Buddhism, Confucianism, and Daoism. The course examines such topics as symbols, images, and metaphors of nature in canonical texts, views of the divine as transcendent to the world, the indwelling of the sacred in the earth, the ethics of using and valuing nature, ritual practices that link humans to the natural world, and cosmology as orienting humans to the world and embedding them in place.

RLST 875a^U/REL 810a, Indigenous Traditions and Ecology John Grim

The course explores how particular indigenous peoples relate to local bioregions and biodiversity. Opening with an examination of such terms as “indigenous,” “religion,” and “ecology,” the course proceeds to investigate religious studies and ethnography related to small-scale societies and the many ways in which they relate to local bioregions and biodiversity. The course examines indigenous ethnic diversity and cultural relationships to place, and the ways values associated with physical places are articulated in symbols, myths, rituals, and other embodied practices. Finally, this course involves questions of environmental justice, namely, the imposition of environmentally damaging projects on a people whose voice in decision making is diminished or totally eliminated.
TH 2:30–4:20

RLST 902b, Literature, Theology, and History in the Middle Ages:

An Interdisciplinary Seminar Denys Turner

This seminar is confined to Ph.D. students in the fields of medieval literatures (Latin and vernacular), theology, and history. The purpose is to explore points of contact among literature, theology, and historical context that serve the research purposes of the students participating. For this reason, the precise content of the seminars is negotiated by the participating students together with the instructor before the beginning of the academic year 2009–2010. F 3:30–5:20

RLST 914a/PHIL 709a/REL 831a, Kant's Philosophy of Religion John Hare

The purpose of the course is to look at Kant's writings in the philosophy of religion. The principal readings are from Kant's *Critique of Pure Reason* (especially the Ideal and the Canon), the *Lectures on Ethics*, *The Critique of Practical Reason* (especially the Dialectic), the *Critique of Judgment* (especially the Methodology), *Religion within the Boundaries of Mere Reason*, and *The Conflict of the Faculties*. TTH 3:30–5:20

RLST 915b, Ethics and Human Nature Gene Outka, Frederick Simmons

We examine how beliefs about human nature and moral judgments about character and conduct may combine and may cross-fertilize. Theological estimates about creation, the fall, and salvation, and anthropological estimates of human powers and possibilities and failings, bear on the first side. Ethical estimates about equality, evil, and perfectibility, and capacities for virtue and vice, right and wrong conduct, bear on the second side. HTBA

RLST 916b/PHIL 710b/REL 832b, Kierkegaard's Philosophy of Religion John Hare

This seminar explores a number of texts focusing on the relation between religious faith and the ethical life. We read the following texts (in whole or in part): *Either/Or*, *Fear and Trembling*, *Fragments*, *Concluding Unscientific Postscript*, *Works of Love*. Restricted enrollment. M 3:30–5:20

RENAISSANCE STUDIES

53 Wall, Rm 310, 432.0672
M.A., M.Phil., Ph.D.

Chair

Robert Nelson (*Acting*)

Executive Committee Edwin Duval, Carlos Eire, Roberto González Echevarría, Lawrence Manley, John Matthews, Giuseppe Mazzotta, David Quint, John Rogers, Ellen Rosand, Christopher Wood, Keith Wrightson

Faculty associated with the program Rolena Adorno, Leslie Brisman, Susan Byrne, Angela Capodivacca, Anne Dunlop, Roberta Frank, Paul Freedman, Bruce Gordon, Karsten Harries, K. David Jackson, David Scott Kasten, David Lummus, Stephen Pincus, Francesca Trivellato, Brian Walsh, Keith Wrightson

Fields of Study

Renaissance Studies offers a combined Ph.D. degree that integrates concentration in a departmental field with interdisciplinary study of the broader range of culture in the Renaissance and early modern periods. The program is designed to train Renaissance specialists who are firmly based in a traditional discipline but who can also work across disciplinary boundaries. Departmental areas of concentration available are Classics, Comparative Literature, English, History, History of Art, History of Music, Italian, and Spanish and Portuguese.

Special Admissions Requirements

Only candidates wishing to proceed to a doctorate should apply. Application should be made to the department of concentration, with an indication that the candidate seeks nomination to the combined degree in Renaissance Studies. Applications should be accompanied by scores from the GREs and one research or critical paper.

Special Requirements for the Ph.D. Degree

Students are subject to the combined Ph.D. supervision of the Renaissance Studies program and the relevant participating department. The student's program will be decided in consultation with an adviser, the director of graduate studies in Renaissance Studies, and the director of graduate studies in the participating department. Requirements for the combined degree will vary slightly to accommodate the requirements of the participating departments, but all candidates for the combined degree are expected to meet, at a minimum, the following requirements. Students must demonstrate a reading knowledge of Latin, Italian, and a third language, which will vary according to departmental requirements. At the minimum, an examination in Latin or Italian should normally be passed upon entrance; a second language should be passed before the third term; and a third language by the end of the second year. Each student is required to take sixteen term courses (in History of Art, fifteen). The normal pattern is to have completed fifteen courses during the first two years of study, no more than two of which may be individual

reading and research. A two-term core seminar, designed to present a wide range of topics concerned with Renaissance and early modern culture, is required of all combined degree candidates. This course, offered every other year, is open to students from other departments.

Students concentrating in modern language and literature departments (including Comparative Literature, English, Italian, and Spanish and Portuguese) are required to complete three courses in at least two disciplines outside of literature, three courses in the Renaissance literature of the primary department, and two courses in Renaissance literatures outside of the primary department. The remaining courses will be taken in other periods and topics as required by the department of concentration. Students concentrating in History or Music are required to complete four courses dealing with Renaissance culture in disciplines outside of the primary department and four courses in the Renaissance period within the department; the remaining courses are to be taken in other periods and topics as required by the department of concentration. Students concentrating in History of Art are required to take four courses within the department and three courses outside the department dealing with the Renaissance period. Students concentrating in Classics are required to take six courses outside the department in the Renaissance period. Training in teaching, through teaching fellowships, is considered an important part of every student's program. Most students teach in their third and fourth years.

The scheduling of the oral examination and the dissertation prospectus follows the practice of the primary department, but in every case the two requirements must be completed not later than September of the fourth year. The oral examination, varying in length from two hours to two hours and fifteen minutes, will include a standard fifteen-minute question on the bibliographical resources for Renaissance Studies across the disciplines and three fifteen-minute questions (in the case of English two fifteen-minute questions) in Renaissance topics outside the primary discipline. The remainder of the examination will be devoted to the primary discipline, including (except in the case of Classics) some further coverage of the Renaissance period. Students take additional written examinations as required by the primary departments.

Upon completion of all predissertation requirements, including the prospectus, students are admitted to candidacy for the combined Ph.D. degree. Admission to candidacy must be completed by the beginning of the fourth year. The dissertation will be advised and completed according to departmental guidelines, but one of the readers will normally be a member of the Renaissance Studies Executive Committee.

Master's Degrees

M.Phil. The combined M.Phil. degree may be requested after all requirements but the dissertation are met.

M.A. (en route to the Ph.D.) The M.A. degree is awarded upon completion of eight term courses, taken in at least three disciplines, and with at least three grades of Honors. The examination in Latin or Italian must have been passed.

Program materials are available upon request to the Chair, Renaissance Studies Program, Yale University, PO Box 208298, New Haven CT 06520-8298.

Courses

RNST 500a,b,/ITAL 600a,b, Introduction to Renaissance Studies David Quint [F],
Bruce Gordon, John Rogers [Sp]

An introduction to the major texts, issues, bibliography, and methods in the interdisciplinary study of the Renaissance. Emphasis in the first term on Italy and in the second on northern Europe. T 9:25–11:15 [F], W 1:30–3:20 [Sp]

SLAVIC LANGUAGES AND LITERATURES

2704 Hall of Graduate Studies
432.1300, slavic.department@yale.edu
www.yale.edu/slavic/
M.A., M.Phil., Ph.D.

Chair

Vladimir Alexandrov

Director of Graduate Studies

Katerina Clark

Professors Vladimir Alexandrov, Katerina Clark, Laura Engelstein (*History*), Harvey Goldblatt, Robert Greenberg (*Adjunct*), Benjamin Harshav (*Comparative Literature*), John MacKay, Tomas Venclova

Assistant Professor Molly Brunson

Lecturer Hilary Fink

Senior Lector II Irina Dolgova

Senior Lector I Krystyna Illakowicz

Fields of Study

Fields include Russian literature, medieval Slavic literature and philology (by special arrangement), Polish literature (by special arrangement).

Special Admissions Requirement

An advanced-level command of the Russian language is required.

Special Requirements for the Ph.D. Degree

All entering graduate students must pass departmental proficiency examinations in Russian. During their residence, students specializing in Russian literature take a minimum of sixteen term courses (including three required courses) and are expected to acquire a comprehensive knowledge in all periods of Russian literature, a familiarity with medieval Slavic literature, a thorough command of the Russian language, and a mastery of a field of concentration within Russian literature. The student's course work, with the approval of the director of graduate studies, may be selected from the offerings of the department and (if relevance can be demonstrated) any other department of the University. In addition, the student will be responsible for developing a minor field of specialization in one of the following: (1) a Western or non-Western literature; (2) film studies; (3) a topic in intellectual history; (4) one of the other arts; (5) another Slavic literature; (6) Slavic linguistics; (7) another discipline relevant to the student's primary interests in Russian literature. A special curriculum may be arranged for students wishing to specialize in either medieval Slavic literature and philology or Polish literature. A reading examination in either French or German, administered and evaluated by the department, must be

passed by all graduate students by the beginning of the fifth term of study. The qualifying examinations should be passed by the end of the sixth term of study. A dissertation prospectus must be submitted no later than September 15 of the seventh term of study. For additional details, see the director of graduate studies and the departmental Web site: www.yale.edu/slavic. Upon completion of all predissertation requirements, including the prospectus and its defense, students are admitted to candidacy for the Ph.D.

The faculty considers teaching to be an important part of the professional preparation of graduate students. Students in Slavic normally teach in their third and fourth years.

Joint Ph.D. Program with Film Studies

The Department of Slavic Languages and Literatures also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in Slavic Languages and Literatures and Film Studies. For further details, see Film Studies. Applicants to the joint program must indicate on their application that they are applying both to Film Studies and to Slavic Languages and Literatures. All documentation within the application should include this information.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations. Additionally, students in Slavic Languages and Literatures are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

Terminal Master's Degree Program The Department of Slavic Languages and Literatures does not admit students for the terminal M.A. degree, nor does it award an M.A. en route to the Ph.D. degree. If, however, a student admitted for the Ph.D. leaves the program prior to completion of the doctoral degree, he or she may be eligible to receive a terminal master's degree. He or she must have completed at least fifteen term courses in Russian literature and linguistics, chosen in consultation with the director of graduate studies. A grade of Honors in at least two term courses and an average of High Pass in the remaining courses must be attained. A reading knowledge of French or German is required, and candidates must pass departmental proficiency examinations in Russian.

Program materials are available upon request to the Chair, Slavic Languages and Literatures, Yale University, PO Box 208236, New Haven CT 06520-8236.

Courses

RUSS 603b, Russian Realist Literature and Painting Molly Brunson

An interdisciplinary examination of the development of nineteenth-century Russian Realism in the literary and visual arts. Topics include the Natural School and the formulation of a realist aesthetic; the artistic strategies and polemics of critical Realism; narrative, genre, and the rise of the novel; the Wanderers and the articulation of a Russian school of painting. Readings include novels, short stories, and critical works by Dostoevsky, Turgenyev, Goncharov, Tolstoy, Chekhov, and others. Painters of focus include Fedotov, Perov, Shishkin, Repin, and Kramskoy. Special attention is given to the particular methodological demands of inter-art analysis. W 9:25–11:15

RUSS 605b, Topics in Russian Literature: From the Origins of East Slavic**Writing to 1750** Harvey Goldblatt

Representative works, selected from both “old” Russian “bookish writing” and the “new” Russian literature of the seventeenth and first half of the eighteenth century, are examined against a broad comparative background to illustrate the development of various literary types and writing techniques. Special attention is devoted to (1) diverse historiographic and methodological approaches, (2) traditional and innovative theories of literary expression, and (3) the connections between writing activity and ideological trends. M 9:25–11:15

RUSS 652a, Nineteenth-Century Russian Lyric Poetry Tomas Venclova

Textual analysis of selected poems from major nineteenth-century Russian lyric poets: Zhukovskij, Batjushkov, Baratynskij, Tjutchev, Lermontov, Fet, and Nekrasov. As well as acquainting students with nineteenth-century Russian lyric poetry, the course aims at evolving a meaningful approach to poetry in general. Open to qualified undergraduates. TH 9:25–11:15

RUSS 675a/CPLT 571a, Promised Lands: Slavery, Literature, and Modernity in**Russia and the United States** John MacKay

Close, comparative, contextualized examination of literary and other forms of cultural production associated with U.S. slavery and Russian serfdom. Special attention is paid to the relation between bondage and national, cultural, and personal identity, the role of bondage in definitions of “aesthetic experience” in the pre- and post-emancipation periods, the relation between literacy and the literary, literature of protest in the two countries, and connections between geographical and subjective space within cultures of enslavement. We examine works by Pushkin, Aksakov, Gogol, Simms, Cooper, Crevecoeur, Radishchev, Karamzin, Goncharov, Tolstoy, Kennedy and the “plantation novelists,” Stowe, Melville, Turgenev, slave and serf autobiographers, freedman’s textbooks, Fet, Lanier, Page, Chesnutt, and Bunin; historical treatments by Kolchin, Genovese, and others; theoretical works by Said, Jameson, Saidiya Hartman, Bakhtin, and others. Requirements: in-class presentations; research paper. No knowledge of Russian required. T 3:30–5:20

RUSS 690a, Pasternak Tomas Venclova

Investigation of Pasternak’s place in the history of Russian literature in the twentieth century. Special attention is given to close analysis of his poetry. T 1:30–3:20

RUSS 695b, Soviet Literature of the 1920s and 1930s Katerina Clark

The 1920s were both the most fertile and the most fateful period in Soviet literature. The period ended in 1932 with the imposition of Socialist Realism, but that resolution represented only a small fraction of the possibilities that had emerged during the decade. This course presents an historical overview, incorporating some of the main landmarks of the 1920s and 1930s including works by Pilnyak, Bakhtin, the Formalists, Eisenstein, Platonov, Mayakovsky, Bulgakov, and Zoshchenko. W 1:30–3:20

RUSS 700b, Russian Émigré Culture between the Wars Vladimir Alexandrov

A seminar on the literature (Bunin, Nabokov, Gazdanov, Evreinov, Ivanov, Adamovich, Khodasevich, etc.) and other forms of cultural production (theater, film, painting,

cabarets, publishing) of the interwar Russian emigration, primarily in Western Europe. TH 1:30–3:20

RUSS 712a/CPLT 840a/FILM 840a/GMAN 652a^U/HSAR 687a, Moscow/Berlin:

Leftist Avant-Gardes and Interwar Modernism Katerina Clark, Katie Trumpener
From 1918 to the mid-1930s, Moscow and Berlin were both central gathering points for left-wing modernists. Each city developed its own modes of modernism, yet in sustained dialogue, given massive Russian emigration to Berlin after 1918, the Weimar obsession with early Soviet aesthetics (and cinema), intellectuals traveling in both directions, and the large-scale emigration of German leftists to the Soviet Union after 1933. The final week or two of the course end by considering the shaping influence of Soviet intellectuals (and German emigrants returning from Moscow) on East Berlin “late modernism” of the 1940s and ‘50s. Centered on literature and film, the course also considers a wide array of art forms (including painting, photography, architecture, music, and aesthetic theory). Works by modernists such as Eisenstein, Pudovkin, Vertov, Kosinzev, Trauberg, Shklovsky, El Lissitzky, Rodchenko, Malevich, Shostakovich, Tretiakov, Babel, Lukacs, Moholy-Nagy, Benjamin, Brecht, Richter, Beckmann, Schwitters, Grosz, Heartfield, Döblin, Ruttman, van der Rohe, Eisler, Busch. Texts are available in English translation; knowledge of Russian and/or German very helpful. At the first meeting, students help shape the final syllabus. W 1:30–3:20

RUSS 748b/CPLT 570b, Marxist Theory John MacKay

Not a survey class, this course examines selected methodologies of social-historical interpretation in the humanities (primarily literature, moving image media, photography, music, art history) that stem from or emerge out of the Marxist tradition. Problems to be discussed include periodization, base and superstructure, reification and commodification, and alternative cultural practices. We may discuss works by (among others) members of the Frankfurt School, Fredric Jameson, Raymond Williams, Franco Moretti, Etienne Balibar, Jacques Rancière, and members of the *October* group. Regular writing assignments and in-class reports; open to interested undergraduates. M 7–8:50

RUSS 834a, Aspects of Russian Grammar and Teaching Methodology

Irina Dolgova

The course examines various aspects of Russian grammar and the use of different teaching methodologies. Special emphasis is placed on the connection between linguistic knowledge and its application for teaching Russian in an English-speaking classroom. Different types of language learners, diverse teaching strategies, and existing resources for teaching Russian are discussed. TH 1:30–3:20

RUSS 851a, Proseminar in Russian Literature Vladimir Alexandrov

Introduction to the graduate study of Russian literature. Topics include literary theory, methodology, introduction to the profession. TH 1:30–3:20

SLAV 752a^U, The Slavic Peoples and Their Languages: From Unity to Diversity

Robert Greenberg

Examination of the linguistic and cultural history of the Slavs from the period of the earliest Slavic migrations up to modern times. Emphasis on the Slavic national awakenings,

formation of their languages and literatures, and an introduction to contemporary Slavic cultures. M 7–8:50

SLAV 754a, Old Church Slavic Harvey Goldblatt

The study of OCS and its place in the history of Church Slavic. The main features and the grammar of OCS. The Glagolitic and Cyrillic writing systems. Close readings from the “canon” of OCS literary monuments. OCS in relation to modern Slavic languages (especially Russian). M 9:25–11:15

SLAV 784b^U, Language and Politics Robert Greenberg

This course explores political controversies surrounding issues of language planning and language policy. Consideration is given to how social and political actors differentiate languages and dialects, and how nationalist ideology has shaped language choices. Topics include the English-only movements in the U.S., the policy of official bilingualism in Canada, and language policies in Europe with emphasis on the Slavs. M 7–8:50

SLAV 900, Directed Reading

By arrangement with faculty.

SOCIOLOGY

140 Prospect, 432.3323
www.yale.edu/sociology/
 M.A., M.Phil., Ph.D.

Chair

Karl Ulrich Mayer

Director of Graduate Studies

Richard Breen

Professors Julia Adams, Jeffrey Alexander, Elijah Anderson, Scott Boorman, Richard Breen, Hannah Brueckner, Deborah Davis, Ron Eyerman, Philip Gorski, Karl Ulrich Mayer, Ivan Szelenyi

Associate Professor Philip Smith

Assistant Professors Averil Clarke, Vida Maralani, Peter Stamatov

Fields of Study

Fields include Comparative Sociology/Macrosociology, Cultural and Historical Sociology, Life Course/Social Stratification, Mathematical Sociology, Methodology (Qualitative and Quantitative Approaches), Networks, Political Sociology, Race/Gender/Ethnic/Minority Relations, Social Change, Social Demography, Social Movements, Theory (General, Critical, Hermeneutic), Urban Sociology.

Special Requirements for the Ph.D. Degree

Qualification for admission to candidacy for the Ph.D. will take place during the student's first three years of study at Yale. A student who has not been admitted to candidacy will not be permitted to register for the seventh term of study. To qualify for candidacy the student must take twelve seminars to be completed in years one and two, four required courses (SOCY 542a, 578a, 580a, 581b), and eight electives, including at least one workshop. After completion of courses, students prepare a research paper and one field exam and defend a dissertation prospectus.

Teaching is an important part of the professional preparation of graduate students in Sociology. Students teach therefore in the third and fourth years of study.

Combined Ph.D. Degree in Sociology and African American Studies

The Department of Sociology offers, in conjunction with the program in African American Studies, a combined Ph.D. degree in Sociology and African American Studies.

Students accepted to the combined Ph.D. program must meet all of the requirements of the Ph.D. in Sociology with the exception that, excluding the courses required, a research paper, and a field exam, combined-degree students may substitute African American Studies courses for six of the twelve term courses required to qualify for the Ph.D. in Sociology. For further details see African American Studies.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations.

M.A. (en route to the Ph.D.) Eight term courses are required for the M.A. degree. Two of these courses must include statistics and theory. A grade of High Pass or Honors must be achieved in five of the eight required courses. A student may petition for the M.A. degree in the term following the one in which he/she completes the course requirements.

Program materials are available at www.yale.edu/socdept/.

Courses

SOCY 502b, Contemporary Sociological Theory: Durkheimian Sociology

Philip Smith

The course looks at the work of Emile Durkheim and his legacy for both social theory and empirical sociology. In the first part we examine Durkheim's major writings and key concepts. Next an exploration is made of the multiple and often contending ways these have been taken up and interpreted over the past hundred or so years. Particular emphasis is given to the decline in functionalist and positivist readings of Durkheim and his emergence as a major cultural theorist in recent decades. We consider the contributions of Mauss, Bataille, Goffman, Victor Turner, Collins, Lukes, Douglas. TH 9:25–11:15

SOCY 503a^U/PLSC 522a, Historical Explanations Sigrun Kahl

This seminar provides an introduction to historical explanation. It covers a wide range of topics, from the classics of political science and sociology up to recent comparative historical work. At each meeting we pair up readings on specific methodological themes and problems with substantive works. W 1:30–3:20

[SOCY 507a/b/EAST 501a, Social Science Workshop on Contemporary China]

SOCY 510a^U, Religious Nationalism Philip Gorski

"Religious nationalism" treated as more than a transitional phase. Readings and reflections about 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. TH 1:30–3:20

[SOCY 511a^U, Building Social Theory for Empirical Analysis]

[SOCY 515a^U, Urban Poverty and Policy]

[SOCY 520b, Revolutions in a Comparative Perspective]

SOCY 535b/F&ES 90025b, Consumption and Sustainability Juliet Schor

This course addresses the role of consumption in achieving sustainability, considering challenges such as the scale of consumption in the global north, the adoption of high-impact life styles in the global south, and the role of particular high-impact goods and services. The subtext of much of the discussion to date has been about how difficult it is to affect the trajectory and composition of consumption. However, a look at the historical

path of consumer cultures reveals that they are dynamic, multifaceted, and complex entities, with numerous possibilities for transformation. HTBA

SOCY 542a, Sociological Theory Peter Stamatov

The course seeks to give graduate students the basic tools for a constructive engagement with sociological theory and practice. We read closely the major works that have informed the logic of theoretical inquiry in contemporary sociology. The main focus is on the writings of Weber, Marx, and Durkheim. We trace the lineaments of dominant theoretical approaches and explore the ways in which sociologists have contended with these approaches when confronting the central questions of the discipline. W 2:30–4:20

SOCY 548a, The Sociology of the Arts and Popular Culture Ron Eyerman

This seminar examines sociological perspectives on the arts and popular culture. Emphasis is given to the conceptualization of the arts and popular culture within sociological theory, as well as the interpretation of cultural representations and artifacts, art works, film, music, literature, and so on. Students are exposed to a range of classical and contemporary perspectives and styles of analysis, from the normative to the strictly empirical. W 9:25–11:15

SOCY 550a, A Secular Age? Philip Gorski

Do we live in a secular age? How would we know? What, precisely, do we mean by the term “secular”? Or, for that matter, “religious”? Is “the secular” simply “the world” minus religion? Or is “the secular” itself a cultural ethos? To what extent do these categories translate to non-Western contexts? Does resurgent religion imperil the secular order of the modern world? Or is an overweening secularism the real danger? These are some of the questions we consider in this course, which plunges into the ongoing debate about “the secular” in the social sciences and humanities and considers how the secular can be made into an object for scholarly research as well as rational reflection. M 3:30–5:20

SOCY 553a^U, Empires and Imperialism Peter Stamatov, Samuel Nelson

The course explores empire as a territorial organization of political power. We compare empires in different historical periods, from antiquity to European overseas expansion in the fifteenth through twentieth centuries, and in different geographic contexts in Africa, Asia, and Europe. In the process, we review various economic, political, and cultural theories of imperialism, colonialism, and decolonization. W 9:25–11:15

SOCY 557b, Political Sociology Julia Adams

A survey of key developments in the field of political sociology. Seminar topics include the formation of national states in relationship to the longer history of world empire; political culture; collective action; and contemporary American and transnational regimes of welfare and warfare. T 9:25–11:15

SOCY 558b, Topics in Social Stratification Richard Breen, Vida Maralani

Empirical, theoretical, and methodological issues in the contemporary study of social stratification, inequality, and mobility. Topics include inequalities in class, occupations, income, wealth, education, health, lifestyle, and neighborhoods, as well as intergenerational mobility, marriage and family processes, and inequalities of race, ethnicity, and gender. The class focuses on the U.S. experience but seeks to place it in a comparative perspective. M 3:30–5:20

SOCY 560a, Comparative Research Workshop Philip Gorski, Ivan Szelenyi

This workshop is a weekly interdisciplinary seminar dedicated to group discussion of work-in-progress by distinguished visiting scholars, Yale sociology graduate students, and in-house faculty from various disciplines. Papers are distributed a week ahead of time and also posted at the Web site of the Center for Comparative Research (www.yale.edu/ccr/). Students who take the course for a letter grade are expected to present a paper-in-progress the term that they are enrolled for credit. M 11:30–1:20

SOCY 560b, Comparative Research Workshop Julia Adams, Philip Gorski, Ivan Szelenyi

See SOCY 560a for description.

[SOCY 561b^U, Civil Society in China]**SOCY 562a, Topics in Cultural Sociology** Jeffrey Alexander

After reviewing contemporary sociological perspectives on culture, the seminar concentrates on the intellectual origins, theories, and empirical exemplars of the strong program in cultural sociology. We discuss hermeneutics and interpretation, critical theory, semiotics, structuralism, and post-structuralism; how a cultural-sociological program emerged in the late 1980s and early 1990s; and how this program has produced a range of research studies. We examine in particular emerging foci on social drama and performance, cultural trauma, and the iconic turn. TH 9:25–11:15

SOCY 565a/b, Advanced Seminar in Cultural Sociology Philip Smith

This seminar focuses on the unpublished work of advanced graduate students in cultural sociology at Yale and elsewhere, as well as on just-emerging published work that exemplifies “strong program” work in cultural sociology and surrounding fields. The format is intended to maximize student participation so as to develop collegial networks of intellectual support as well as capacities for critical evaluation. The workshop may be audited by more advanced graduate students who wish to participate in this process but whose course work is completed, as well as by Visiting Fellows to the Center for Cultural Sociology, or with permission of the instructor. T 3:30–5:20

SOCY 570b, Social Theory Trauma and Memory Ron Eyerman

This seminar explores sociological approaches to memory and trauma. A central theme is how cultural trauma has influenced the development of social theory, as well as literature and the arts generally. While aimed at graduate students in the social sciences and humanities, the seminar is open to advanced graduate students after consultation with the instructor. W 9:25–11:15

SOCY 578a, Logic of Empirical Social Research Richard Breen

The seminar is an intensive introduction into the methodology of the social sciences. It covers such topics as concepts and indicators, propositions and theory, explanation and understanding, observation and measurement, methods of data collection, types of data, units of analysis and levels of variables, research design (experiments and quasi-experiments), description and causal modeling, verification and falsification, testing and inference, longitudinal analysis. Besides the discussion of selected texts we re-analyze classical studies as well as recent research papers. T 9:25–11:25

SOCY 580a, Statistics I Berkay Ozcan

Introduction to probability and descriptive statistics. In-depth coverage of the linear model and its assumptions. T 1:30–3:20, 1 HTBA

SOCY 581b, Statistics II Vida Maralani

This course provides the second part of a two-term introduction to statistical analysis for quantitative social science research. The course covers advanced topics in linear regression and provides an introductory overview of models for categorical and count data, the analysis of time data, and longitudinal data. We also discuss data-related issues such as missing data and weighting, and data that are complicated by issues of non-random design. TTH 1–2:15, 1 HTBA

SOCY 582a, Statistics III Richard Breen

Covers more advanced statistical topics following on from Statistics II. Topics include matrix algebra, probability, calculus of optimization; properties of estimators; maximum likelihood estimation; identification; simultaneous equation models; estimation of measurement and structural models; simulation methods. TH 11:30–1:20

[SOCY 583b, Ethnography of the African American Community]**SOC 585a, Sociology of the Life Course** Karl Ulrich Mayer

Comprehensive overview of the current state of life course theory, methods, and research. The first part of the course covers methods of cohort and event history analysis. The second part covers essentials of life course theory: How do societies structure human lives? What is the relationship among human development, aging, and the life course? How do life course patterns change over historical time, and how do they differ between societies? How are welfare regimes, stratification, and life course patterns related to each other? In the third part of the course we read samples of empirical research and do research exercises. W 3:30–5:20

SOCY 589b^u, Classical Social Theory: The Marx-Weber Debate Ivan Szelenyi

Close reading of critical texts by Marx and Weber. Evaluation of the authors' differences and similarities. W 1:30–3:20

SOCY 595a, Inequality and Life Course Workshop Karl Ulrich Mayer,

Richard Breen, Hannah Brueckner, Ivan Szelenyi

In this workshop we present and discuss ongoing research work, primarily but not exclusively quantitative analyses. In addition, we address theoretical and methodological issues in the areas of the life course (education, training, labor markets, aging as well as family demography), social inequality (class structures, stratification, and social mobility), and related topics. F 2–4

SOCY 595b, Inequality and Life Course Workshop Richard Breen, Hannah

Brueckner, Vida Maralani, Karl Ulrich Mayer, Ivan Szelenyi

See SOCY 595a for course description.

SOCY 597a,b, Special Topics in Sociology Faculty

Students enroll in Special Topics if they wish to retake a course for credit when there is a new instructor and a substantially different syllabus from the first time they took the course. Only with the permission of the DGS.

SOCY 598a, 599b, Independent Study

By arrangement with faculty. Directed Reading Course Selection Form should be completed.

SOCY 610b^U/WGSS 745b^U, Race, Gender, and the African American Experience

Averil Clarke

This course explores how the social constructs of race and gender impact individual and collective black experiences within major social institutions (i.e., education, family, criminal justice, media and entertainment, and politics and the economy). It also analyzes the ways in which these institutions produce and are constituted by race and gender inequality. Attention is paid to theories of discrimination and to social movements that both differentiate and unite the black experience along gender lines. Enrolled students are required to present the oral and written results of research on race and gender in one such social institution. T 9:25–11:15

[SOCY 612b, Agency and Action]

[SOCY 616a, Urban Ethnography]

SOCY 625a, Analysis of Social Structure Scott Boorman

Emphasizing analytically integrated viewpoints, this course develops a variety of major contemporary approaches to the study of social structure and social organization. Building in part on research viewpoints articulated by Kenneth J. Arrow in *The Limits of Organization* (1974), by János Kornai in an address at the Hungarian Academy of Sciences published in 1984, and by Harrison C. White in *Identity and Control* (2nd ed., 2008), four major species of social organization are identified as focal: (1) social networks, (2) competitive markets, (3) hierarchies/bureaucracy, and (4) collective choice. This lecture course uses mathematical and computational models – and comparisons of their scientific styles and contributions – as analytical vehicles in coordinated development of the four species. M 9:25–11:15

SOCY 628a, Workshop in Cultural Sociology Jeffrey Alexander, Ron Eyerman,

Philip Smith

This workshop is designed to be a continuous part of the graduate curriculum. Meeting weekly throughout both the fall and spring terms, it constitutes an ongoing, informal seminar to explore areas of mutual interest among students and faculty, both visiting and permanent. The core concern of the workshop is social meaning and its forms and processes of institutionalization. Meaning is approached as both structure and performance, drawing not only on the burgeoning area of cultural sociology but on the humanities, philosophy, and other social sciences. Discussions range widely among methodological, theoretical, empirical, and normative issues. Sessions alternate between presentations by students of their own work and by visitors. Contents of the workshop vary from term to term, and from year to year. Enrollment is open to auditors who fully participate and for credit to students who submit written work. HTBA

SOCY 628b, Workshop in Cultural Sociology Jeffrey Alexander, Ron Eyerman,
Philip Smith

Continuation of SOCY 628a; see 628a for course description. HTBA

SOCY 630a/AFAM 773a, Workshop in Urban Ethnography Elijah Anderson

The ethnographic interpretation of urban life and culture. Conceptual and methodological issues are discussed. Ongoing projects of participants are presented in a “workshop” format, thus providing participants with critical feedback as well as the opportunity to learn from and contribute to ethnographic work in progress. Selected ethnographic works are read and assessed. T 11:30–1:20

SOCY 630b/AFAM 773b, Workshop in Urban Ethnography Elijah Anderson

See SOCY 630a/AFAM 773a for course description.

[**SOCY 631a, Sociology of Work**]

SOCY 647b, Social Processes Scott Boorman

Focus is on identifying and exploring robust alternatives/complements to the rational choice models that have come to dominate so much of the analysis of social (including organizational) processes in recent years. Specifically, emphasis is placed on a range of mathematical models and related analytic approaches originating outside of the rational choice literature – in fields such as social network analysis, evolutionary biology, organization theory, and the law. Possible starting points include the Boorman-Levitt network matching model (see, e.g., Scott A. Boorman and Paul R. Levitt, “The network matching principle: A model of efficient resource allocation by informal social networks in non-profit and other non-market social structures,” *Economics Letters*, 1982, 10, 1–7) and its applications to nonprofits and complex statutes; weak ties models of job information transmission and other information transfer in elite social networks; “garbage can” models of the internal problem-solving dynamics of complex organizations. M 9:25–11:15

[**SOCY 654b^U/AFAM 719b^U/AMST 680b/WGSS 719b^U, Race, Racism, and Social Theory**]

SOCY 656a, Professional Seminar DGS and faculty

This required seminar aims at introducing incoming sociology graduate students to the department and the profession. Members of the department are invited to discuss their research. There are minimum requirements, such as writing a book review. No grades are given. The Sociology DGS is responsible for the seminar. Held biweekly. F 9:25–11:15

SPANISH AND PORTUGUESE

82–90 Wall Street, 432.5439, 432.1151

www.yale.edu/span-port/

M.A., M.Phil., Ph.D.

Chair

Rolena Adorno

Director of Graduate Studies

Noël Valis

Professors Rolena Adorno, Aníbal González, Roberto González Echevarría, K. David Jackson, María Rosa Menocal, Noël Valis

Assistant Professors Susan Byrne, Ernesto Estrella, Paulo Moreira, Kevin Poole

Senior Lecturer Sonia Valle

Fields of Study

Fields include Spanish Peninsular literature, Latin American literature, Portuguese and Brazilian literatures.

The doctoral program offers: (1) a concentration in Spanish specializing in a single field of study (medieval, Renaissance/Golden Age, modern Spanish Peninsular, colonial Spanish American, contemporary Spanish American); (2) a joint concentration in Spanish and Portuguese offering the student the opportunity to work in both the Luso Brazilian and Spanish/Spanish American fields. In addition, the department participates in (1) a combined Ph.D. program in Spanish and Portuguese and African American Studies offered in conjunction with the African American Studies department and (2) a combined Ph.D. program in Spanish and Portuguese and Renaissance Studies offered in conjunction with the Renaissance Studies program.

Special Admissions Requirements

Thorough command of the language in which the student plans to specialize and a background in its literature, as well as command of at least one of the three additional languages in which the student will need to fulfill requirements.

Application must include GRE scores, a personal statement, and an academic writing sample in the language of the proposed specialization, not to exceed twenty-five pages in length. Students whose native language is not English must submit scores of the Test of English as a Foreign Language (TOEFL).

Special Requirements for the Ph.D. Degree

The department requires two years of course work, sixteen term courses with a grade of Honors in at least two courses, and a minimum grade average of High Pass. Course work includes two required courses, SPAN 500, History of the Spanish Language, and SPAN 790, Methodologies of Modern Foreign Language Teaching, and two courses taken outside the department. Also required are a reading knowledge of Latin and a

second language, as well as a third language-literature minor. In the third year, the student is expected to pass the qualifying examination (written and oral components) and submit and receive approval of the dissertation prospectus. Upon completion of all pre-dissertation requirements, including the dissertation prospectus, students are admitted to candidacy for the Ph.D. The entire program, including the dissertation, can be completed in five years.

Participation in the department's teaching and pedagogy program is a degree requirement. It consists of taking the required course SPAN 790 in the second year and teaching one section per term of a course in the beginning language sequence during the third and fourth years of study. Viewed as an integral part of the course of study for the doctorate, this program includes supervision by the director of the language program and course directors.

Combined Ph.D. Programs

SPANISH AND PORTUGUESE AND AFRICAN AMERICAN STUDIES

The Department of Spanish and Portuguese also offers, in conjunction with the Department of African American Studies, a combined Ph.D. in Spanish and Portuguese and African American Studies. For further details, see African American Studies.

SPANISH AND PORTUGUESE AND RENAISSANCE STUDIES

The Department of Spanish and Portuguese also offers, in conjunction with the Renaissance Studies program, a combined Ph.D. in Spanish and Portuguese and Renaissance Studies. For further details, see Renaissance Studies.

Master's Degrees

M.Phil. See Degree Requirements under Policies and Regulations. Additionally, students in Spanish and Portuguese are eligible to pursue a supplemental M.Phil. degree in Medieval Studies. For further details, see Medieval Studies.

M.A. (en route to the Ph.D.) The M.A. en route is awarded upon the satisfactory completion of eight term courses and two of the three language requirements (Latin and one other language).

Courses

PORT 975b^u, Brazilian Concrete Poetry K. David Jackson

Brazilian concrete poetry in international perspective, production and theory of concrete poetry, translation, and criticism during the second half of the twentieth century. Place of the Brazilian concrete poets within visual and concrete poetics, through the study of representative works, from "Pilot Plan" and *Theory of Concrete Poetry* (1964) to graphic and spatial poems in the journals *Noigandres* and *Invenção* and public exposition of works in museums and conferences. Literary background and interaction with other arts. In English. TH 9:25–11:15

PORT 991a, Tutorial

By arrangement with faculty.

PORT 991b, Tutorial

By arrangement with faculty.

SPAN 500a, History of the Spanish Language Kevin Poole

The evolution of modern Spanish from spoken Latin, the origin and development of philology as the foundational discipline of literary studies, the rise of linguistics as a positivist field, the separation of linguistics from literary studies, and the fracturing of Romance studies into separate language and culture fields. In Spanish. TH 1:30–3:20

SPAN 520b, The World of Alfonso the Learned María Rosa Menocal

An integrated study of the cultural and historical universe of the medieval monarch (Alfonso el Sabio) whose vision and politics transformed Castilian from one of many regional dialects into the powerful written vernacular that would become the national language. Readings include at least excerpts from the numerous foundational texts authored or supervised by the “Learned King,” from the still-used *Siete Partidas* to the lavishly illustrated songbooks in Galician-Portuguese. In Spanish. T 1:30–3:20

SPAN 527a, Love in the Literature of Medieval Spain Susan Byrne

A study of canonical works of the thirteenth, fourteenth and fifteenth centuries. Love as religious fervor in Gonzalo de Berceo's *Milagros de nuestra Señora*, as physical experience and intellectual challenge in Juan Ruiz's *Libro de buen amor*, as courtesan excess and anguish in Diego de San Pedro's *Cárcel de amor* and Juan de Flores's *Grisel y Mirabella*. In Spanish. M 1:30–3:20

SPAN 660a^U/CPLT 647a^U, Cervantes: *Don Quijote* Roberto González Echevarría

A detailed, contextualized reading of Cervantes's *Don Quijote*, accompanied by a commentary of the most important criticism of the novel. In Spanish. W 3:30–5:20

SPAN 750a, Spanish Narrative in Transition (1975–1995) Noël Valis

On the literary production of post-Franco Spain (1975–1995). We focus on the cultural-historical landscape in which these novels appeared and their narrative art. Authors include Carmen Martín-Gaité, Javier Marías, Antonio Muñoz Molina, Rosa Montero, Juan Marsé, and others. In Spanish. M 3:30–5:20

SPAN 790b, Methodologies of Modern Language Teaching Sonia Valle

Preparation for a teaching career through readings, lectures, classroom discussions, and presentations on current issues in foreign/second language acquisition theory and teaching methodology. Classroom techniques at all levels. In Spanish. M 3:30–5, practicum 5–6:30

SPAN 815a, Spanish American Literature from the Baroque to Romanticism

Rolena Adorno

Major works from the Baroque through the Enlightenment to Romanticism that look forward as they look back. In prose, Juan Rodríguez Freile, Sor Juana Inés de la Cruz, el padre Antonio Vieira, Carlos de Sigüenza y Góngora, Alonso Carrió de la Bandera, Francisco Javier Clavijero, Simón Bolívar, Andrés Bello. In verse, Diego de Hojeda, Hernando Domínguez Camargo, Sor Juana, Andrés Bello, José Joaquín Olmedo, and José María Heredia. In Spanish. T 1:30–3:20

SPAN 912b/CLPT 942b, The Borges Effect Roberto González Echevarría

Since the publication of *Ficciones* in 1944 and especially since achieving worldwide acclaim after receiving *ex-aequo* with Samuel Beckett the Formentor Prize in 1961, Jorge Luis Borges has become one of the most influential modern writers. He is a recognizable and often acknowledged presence in the work of novelists and short-story writers, as well as in that of philosophers and literary theorists. There is a Borges “effect,” which can be perceived in John Barth, Julio Cortázar, Gabriel García Márquez, Italo Calvino, Umberto Eco, and in Maurice Blanchot, Michel Foucault, Gerard Genette, and Jacques Derrida, among others. That effect is also projected retrospectively in Borges’s particular way of reading classics like Homer, Dante, and Cervantes. An elegant, playfully ironic skepticism, together with a fondness for aporias, enigmas, puzzles, labyrinths as well as for minor genres such as the detective story are the most recognizable components of Borges’s style and thought. Taken together these components suggest theories about writing and reading. We read closely Borges’s most influential stories, such as “Tlön, Uqbar, Orbis Tertius,” “Pierre Menard, Author of the *Quijote*,” and “The Garden of Forking Paths,” as well as his essays on Homer, Dante, and Cervantes. We then follow his track in the writers mentioned. Class discussions in English and readings in English or the French, Spanish, or Italian originals. W 3:30–5:20

SPAN 974b, Narrative and Journalism in Spanish America: Bicentennial Readings

Aníbal González

A study of the narrative-journalism relation in Spanish America from the early nineteenth to the early twenty-first century. Topics include definitions of journalistic discourse; the “law of dissimulation”; journalism and the self; journalism versus genealogy; journalism and avant-garde writing; testimonial and documentary fiction. Readings from works by J.J. Fernández de Lizardi, Ricardo Palma, Heriberto Frías, José Martí, Rubén Darío, Roberto Arlt, Jorge Luis Borges, Julio Cortázar, Gabriel García Márquez, Elena Poniatowska, Tomás Eloy Martínez, Laura Restrepo. In Spanish. TH 1:30–3:20

SPAN 991a, Tutorial

By arrangement with faculty.

SPAN 991b, Tutorial

By arrangement with faculty.

STATISTICS

24 Hillhouse, 432.0666

www.stat.yale.edu/

M.A., Ph.D.

Chair

Joseph Chang

Director of Graduate Studies

Andrew Barron (24 Hillhouse, andrew.barron@yale.edu)

Professors Donald Andrews (*Economics*), Andrew Barron, Joseph Chang, Donald Green (*Political Science*), John Hartigan (*Emeritus*), Theodore Holford (*Epidemiology & Public Health; Biostatistics*), Peter Phillips (*Economics*), David Pollard, Heping Zhang (*Epidemiology & Public Health; Biostatistics*), Hongyu Zhao (*Epidemiology & Public Health; Biostatistics*)

Associate Professors John Emerson, Sekhar Tatikonda (*Electrical Engineering*), Edmund Yeh (*Electrical Engineering*), Harrison Zhou

Assistant Professors Lisha Chen, Mokshay Madiman

Lecturers Balaji Raman, Jonathan Reuning-Scherer

Fields of Study

Fields comprise the main areas of statistical theory (with emphasis on foundations, Bayes theory, decision theory, nonparametric statistics), probability theory (stochastic processes, asymptotics, weak convergence), information theory, econometrics, classification, statistical computing, and graphical methods.

Special Admissions Requirements

GRE scores for the General Test and for the Subject Test in the area closest to the undergraduate major should accompany an application; the Math Subject Test is strongly recommended. All applicants should have a strong mathematical background, including advanced calculus, linear algebra, elementary probability theory, and at least one course providing an introduction to mathematical statistics. An undergraduate major may be in statistics, mathematics, computer science, or in a subject in which significant statistical problems may arise. For those whose native language is not English, the Test of English as a Foreign Language (TOEFL) scores are required.

Special Requirements for the Ph.D. Degree

There is no foreign language requirement. Normally during the first two years, fourteen term courses in this and other departments are taken to prepare students for research and practice of statistics. These include courses devoted to case studies and practical work, for which students prepare a written report and give an oral presentation. The qualifying examination consists of three parts: a written report on an analysis of a data set, a written examination on theoretical statistics, and an oral examination. The examination is

taken not later than when scheduled by the department in the middle of the second year, with provision for one subsequent reexamination of one or more parts in the event that a student does not pass the first time. All parts of the qualifying examination must be completed before the beginning of the third year. A prospectus for the dissertation should be submitted no later than the first week of March in the third year. The prospectus must be accepted by the department before the end of the third year if the student is to register for a fourth year. Upon successful completion of the qualifying examination and the prospectus (and meeting of Graduate School requirements), the student is admitted to candidacy. Students are expected to attend weekly departmental seminars.

Master's Degree

M.A. (en route to the Ph.D.) This degree may be awarded upon completion of eight term courses and two terms of residence.

Terminal Master's Degree Program Students are also admitted directly to a terminal master's degree program. To qualify for the M.A., the student must successfully complete an approved program of eight term courses, chosen in consultation with the director of graduate studies. Full-time students must take a minimum of four courses per term. Part-time students are also accepted into the master's degree program. See Terminal M.A./M.S. Degrees, under Policies and Regulations.

Program information is available on the Web at www.stat.yale.edu.

Courses

STAT 500b, Introductory Statistics Balaji Raman

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. MWF 10:30–11:20

STAT 501–506, 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 are attended by all students in STAT 501–506 together as general concepts and methods of statistics are developed. The course separates for the last six and a half weeks, which 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.

STAT 501a^U/E&EB 510a^U, Introduction to Statistics: Life Sciences

Jonathan Reuning-Scherer, Günther Wagner

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. TTH 1–2:15

STAT 502a^U, Introduction to Statistics: Political Science Jonathan Reuning-Scherer,
Alan Gerber

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. TTH 1–2:15

STAT 503a^U, Introduction to Statistics: Social Sciences Jonathan Reuning-Scherer
Descriptive and inferential statistics applied to analysis of data from the social sciences. Introduction of concepts and skills for understanding and conducting quantitative research. TTH 1–2:15

STAT 505a^U, Introduction to Statistics: Medicine Jonathan Reuning-Scherer,
David Salsburg

Statistical methods relied upon in medicine and medical research. Practice in reading medical literature competently and critically, as well as practical experience performing statistical analysis of medical data. TTH 1–2:15

STAT 506a^U, Introduction to Statistics: Data Analysis Jonathan Reuning-Scherer,
Harrison Zhou

An introduction to probability and statistics with emphasis on data analysis.

STAT 530b^U, Introductory Data Analysis Jonathan Reuning-Scherer

Survey of statistical methods: plots, transformations, regression, analysis of variance, clustering, principal components, contingency tables, and time series analysis. The R computing language and Web data sources are used. After STAT 501a. MW 2:30–3:45

STAT 538a^U, Probability and Statistics Joseph Chang

Fundamental principles and techniques of probabilistic thinking, statistical modeling, and data analysis. Essentials of probability: conditional probability, random variables, distributions, law of large numbers, central limit theorem, 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 throughout for calculations, simulations, and analysis of data. After MATH 118a or b or 120a or b. Some acquaintance with matrix algebra and computing assumed. MWF 2:30–3:20

STAT 541a^U, Probability Theory Balaji Raman

A first course in probability theory: probability spaces, random variables, expectations and probabilities, conditional probability, independence, some discrete and continuous distributions, central limit theorem, Markov chains, probabilistic modeling. After or concurrent with MATH 120a or b or the equivalent. MWF 9:25–10:15

STAT 542a^U, b^U, Theory of Statistics Andrew Barron [F], Mokshay Madiman [Sp]

Principles of statistical analysis: maximum likelihood, sampling distributions, estimation; confidence intervals; tests of significance; regression; analysis of variance; and the method of least squares. Some statistical computing. Concurrently with or after STAT 541a and MATH 222a or b or 225a or b or the equivalent. HTBA [F], MWF 9:25–10:15 [Sp]

STAT 551b^U, Stochastic Processes Balaji Raman

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, genetics, and evolution. After STAT 541a or the equivalent. MW 1–2:15

STAT 600b^U, Advanced Probability David Pollard

Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis is assumed. TTH 2:30–3:45

[STAT 602b, Probability Coupling]**STAT 603b, Advanced Stochastic Processes** David Pollard

Martingales in continuous time, with applications to the stochastic calculus of semi-martingales. Random trees and other exotic random processes are also discussed, time permitting.

[STAT 606b, Markov Processes and Random Fields]**[STAT 607b, Inequalities for Probability and Statistics]****STAT 610a, Statistical Inference** Mokshay Madiman

A systematic development of the mathematical theory of statistical inference covering methods of estimation, hypothesis testing, and confidence intervals. An introduction to statistical decision theory. Undergraduate probability at the level of STAT 541a assumed. TTH 10:30–11:45

STAT 612a^U, Linear Models Balaji Raman

The geometry of least squares; distribution theory for normal errors; regression, analysis of variance, and designed experiments; numerical algorithms (with particular reference to S-plus); alternatives to least squares. Generalized linear models. Linear algebra and some acquaintance with statistics assumed. TTH 9–10:15

[STAT 613b^U, Experimental Design]**[STAT 617b, Random Matrices in Statistics]****STAT 618a, Asymptotics** Staff

A careful study of some standard asymptotic techniques in statistics and econometrics, and their modern refinements. Topics selected from classical likelihood theory and M-estimation; empirical process methods; concentration inequalities; semiparametric models; local asymptotic normality; concepts of efficiency. Prerequisite: knowledge of probability at the level of STAT 600b.

STAT 619b, Statistical Decision Theory in Modern Statistical Methodology Staff

Shrinkage estimation and its connection to minimaxity, admissibility, Bayes, empirical Bayes, and hierarchical Bayes. Shrinkage captures essential nonlinearity necessary to outperform standard linear estimators in Gaussian regression models and random effects

models. Relationship to model selection and to sparsity in the estimation of functions by selection from large dictionaries of candidate terms. Nonparametric estimation. Tests of statistical hypotheses. Multiple comparisons. Some knowledge of statistical theory at the level of STAT 610a is assumed. HTBA

STAT 625a, Case Studies John Emerson

Statistical analysis of a variety of problems including the value of a baseball player, the fairness of real estate taxes, how to win the Tour de France, energy consumption in Yale buildings, and interactive questionnaires for course evaluations. We emphasize methods of choosing data, acquiring data, and assessing data quality. Computations use R.

STAT 626b, Practical Work Staff

Individual one-term projects, with students working on studies outside the department, under the guidance of a statistician.

STAT 627a and b, Statistical Consulting John Emerson [F], John Hartigan [Sp]

Statistical consulting and collaborative research projects often require statisticians to explore new topics outside their area of expertise. This course exposes students to real problems, requiring them to draw on their expertise in probability, statistics, and data analysis. Students complete the course with individual projects supervised jointly by faculty outside the department and by one of the instructors. Students enroll for both terms and receive one credit at the end of the year.

[STAT 636b, Monte Carlo Methods]

[STAT 637a, Deterministic and Stochastic Optimization]

STAT 645b/CB&B 645b, Statistical Methods in Genetics and Bioinformatics

Hongyou Zhou

Stochastic modeling and statistical methods applied to problems such as mapping quantitative trait loci, analyzing gene expression data, sequence alignment, and reconstructing evolutionary trees. Statistical methods include maximum likelihood, Bayesian inference, Markov chain Monte Carlo, and some methods of classification and clustering. Models introduced include variance components, hidden Markov models, Bayesian networks, and coalescent. After STAT 542a or b or STAT 538a. Prior knowledge of biology is not required. TTH 10:30–11:45

[STAT 654a, Topics in Bayesian Inference and Data Analysis]

STAT 660b^U, Multivariate Statistical Methods for the Social Sciences

Jonathan Reuning-Scherer

An introduction to the analysis of multivariate data. Topics include principal components analysis, factor analysis, cluster analysis (hierarchical clustering, k-means), discriminant analysis, multidimensional scaling, and structural equations modeling. Emphasis is placed on practical application of multivariate techniques to a variety of examples in the social sciences. Students complete extensive computer work using either SAS or SPSS. Prerequisites: knowledge of basic inferential procedures, experience with linear models (regression and ANOVA). Experience with some statistical package and/or familiarity with matrix notation is helpful but not required. Requirements: regular assignments and a final project. TTH 1–2:15

STAT 661a^U, Data Analysis John Emerson

By analyzing data sets using the R statistical computing language, a selection of statistical topics are studied: linear and nonlinear models, maximum likelihood, resampling methods, curve estimation, model selection, classification, and clustering. Weekly sessions are held in the Social Sciences Statistical Laboratory. After or concurrent with STAT 542a or b and MATH 222a or b or 225a or b or the equivalents. MW 2:30–3:45

[STAT 662a, Statistical Computing]**STAT 664b^U/ENAS 954b^U, Information Theory** Mokshay Madiman

Foundations of information theory in communications, statistical inference, statistical mechanics, probability, and algorithm complexity. Quantities of information and their properties: entropy, conditional entropy, divergence, mutual information, channel capacity. Basic theorems of data compression and coding for noisy channels. Applications in statistics, communication networks, and finance. After STAT 541a. TTH 9–10:15

STAT 665b^U, Statistical Machine Learning Harrison Zhou

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 542a or b. MW 11:30–12:45

STAT 667a/AMTH 605a/ENAS 503a, Probabilistic Networks, Algorithms, and Applications Sekhar Tatikonda

This course examines probabilistic and computational methods for the statistical modeling of complex data. The emphasis is on the unifying framework provided by graphical models, a formalism that merges aspects of graph theory and probability theory. Graphical models: Markov random fields, Bayesian networks, and factor graphs. Algorithms: filtering, smoothing, belief-propagation, sum-product, and junction tree. Variational techniques: mean-field and convex relaxations. Markov processes on graphs: MCMC, factored HMMs, and Glauber dynamics. Some statistical physics techniques: cavity and replica methods. Applications to error-correcting codes, computer vision, bio-informatics, and combinatorial optimization.

[STAT 668a, Information and Probability]**[STAT 669a, Information and Statistics]****[STAT 673a, Functional Data Analysis]****[STAT 674a^U, Analysis of Spatial and Time Series Data]****[STAT 675b, Unsupervised Learning: Dimension Reduction and Clustering Analysis]****STAT 678b, Portfolio Estimation for Compounding Wealth** Andrew Barron

Statistical methodology and analysis for compounded wealth in repeated gambling and in stock market investment. Strategies of highest concentrated wealth. Relationship to

maximum likelihood and greedy strategies. Universal portfolios and their relationship to Bayes methods. Wealth analysis both for stochastic stock price sequences and its minimax behavior for arbitrary price sequences. Fast algorithms for universal portfolios. Prerequisite: STAT 542a or 538, or ECON 550a or equivalent.

STAT 680b, Nonparametric Statistics Harrison Zhou

Introduction to nonparametric methods such as kernel estimation, Fourier basis estimation, wavelet estimation. Optimal minimax convergence rates and constants for function spaces, with connections to information theory. Adaptive estimators (e.g., adaptive shrinkage estimation). If time permits: high dimensional function estimation, functional data estimation, classification, or nonparametric asymptotic equivalence. Applications to real data. Some knowledge of statistical theory at the level of STAT 610a is assumed.

STAT 690a or b, Independent Study

By arrangement with faculty. Approval of director of graduate studies required.

STAT 695a, Internship in Statistical Research Andrew Barron

The internship is designed to give students an opportunity to gain practical exposure to problems in the analysis of statistical data, as part of a research group within industries such as medical and pharmaceutical research, finance, information technologies, telecommunications, public policy, and others. The internship experience often serves as a basis for the Ph.D. dissertation. Students work with the director of graduate studies and other faculty advisers to select suitable placements. Students submit a one-page description of their internship plans to the DGS by May 1, which will be evaluated by the DGS and other faculty advisers by May 15. Upon completion of the internship, students submit a written report of their work to the DGS, no later than October 1. The internship is graded on a Satisfactory/Unsatisfactory basis, and is based on the student's written report and an oral presentation. This course is an elective requirement for the Ph.D. degree. Prerequisites: completion of one term of the Ph.D. program.

URBAN EDUCATION STUDIES PROGRAM

35 Broadway, 432.4631
www.yale.edu/urbanteaching/
 M.A.

Director and Director of Graduate Studies

Jonathon Gillette

Committee of the Yale Teacher Preparation and Education Studies Program David Berg (*Teacher Preparation Program*), Jill Campbell (*Professor, English*), Linda Cole-Taylor (*Associate Director, Teacher Preparation Program*), Gordon Geballe (*Associate Dean, Forestry & Environmental Studies*), Jonathon Gillette (*Director, Teacher Preparation Program; Lecturer, Sociology and Child Study Center*), Judith Hackman (*Associate Dean, Yale College*), Roger Howe (*Professor, Mathematics*), Matthew Jacobson (*Professor & Chair, American Studies; Professor, History and African American Studies*), Frank Keil (*Professor, Psychology and Linguistics*), Michael Morand (*Associate Vice President, New Haven and State Affairs*), Barbara Shiller (*Teacher Preparation Program*), Robert Wyman (*Professor, Molecular, Cellular & Developmental Biology*)

The Urban Education Studies Program is a one-year terminal master's that integrates advanced graduate work with preparation for teaching in an urban setting. Candidates complete an intensive twelve-course study program over a fourteen-month period and gain both a Master of Arts in Urban Education Studies and a State of Connecticut Initial Educator License for grades seven to twelve. Courses begin in the summer for ten weeks along with summer school teaching, continue through the academic year, and end with a final five-week summer course. Students who successfully complete the program are expected to do multi-year teaching in New Haven Public Schools.

Courses

TPRP 590a^U, Schools, Community, and the Teacher Jonathon Gillette

A survey of the important historical shifts in the purpose of education as well as the growing literature on the role of race in achievement. Students identify different philosophical stances and begin to generate their own guiding principles. TTH 1–2:15

TPRP 594c, Education Psychology: Learning Theory and Urban Classrooms

David Berg

An introduction to cognitive and social psychology as well as the intersection of adolescence with race and class. HTBA

TPRP 595c, Special Education: Legal and Psychological Issues Barbara Shiller

An introduction to the legal mandates of IDEA legislation as well as a survey of the various learning styles of students eligible for special education. HTBA

TPRP 598c, An Introduction to Urban Education Linda Cole-Taylor

An introduction to a way of thinking about teaching that involves an understanding of one's discipline, sociological understanding of context, and psychological knowledge of students. HTBA

TPRP 599a, Seminar in Teaching and Learning Linda Cole-Taylor

Taught in conjunction with TPRP 650a, this seminar expects students to demonstrate growing proficiency merging theory and practice. In addition to seminar discussion and purposeful assignments, this seminar supports a daily teaching internship in New Haven as the lead teacher in a mentor's classroom. Together, the field and campus work are intended to deepen one's professional habits of practice and encourage the candidate to significantly contemplate one's role within this teaching context. HTBA

TPRP 600–604a^U, The Methods of Teaching

A design seminar based on translating content knowledge into instructional practice. Participants demonstrate an ability to break down complex concepts in order to develop higher-order learning experiences for students.

TPRP 600a^U, The Teaching of English Faculty

M 2:30–4:20

TPRP 601a^U, The Teaching of History Linda Cole-Taylor

M 2:30–4:20

TPRP 602a^U, The Teaching of Languages Nancy Levy-Konesky

M 2:30–4:20

TPRP 603a^U, The Teaching of Mathematics Faculty

M 2:30–4:20

TPRP 604a^U, The Teaching of Science Faculty

M 2:30–4:20

TPRP 620b, Student Teaching Linda Cole-Taylor

This 3-credit seminar (620/621/622) is taken in conjunction with the full-time teaching placement in the Urban Education master's program. The weekly seminar is designed to support and deepen the candidate's work with New Haven students while challenging the candidate to enact the theoretical basis of the academic study in the program. HTBA

TPRP 621b^U, Student Teaching Linda Cole-Taylor**TPRP 622b^U, Student Teaching** Linda Cole-Taylor**TPRP 650a, Advanced Issues in Urban Settings** Jonathon Gillette

This seminar is designed to extend and deepen themes introduced in earlier course work as well as to integrate theoretical understanding with candidates' daily teaching practice. Topics include developing an initial intellectual identity in one's academic field and generating alternate understandings of urban students' behavior. F 2:30–4:20

TPRP 650b, Advanced Issues in Urban Settings Jonathon Gillette

Structured like the fall seminar. Topics for the spring include stereotype threat and cross-racial feedback, advances in cognition and their implication for learning theory, theories of student resistance, and theories of organizational change. TH 2:30–4:20

TPRP 660c, Theory into Practice Jonathon Gillette

A capstone seminar in which candidates examine the dual dynamics of "teaching against the grain." Elements include articulating an instructional stance as teachers, and different approaches to creating and managing an alternative class culture. HTBA

Non-Degree-Granting Programs, Councils, and Research Institutes

ATMOSPHERIC SCIENCE

Advisory Committee Hagit Affek (*Geology & Geophysics*), Donald Aylor (*Forestry & Environmental Studies*), Sarbani Basu (*Astronomy*), Michelle Bell (*Forestry & Environmental Studies*), Alexey Fedorov (*Geology & Geophysics*), Gary Haller (*Chemical Engineering; Chemistry*), Xuhui Lee (*Forestry & Environmental Studies*), Steven Orszag (*Applied Mathematics; Mathematics*), Rajendra Pachauri (*Forestry & Environmental Studies*), Mark Pagani (*Geology & Geophysics*), Daniel Rosner (*Chemical Engineering; Mechanical Engineering*), Ronald Smith (*Geology & Geophysics*), Mitchell Smooke (*Mechanical Engineering*), Sabatino Sofia (*Astronomy*), Mary-Louise Timmermans (*Geology & Geophysics*), Karl Turekian (*Geology & Geophysics*), John Wettlaufer (*Geology & Geophysics; Physics*)

A number of departments of the Graduate School offer courses dealing with the physics, dynamics, and chemistry of the atmosphere, and the interactions of the atmosphere with the biosphere, oceans, and cryosphere, including all biogeochemical cycles. The mathematical and physical science basis for these phenomena is developed in course work and research foci across a range of departments. In order to permit students whose interests lie in the field of atmospheric science to develop an integrated program of studies, an interdisciplinary program is offered. Typical areas of interest included in the scope of the program are theory of weather and climate, computational fluid dynamics, air pollution from industrial and natural sources, urban environmental health, global climatic change, paleoclimatology, hydrometeorology, and dynamics of atmospheric and oceanic motions. The program is individually planned for each student through a faculty adviser system.

Special Admissions Requirements

A student should, on the basis of scientific orientation, seek admission to one of the participating departments. The Department of Geology and Geophysics is the focus for studies of physical and dynamical meteorology, oceanography, and atmospheric chemistry, with allied methods and approaches in the Program on Applied Mathematics and the departments of Epidemiology and Public Health and Engineering & Applied Science (which includes the programs of Applied Physics, Biomedical Engineering, Chemical Engineering, Electrical Engineering, Environmental Engineering, and Mechanical Engineering) provide additional courses in environmental health and atmospherically related processes. The Ph.D. and M.Phil. requirements are those of the admitting departments (see entries in this publication).

COMBINED PROGRAM IN THE BIOLOGICAL AND BIOMEDICAL SCIENCES (BBS)

L-203 Sterling Hall of Medicine, 785.3735

<http://info.med.yale.edu/bbs/>

Director

Lynn Cooley (lynn.cooley@yale.edu)

Fields of Study

The Yale Combined Program in the Biological and Biomedical Sciences (BBS) offers unprecedented access to Yale's extensive array of bioscience resources, encompassing everything the University has to offer in one comprehensive, interdisciplinary graduate program. BBS has no boundaries, either departmental or geographical. Students therefore have access to courses, seminars, and faculty labs in every department. Moreover, students can participate in research activities anywhere — on the main University campus as well as at the School of Medicine.

Within BBS there are approximately 260 participating faculty, several dozen courses, and a great many seminars from which to choose. BBS is currently divided into eight interest-based "tracks":

- Computational Biology and Bioinformatics
- Immunology
- Microbiology
- Molecular Biophysics and Biochemistry
- Molecular Cell Biology, Genetics, and Development
- Neuroscience
- Pharmacological Sciences and Molecular Medicine
- Physiology and Integrative Medical Biology

Students apply to and, upon matriculation, affiliate with one of these eight tracks. It is important to note that, regardless of a student's home track, all courses, faculty, and research opportunities at the University remain available.

Year 1 Each track has a faculty director who helps first-year students select courses and find suitable lab rotations. Students typically take two to three courses per term and conduct two to four lab rotations over the course of the year.

Year 2 Just prior to the start of the second year, students select a thesis adviser in whose lab they will conduct their doctoral research. They also then leave their BBS track and formally join one of twelve Ph.D.-granting programs:

- Cell Biology
- Cellular and Molecular Physiology
- Computational Biology and Bioinformatics
- Experimental Pathology
- Genetics
- Immunobiology
- Interdepartmental Neuroscience Program

Microbiology
 Molecular Biophysics and Biochemistry
 Molecular, Cellular, and Developmental Biology
 Neurobiology
 Pharmacology

Students in year 2 complete the course requirements for the graduate program they have joined, take a qualifying exam, act as teaching assistants in lecture or lab courses, and begin thesis research.

Year 3 and beyond Students focus primarily on thesis research, publishing their results, and presenting their work at scientific meetings.

The average time to degree is 5.5 years.

For the duration of their studies all students receive a stipend, full tuition, and health coverage. Financial support comes from university fellowships, National Institutes of Health (NIH) training grants, and grants from foundations and companies.

Special Admissions Requirements

Entrance requirements to BBS are track-specific but include the following: GRE General Test scores; relevant GRE Subject Test scores (strongly recommended but not a strict requirement); undergraduate major in a relevant biological, chemical, or physical science; three letters of recommendation addressing the student's academic performance and/or laboratory training; and TOEFL exam scores for students whose native language is not English. Track-specific requirements are listed below.

COMPUTATIONAL BIOLOGY AND BIOINFORMATICS

All applicants are expected to meet general BBS requirements for entrance. In addition, successful applicants will have a strong foundation in the basic sciences such as biology, chemistry, and mathematics. Training in computing/informatics is also essential and should include significant computer programming experience. The GRE Subject Test in cellular and molecular biology, biology, biochemistry, chemistry, computer science, or other relevant discipline is recommended. The MCAT is also accepted.

IMMUNOLOGY

All applicants are expected to meet general BBS requirements for entrance. In addition, successful applicants are expected to have a firm foundation in the biological and physical sciences. It is preferred that students have taken courses in biology, organic chemistry, biochemistry, genetics, cell biology, physics, and mathematics. Actual course requirements are not fixed, however, and students with outstanding records in any area of the biological sciences may qualify for admission. There are no specific grade requirements for prior course work, but a strong performance in basic science courses is of great importance for admission. In special cases the Medical College Admission Test (MCAT) may be substituted.

MICROBIOLOGY

No additional requirements or recommendations.

MOLECULAR BIOPHYSICS AND BIOCHEMISTRY

All applicants are expected to meet general BBS requirements for entrance. Successful applicants will have a firm foundation in the sciences. Desirable courses include biology; biochemistry; general, organic, and physical chemistry; physics; and math. A pertinent GRE Subject Test is strongly recommended.

MOLECULAR CELL BIOLOGY, GENETICS, AND DEVELOPMENT

In addition to general BBS requirements, the GRE Subject Test in Biochemistry, Cell and Molecular Biology, Biology, or Chemistry is recommended.

NEUROSCIENCE

All applicants are expected to meet general BBS requirements for entrance. Successful applicants will have a firm foundation in the sciences. The Neuroscience track will accept the Medical College Admission Test (MCAT) in lieu of the Graduate Record Examination (GRE) General Test.

PHARMACOLOGICAL SCIENCES AND MOLECULAR MEDICINE

All applicants are expected to meet general BBS requirements for entrance. Successful applicants will have a firm foundation in the sciences. A GRE Subject Test in Biology or Chemistry is preferred. The experimental approaches and methods in this track are diverse and involve chemistry, biochemistry, physiology, and biophysics. For this reason, appropriate undergraduate preparation may involve majors that emphasize biology, chemistry, or physics.

PHYSIOLOGY AND INTEGRATIVE MEDICAL BIOLOGY

All applicants are expected to meet general BBS requirements for entrance. Successful applicants should have backgrounds in the biological, chemical, and/or physical sciences. These include majors in biology, biochemistry, physiology, genetics, chemistry, physics, mathematics, engineering, computer science, and psychology. Courses in biology, biochemistry, organic and physical chemistry, and mathematics through elementary calculus are recommended.

Program materials are available by request to Bonnie Ellis, Assistant Administrative Director, BBS Program, Yale University, PO Box 208084, New Haven CT 06520-8084; telephone 203.785.5663; fax 203.785.3734; e-mail, bbs@yale.edu; Web site, www.bbs.yale.edu

THE COWLES FOUNDATION

30 Hillhouse, 432.3702

<http://cowles.econ.yale.edu/>

Director

Philip Haile

The Cowles Foundation for Research in Economics at Yale University has as its purpose the conduct and encouragement of research in economics and related fields. The Cowles Foundation seeks to foster the development and application of rigorous logical, mathematical, and statistical methods of analysis. Members of the Cowles research staff are faculty members with appointments and teaching responsibilities in the Department of Economics and other departments. Among its activities, the Cowles Foundation provides financial support for research, visiting faculty, postdoctoral fellowships, workshops, and graduate students. Cowles regularly sponsors conferences and publishes a working paper series and research monographs.

THE ECONOMIC GROWTH CENTER

27 Hillhouse, 432.3610
www.econ.yale.edu/~egcenter/

Director

Mark Rosenzweig

The Economic Growth Center is a research organization within the Yale Department of Economics that was created in 1961 to analyze, both theoretically and empirically, the process of economic growth and the economic relations between low- and high-income countries. The research program emphasizes the search for regularities in the process of growth and changes in economic structure by means of cross-sectional and intertemporal studies and the analysis of policies that affect that process. An increasing share of the research involves statistical study of the behavior of households and firms as revealed in sample surveys by the application of microeconomic theory. Current projects include research on technology development, choice and transfer, household consumption, investment and demographic behavior, agricultural research and productivity growth, labor markets and the returns to education of women and men, labor markets and migration, income distribution, and international economic relations, including monetary and trade policies. The center's research faculty hold appointments in the Department of Economics and other departments at Yale, and accordingly have teaching as well as research responsibilities.

The center administers, jointly with the Department of Economics, the Yale master's degree training program in International and Development Economics, in which most students have experience as economists in foreign central banks, finance ministries, and public and private development agencies. It presents a regular series of workshops on trade and development, on the microeconomics of labor and population, and on economic history and includes among its publications book-length studies, reprints by its members, and discussion papers.

The Economic Growth Center Collection, housed in a separate facility at the Social Science Library, is a special collection focused on the statistical, economic, and planning documents of developing countries, including government documents.

INSTITUTION FOR SOCIAL AND POLICY STUDIES

77 Prospect, 432.3234
www.yale.edu/isps/

Director

Donald Green

Executive Committee Jeffrey Alexander, Kelly Brownell, Ian Shapiro, Jody Sindelar, Stephanie Spangler, Christopher Udry

The Institution for Social and Policy Studies (ISPS) facilitates interdisciplinary inquiry in the social sciences and research on important public policy subjects. Recognizing that important social problems cannot be studied adequately by a single discipline, the Yale Corporation established the Institution for Social and Policy Studies in 1968 in order to stimulate interdisciplinary collaboration within the University. Faculty and students from many departments in the Faculty of Arts and Sciences and from Yale's graduate and professional schools are involved in a variety of activities. These include interdisciplinary faculty seminars, research projects, postdoctoral programs, and the undergraduate major in Ethics, Politics, and Economics. Through these activities, ISPS seeks to provide intellectual leadership in the social sciences and shape public policies of local, national, and international significance.

Among the major programs at ISPS are the Yale University Interdisciplinary Center for Bioethics, David Smith, director; the Center for the Study of American Politics, Alan Gerber, director; the Agrarian Studies Program, James Scott, director; the Program in Ethics, Politics, and Economics, Ian Shapiro, director; and the Yale Initiative for Interdisciplinary Study of Antisemitism, Charles Asher Small, director. One of the hallmarks of ISPS is its commitment to field experimentation. For examples of experiments currently being conducted by ISPS scholars, please visit our Web site: www.yale.edu/isps/publications/field.html.

For more information, refer to the ISPS Bulletin and the Web site, www.yale.edu/isps.

INTERNATIONAL SECURITY STUDIES

31 Hillhouse, 432.6242

www.yale.edu/iss/

Director

Paul Kennedy

International Security Studies (ISS) supports interdisciplinary research and teaching in grand strategy, as well as international, diplomatic, and strategic history. Its goals are to fill the critical national need for educators and leaders with knowledge of these fields; to advance analysis, training, and teaching in its areas of interest; and to provide a forum for informed and independent discussions of historical and contemporary policy thinking and policy making on relevant issues.

ISS is not a degree-granting program: it facilitates the work and welcomes the participation of all Yale undergraduate, graduate, and professional school students in its events and its program of research grants and internship support. ISS is supported by Yale University, the Smith Richardson Foundation, the George Frederick Jewett Foundation, and the Friends of ISS, an organization of private donors.

The Brady-Johnson Program in Grand Strategy at Yale University, led by John Lewis Gaddis, is part of ISS. The program—which includes the Ivy Scholars Program, a rigorous academic experience for outstanding high school students—seeks to revive the study and practice of grand strategy by teaching future leaders to appreciate and apply its principles; by supporting undergraduate, graduate, and postdoctoral education and scholarship grounded in these principles; and by promoting a broader recognition of the centrality of grand strategy to successful, pragmatic leadership.

The program, launched in January 2000 and dedicated on December 11, 2006, to Nicholas F. Brady (B.A. 1952) and Charles B. Johnson (B.A. 1954), combines historical depth and analytical range with the belief that training future leaders at the graduate and undergraduate levels is the best long-term investment ISS can make in the future.

Inquiries should be directed to International Security Studies, Yale University, PO Box 208353, New Haven CT 06520-8353. Further information on ISS and the Brady-Johnson Program can be found at www.yale.edu/iss.

JUDAIC STUDIES

451 College, 432.0843
www.yale.edu/judaicstudies

Chair and Director of Graduate Studies

Steven Fraade

Professors Steven Fraade (*Religious Studies*), Benjamin Harshav (*Comparative Literature*), Christine Hayes (*Religious Studies*), Paula Hyman (*History; Religious Studies*), Ivan Marcus (*History; Religious Studies*), Michael Morgan (*Visiting, Philosophy*), Moshe Rosman (*Visiting, History*), Meira Polliack (*Visiting, Religious Studies*)

Lecturers Orna Goldman, Micha Perry (*History*), Hizky Shoham (*Religious Studies; Humanities*)

Senior Lector Ayala Dvoretzky (*Near Eastern Languages & Civilizations*)

Lectors Elitzur Bar-Asher (*Near Eastern Languages & Civilizations*), Shiri Goren (*Near Eastern Languages & Civilizations*)

Judaic Studies offers an interdisciplinary approach to the critical study of the languages, history, literature, religion, and culture of the Jews. Jewish society, texts, ideologies, and institutions are studied in comparative historical perspective in relation to the surrounding societies and cultures.

Graduate-level programs are available through the following departments: History (Ancient, Medieval, and Modern Jewish History), Religious Studies (History and Literature of Ancient Judaism, Medieval and Modern Jewish History), Near Eastern Languages and Civilizations (Northwest Semitic, Hebrew Language and Literature), Comparative Literature (Hebrew and Comparative Literature). Applications are made to a specific department, and programs of study are governed by the degree requirements of that department.

Other resources include the Judaica collection of Sterling Memorial Library and its Judaica bibliographer, the Fortunoff Archive for Holocaust Testimonies, the biweekly faculty/graduate student Judaic Studies Seminar, several lecture series, postdoctoral fellowships, and graduate fellowships in Judaic Studies.

Program materials are available on request to the director of graduate studies of the department of intended specialization, or to the Chair, Program of Judaic Studies, Yale University, PO Box 208287, New Haven CT 06520-8287, and at www.yale.edu/judaicstudies.

Courses

JDST 692b/HSAR 731b/REL 836b/RLST 798b, Witnessing, Remembrance,

Commemoration Margaret Olin

The interconnecting concepts of witnessing, remembrance, and commemoration are investigated through discussions of writings chosen from the works of Sigmund Freud, the authors of the Book of Genesis, Pierre Nora, and others, as well as contemporary visual practices that engage these concerns. TH 2:30–4:20

JDST 721b^U, Introduction to Judaism in the Ancient World Steven Fraade

The emergence of classical Judaism in its historical setting. Jews and Hellenization; varieties of early Judaism; apocalyptic and postapocalyptic responses to suffering and catastrophe; worship and atonement without sacrificial cult; interpretations of scriptures; law and life; the rabbi; faith in reason; Sabbath and festivals; history and its redemption. No prior background in Jewish history assumed. TTH 11:35–12:50

JDST 724a^U/RLST 765a^U, Female Characters in the Hebrew Bible Meira Polliack

This course focuses on complex female characters such as Tamar, Hannah, Rebecca. It explores the tension between their patriarchal depiction as marginal to male characters, on the one hand, and, on the other hand, their psychological and literary portrayal as dominant and active heroines who transcend the limited social and religious roles assigned to them in patriarchal society. TH 9:25–11:15

JDST 725a^U/RLST 757a^U, The Dead Sea Scrolls and the History of Ancient Judaism: The Damascus Document Steven Fraade

Study of one of the most important of the Dead Sea Scrolls. Attention to its place within the history of biblical interpretation and ancient Jewish law; the nature and rhetorical function of its textual practices, both narrative and legal; its ideological formulations, literary history, and relation to the central sectarian writings of the Qumran community. Prerequisite: reading fluency in ancient Hebrew. W 9:25–11:15

JDST 726b^U/RLST 767b^U, Genres of Biblical Literature and Their Interpretive History Meira Polliack

This course focuses on two major genres of biblical literature: narrative and prophecy. It introduces students to the contemporary biblical study of literary, psychological, historical, and ideational themes in the modern appreciation of these genres, while also exploring their pre-modern and medieval interpretive history. TH 9:25–11:15

JDST 727a^U/RLST 752a^U, Mishnah Seminar: Tractate Sanhedrin Steven Fraade

Study of a major early rabbinic legal text treating religious courts and their jurisprudential practice. Dual attention to the historical significance of the institutions of law represented and to the cultural significance of the rhetoric of that representation. Prerequisites: reading fluency in ancient Hebrew; permission of instructor. M 9:25–11:15

JDST 728b^U/RLST 751b^U, Midrash Seminar: The Theophany at Sinai

Steven Fraade

The giving of the Torah to Israel as seen through rabbinic eyes. Close readings of midrashic texts. Views of revelations, tradition, interpretation, law, and commandment in their literary and historical contexts. Interpretations and interpretive strategies compared and contrasted with those of other ancient biblical exegetes (Jewish and non-Jewish). Prerequisites: reading fluency in ancient Hebrew; permission of instructor. W 9:25–11:15

JDST 756b/RLST 808b, Second Temple Seminar: Formation of Authoritative Literature in Ancient Judaism John Collins

The topic of this seminar changes yearly. This year the seminar examines the problems of determining what literature was canonical or authoritative in the Second Temple period. Prerequisite: ability to read Hebrew and Greek. W 1:30–3:20

JDST 760b/RLST 772b, Rabbinics Research Seminar Christine Hayes

An in-depth survey of research debates and of methods and resources employed in the study of classical (pre-Geonic) rabbinic literature of all genres. Prerequisite: knowledge of Hebrew and Aramaic; ability to read academic Hebrew. This seminar is required of graduate students in Ancient Judaism. By permission of the instructor only. M 1:30–3:20

JDST 761a^U/HIST 535a^U/RLST 773a^U, History of the Jews to the Reformation

Ivan Marcus

A broad introduction to the history of the Jews from biblical beginnings until the European Reformation and the Ottoman Empire, with the main focus on the formative period of classical rabbinic Judaism and on the symbiotic relationship among Jews, Christians, and Muslims. An overview of Jewish society and culture in its biblical, rabbinic, and medieval settings. TTH 11:35–12:50

JDST 763a^U, Medieval Jews, Christians, and Muslims Imagining Each Other

Ivan Marcus

How members of Jewish, Christian, and Muslim communities thought of and interacted with members of the other two cultures during the Middle Ages. Topics include the cultural grids and expectations each imposed on the other; the rhetoric of otherness such as 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. T 1:30–3:20

JDST 767a^U, The World, Man, and Society in Jewish Mentalities of the Middle Ages

Micha Perry

After presenting the field of *histoire des mentalités* (history of mentalities), its history, questions, and methods, we explore several themes of Jewish mentality in the Middle Ages. Topics include time and space; the next world; love; childhood; truth and fraud; the self; life and death; and the “other.” The main question we put forward is whether there was a distinguishable Jewish mentality as distinct from the general Christian one. Every meeting includes a theoretical discussion and close reading of historical sources (in English translations). TH 1:30–3:20

JDST 768b^U, Past Present Tense: Jewish Historical Writings in the Middle Ages and the Renaissance Micha Perry

Though some have claimed that Jews did not write history during the Middle Ages, or even had no “historical” sense of the past, this course begs to differ. We read selected historical texts from the Jewish Middle Ages and Renaissance (tenth to sixteenth century) in Hebrew; present the recent research on medieval historiography and perceptions of time; explore different perceptions of time, history, and the past: annals, world history, local history, linear time, circular time, memory, narrative, and so on; and, finally, broaden the horizons of the topic by exploring some of the vast methods by which Jews made the past present in their lives and culture, such as liturgy and ritual. The course is divided into two unequal parts, emphasizing the Middle Ages. The reading of medieval texts in Hebrew helps strengthen Hebrew reading and decoding skills, and there are occasional assignments in modern scholarship in Hebrew. Prerequisite: reading fluency in Hebrew (classical or modern). M 9:25–11:15

JDST 769b^U, Revelation and Representation: Images as Encounter with the Divine

Sandra Valabregue-Perry

Often Judaism has been represented as an iconoclastic culture, oriented and driven by the book and its law. “Thou shall not make unto thee a graven image, nor any manner of likeness, of any thing that is in heaven above, or that is in the earth beneath” (Exodus 20:3). On the other hand, it is said: “And God said, Let us make man in our image, after our likeness the man was created in the image of God” (Genesis 1:26). Thus, first, even though God has no representation, he has an image; second, man’s image is profoundly related to God’s. A similar contradiction is expressed when Moses asks God to see his Glory, and he is answered: “No man shall see me and live” (Exod. 33:18). Yet he sees God’s “Back”, and not his “Face” (Exod. 33:19). If Moses is the greatest of the Jewish Prophets, what did he see at all? What was experienced by Abraham, Jacob, Ezekiel, Daniel, and all the prophets who had a direct encounter with God? In this seminar we study major philosophical and mystical texts on the question of prophecy and its correlative question, the representation of God. We deal with different issues that arise from the question of what the prophets saw. Thus, for example, we approach the question of anthropomorphism, the human image of God, and vice versa. Through these questions we touch upon the general background, the legacy, the epistemology, and the theology of medieval Judaism. T 9:25–11:15

JDST 774a^U, Jews of East Europe, 1500–1900 Moshe Rosman

This course surveys and analyzes the social, economic, cultural, and political history of the Jews in historical Poland and Russia in the early modern and modern periods. TH 3:30–5:20

JDST 786a^U/PHIL 603a^U, Jewish Philosophy in the Twentieth Century

Michael Morgan

Examination of the major figures in the tradition of Jewish philosophy in the twentieth century. Consideration of their engagement with the Western philosophical tradition, especially in Europe (Hermann Cohen, Martin Buber, Franz Rosenweig) and in post-war America (Emil Fackenheim, Abraham Joshua Herschel, Joseph Soloveitchik). The impact of the Six Day War and the Nazi Holocaust on American Jewish thinkers (Richard Rubenstein, Irving Greenberg, Eliezer Berkovits). T 9:25–11:15

JDST 792b/RLST 770b, Cultural Theories: Methodological Aspects Hizky Shoham

This course offers a close and detailed acquaintance with classic and current approaches to “culture” and “cultural studies.” Students are introduced to the different and unsettled meanings of the concept of culture, and to the variety of methods, research topics, and theoretical issues in the field. Although sociological-anthropological classics on culture are the core of the readings, the scope is also broadened to tangent disciplines such as philosophy, linguistics, literature, theater theory, and intellectual history, thus demonstrating interdisciplinary thought. Designated for graduate students from all humanities and social science disciplines, the seminar emphasizes methodological issues and equips students with effective research tools. TH 1:30–3:20

Related Courses

HEBR 501a^U, Elementary Modern Hebrew I

HEBR 501b^U, Elementary Modern Hebrew II

HEBR 502a^U, Intermediate Modern Hebrew I

HEBR 502b^U, Intermediate Modern Hebrew II

HEBR 504a^U, Introduction to Modern Israeli Literature

HEBR 505b^U, Contemporary Israeli Society in Film

HEBR 509b, Reading Academic Texts in Modern Hebrew

NELC 554b^U, Israeli Identity and Culture: 1948 to the Present

For descriptions, see under Near Eastern Languages and Civilizations.

THE WHITNEY AND BETTY MACMILLAN CENTER FOR INTERNATIONAL AND AREA STUDIES AT YALE

Luce Hall, 34 Hillhouse, 432-3410
www.yale.edu/macmillan

Director

Ian Shapiro (*Political Science*)

Executive Committee Nancy Ruther (*Secretary; Associate Director, The MacMillan Center*), Michael Cappello (*Medicine; World Fellows Program*), Judith Chevalier (*School of Management*), Michael Donoghue (*Ecology & Evolutionary Biology*), Laura Engelstein (*History*), Philip Gorski (*Sociology*), Oona Hathaway (*Law*), Daniel Junior (*Associate Director, The MacMillan Center*), Richard Kane (*Associate Director, The MacMillan Center*), William Kelly (*Anthropology*), Charles Long (*Deputy Provost*), Thomas Pogge (*Philosophy*), Benjamin Polak (*Economics; School of Management*), Nicholas Sambanis (*Political Science*), Susan Stokes (*Political Science*), Christopher Udry (*Economics*)

For more than four decades the Whitney and Betty MacMillan Center for International and Area Studies at Yale has been 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 endeavors to make understanding the world outside the borders of the U.S. an integral part of liberal education and professional training at the University. It brings together scholars from all relevant schools and departments to provide insightful interdisciplinary comparative and problem-oriented teaching and research on regional, international, and global issues.

The MacMillan Center provides twelve degree programs. The eight undergraduate majors include 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. The four graduate degree programs award master's degrees in African Studies, East Asian Studies, International Relations, and European and Russian Studies. There are joint-degree graduate programs with the schools of Management, Law, Forestry & Environmental Studies, and Public Health. Additionally, the programs offer six Graduate Certificates of Concentration: in African Studies, European Studies, International Development Studies, International Security Studies, Latin American and Iberian Studies, and Modern Middle East Studies.

The many councils, committees, and programs at the MacMillan Center support research and teaching across departments and professions, support doctoral training, advise students at all levels, and provide extracurricular learning opportunities, as well as funding resources for student and faculty research related to their regions and subject areas. Regional studies programs include African Studies, British Studies, Canadian Studies, East Asian Studies, European Studies, Hellenic Studies, Latin American and Iberian Studies, Middle East Studies, South Asian Studies, and Southeast Asia Studies. Comparative and international programs include the Center for the Study of Globalization; Ethnicity, Race, and Migration; European Union Studies; Genocide Studies; the Gilder Lehrman Center for the Study of Slavery, Resistance, and Abolition; Global

Health; International Affairs; International and Comparative Political Economy; International Security Studies; Order, Conflict, and Violence; Program on Democracy; and Religion, Politics, and Society.

The MacMillan Center provides opportunities for scholarly research and intellectual innovation; awards nearly 500 fellowships and grants each year; encourages faculty/student interchange; sponsors some 750 lectures, conferences, workshops, seminars, and films each year (most of which are free and open to the public); produces a range of working papers and other academic publications; and contributes to library collections comprising 1.4 million volumes in the languages of various areas. Through the Programs in International Educational Resources (PIER), it brings international education and training to educators, K-12 students, the media, businesses, and the community at large.

For details on degrees, programs, and faculty leadership, please consult www.yale.edu/macmillan/.

Graduate Certificates of Concentration in International and Area Studies

GENERAL GUIDELINES — PROGRAM DESCRIPTION

The Whitney and Betty MacMillan Center for International and Area Studies at Yale, through its councils on African, European, International Affairs, Latin American and Iberian, and Middle East Studies, sponsors graduate certificates of concentration that students may pursue in conjunction with graduate-degree programs in the Graduate School of Arts and Sciences and the professional schools. The certificate is intended for students seeking to demonstrate substantial preparation in the study of one of the six areas of concentration: regional (Africa, Europe, Latin America, Middle East) or thematic and international (Development and Security).

Candidates for the certificate must demonstrate expertise in the area of concentration through their major graduate or professional field, as well as show command of the diverse interdisciplinary, geographic, and cultural-linguistic approaches associated with expertise in the area of concentration. Admission to the graduate certificate is contingent on the candidate's acceptance into a Yale graduate-degree program. Award of the graduate certificate, beyond fulfilling the relevant requirements, is contingent on the successful completion of the candidate's Yale University degree program.

Application Procedure

Specific requirements of each council are reflected in its application, monitoring, and award procedures. Application forms can be picked up at the relevant council or downloaded from its Web site. Prospective students should submit a completed application form to the relevant council.

Applications may be submitted by students admitted to a graduate program at Yale or during their program of study but no later than the beginning of the penultimate term of study. Each council may set limits on the number of candidates for its program in any given year. For further information, see the council administrator.

Summary of General Requirements

While the general requirements are consistent across all councils of the MacMillan Center, the specific requirements of each council may vary according to the different expertise required for its area of concentration. In addition to the specific requirements, students pursuing the certificate are expected to be actively engaged in the relevant council's intellectual community and to be regular participants at its events, speaker series, and other activities. Serious study, research, and/or work experience overseas in the relevant region is highly valued. The requirements:

1. Six courses in the area of concentration (in at least two different fields).
2. Language proficiency in at least one language relevant to the area of concentration beyond proficiency in English. For some councils and for some individual circumstances, proficiency in two languages beyond English is required.
3. Interdisciplinary research paper focused on the area of concentration.

Further Details on General Requirements

1. Course work

Students must complete a total of six courses focused on the area from at least two different fields including a Foundations Course (if designated by the council). Of the remaining five courses only two may be "directed readings" or "independent study." Please note:

- No more than four courses may count from any one discipline or school.
- Courses from the home field of the student are eligible. Courses may count toward the student's degree as well as toward the certificate.
- Literature courses at the graduate level may count toward the six-course requirement but not elementary or intermediate language offerings. At the discretion of the faculty adviser, an advanced language course at the graduate level may be counted if it is taught with substantial use of field materials such as literature, history, or social science texts and journals relevant to the area.
- Course work must demonstrate broad comparative knowledge of the region rather than focus on a specific country.
- Course work must demonstrate a grasp of the larger thematic concerns affecting the region, such as environment, migration, or global financial movements.
- Only those courses listed on the Graduate Course Listings provided by the area council may be used to fulfill course requirements. For courses not listed there, please consult the certificate adviser. Non-listed courses may only be counted with prior approval of the council adviser, not after the fact.
- A minimum grade of HP must be obtained or the course will not be counted toward the certificate.
- Only course work taken during the degree program at Yale may be counted toward the certificate.

2. Language proficiency

In the major-area language targeted for meeting the proficiency requirement, students must demonstrate the equivalent ability of two years of language study at Yale with a grade of HP or better. Language proficiency must encompass reading, writing,

speaking, and listening skills plus grammar. Students may demonstrate proficiency by completing course work, by testing at Yale, or by other means as approved by the council adviser. When a second major language of the region beyond English is required, the relevant council will specify the target level. The typical departmental graduate reading exam is not sufficient for certifying the four-skill language requirement of the certificate.

Normally, when the candidate is a native speaker of one of the area's major languages, he/she will be expected to develop language proficiency in a second major area language.

3. Interdisciplinary research paper

A qualifying research paper is required to demonstrate field-specific research ability focused on the area of concentration. After they have completed substantial course work in the area of concentration, students must seek approval from the council faculty adviser for the research project they propose as the qualifying paper. Normally, the student will submit the request no later than the fourth week of the term in which he or she plans to submit the qualifying paper.

The interdisciplinary research paper may be the result of original research conducted under the supervision of a faculty member in a graduate seminar or independent readings course or in field research related to the student's studies. An M.A. thesis, Ph.D. prospectus, or dissertation may also be acceptable if it is interdisciplinary as well as focused on the area of concentration. The qualifying paper should examine questions concerning the area of concentration in a comparative and/or interdisciplinary context. It should also use relevant international and area-focused resource materials from a relevant region and/or resource materials in the language(s) of a relevant region or regions. Normally the paper should incorporate at least two of the following elements:

- Address more than one country relevant to the area of concentration
- Draw on more than one disciplinary field for questions or analytic approaches
- Address a transregional or transnational theme relevant to the area of concentration

The paper will be read by two faculty members selected in agreement with the council adviser. The readers will be evaluating the paper for the quality of research, knowledge of the relevant literature, and the depth of analysis of the topic. The qualifying paper must be fully footnoted and have a complete bibliography. The council adviser may call for a third reader as circumstances warrant.

Progress Reports and Filing for the Award of the Certificate/Qualification

Students should submit a progress report along with a copy of their unofficial transcript to the council faculty adviser at the end of each term. Ideally, this will include a brief narrative describing the student's engagement in the relevant council's intellectual community and participation in its events, speaker series, and the like, as well as any planned or newly completed experience overseas.

A student who intends to file for the final award of the certificate should contact the council no later than the end of the term prior to award. By the fourth week of the term of the expected award at the latest, the candidate should demonstrate how he/she has or will have completed all the requirements on time.

At the end of the term as grades are finalized, the council will confirm that the candidate is cleared to receive the home degree and has fulfilled all the requirements of the certificate. The final award will require review and clearance by the relevant associate director of the MacMillan Center.

Pursuit of Two Certificates by a Single Student

No courses may overlap between the two certificates. Any application for two certificates by a single student must robustly fulfill all of the requirements for each of the two certificates. Each certificate must be approved independently by each respective council's certificate adviser.

In addition to the approval of both council advisers, any award of two certificates will require review and approval by the relevant associate director of the MacMillan Center.

COUNCIL ON AFRICAN STUDIES

The MacMillan Center

142 Luce Hall, 34 Hillhouse, 432.3436

www.yale.edu/macmillan/african

Graduate Certificate of Concentration in African Studies

Chair

Kamari Clarke (*Anthropology*)

Faculty

For faculty listings, see the section on African Studies, under Degree-Granting Departments and Programs in this bulletin.

Special Requirements for the Graduate Certificate of Concentration in African Studies

The Certificate in African Studies enables graduate and professional school students in fields other than African Studies to demonstrate interdisciplinary area expertise, language proficiency, and research competence in African Studies. The certificate program is intended to complement existing fields of studies in other M.A. and Ph.D. programs and to provide the equivalent of such specialization for students in departments and schools without Africa-related fields of study. The certificate program is designed to be completed within the time span of a normal Ph.D. residence. Professional school students and M.A. students in the Graduate School may require an additional term of registration to complete the certificate requirements depending on the requirements of specific programs.

The certificate program includes interdisciplinary course work, language study, and research components. The specific requirements are:

1. Successful completion of at least six courses in African Studies from at least two departments or schools, one of which is a core course in African Studies (AFST 764a, Africa and the Disciplines, or AFST 501a, Research Methods in African Studies).
2. Demonstration of proficiency in an African language.
3. Evidence of research expertise in African Studies. Research expertise may be demonstrated by completion of an interdisciplinary thesis, dissertation prospectus, or dissertation or by completion of a substantive research seminar paper or the equivalent as approved by the faculty adviser.

The certificate courses and research work should be planned to demonstrate clearly fulfillment of the goals of the certificate. Certificate candidates should design their course schedules in consultation with the director of graduate studies for African Studies. Ideally, students should declare their intention to complete the certificate requirements early in their program at Yale. Graduate and professional school students who intend to complete the certificate program must declare their intention to do so no later than during their penultimate term of enrollment.

For course listings, see African Studies, under Degree-Granting Departments and Programs in this bulletin.

Program materials are available upon request from the Director of Graduate Studies, Council on African Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; e-mail: african.studies@yale.edu.

COUNCIL ON EAST ASIAN STUDIES

The MacMillan Center
 320 Luce Hall, 34 Hillhouse, 432.3426
<http://research.yale.edu/eastasianstudies>

Chair

Haun Saussy (*Comparative Literature; East Asian Languages & Literatures*)

Faculty

For faculty listings, see the section on East Asian Studies, under Degree-Granting Departments in this bulletin.

The Council on East Asian Studies (CEAS) at the MacMillan Center was founded in 1961 and continues a long tradition of East Asian Studies at Yale. CEAS provides an important forum for academic exploration and support related to the study of China, Japan, and Korea. For more than forty years, it has promoted education about East Asia both in the college curricula and through lectures and workshops, conferences, cultural events, and educational activities open to faculty, students, and the general public. CEAS has been designated a National Resource Center for the study of Asian languages and cultures by the U.S. Department of Education. With more than twenty core faculty and twenty language instructors spanning twelve departments on campus, East Asian Studies remains one of Yale's most extensive area studies programs. Its interdisciplinary emphasis encourages collaborative linkages across fields and departments and contributes to diversity across the curricula and in the classroom. Approximately one hundred fifty courses on East Asia in the humanities and social sciences are offered each year.

CEAS administers Bachelor of Arts (B.A.) and Master of Arts (M.A.) programs. The M.A. program focuses on Chinese, Japanese, and Korean Studies. For details on the M.A. program, see the section on East Asian Studies, under Degree-Granting Departments in this bulletin.

COUNCIL ON EUROPEAN STUDIES

The MacMillan Center

242 Luce Hall, 34 Hillhouse, 432.3423

www.yale.edu/macmillan/europeanstudies

Graduate Certificate of Concentration in European Studies

Chair

Steven Pincus (*History*)

Faculty and Participating Staff

For faculty listings, see the section on European and Russian Studies, under Degree-Granting Departments and Programs in this bulletin.

For course listings, see European and Russian Studies, under Degree-Granting Departments and Programs in this bulletin.

For more information, visit www.yale.edu/macmillan/grad_certificates.htm and www.yale.edu/macmillan/iac/certificates.htm, write to European Studies Council, Yale University, PO Box 208206, New Haven CT 06520-8206, or call 203.432.3423.

The European Studies Council formulates and implements new curricular and research programs on European politics, culture, economy, society, and history. The geographical scope of the council's activities extends from Ireland to the lands of the former Soviet Union. Its concept of Europe transcends the conventional divisions into Western, Central, and Eastern Europe, and includes the Balkans and Russia. In 2006 the U.S. Department of Education again designated the council a National Resource Center under its HEA Title VI program.

The European Studies Council builds on existing programmatic strengths at Yale, while serving as a catalyst for the development of new initiatives. Yale's current resources in European Studies are vast and include the activities of many members of the faculty who have teaching and research specialties in the area. Such departments as Comparative Literature, Economics, English, History, History of Art, Political Science, Slavic Languages and Literatures, and Sociology regularly offer courses with a European focus. These are complemented by the rich offerings and faculty strength of the French, German, Italian, and Spanish and Portuguese language and literature departments, as well as the European resources available in the professional schools and other programs, such as Film Studies. By coordinating Yale's existing resources, including those in the professional schools, encouraging individual and group research, and promoting an integrated comparative curriculum and degree programs, the council strongly supports the disciplinary and interdisciplinary study of European regions and their interactions. The council is also home to special programs in European Union Studies, British Studies, Baltic Studies, and the Hellenic Studies program.

In addition to the M.A. degree program, the council offers students in the University's doctoral and other professional degree programs the chance to obtain a Graduate Certificate of Concentration in European Studies by fulfilling a supplementary curriculum. The undergraduate major in Russian and East European Studies is administered by the Department of Slavic Languages and Literatures.

The benefits provided to the Yale community by the European Studies Council include not only its status as an HEA Title VI National Resource Center, but also its affiliation with interuniversity and international organizations that can offer specialized training programs and research grants for graduate students, support conferences among European and American scholars, and subsidize European visitors to Yale. The Fox International Fellowship Program, for example, offers generous fellowship support to qualified students who undertake research at specified institutions in the United Kingdom, Germany, France, and Russia. Furthermore, the council supplements the regular Yale curriculum with lectures and seminars by eminent European and American scholars, diplomats, and political officials. Each year the European Commission sponsors a European Union Fellow at Yale. The European Studies Council is now pursuing formal links with a variety of European institutions and in 2007–2008 the council initiated a scholarly exchange with École des Hautes Études en Sciences Sociales (EHESS) in Paris.

Fields of Study

European and Slavic languages and literatures; economics; history; music; political science; law; sociology.

Special Requirements for the Graduate Certificate of Concentration in European Studies

Yale students may pursue the Graduate Certificate of Concentration in European Studies in conjunction with graduate-degree programs in the Graduate School of Arts and Sciences and the professional schools. Candidates will specify as an area of primary focus either (1) Russia and Eastern Europe or (2) Central and Western Europe. Admission is contingent on the candidate's acceptance into a Yale graduate-degree program. To complete the certificate, candidates must demonstrate expertise in the area through their major graduate or professional field, as well as show command of the diverse interdisciplinary, geographic, and cultural-linguistic approaches associated with expertise in the area of concentration. Award of the certificate, beyond fulfilling the relevant requirements, is contingent on successful completion of the candidate's Yale University degree program.

Specific Requirements

1. Language proficiency in two modern European languages, in addition to English. Students wishing to focus on Russia and Eastern Europe will need to demonstrate knowledge of Russian or an Eastern European language; those focusing on Central and Western Europe will need to demonstrate knowledge of one of the appropriate languages.
2. Six courses in the area of concentration, of which:
 - a. three courses must offer transnational approaches to Europe-related issues, and
 - b. of the remaining three courses, students focusing on Russia and Eastern Europe must take at least one course concerning the nations of Central and Western Europe. For those focusing on Central and Western Europe, at least one course must concern Russia and Eastern Europe.

3. Interdisciplinary research paper written either:
 - a. in the context of one of the six courses in the area of concentration, or
 - b. as independent work under faculty supervision, replacing one of the six required courses.

A qualifying research paper is required to demonstrate field-specific research ability focused on the area of concentration. After they have completed substantial course work in the area, students must seek approval from the council faculty adviser for the research project they propose as the qualifying paper. Normally, students will submit their proposals no later than the fourth week of the term in which they plan to submit the qualifying paper.

INTERNATIONAL AFFAIRS COUNCIL

The MacMillan Center

210 Luce Hall, 34 Hillhouse, 432.3418

www.yale.edu/macmillan/iac

Graduate Certificate of Concentration in Development Studies

Graduate Certificate of Concentration in International Security Studies

Chair

Julia Adams (*Sociology*)

Faculty

For faculty listings, see the section on International Relations, under Degree-Granting Departments and Programs in this bulletin.

For more information, visit http://www.yale.edu/macmillan/grad_certificates.htm and www.yale.edu/macmillan/iac/certificates.htm, write to International Affairs Council, Yale University, PO Box 208206, New Haven CT 06520-8206, e-mail international.relations@yale.edu, or call 203.432.3418.

Graduate Certificate of Concentration in Development Studies

The Graduate Certificate of Concentration in Development Studies provides recognition that a graduate or professional student at Yale has completed interdisciplinary study and integrative research to address fundamental and applied economic, political, social, and cultural issues facing developing countries.

The certificate in Development Studies may be pursued only in conjunction with graduate degree programs in the Graduate School of Arts and Sciences and the professional schools. By pursuing the certificate, students are able to develop and demonstrate their competence in this interdisciplinary field. Award of the certificate, beyond fulfilling the relevant requirements, is contingent on the successful completion of the candidate's Yale University degree program. The Development Studies faculty adviser may set a limit on the number of applicants accepted for this program in any given year.

The certificate courses and research should be planned, in consultation with the Development Studies faculty adviser, to clearly demonstrate fulfillment of the goals of the Development Studies certificate. Certificate candidates should apply to pursue the certificate early in their degree program, and must do so no later than their penultimate term of enrollment.

Candidates for the certificate will receive preference, after students enrolled in the council's degree programs, for International Affairs Council research and speaker funds that are awarded through annual competitions.

REQUIREMENTS

1. Six courses in the area of Development Studies: Each year, the Development Studies faculty adviser will provide a list of courses that will count toward the six-course requirement. These courses will draw primarily on Graduate School offerings in economics, political science, history, international relations, anthropology, and sociology and courses at the professional schools, including Law, Management, Forestry

& Environmental Studies, and Public Health. Candidates may petition the faculty adviser to have other relevant courses count.

2. **Language proficiency:** Students must demonstrate proficiency in one relevant language other than English. The language should be either a major world language relevant to development studies or the language of the region on which the candidate is focusing.
3. **Economics proficiency:** Students must demonstrate proficiency in the basic concepts of economic analysis, either by demonstrating substantial prior course work in economics or by taking a graduate- or professional-level economics course at Yale. Such a course may count toward the certificate with the approval of the faculty adviser.
4. **Research requirement:** Candidates must write a substantial research paper. The paper must demonstrate the ability to use interdisciplinary resources in development studies, including, where appropriate, primary sources, field research, data analysis, and non-English sources. If the paper is of sufficient quality, the faculty adviser may submit it for publication in the IAC Development Studies Working Paper Series.

Graduate Certificate of Concentration in International Security Studies

The Graduate Certificate of Concentration in International Security Studies provides recognition that a graduate or professional student at Yale has completed interdisciplinary study and integrative research to address fundamental and applied economic, political, social, and cultural issues relevant to the study of international security.

The certificate in International Security Studies may be pursued only in conjunction with graduate-degree programs in the Graduate School of Arts and Sciences and the professional schools. It allows students to develop and demonstrate their competence in this interdisciplinary field. Award of the certificate, beyond fulfilling the relevant requirements, is contingent on successful completion of the candidate's Yale University degree program. The International Security Studies certificate faculty adviser may set a limit on the number of applicants accepted into this certificate program in any given year.

The certificate courses and research should be planned, in consultation with the International Security Studies faculty adviser, to clearly demonstrate fulfillment of the goals of the International Security Studies certificate. Certificate candidates should submit their application to pursue the certificate early in their degree program, and must do so no later than their penultimate term of enrollment.

Candidates for the certificate will receive preference, after students enrolled in the council's degree programs, for International Affairs Council research and speaker funds that are awarded through annual competitions.

REQUIREMENTS

1. **Six courses in the area of International Security:** Each year the International Security Studies certificate faculty adviser will provide a list of courses that will count toward this six-course requirement. This list will draw primarily on Graduate School offerings in anthropology, economics, history, international relations, political science, and sociology and courses at the professional schools, including Forestry &

Environmental Studies, Law, Management, and Public Health. Candidates may petition the faculty adviser to have other relevant courses count.

One of these six courses must have a core focus on international security issues. The International Security Studies certificate faculty adviser will provide a list of courses each year that meet this requirement.

Up to three courses may focus on a particular region.

2. **Language proficiency:** Candidates must demonstrate proficiency in one relevant language other than English. The language should be either a major world language relevant to international security studies or the language of the region on which the candidate is focusing.
3. **Research requirement:** Candidates must write a substantial research paper. The paper must demonstrate the ability to use interdisciplinary resources in international security studies, including, where appropriate, primary sources, field research, data analysis, and non-English sources. If the paper is of sufficient quality, the faculty adviser may submit it for publication in the IAC International Security Studies Working Paper Series.

COUNCIL ON LATIN AMERICAN AND IBERIAN STUDIES

The MacMillan Center

232 Luce Hall, 34 Hillhouse, 432.3422

www.yale.edu/macmillan/lais

Graduate Certificate of Concentration in Latin American and Iberian Studies

Chair

Stuart B. Schwartz (*History*)

Professors Rolena Adorno (*Spanish & Portuguese*), Mark Ashton (*Forestry & Environmental Studies*), Garry Brewer (*School of Management*), Richard Burger (*Anthropology*), Hazel Carby (*African American Studies; American Studies*), Amy Chua (*Law*), Lisa Curran (*Forestry & Environmental Studies*), Carlos Eire (*History; Religious Studies*), Eduardo Engel (*Economics*), Robert Evenson (*Economics*), Paul Freedman (*History*), Aníbal González (*Spanish & Portuguese*), Roberto González Echevarría (*Spanish & Portuguese*), K. David Jackson (*Spanish & Portuguese*), Gilbert Joseph (*History*), Efsthios 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; African American Studies; Anthropology*), Stephen Pitti (*History*), Susan Rose-Ackerman (*Law; 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; American Studies; African American Studies*), Elisabeth Wood (*Political Science*)

Associate Professors Leonard Munstermann (*Senior Research Scientist, Epidemiology & Public Health*), Alicia Schmidt-Camacho (*American Studies*)

Assistant Professors Robert Bailiss (*Forestry & Environmental Studies*), Irene Brambilla (*Economics*), Susan Byrne (*Spanish & Portuguese*), Ana De La O Torres (*Political Science*), Thad Dunning (*Political Science*), Ernesto Estrella (*Spanish & Portuguese*), Paulo Moreira (*Spanish & Portuguese*), Moira Fradinger (*Comparative Literature*), Lillian Guerra (*History*), Paulina Ochoa Espejo (*Political Science*)

Senior Lectors I, II (Spanish and Portuguese) Sybil Alexandrov, Marta Almeida, Teresa Carballal, Mercedes Carreras, Sebastián Díaz, María Jordán, Juliana Ramos-Ruano, Lissette Reymundi, Lourdes Sabé, Terry Seymour, Margherita Tortora, Sonia Valle

Lectors (Spanish and Portuguese) Maria Pilar Asensio-Marinque, Yovanna Cifuentes, Ame Cividanes, Maria de La Paz García, Oscar González-Barreto, Tania Martuscelli, Barbara Saffile

Others Jane Edwards (*Associate Dean, Yale College*), Jaime Lara (*Lecturer, Institute of Sacred Music*), Nancy Ruther (*Lecturer, Political Science*), César Rodríguez (*Curator, Latin American Collection, Sterling Memorial Library*), John Sullivan (*Instructor, Nahuatl*)

Professors Emeriti Emilia Viotti da Costa (*History*), Josefina Ludmer (*Spanish & Portuguese*), Juan Linz (*Political Science; Sociology*), Gustav Ranis (*Economics*)

A variety of Latin American Studies options are available for graduate students in history and other humanities disciplines, the social sciences, and the professional schools. Latin American Area course offerings are available in nineteen disciplines with distinct strengths in Anthropology, History, History of Art, Political Science, and Spanish and Portuguese. Latin Americanist faculty specialize in the Andes (Burger, Mayer), Brazil (Jackson, Moreira, Pessar, Schwartz), the Caribbean (Guerra, Pessar, Thompson), Central America (Canuto, Joseph, Miller, Wood), Mexico (Camacho, Canuto, Fein, Joseph, Lara, Miller, Pitti), and the Southern Cone (Brambilla, Engel, Fein, Stokes). F&ES faculty (Anisfeld, Ashton, Clark, Curran, Doolittle, Dove, Mendelsohn, Montagnini) have tropical research interests or participate in educational exchanges with Argentina, Bolivia, Brazil, Costa Rica, Dominica, Ecuador, Guyana, Honduras, Mexico, Nicaragua, Panama, Peru, and Venezuela. Latin American content courses are also offered in the Divinity School, Public Health, Law, and Management.

Students may pursue the Graduate Certificate of Concentration in Latin American and Iberian Studies in conjunction with graduate degree programs in the Graduate School of Arts and Sciences and the professional schools. To complete the certificate, candidates must demonstrate expertise in the area through their major graduate or professional field, as well as show command of the diverse interdisciplinary, geographic, cultural, and linguistic approaches associated with expertise in Latin America or Iberia.

Admission is contingent on the candidate's acceptance into a Yale graduate degree program, and award of the certificate, beyond fulfilling the relevant requirements, requires the successful completion of the candidate's Yale University degree program. Active participation in the council's extracurricular and research programs and seminars is also strongly encouraged.

Limited financial resources, such as the Foreign Language and Area Studies fellowships, Tinker Field Research Grants, and LAIS Summer Research grants, are available to graduate and professional school students.

Specific Requirements for the Graduate Certificate of Concentration

Language proficiency The equivalent of two years' study of one language and one year of the other, normally Spanish and Portuguese. Less frequently taught languages, such as Nahuatl, Quechua, or Haitian Creole, may also be considered for meeting this requirement.

Course work Six graduate courses in at least two different disciplines. No more than four courses may count in any one discipline.

Geographical and disciplinary coverage At least two countries and two languages must be included in the course work or thesis.

Research A major graduate course research paper or thesis that demonstrates the ability to use field resources, ideally in one or more languages of the region, normally with a focus on a comparative or regional topic rather than a single country.

The certificate adviser of the Council on Latin American and Iberian Studies will assist

graduate students in designing a balanced and coordinated curriculum. The council will provide course lists and other useful materials.

Academic Resources of the Council

The council supplements the graduate curriculum with annual lecture and film series, special seminars, and conferences that bring visiting scholars and experts to campus. The council also serves as a communications and information center for a vast variety of enriching events in Latin American studies sponsored by the other departments, schools, and independent groups at Yale. It is a link between Yale and Latin American centers in other universities, and between Yale and educational programs in Latin America and Iberia.

The Latin American Collection of the University library has approximately 522,000 printed volumes, plus newspapers and microfilms, CD-ROMs, films, sound recordings, and maps. The library's Latin American Manuscript Collection is one of the finest in the United States for unpublished documents for the study of Latin American history. Having the oldest among the major Latin American collections in the United States, Yale offers research opportunities unavailable elsewhere.

Information about the Graduate Certificate of Concentration in Latin American Studies may be requested from the Council on Latin American and Iberian Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; e-mail: latin.america@yale.edu; or telephone 203.432.3422.

COUNCIL ON MIDDLE EAST STUDIES

The MacMillan Center

342 Luce Hall, 34 Hillhouse, 432.5596

www.yale.edu/macmillan/cmcs

Graduate Certificate of Concentration in Modern Middle East Studies

Chair

Marcia Inhorn (*Anthropology and International Affairs*)

Associate Chair

Frank Griffel (*Religious Studies*)

Professors Abbas Amanat (*History*), Harold Attridge (*Divinity; Religious Studies*), Gerhard Böwering (*Religious Studies*), Adela Yarbro Collins (*Divinity*), John J. Collins (*Divinity*), John Darnell (*Near Eastern Languages & Civilizations*), Owen Fiss (*Law*), 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*), Frank Hole (*Emeritus, Anthropology*), Paula Hyman (*History; Religious Studies*), Marcia Inhorn (*Anthropology*), Stanley Insler (*Linguistics*), Bentley Layton (*Religious Studies*), James Leckman (*Psychology & Pediatrics*), Ellen Lust (*Political Science*), Ivan Marcus (*History*), Ashgar Rastegar (*Medicine*), W. Michael Reisman (*Law*), Lamin Sanneh (*Divinity; History*), Harvey Weiss (*Near Eastern Languages & Civilizations*), Robert Wilson (*Divinity*)

Associate Professors Ala Alryyes (*Comparative Literature*), Stephen Davis (*Religious Studies*)

Assistant Professors Michael Gasper (*History*), Mokhtar Ghambou (*English*), Zareena Grewal (*American Studies; Religious Studies*), Kaveh Khoshnood (*Epidemiology & Public Health*), Adria Lawrence (*Political Science*), Colleen Manassa (*Near Eastern Languages & Civilizations*), Andrew March (*Political Science; Religious Studies*), Ahmed Mobarak (*Economics*), Hala Nassar (*Near Eastern Languages & Civilizations*), Kishwar Rizvi (*History of Art*), Youval Rotman (*History*)

Lecturers Adel Allouche (*History; Religious Studies*), Muhammad Aziz (*Near Eastern Languages & Civilizations*), Karen Foster (*Near Eastern Languages & Civilizations; History of Art*), Tolga Köker (*Economics*), Kathryn Slanski (*Near Eastern Languages & Civilizations*)

Senior Lectors (I, II) and Lectors Fereshteh Amanat-Kowssar (*Persian*), Muhammad Aziz (*Arabic*), Ayala Dvoretzky (*Hebrew*), Shiri Goren (*Hebrew*), Ghassan Husseinali (*Arabic*), Boutheina Khaldi (*Arabic*), Yechiel Schur (*Hebrew*), Betül Tarhan (*Turkish*)

Librarians Ulla Kasten (*Babylonian Collection*), Susan Matheson (*Yale University Art Gallery Ancient Arts*), Simon Samoeil (*Sterling Memorial Library*), Nannette Stahl (*Judaica Collection*)

Students with an interest in the Middle East should apply to one of the University's degree-granting departments, such as Anthropology, History, Linguistics, Near Eastern Languages and Civilizations, Political Science, or Religious Studies. The Council on Middle East Studies is part of the Whitney and Betty MacMillan Center for International and Area Studies. It has been organized to provide guidance to graduate students who desire to use the resources of the departments of the University that offer Middle East-related courses.

The council brings together faculty and students sharing an interest in the Middle East by sponsoring conferences, discussions, films, and a lecture series by scholars from Yale as well as visiting scholars. It provides information concerning grants, fellowships, research programs, and foreign study opportunities. It also administers research projects in a variety of Middle East-related areas.

In addition to the resources of the individual departments, Yale's library system has much to offer the student interested in Middle East studies. Of particular note are the collections of Arabic and Persian manuscripts, as well as large holdings on the medieval and modern Middle East.

The Council on Middle East Studies administers the Middle East Studies National Resource Center at Yale. The center supports a number of projects and activities, including postdoctoral and visiting scholar appointments, summer and academic year language fellowships, and an extensive outreach program as well as conferences, travel funds, and research projects. The National Resource Center is funded by the United States Department of Education under HEA Title VI.

The council also offers a Graduate Certificate of Concentration in Modern Middle East Studies.

The Graduate Certificate of Concentration in Modern Middle East Studies

The certificate represents acknowledgment of substantial preparation in Middle East Studies, both in the student's major graduate or professional field and also in terms of the disciplinary and geographical diversity required by the council for recognized competency in the field of Middle East Studies. As language and culture are the core of the area studies concept, students are required to attain or demonstrate language proficiency.

REQUIREMENTS

1. Language proficiency: the equivalent of two years of study at a passing grade in one of the four languages of the Middle East—Arabic, Hebrew, Persian, and Turkish.
2. Course work: six graduate courses in at least two different disciplines. No more than four courses may count in any one discipline. Included in these six courses must be an introductory Middle East history course, such as State and Society and Culture in the Middle East (taken with special supplemental graduate readings and assignments). The preferred course, when available, is ANTH 538/INRL 615, Culture and Politics in the Contemporary Middle East.
3. Interdisciplinary coverage: both courses and any research project undertaken in lieu of a course must reflect experience of at least two disciplines.

4. Research: a major graduate course research paper, dissertation prospectus, dissertation, or thesis that demonstrates ability to use field resources, ideally in one or more languages of the region.

For more information on the Graduate Certificate and inquiries about Middle East studies, contact the Council on Middle East Studies, Yale University, PO Box 208206, New Haven CT 06520-8206, or the council e-mail, cmes@yale.edu.

SOUTH ASIAN STUDIES COUNCIL

The MacMillan Center
309 Luce Hall, 34 Hillhouse Avenue, 432.5596
www.yale.edu/macmillan/southasia

Chair

Kalyanakrishnan Sivaramakrishnan (*Anthropology*)

Professors Akhil Amar (*Law*), Timothy Barringer (*History of Art*), Michael Dove (*Forestry & Environmental Studies*), Sara Suleri Goodyear (*English*), Phyllis Granoff (*Religious Studies*), Stanley Insler (*Linguistics*), Gustav Ranis (*Emeritus, Economics*), T. N. Srinivasan (*Economics*), Shyam Sunder (*School of Management*), Kalyanakrishnan Sivaramakrishnan (*Anthropology*), Christopher Udry (*Economics*)

Associate Professors J. Bernard Bate (*Anthropology*), Nihal deLanerolle (*School of Medicine*), Mridu Rai (*History*)

Assistant Professors S. Shameem Black (*English*), Ashwini Deo (*Linguistics*), Mayur Desai (*Psychiatry/VAMC*), El Mokhtar Ghambou (*English*), Zareena Grewal (*Ethnicity, Race & Migration*), Karuna Mantena (*Political Science*), Kishwar Rizvi (*History of Art*), Tamara Sears (*History of Art*), Sarah Weiss (*Music*)

Senior Lecturers Carol Carpenter (*Forestry & Environmental Studies*), Geetanjali Singh Chanda (*Women's, Gender & Sexuality Studies*), Koichi Shinohara (*Religious Studies*)

Lecturers Nandini Bhattacharya (*History of Science, History of Medicine*), Harry Blair (*Political Science*), Ashish Chadha, Hugh Flick (*Religious Studies*), Priya Kanungo, Vani Kulkarni, Marina Martin, Alessandro Monsutti, Shreeyash Palshikar (*South Asian Studies; Political Science*), Thariq Thachil

Senior Lector Seema Khurana (*Hindi*)

Lectors David Brick (*Sanskrit*), Swapna Sharma (*Hindi*), Blake Wentworth (*Tamil*)

Students with an interest in South Asian Studies should apply to one of the University's degree-granting departments, such as Anthropology, History, Political Science, Economics, or Religious Studies. The Council on South Asian Studies is part of the MacMillan Center for International and Area Studies. It has been organized to provide guidance to graduate students who desire to use the resources of the departments of the University that offer South Asia-related courses.

The South Asian Studies Council aims to bring together faculty and students sharing an interest in South Asia, and it supplements the curriculum with seminars, conferences, and special lectures by scholars from Yale as well as visiting scholars. It provides information concerning grants, fellowships, research programs, and foreign study opportunities.

Language instruction is offered in Hindi and Tamil. Students planning to undertake field research or language study in South Asia may apply to the council for summer fellowship support.

For information and program materials, contact the South Asian Studies Council, Yale University, PO Box 208206, New Haven CT 06520-8206; or see www.yale.edu/macmillan/southasia.

Courses

ANTH 619a^U/SAST 300a, Language and the Public Sphere J. Bernard Bate

This seminar interrogates the relationship between language and the public sphere in a number of societies. Beginning with foundational statements on the problem by Jürgen Habermas, Benedict Anderson, and their critics, we move to explore the ways in which differing communicative modalities mediated distinct imaginaries of large-scale socio-political order, public spheres, and other cosmologies in a variety of social and historical contexts. T 1:30–3:20

ANTH 942a and b, Research Seminar in South Asia Anthropology

Kalyanakrishnan Sivaramakrishnan

This seminar is for students preparing to become scholars of South Asia. It consists of systematic reading, analysis, discussion, and writing about the anthropological literature in English. It deals with a selection of key ethnographic monographs that cover important topics and debates in the anthropology of South Asia and India including caste, class, community, gender, language, development, environment, politics, and popular culture. Students actively prepare and lead discussions, and write either a proposal or research paper at the end of term. The seminar is designed for doctoral students working on South Asia. Others with appropriate background and interests may be admitted by permission of the instructor. T 9:25–11:15

HIST 893a, Subaltern Studies Mridu Rai

This class seeks to introduce students, broadly, to the historiography of South Asia and, more specifically, to debates about dominance, resistance, and writing about both, in the context of colonialism, nationalism, and “postcoloniality.” As such, the course is structured around an assessment of the Subaltern Studies project, one of the most influential recent interventions in South Asian history and politics. Open to undergraduates with permission of instructor. W 3:30–5:20

HNDI 510a^U, Elementary Hindi Seema Khurana, Swapna Sharma

An in-depth introduction to modern Hindi, including the Devanagari script. Through a combination of graded texts, written assignments, audiovisual material, and computer-based exercises, the course provides cultural insights and increases proficiency in understanding, speaking, reading, and writing Hindi. Emphasis placed on spontaneous self-expression in the language. No prior background in Hindi assumed.

510a-1: MTWTHF 10:30–11:20

510b-2: MTWTHF 1:30–2:20

HNDI 520b^U, Elementary Hindi II Seema Khurana, Swapna Sharma

Continuation of HNDI 510.

520b-1: MTWTHF 10:30–11:20

510b-2: MTWTHF 1:30–2:20

HNDI 530a^U, Intermediate Hindi I Seema Khurana, Swapna Sharma

First half of a two-term sequence designed to develop proficiency in the four language skill areas. 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 various Hindi literary traditions. Emphasis on spontaneous self-expression in the language. After HNDI 510 or equivalent.

530a-1: MTWTHF 11:35–12:25

530b-2: MTWTHF 2:30–3:20

HNDI 540b^U, Intermediate Hindi II Seema Khurana, Swapna Sharma

Continuation of HNDI 530a, focusing on further development of proficiency in the four language skill areas. After HNDI 530a or equivalent.

540b-1: MTWTHF 11:35–12:25

540b-2: MTWTHF 2:30–3:20

HNDI 550a^U, Advanced Hindi Seema Khurana, Swapna Sharma

An advanced language course aimed at enabling students to engage in fluent discourse in Hindi and to achieve a comprehensive knowledge of formal grammar. Introduction to a variety of styles and levels of discourse and usage. Emphasis on the written language, with readings on general topics from newspapers, books, and magazines. Prerequisite: HNDI 540b or permission of instructor. TTH 4–5:15

HNDI 598a^U or b^U, Advanced Tutorial Seema Khurana, Swapna Sharma

For students with advanced Hindi language skills who wish to engage in concentrated reading and research on material not otherwise offered by the department. The work must be supervised by an adviser and must terminate in a term paper or its equivalent. Prerequisites: HNDI 540a, and submission of a detailed project proposal and its approval by the language studies coordinator. 1 HTBA

INDC 771b, Middle Indic: Pali and Prakrit Stanley Insler

Introduction to the old Indic vernaculars. Readings from the Buddhist Canon, inscriptions of Asoka and Prakrit literary texts. TH 1:30–3:20

LING 515^U, Elementary Sanskrit Ashwini Deo [F], David Mellins [Sp]

Careful study of Sanskrit grammar both in its historical development and as the synchronic systems attested in classical Sanskrit. Comparisons with other Indo-European languages. Close reading of later Sanskrit texts. MWF 9:25–10:15

RLST 555b, Topics in the Study of Tibetan Buddhism Jacob Dalton

Study of the Buddhism of Tibet. TH 2:30–4:20

TAML 510a^U, Introductory Tamil I Blake Wentworth

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. MTWTHF 10:30–11:20

TAML 520b^U, Introductory Tamil II Blake Wentworth

Continuation of TAML 510a^U. MTWTHF 10:30–11:20

TAML 530a^U, Intermediate Tamil I Blake Wentworth

First half of a two-term sequence designed to develop proficiency in the four language skill areas. Focus on improving comprehension, speaking, reading, and writing skills

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 515 or equivalent. MTWTHF 11:35–12:25

TAML 540b^U, Intermediate Tamil II Blake Wentworth

Continuation of TAML 530a, focusing on further development of proficiency in four language skill areas. Students are prepared to begin conducting field work in Tamil. Prerequisite: TAML 530a or equivalent. MTWTHF 11:35–12:25

TAML 550b, Advanced Tamil Blake Wentworth

An advanced language course designed to help students understand speech from the public platform, conduct interviews in Tamil, and analyze texts through critical reading, discussion, writing, and translation. Texts may include creative literature of the modern period, contemporary cultural and political writings, and other genres as determined by student interests. Prerequisite: TAML 540b or equivalent. HTBA

TAML 590b^U, Literatures of South Indian Languages in Translation

Blake Wentworth

The course introduces literatures of the modern period in their translation in English from four languages of South India: Tamil, Malayalam, Kannada, Telugu. The literary works selected for their creative and translation quality are from the colonial and post-colonial periods and represent various aspects of the South Indian society in particular, which are illustrative of South Asian society in general. Students read at home the selected works pertaining to a particular aspect and discuss them in class. Knowledge of any of the four languages is not assumed. MW 2:30–3:45

TAML 598a or 598b, Advanced Tutorial Blake Wentworth

For students with advanced Tamil language skills who wish to engage in concentrated reading and research on material not otherwise included in the courses offered by the department. The work is supervised by the instructor and concludes with a term paper or its equivalent. Prerequisites: submission of a detailed proposal of study and its approval by the instructor and DGS. F 2:30–4:20

COUNCIL ON SOUTHEAST ASIA STUDIES

The MacMillan Center

311 Luce Hall, 34 Hillhouse, 432.3431, seas@yale.edu

www.yale.edu/seas

Chair

J. Joseph Errington (*Anthropology*)

Professors William Burch (*Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies*), J. Joseph Errington (*Anthropology*), William Kelly (*Anthropology*), Benedict Kiernan (*History*), James Scott (*Political Science*), Mimi Yiengpruksawan (*History of Art*)

Associate Professor Sarah Weiss (*Music*)

Assistant Professor Erik Harms (*Anthropology*)

Lecturers and Senior Lectors (I, II) Carol Carpenter (*Forestry & Environmental Studies*), Amity Doolittle (*Forestry & Environmental Studies*), Quang Phu Van (*Southeast Asian Languages*), Indriyo Sukmono (*Southeast Asian Languages*)

Yale does not offer higher degrees in Southeast Asia Studies. Instead, students apply for admission to one of the regular degree-granting departments and turn to the Council on Southeast Asia Studies for guidance regarding the development of their special area interest, courses outside their department, and instruction in Southeast Asian languages related to their research interest. The council aims to bring together faculty and students sharing an interest in Southeast Asia and supplements the graduate curriculum with an annual seminar series, periodic conferences, and special lectures.

Yale offers extensive library and research collections on Southeast Asia in Sterling Memorial Library, the Economic Growth Center, the Peabody Museum of Natural History, and the Human Relations Area Files. Further information on library resources is available from Rich Richie, Curator, Southeast Asia Collection, Sterling Memorial Library (432.1858, rich.richie@yale.edu).

Language instruction is offered in two Southeast Asian languages, Indonesian and Vietnamese. The council supports language tables and tutoring in other Southeast Asian languages by special arrangement. Students planning to undertake field research or language study in Southeast Asia may apply to the council for summer fellowship support.

For information on program activities, contact the Council on Southeast Asia Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; or see our Web site, www.yale.edu/seas.

Courses

INDN 520^U, Elementary Indonesian Indriyo Sukmono

An introductory course in Standard Indonesian with emphasis on developing communicative skills through systematic survey of grammar and graded exercises. Introduction to

reading in the second term, leading to mastery of language patterns, essential vocabulary, and basic cultural competence. 5 HTBA

INDN 527^U, Intermediate Indonesian Indriyo Sukmono

Continues practice in colloquial Indonesian conversation and reading and discussion of texts. 3 HTBA

INDN 560, Readings in Indonesian Indriyo Sukmono

For students with advanced Indonesian language skills working on modern Indonesian literature.

VIET 515^U, Elementary Vietnamese Quang Phu Van

Students acquire basic working ability in Vietnamese including sociocultural knowledge. Attention paid to integrated skills such as speaking, listening, writing (Roman script), and reading. No previous knowledge of or experience with Vietnamese language required. MTWTHF 9:30–10:20

VIET 530^U, Intermediate Vietnamese Quang Phu Van

An integrated approach to language learning aimed at strengthening students' listening, speaking, reading, and writing skills in Vietnamese. Students are thoroughly grounded in communicative activities such as conversations, performance simulation, drills, role playing, and games. Discussion of aspects of Vietnamese society and culture. Prior knowledge of Vietnamese required. MTWTHF 10:30–11:20

VIET 560, Readings in Vietnamese Quang Phu Van

For students with advanced Vietnamese language skills who wish to engage in concentrated reading and research.

ORGANISMAL AND INTEGRATIVE BIOLOGY (OIB)

Osborn Memorial Laboratories, Rm 122
165 Prospect Street, 432.3837
www.biology.yale.edu/oib

Advisory Committee

Durland Fish, Vice Director (*Epidemiology & Public Health*), Leo Hickey (*Geology & Geophysics*), Andrew Hill (*Anthropology*), Richard Prum, Director (*Ecology & Evolutionary Biology*), Nancy Ruddle (*Epidemiology & Public Health*), Oswald Schmitz (*Forestry & Environmental Studies*), David Skelly (*Forestry & Environmental Studies*)

Organismal and Integrative Biology (OIB) was created in response to changing opportunities for cross-disciplinary research in the biological sciences. Our goal is to provide an environment for doctoral study utilizing Yale's diverse resources to encourage broad intellectual development. New theory, empirical findings, and technological developments promise unification of formerly disparate biological fields through research approaches that are actively synthetic, reaching across levels of organization to uncover fundamental organizing principles of biology.

Special Admissions Requirements

Based on their interests, students should seek admission to one of the participating departments: Anthropology, Ecology and Evolutionary Biology, Epidemiology and Public Health, Forestry & Environmental Studies, Geology and Geophysics. The Ph.D. and M.Phil. requirements are those of the participating departments.

WOMEN'S, GENDER, AND SEXUALITY STUDIES

315 William L. Harkness Hall, 432.0845

www.yale.edu/wgss/

Chair

Sally Promey

Director of Graduate Studies

Margaret Homans [F]

Jill Campbell [Sp]

Professors Elizabeth Alexander (*African American Studies*), Seyla Benhabib (*Political Science*), Jill Campbell (*English*), Hazel Carby (*African American Studies; American Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), George Chauncey (*History*), M. Kamari Clarke (*Anthropology*), Glenda Gilmore (*History; American Studies; African American Studies*), Inderpal Grewal (*Women's, Gender & Sexuality Studies; American Studies; Anthropology*), Dolores Hayden (*Architecture; American Studies*), Margaret Homans (*English; Women's, Gender & Sexuality Studies*), Paula Hyman (*History; Religious Studies*), Marianne LaFrance (*Psychology; Women's, Gender & Sexuality Studies*), Joanne Meyerowitz (*History*), Sally Promey (*American Studies; Institute of Sacred Music; Religious Studies*), Cynthia Russett (*History*), Vicki Schultz (*Law*), Sallama Shaker (*Visiting, Divinity; Islamic Studies*), Emilie Townes (*Divinity*), Laura Wexler (*American Studies; Women's, Gender & Sexuality Studies*)

Associate Professors Bernard Bate (*Anthropology*), Alondra Nelson (*Sociology; African American Studies*), Naomi Rogers (*History of Science & Medicine; Women's, Gender & Sexuality Studies*), Alicia Schmidt Camacho (*American Studies*)

Assistant Professors Jafari Allen (*African American Studies; Anthropology*), Averil Clarke (*Sociology*), Moira Fradinger (*Comparative Literature*), Terri Francis (*Film Studies*), Lillian Guerra (*History*), Karen Nakamura (*Anthropology*), Ludger Viefhues (*Religious Studies*)

Lecturers Melanie Boyd (*Women's, Gender & Sexuality Studies*), Geetanjali Singh Chanda (*Women's, Gender & Sexuality Studies*), Kathleen Cleaver (*African American Studies*), Michael Mahoney (*History*), Graeme Reid (*Women's, Gender & Sexuality Studies; Anthropology*), Timothy Stewart-Winter (*Women's, Gender & Sexuality Studies*)

Fields of Study

The Program in Women's, Gender, and Sexuality Studies considers gender and sexuality as fundamental categories of social and cultural analysis and offers critical perspectives upon them as a basis from which to study the diversity of human experience. Gender (the social and historical meanings of the distinction between the sexes) and sexuality (the domain of sexual practices, identities, discourses, and institutions) are studied as they intersect with class, race, ethnicity, nationality, and other axes of human difference. The introduction of these perspectives into all fields of knowledge necessitates new research, criticism of existing research, and the formulation of new paradigms and organizing concepts.

The Qualification in Women's, Gender, and Sexuality Studies is open to students already enrolled in a Ph.D. program at Yale. Interested students are strongly encouraged to register for the Qualification by meeting with the DGS during their first year. Students who wish to receive the Qualification must (1) complete the core course, WGSS 619b, *Feminist and Queer Theory: National and Transnational Perspectives*, or, with permission of the DGS, another course in the theory of gender and sexuality; (2) complete two electives to be determined in consultation with the DGS and their individual WGSS graduate adviser; (3) demonstrate the capacity to pursue independent, interdisciplinary research in Women's, Gender, and Sexuality Studies by presenting a qualifying paper at a meeting of the WGSS Colloquium; and (4) demonstrate readiness to teach basic and advanced courses in this field by serving as TF in a WGSS lecture course or teaching a seminar on a WGSS topic, and by preparing appropriate course syllabi. Students who fulfill these expectations will receive a letter from the DGS, indicating that they have completed the work for the Qualification.

Program information and the requirements for the Qualification are available on the Women's, Gender, and Sexuality Studies Web site, or by contacting 432.0845 or wgss@yale.edu.

Courses

[WGSS 619b, *Feminist and Queer Theory: National and Transnational Perspectives*]

[WGSS 621b/INRL 621b/REL 827b, *Women, Religion, and Representation in an Age of Globalization*]

WGSS 651a^U/ANTH 651a^U, *Intersectionality and Women's Health: Ethnographic Approaches to Race, Class, Gender, and Difference* Marcia Inhorn

This interdisciplinary seminar is designed to explore how the intersections of race, class, gender, and other axes of "difference" (age, sexual orientation, disability status, nation, religion) affect women's health, primarily in the contemporary United States. Recent feminist approaches to intersectionality and multiplicity of oppressions theory are introduced. In addition, the course demonstrates how anthropologists studying women's health issues have contributed to social and feminist theory at the intersections of race/class/gender. W 2:30–4:20

WGSS 660b^U/ANTH 684b^U, *Men, Manhood, and Masculinity* Graeme Reid

Cultural and historic constructions of masculinity through an investigation of male bodies, sexualities, and social interactions. Examination of multiple masculinities and exploration of the relationship between hegemonic, non-hegemonic, and subordinate masculinities.

WGSS 681b^U/PLSC 604b^U, *European Political Thought from Weber to Derrida*

Seyla Benhabib

A survey of major themes in twentieth-century Continental political thought. Topics include reason and rationalization in modernity; legality, legitimacy, and sovereignty; decline of the public sphere; origins of totalitarianism; and communicative ethics and the inclusion of the "other" in the new Europe. Readings from Max Weber, the Frankfurt

school, Walter Benjamin, Hannah Arendt, Martin Heidegger, Carl Schmitt, Jürgen Habermas, and Jacques Derrida. Prerequisite: permission of instructor. TTH 2:30–3:20, 1 HTBA

WGSS 685a^U/ANTH 619a^U, Language and the Public Sphere J. Bernard Bate

Explores the relationship between language and the public sphere through consideration of theoretical perspectives of Jürgen Habermas and Benedict Anderson, along with 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 century. T 1:30–3:20

[WGSS 689a/ANTH 591a, **Black Feminist Theory and Praxis**]

[WGSS 699b/AMST 863b, **Feminist Visual Theory**]

[WGSS 701b/ANTH 508b, **Queer Ethnographies**]

[WGSS 704b/LAW 21577/SOCY 601b, **Work and Gender**]

WGSS 705b^U/AFAM 731b^U, Theories of Black Women and Film Terri Francis

Study of films and videos made by women of African descent during the twentieth and twenty-first centuries. Focus on filmmaking as a critical practice and an art form, particularly how it engages cinematic perceptions of black womanhood. Films placed in a matrix of African American film history, feminist film theory, and legacies of black feminist writing and image making. Topics include film language, authorship, performance, and the question of audience. T 1:30–3:20, screening M 9 P.M.

[WGSS 710a^U, **Reading Gender and Sexuality in the Archive**]

[WGSS 712b/HIST 775b/AMST 866b, **Readings in the History of Sexuality**]

WGSS 715b/AFAM 829b, American Legal History: Citizenship and Race

Kathleen Cleaver

The seminar examines the evolution of U.S. citizenship as defined and interpreted by courts during the nineteenth and twentieth centuries, with particular attention to the way historical events that defined race have affected citizenship. Topics of study include the Thirteenth, Fourteenth, and Fifteenth Amendments to the U.S. Constitution, the 1866 Civil Rights Act, Reconstruction legislation, immigration restrictions imposed on Asians, legislation impacting the racial classification of Mexicans, statutes governing the citizenship of indigenous native peoples, racially based prohibitions against voting, education, and employment, and efforts to reduce them by civil rights legislation culminating with the 1964 Civil Rights Act. Each seminar participant has to research several topics and make a presentation to the class on at least one topic. Engagement in seminar discussion and the drafting of research papers are the basis for grading. TH 2:30–4:20

[WGSS 719b^U/SOCY 654b^U/AFAM 719b^U/AMST 680b, **Race, Racism, and Social Theory**]

WGSS 721b/RLST 512b, Feminist Philosophy of Religion Ludger Viefhues-Bailey,
Siobhán Garrigan

An exploration of current feminist philosophy of religion. Topics include feminist epistemology and philosophy of religion, the role of desire, of practices and ritualizing in the philosophy of religion, and feminist/womanist ethics and religion. Authors: Pamela Anderson, Sandra Harding, Ellen Amour, Grace Jantzen, Julia Kristeva, Katie Cannon, Kelly Brown Douglas, Amy Hollywood, Wendy Farley, and others. TH 3:30–5:20

WGSS 723a/REL 877a, Religion and Feminization of Poverty Salama Shaker

The seminar reflects on the challenges of postmodernity and globalization facing women in the world in view of what Diane Pearce describes as the phenomenon of “feminization of poverty.” The course addresses gender studies as an effective tool to map out and analyze alternative readings of Islam since gender seems to be the nexus of Islamic normative and legal principles and practices.

WGSS 732b/HIST 940b/HSBM 919b, Research in Twentieth-Century U.S. Health, Medicine, and the Body Naomi Rogers

Research seminar in twentieth-century U.S. health, medicine, and the body, with primary focus on each student completing her/his own major research paper. Projects chosen from post-Civil War period, with emphasis on the twentieth century. Class sessions also explore research techniques, writing styles, and the interrogation of sources. T 9:25–11:15

WGSS 735b/AFAM 749b/AMST 648b, Transnational Imaginaries Hazel Carby

We traverse the boundaries of conceptual, disciplinary, historical, and theoretical imaginings of the transnational. How the transnational has been imagined is posed as a series of questions rather than as a fixed definition: for example, what constitutes the transnational; how do we think the transnational; why should we think in terms of the transnational; and what is the relation or difference among the transnational, the cosmopolitan, and globalization? We consider creative responses to the consequences of the unquenchable, demonic thirst of European and American powers for the control of trade, land, and resources, attempts to render visible what Amitav Ghosh refers to as “the results of the five hundred years of pure, undistilled violence and terror unleashed in the name of modernity.” We analyze the spatial, temporal, and historical dimensions of the creation of literary and visual narratives that seek to represent the displacement of peoples, the formation of diasporas, the invention and reinvention of subjects and subjectivities, and the politics of knowledge and power. Final paper. M 2:30–4:20

WGSS 736a/AFAM 709a/AMST 709a/HIST 736a, Research in Twentieth-Century U.S. Political and Social History Glenda Gilmore

Projects chosen from post-Civil War period, with emphasis on twentieth-century social and political history, broadly defined. Research seminar. TH 3:30–5:20

WGSS 739a/AFST 947a/HIST 847a, Women and Gender in African History
Michael Mahoney

Examination of both the particularities of the historical experiences of African women and the ways that gender has been defined in an African context. Context covers pre-

colonial, colonial, and postcolonial periods. Topics include masculinity, sexuality, and the representation of African women. T 1:30–3:20

WGSS 744a/ AMST 786a/HIST 744a, Readings in the History of Gender

Joanne Meyerowitz

Selected topics in women's and gender history with emphasis on U.S. history. Themes include changing conceptions of sex, gender, womanhood, manhood, femininity, and masculinity; the language of gender as a constitutive part of various social hierarchies; class, racial/ethnic, regional, and national differences; and gendered participation in religion, labor, politics, war, and social reform movements. Readings, writing assignments, and classroom discussions address recent historical literature, historiographic trends and debates, and theoretical and methodological approaches. W 2:30–4:20

WGSS 745b^U/SOCY 610b^U, Race, Gender, and the African American Experience

Averil Clarke

This course explores how the social constructs of race and gender impact individual and collective black experiences within major social institutions (i.e., education, family, criminal justice, media and entertainment, and politics and the economy). It also analyzes the ways in which these institutions produce and are constituted by race and gender inequality. Attention is paid to theories of discrimination and to social movements that both differentiate and unite the black experience along gender lines. Enrolled students are required to present the oral and written results of research on race and gender in one such social institution. T 9:25–11:15

WGSS 750b/AMST 770b/HIST 770b, Research in Gender and Sexuality

George Chauncey

Students conduct research in primary sources and write original monographic essays on the history of gender and sexuality. Readings include key theoretical works as well as journal articles that might serve as models for student research projects. T 1:30–3:20

WGSS 752b/HIST 812b, Race, Nation, and Imperialism in Modern Latin America

Lillian Guerra

Focus on works exploring the relationship between interpretations of race, nation, and modernity in Latin American societies deeply affected by direct and indirect forms of U.S. imperialism. Topics covered include blackness, whiteness, and mestizaje as discursive constructions and political ideals in comparative processes of nation-building. Reading knowledge of Spanish is desirable. T 3:30–5:20

WGSS 770a^U/CHNS 501a^U, Women and Literature in Traditional China

Kang-i Sun Chang

This course focuses on 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, Daoist 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. All readings in translation; no knowledge of Chinese required. TTH 1–2:15

WGSS 773b^U/AFAM 838b^U/ENGL 988b^U, Contemporary African American Poetry

Elizabeth Alexander

In this course we study African American poetry of the contemporary era, from 1960 to the present. We also cover predominant theoretical approaches to African American poetry and poetics. Authors include late Gwendolyn Brooks and Robert Hayden, Amiri Baraka, Lucille Clifton, Audre Lorde, Yusef Komunyakaa, Rita Dove, Michael Harper, and poets of the new generation. W 1:30–3:20

WGSS 776b/ENGL 969b/CPLT 520b, Narratives of Formation Barry McCrea

An examination of models of personal progress and maturation in a variety of narratives and periods. We read critical anthropological and psychoanalytic texts in conjunction with primary texts. All non-English language texts are read in translation. Authors may include some of the following: Mme de Lafayette, anonymous author of *Lazarillo de Tormes*, Dickens, Balzac, Musil, Wilde, James, Forster, Chandler, Bechdel. M 9:25–11:15

WGSS 777b/HSAR 683b^U, Art and Feminism Carol Armstrong

This seminar considers past, present, and future relations between art-making and the history of feminist thought. Though most of what we address on both fronts is by women, the seminar is focused neither on the question of the woman artist per se (that is just one of its topics), nor on self-described feminist art practice (that is another of its topics). Instead, it considers different kinds of relation between art-making and feminist contributions to the history of thought about art, art history and aesthetics, gender and sexuality, subjectivity and the other, the nature and culture of the human body, concepts of the optical and the haptic, text and image, phenomenology and film theory, and so on. It consists of two meetings each on the following topics: the problem of the woman artist and author; intersections between the history of art, art criticism, and feminist thought; feminist essentialisms; art and feminist responses to psychoanalysis; art, concepts of the gaze, and feminist film theory; feminist curatorial practice. Writers and artists considered include Virginia Woolf, Linda Nochlin, Lucy Lippard, Luce Irigaray, Julia Kristeva, Laura Mulvey, Sally Potter, Judy Chicago, Mary Kelly, Eva Hesse, Louise Bourgeois, Catherine de Zegher, Connie Butler, and others. We also address questions such as contributions by men to feminism, and where from here? It is possible that the seminar may include some collaboration with the Museum of Modern Art. T 1:30–3:20

YALE CENTER FOR THE STUDY OF GLOBALIZATION

Betts House, 393 Prospect Street, 432.1900
globalization@yale.edu
YaleGlobal Online magazine: www.yaleglobal.yale.edu
Center Web site: www.ycsg.yale.edu

Director

Ernesto Zedillo

The Yale Center for the Study of Globalization (YCSG) is devoted to examining the impact of our increasingly integrated world on individuals, communities, and nations. The center's purpose is to support the creation and dissemination of ideas for seizing the opportunities and overcoming the challenges resulting from globalization's impact on the world's people and places. The center also studies problems that, even if they do not result directly from globalization, are global in nature and can therefore be effectively addressed only through international cooperation. In pursuit of this mission, and to assist in Yale's effort to become a more international institution, the core of our strategy is collaboration both with the Yale community and with a variety of institutions and individuals across the globe.

One of the center's strengths, and an important area of focus, is its ability to engage with multilateral institutions and global organizations in activities pertinent to its mission, thereby connecting academia with the world of public policy. Through these projects, YCSG produces reports, policy papers, and other publications that contribute toward influencing the attitudes and actions of policy makers, academics, and institutions. Natural opportunities exist to present the results of this work at Yale through seminars, colloquia, and public lectures.

Included among the center's recent international activities are the following:

YCSG is collaborating with the Commission on Modernization of World Bank Group Governance to explore ways in which the World Bank can operate more effectively, efficiently, dynamically, and legitimately in a transformed global political economy.

The center is collaborating with the International Commission on Nuclear Non-Proliferation and Disarmament in an effort to reinvigorate at a high political level the global debate on the need for nuclear non-proliferation and disarmament, in the context both of the 2010 NPT Review Conference and beyond.

YCSG collaborated with the International Atomic Energy Agency to produce a report on the future of the IAEA that has now become the primary reference for the institution's reform.

Through its collaboration with the Global Development Network, the center has been successful in networking with research development institutions in eleven regions in the developing world and more than 100 countries, and involved in the support of over 7,800 researchers and 800 development projects worldwide.

The center joined with the Commission on Growth and Development to compile the best contemporary understanding about the policies and strategies underlying rapid and sustained economic growth and poverty reduction.

On campus, the center hosts international conferences, organizes workshops and panels, and works constantly to bring to the Yale community individuals who have input on international policy. YCSG's Distinguished Visiting Fellows interact with faculty and students and are expected to produce one or more publications during their tenure.

In order to multiply the effects of the internal and external dimensions of the center's strategy, YCSG has developed a global media instrument, *YaleGlobal Online* magazine (www.yaleglobal.yale.edu). *YaleGlobal* explores the growing interconnectedness of the world and aims to analyze and promote debate on all aspects of globalization. The magazine posts three original articles per week, re-publishes and archives articles from around the globe, and offers video recordings of the center's events at Yale. With a vastly increased readership in over 160 countries, *YaleGlobal* now receives 1.5 to 2 million hits per week.

Policies and Regulations

ADMISSIONS

www.yale.edu/graduateschool/admissions/

Application for admission to any of the Graduate School's programs should begin in the summer or fall of the academic year prior to the one in which the applicant proposes to matriculate. Application can be made to only one department or program. The Graduate School utilizes an online application. Access to this application as well as application procedures, guidelines, requirements, fees, deadline dates, and all other information that an applicant will need are available at the Web site listed above.

Holders of American Ph.D. or Sc.D. degrees, or their foreign equivalents, are not eligible for admission to the Graduate School in the field in which they have already earned a degree. They may, however, apply in other fields and are also eligible to apply for admission to the Division of Special Registration as special students for nondegree study (see Nondegree Study below for more information or visit the Web site listed above). With the approval of the appropriate associate dean, holders of master's degrees are eligible for admission to a terminal master's degree program in the same field at the Graduate School provided that there is significant curricular distinction between the previous and proposed programs of study.

Individual program descriptions, prerequisites, special admissions requirements, and links to these programs are available via the Admissions Web site. Although programs may have varying prerequisites and special requirements for admission, all programs will require, in addition to an application and the application fee, three letters of recommendation, transcripts from each academic institution previously attended, and the results of the Graduate Record Examinations (GRE) General Test, which is administered in the United States and abroad by Educational Testing Service (ETS). This examination, in addition to any GRE Subject Tests which may be required by the student's program of study, should be taken as early as possible to ensure that official scores are released and received no later than the stated deadline of the program for which the student is applying.

Applicants whose native language is not English must present evidence of proficiency in English by satisfactorily completing the Test of English as a Foreign Language (TOEFL), which is administered by ETS, or the International English Language Testing System (IELTS). This requirement is waived only for applicants who will have received a baccalaureate degree, or its foreign equivalent, prior to matriculation at Yale, from a college or university in which English is the primary language of instruction. The examination, if required, should be taken as early as possible to ensure that official scores are released and received no later than the stated deadline of the program for which the student is applying.

Students who do not demonstrate sufficient proficiency in English may be retested or asked to take courses in English for speakers of other languages. A higher level of proficiency will be required in order for students to serve as teaching fellows.

International applicants who accept offers of admission will be required to give appropriate evidence of necessary financial support before the University will be able to issue visa documents.

The application contains questions regarding prior or pending criminal convictions and disciplinary actions. When an applicant answers affirmatively to either of these questions, the Graduate School will evaluate the circumstances outlined by the applicant to determine if they are potentially relevant to his or her participation in the Yale community as a graduate student. In cases where such charges are pending, the Graduate School may decide to admit the applicant contingent upon the charges being resolved or to defer the decision on admission until the charges are resolved.

Applicants are typically notified of decisions regarding their applications during the months of February and March. Official notification is sent from the Graduate School of Arts and Sciences only.

All entering students must have obtained the bachelor's degree or its foreign equivalent. Offers of admission are contingent on a student providing an official transcript indicating that the student has been awarded a baccalaureate degree (or its foreign equivalent) prior to matriculation. Students who are not able to provide such evidence will not be permitted to register. Those who have been engaged in graduate work at Yale or another university must also present an official transcript giving evidence of degree(s) awarded and/or satisfactory completion of the previous year's work.

Applicants who have been previously denied admission to the Graduate School of Arts and Sciences three times may not apply again.

The Office of Graduate Admissions will not release application materials, including standardized test scores, letters of recommendation, or transcripts, to the applicant or other institutions or agencies for any purpose. Students will need to contact ETS, recommenders, or educational institutions they have previously attended in order to furnish such materials to a third party.

PROGRAMS OF STUDY

Full-Time Degree Candidacy

Most students enrolled in the Graduate School are registered for full-time study as they pursue a Ph.D. or master's degree program. These students devote their full effort to course work, preparation for qualifying examinations, gaining teaching experience, and the research and writing leading to the completion of the dissertation.

Part-Time Study

In rare circumstances, qualified individuals who are unable to devote their full time to graduate study may apply and be admitted as part-time students in either doctoral or terminal master's programs. For more complete information, see Part-Time Study under Degree Requirements, below.

Nondegree Study

Qualified individuals who wish to study at the graduate level as nondegree candidates may be admitted to the Division of Special Registration (DSR). Admission to the DSR

is for one term or for one year only and carries with it no commitment by the Graduate School for further study. Students admitted for the academic year must demonstrate satisfactory academic performance in the first term in order to register for the second term. Students in the DSR may obtain transcripts indicating the appropriate credit for work completed.

Application procedures and forms for the DSR are available online at www.yale.edu/graduateschool/admissions/nondegreeprograms.html. In addition, applicants to the DSR must provide evidence of health care for the duration of their studies at Yale at the time of application.

DSR students engaged in course work or a combination of course work and research are identified as Special Students. Although normally admitted for full-time study, Special Students may be admitted for part-time study and are charged tuition on a per-course basis, whether for credit or audit. Please refer to Financing Graduate School below for a schedule of tuition and fee charges. Students admitted to the DSR as Special Students are not eligible for financial aid, including federal and most nonfederal student loans.

More advanced graduate students who are degree candidates at other universities and who wish to do full-time dissertation-level research or a combination of research and course work at Yale may be admitted to the DSR as Visiting Affiliated Research Graduate Students. Such students are charged full tuition. A limited amount of tuition assistance based on need may be available. Please refer to Financing Graduate School below for a schedule of tuition and fee charges. Applicants for admission as Visiting Affiliated Research Graduate Students should complete the Applicant's Financial Statement and must submit any other documentation that would clearly establish their need for tuition assistance. Support beyond tuition in the form of fellowship stipends, teaching fellowships, or research assistantships is not available.

In certain circumstances, advanced graduate students who are degree candidates at another university and who have made arrangements with a specific Graduate School faculty member for a research project under his or her direct supervision may be admitted to the DSR as Visiting Assistants in Research. Undergraduate students in combined or simultaneous B.S./M.S., B.A./M.A., or similar programs are not considered advanced graduate students. Student research conducted at Yale must be part of the visiting student's thesis or dissertation. The extent and location of the research completed at Yale must be cited in the completed thesis or dissertation. Any proposal for the admission of a Visiting Assistant in Research must be discussed by the relevant departmental director of graduate studies and the appropriate associate dean. The Graduate School does not provide financial support to Visiting Assistants in Research. Such students either hold standard graduate student Assistantship in Research appointments that are funded by the faculty adviser, or provide their own funding through external awards or personal resources. Please refer to Financing Graduate School below for a schedule of tuition and fee charges.

Some departments at Yale have formal exchange agreements with universities in other countries that have been approved by the Graduate School. Graduate students who are admitted to Yale under such approved exchange agreements may be registered as Visiting International Exchange Students. Visiting International Exchange Students normally are not charged tuition.

In rare circumstances, students may apply for a second year of registration in the DSR; however, cumulative enrollment is limited to two years. Students enrolled in the DSR who are subsequently admitted to degree programs in the Graduate School may receive academic and tuition credit for no more than four courses completed while enrolled in the DSR, provided that the department recommends such credit and the appropriate associate dean approves.

Interdisciplinary Study

All graduate students are formally associated with one department or program, and in the case of students in combined-degree programs, with two. Students may, however, be encouraged to take one or more courses in related departments. Students are often advised by faculty members from more than one department during their dissertation research. Students in the Graduate School, with permission of the director of graduate studies and the relevant school, may take advantage of particular course or research opportunities in Yale College and in Yale's professional schools.

Combined and Joint-Degree Programs

Students interested in African American Studies, Film Studies, and Renaissance Studies pursue a combined Ph.D. with departments in related fields. In addition to these academic programs, there are several formal interdisciplinary Ph.D. programs in the Graduate School listed under the appropriate departmental entries of this bulletin. Ad hoc programs may also be approved. A student who is interested in an ad hoc program should prepare a written proposal for review and approval by the relevant departments and associate deans before the student has advanced to candidacy.

Students are encouraged to contact the appropriate directors of graduate studies about specific opportunities for interdisciplinary study throughout the Graduate School and the University.

The Graduate School also participates in the following formal joint-degree programs with the professional schools: the J.D./M.A. and J.D./Ph.D. programs in cooperation with the Law School; the M.D./Ph.D. program in cooperation with the School of Medicine; the M.A./M.B.A. and Ph.D./M.B.A. programs in cooperation with the School of Management; and the M.A./M.F.S. and M.A./M.E.S. programs in cooperation with the School of Forestry & Environmental Studies. For all joint-degree programs except the M.D./Ph.D., students are required to submit formal applications to both the professional school and the Graduate School indicating their interest in enrolling in the joint program. Individuals interested in the M.D./Ph.D. program apply directly to the School of Medicine (see Requirements for Joint-Degree Programs, below).

Exchange Scholar Program

www.yale.edu/graduateschool/academics/exchange.html

Graduate students in Yale Ph.D. programs may petition to enroll full- or part-time for a term or for an academic year as exchange scholars at the University of California at Berkeley, Brown, University of Chicago, Columbia, Cornell, Harvard, MIT, University of

Pennsylvania, Princeton, and Stanford. The Exchange Scholars Program enables students to take advantage of special educational opportunities not available at their home institutions. For applications, contact Assistant Dean Edward Barnaby (edward.barnaby@yale.edu), Room 134, Hall of Graduate Studies (HGS). Applications must be received at least six weeks prior to the beginning of the term for which the student is applying.

International Graduate Student Exchange Agreements

All international exchange agreements must be approved in advance by the Graduate School to ensure that they meet University policy and Graduate School guidelines. Departments interested in establishing an exchange program must prepare a statement that demonstrates that there is a clear academic and reciprocal need for such a program, and that the program will conform to the established guidelines for all such exchange agreements.

INTERNATIONAL EXCHANGE PROGRAMS

Agrarian Studies

Amsterdam School for Social Science Research, Netherlands

Council on East Asian Studies

Inter-University Center for Japanese Language Studies, Yokohama; Inter-University Board for Chinese Language Studies, Tsinghua University, Beijing; International Chinese Language Program, National Taiwan University, Taipei Tokyo University

Economic Growth Center

Research Institute for Economics and Business Administration, Kobe University, Japan

Economics

University of Mannheim, Germany

Graduate School

Royal Holloway College, University of London, England; the Connecticut Department of Education and the State of Baden-Württemberg Exchange, Germany; University of Konstanz, Germany

French

Ecole Normale Supérieure, Paris

German

Free University, Berlin, Germany
Goethe Universität, Frankfurt, Germany

History of Science and Medicine

Ecole des Hautes Etudes en Sciences Sociales, Paris, France
Ecole Normale Supérieure, Paris, France

Linguistics

Gakushuin University, Tokyo, Japan
Tokyo Metropolitan University, Japan

MacMillan Center for International and Area Studies

Fox International Fellowship Program (Moscow State University; University of Cambridge; Free University, Berlin; Fudan University, Shanghai; University of Tokyo; El Colegio de Mexico, Mexico City; Institut d'Etudes Politiques de Paris ("Sciences Po"), Paris; Jawaharlal Nehru University, New Delhi); Graduate Institute of International and Development Studies, Geneva, Switzerland

Molecular, Cellular, and Developmental Biology

Peking University, Beijing, China

Political Science

Nuffield College, University of Oxford, England

Sociology

University of Copenhagen, Denmark

Summer Study

Doctoral students are funded year-round and are expected to make progress toward the completion of their degrees during the summer months (see Summer Registration under Registration Status and Leaves of Absence, below). See individual departmental policies in this volume regarding specific expectations for degree programs during the summer. Although the Graduate School does not offer courses in the summer, intensive language instruction is available through the Yale Summer Session, and graduate students may wish to take advantage of those programs while in New Haven. For further details on summer offerings at Yale, please consult the Yale Summer and Special Programs Web site at www.yale.edu/summer/.

DEGREE REQUIREMENTS

The requirements set forth in the pages that follow are the minimum Graduate School degree requirements and apply to all degree candidates. Students should consult the listings of individual departments and programs for additional specific departmental requirements.

*Requirements for the Degree of Doctor of Philosophy***LENGTH OF STUDY**

In most fields of study, six years should normally be sufficient for the completion of the Ph.D., although it is understood that seven years may be needed by students in fields requiring extensive field work or the mastery of difficult foreign languages. Departments and programs make every effort to design a course of study and to provide advice and guidance to make it possible for students to complete their work within six years. Normally three, or at most three and one-half, years are devoted to the completion of predissertation requirements (courses, examinations, selection of a dissertation topic). The remaining time, typically two to three years, is devoted to conducting research and writing the dissertation. Advanced standing that has been granted for work done in a Yale M.A./M.S. program is counted as part of the six years (for further information, see Transfer Credit and Advanced Standing, below).

RESIDENCE REQUIREMENT

Students seeking the Ph.D. degree are required to be in residence in the New Haven area during at least three academic years. This is an academic requirement, distinct from and independent of the tuition requirement described below. The residence requirement must normally be met within the first four years of study. Any exception to the residence requirement must be approved by the department and by the appropriate associate dean.

TUITION REQUIREMENT AND THE CONTINUOUS REGISTRATION FEE

All Ph.D. candidates are charged four years (eight terms) of full tuition, or proportionately less if all degree requirements, including submission of the dissertation, are completed in less than four continuous years of full-time study from the date of matriculation in the Ph.D. program.

Once the full-tuition obligation has been completed, registered students are charged the Continuous Registration Fee (CRF).

TRANSFER CREDIT AND ADVANCED STANDING

The Graduate School does not award transfer credit for graduate work completed before matriculation at Yale. A department may, with the approval of the Graduate School, waive a portion of the Ph.D. course requirement (normally a maximum of three courses) in recognition of previous graduate-level work done at Yale or elsewhere. Such a waiver does not affect the full-tuition requirement. Courses taken previous to matriculation at Yale will not appear on the student's Graduate School transcript.

With the approval of the department, a student who is currently enrolled may petition for advanced standing in the Graduate School of up to one year for work completed in a Yale master's or professional doctoral program that is relevant to the student's Ph.D. program. This petition must be received by the appropriate associate dean in the Graduate School before the end of the student's first year of study in the Ph.D. program. Such students may also be offered admission with advanced standing by the department and the Graduate School. Such advanced standing will reduce the four-year tuition requirement and eligibility for Graduate School fellowship aid accordingly. The normal six-year period of registration will be similarly reduced.

LANGUAGE REQUIREMENT

Language requirements are set by individual departments and programs. Specific language requirements are explained in the individual departmental listings. All departmental requirements are subject to initial approval by the Executive Committee of the Graduate School and are monitored by the divisional degree committees. A department cannot make exceptions to its own requirements without authorization by the appropriate degree committee.

The required level of proficiency in foreign languages, and the method for demonstrating it, are determined by the individual departments. Most give their own examinations. A few permit the requirement to be satisfied by passing particular courses. Students are urged to be prepared to meet language requirements at the beginning of their first year of study.

COURSE AND HONORS REQUIREMENTS

The course requirements for the Ph.D. degree are set individually by each department or program. Each course offered in the Graduate School counts for a single credit or, in rare cases, one-half credit. Only courses offered by the Graduate School and officially numbered on the graduate level (i.e., 500 or higher) can fulfill requirements for the doctoral degree, with the exception of certain language courses or where specified in advance by the department or program. Although departments may set more stringent requirements, to meet the minimum Graduate School quality requirement for the Ph.D., students must achieve the grade of Honors in at least one full-year or two full-term graduate courses, taken after matriculation in the Graduate School and during the nine-month academic year. The Honors requirement must be met in courses other than those concerned exclusively with dissertation research and preparation.

A student who has not met the Honors requirement at the end of the fourth term of full-time study will not be permitted to register for the fifth term. In exceptional circumstances, the director of graduate studies may petition the degree committee, through the appropriate dean, that a student who has not met the Honors requirement be permitted to continue study. Such a petition should be made before the end of the fourth term of study in time to be considered by the degree committee at its meeting that term. A student who is not in good academic standing with regard to course work or research as defined by the minimum standards established by the Graduate School and the expectations outlined by the student's department or program may be dismissed from the Graduate School. Such dismissal will be recorded on the student's transcript.

QUALIFYING EXAMINATION

Each Ph.D. student must pass a general examination, separate from course examinations, in the major subject offered and in such subordinate subjects as may be required by the department. Such examinations are described in the individual departmental listings. Students should consult with the director of graduate studies for further information about this requirement.

PROSPECTUS

The prospectus should be viewed as a preliminary statement of what the student proposes to do in his or her dissertation and not as an unalterable commitment. The appropriate form and typical content of a prospectus inevitably vary from field to field. In most cases, however, a prospectus should contain the following information:

1. A statement of the topic of the dissertation and an explanation of its importance. What in general might one expect to learn from the dissertation that is not now known, understood, or appreciated?
2. A concise review of what has been done on the topic in the past. Specifically, how will the proposed dissertation differ from or expand upon previous work? A basic bibliography should normally be appended to this section.
3. A statement of where most of the work will be carried out—for example, in the Yale library or another library or archive, in the laboratory of a particular faculty member, or as part of a program of field work at specific sites in the United States or abroad.

4. If the subject matter permits, a tentative proposal for the internal organization of the dissertation—for example, major sections, subsections, sequence of chapters.
5. A provisional timetable for completion of the dissertation.

ADMISSION TO CANDIDACY

Admission to candidacy indicates that the department and the Graduate School consider the student prepared to do original and independent research. Students will be admitted to candidacy when they have completed all predissertation requirements, including the dissertation prospectus and excluding any required teaching. Admission to candidacy will normally take place by the end of the third year of study. Any programmatic variations from this pattern that have been approved by the Executive Committee of the Graduate School are described in the individual department statements. Training in teaching can occur both before and after a student is admitted to candidacy. A student who has not been admitted to candidacy at the expected time will not be permitted to register for the following term. At the time of advancement to candidacy, students who have not petitioned for or received en route degrees (e.g., M.A., M.S., M.Phil.) will automatically be considered for such degrees. If a student advances to candidacy after the deadline to submit a petition for the degree in that term, the student will be considered for a degree in the following term.

TRAINING IN TEACHING

The Teaching Fellow Program (TFP) is the principal framework at Yale in which graduate students learn to become effective teachers. Learning to teach and to evaluate student work is fundamental to the education of graduate students. Teaching is required in some departments and is an expectation for all doctoral students. The TFP provides opportunities for graduate students to develop teaching skills, under faculty guidance, through active participation in the teaching of Yale undergraduates. Teaching fellows who encounter problems or difficulties related to their teaching appointments are encouraged to meet with the director of the TFP (Judith Dozier Hackman) or their associate dean. A student must be registered in the Graduate School to be appointed as a teaching fellow (TF) or as a part-time acting instructor (PTAI). TFs assist faculty in teaching relatively large undergraduate courses. PTAIs are responsible for small undergraduate courses, subject to guidance and advice by department faculty. For a more detailed description of these types of appointments, see Teaching Fellow Levels under Financing Graduate School.

Faculty should clearly communicate to students and teaching fellows their expectations about evaluation of work, feedback to students, and grading policies. Faculty are expected to prepare course syllabi, assignments, and examinations. Typically, they should not ask teaching fellows to give lectures when they are unable to attend class, although they are encouraged to offer occasional opportunities for student lectures when they can attend and advise. While on rare occasions teaching fellows may be asked to assist with administrative activities (such as placing course material on library reserve or online, making photocopies for class, ensuring that audiovisual resources are available and working, and the like), in general such activities should not be done by students.

Graduate students may occasionally serve as graders for graduate-level courses, but only in highly quantitative courses with grading demands for frequent assignments. Even

there, the grading may not count toward final grades and the students may not grade exams. In courses that are double titled with both graduate and undergraduate numbers, the same guidelines hold for the grading of assignments; all other grading of graduate students should be done by the faculty member.

The Graduate School requires that all students who teach be in good academic standing. In addition, they must be fluent in English, except for those who solely grade. Graduate students whose native language is not English are required to meet the oral English proficiency standard before they may begin teaching. The standard may be met by (1) passing the SPEAK test, (2) passing the ELI oral exam, (3) passing the speaking section of the iBT TOEFL, (4) passing the speaking portion of the IELTS exam, or (5) having received an undergraduate baccalaureate degree or its equivalent from an institution where the principal language of instruction is English. In some instances, a student's DGS may require that students with an undergraduate degree from English-speaking institutions also pass the SPEAK test to satisfy the language requirement.

DEFERRAL OF TEACHING YEAR

In the humanities and social sciences, students in a teaching year, normally years three and four, may request to defer a teaching year or term into the fifth or sixth year for compelling academic reasons. Such reasons include but are not limited to a need to conduct research in absentia or undertake additional preparation for teaching.

A student who wishes to defer a teaching year must make arrangements to do so no later than the beginning of the fourth year. At the time the deferral is requested, the student and DGS should agree on the teaching the student will do in the fifth or sixth year. The assignment should be at the level normally expected in a regular teaching year, that is, a TF 3.5 or 4, depending on the department.

The deferral must be approved by the DGS and the associate dean. If the deferral is approved, the conditions associated with the formal teaching years will apply to the specified terms of study, including that the student will receive priority in terms of assignment; the assignment will not be changed unless the student, DGS, and instructor agree upon it; and the student will receive the standard departmental stipend. Under no circumstances may a student defer a teaching year beyond the sixth year, and all students must still complete the Dissertation Fellowship by the end of the sixth year.

DISSERTATION

The dissertation should demonstrate the student's mastery of relevant resources and methods and should make an original contribution to knowledge in the field. Principal advisers of doctoral candidates must have appointments on the Graduate School faculty.

The originality of a dissertation may consist of the discovery of significant new information or principles of organization, the achievement of a new synthesis, the development of new methods or theories, or the application of established methods to new materials.

Normally, it is expected that a dissertation will have a single topic, however broadly defined, and that all parts of the dissertation will be interrelated. This does not mean that sections of the dissertation cannot constitute essentially discrete units. Dissertations

in the physical and biological sciences, for example, often present the results of several independent but related experiments.

Given the diverse nature of the fields in which dissertations are written and the wide variety of topics that are explored, it is impossible to designate an ideal length for the dissertation. Clearly, however, a long dissertation is not necessarily a better one. The value of a dissertation ultimately depends on the quality of its thought and the clarity of its exposition. In consultation with their faculty advisers and directors of graduate studies, students should give serious thought to the scale of proposed dissertation topics. There should be a reasonable expectation that the project can be completed in two to three years.

In accordance with general University policy, classified or restricted research is not acceptable as part of the dissertation. Exceptions must be approved in advance by the appropriate Degree Committee.

For information about submission of the dissertation, see Dissertation Submission under Policies and Regulations. Students should also consult the booklet entitled *Preparation and Submission of the Doctoral Dissertation*, available online at www.yale.edu/graduateschool/.

Requirements for the Degree of Master of Philosophy

The Master of Philosophy is awarded en route to the Ph.D. in many departments. The minimum general requirements for this degree are that a student shall have completed all requirements for the Ph.D. except required teaching, the prospectus, and dissertation. Students will not generally have satisfied the requirements for the Master of Philosophy until after two years of study, except where graduate work done before admission to Yale has reduced the student's graduate course work at Yale. In no case will the degree be awarded for less than one year of residence in the Yale Graduate School.

Not all departments offer the M.Phil. degree. Information regarding special departmental requirements for the degree, if any, are stated in the individual department listings.

Requirements for the Degree of Master of Arts or Master of Science

Except in the case of programs listed below under Terminal M.A./M.S. Degrees, students are not admitted as candidates for the Master of Arts or Master of Science degree. However, students in most doctoral departments may be awarded the M.A. or M.S. en route to the Ph.D. degree.

Although departments may set more stringent requirements, the minimum general requirements that must be met for award of the M.A. or M.S. en route are (1) completion of the first year of the program leading to the Ph.D., with grades that satisfy departmental requirements; (2) completion of one academic year in full-time residence, or the equivalent, at Yale; (3) recommendation by the department for award of the degree, subject to final review and approval by the appropriate degree committee. In no case may courses taken prior to matriculation in the Graduate School, or in Yale College or other summer programs, be applied toward the requirements for the Master of Arts or Master of Science degree.

Some departments do not offer the M.A. or M.S. en route to the Ph.D., or award it only to students who are withdrawing from the Ph.D. program. For information about this or any special departmental requirements additional to the general requirements stated above, see the departmental listings.

Students enrolled in a Ph.D. program may receive a master's degree from another department provided that it is in a related field of study and deemed necessary for the completion of the proposed dissertation research. The student's proposed program of study must receive formal approval in writing from the director of graduate studies in both departments and the appropriate associate dean prior to enrollment in courses that will fulfill master's degree requirements in another department. Courses taken toward a master's degree in another department must be part of the student's course requirement for the Ph.D., as approved by the director of graduate studies in both departments. However, such course work cannot also be counted toward a master's degree in the department to which the student was admitted. A student may not advance to candidacy until all requirements have been completed for both the en route master's degree in the program to which the student was admitted and the proposed master's degree in a related field. Students who wish to obtain a master's degree in a field that is not directly related to the doctoral degree must apply for a personal leave from the Ph.D. program and submit an application for admission to the master's program. Any financial aid offered to the student for a Ph.D. program may not be transferred to a master's degree course of study. Students enrolled in combined programs normally receive combined en route degrees as well.

TERMINAL M.A./M.S. DEGREES

The M.A./M.S. degrees are offered as terminal degrees in twenty-four departments and programs: African Studies, American Studies, Applied Mathematics, Archaeological Studies, Biostatistics (Epidemiology and Public Health), Computational Biology and Bioinformatics, Computer Science, East Asian Studies, Engineering and Applied Science, English, European and Russian Studies, Germanic Languages and Literatures, History, History of Medicine and Science, International and Development Economics (IDE), International Relations, Mathematics, Medieval Studies, Molecular Biophysics and Biochemistry, Music, Near Eastern Languages and Civilizations, Slavic Languages and Literatures, Statistics, and Urban Education Studies.

The residence and tuition requirements for a terminal M.A./M.S. degree are a minimum of one year of full tuition and course work in residence in one-year programs, or a minimum of two years of full tuition and course work in residence in two-year programs. For information about which departments offer one-year programs and which offer two-year programs, see departmental listings.

With the approval of the department and the appropriate associate dean, a student may be admitted for part-time study toward the master's degree. In that case, tuition will be charged on a per-course basis. Part-time study does not change the one- or two-year full-tuition obligation described above. Part-time students must complete all degree requirements within five years of matriculation.

Individual departments establish the specific course and language requirements for these degrees. Although departments may set more stringent requirements, the minimum

Graduate School requirement for students admitted for M.A./M.S. degrees is an overall grade average of High Pass, including a grade of Honors in at least one full-term graduate course (for students enrolled in one-year programs), or in at least two full-term graduate courses (for students enrolled in two-year programs). In order to maintain the minimum average of High Pass, each grade of Pass on the student's transcript must be balanced by one grade of Honors. Each grade of Fail must be balanced by two grades of Honors. If a student retakes a course in which he or she has received a failing grade, only the newer grade will be considered in calculating this average. The initial grade of Fail, however, will remain on the student's transcript. A grade awarded at the conclusion of a full-year course in which no grade is awarded at the end of the first term would be counted twice in calculating this average.

Each course offered in the Graduate School counts for a single credit. Only courses offered by the Graduate School and officially numbered on the graduate level can fulfill requirements for the master's degree, with the exception of certain language courses or where specified in advance by the department or program. A student who has not fulfilled the course requirements for the degree at the conclusion of the standard duration of the program can, at the discretion of the department and associate dean, be granted one additional term to fulfill degree requirements. If the student has not taken the requisite number of courses but has fulfilled the tuition requirement, the student will be charged the Continuous Registration Fee. If the student must take additional courses beyond the number required, the student will be charged tuition on a per-course basis.

No credit will be awarded toward the M.A./M.S. degree for courses taken prior to matriculation in the Graduate School, or taken in Yale or other summer programs. Students in one of Yale's professional schools who matriculate in the Graduate School to complete a joint master's degree may, however, with the permission of their director of graduate studies, count courses already completed in their professional school program toward the joint degree. See the individual program or department listings.

The master's degree may also be earned jointly with the B.A./B.S. in certain departments by students enrolled in Yale College. For further information, see *Yale College Programs of Study*, available from the Office of the Dean of Yale College.

Requirements for Joint-Degree Programs

Students who are candidates for degrees in any of the joint programs sponsored by the Graduate School and Yale's professional schools must meet the requirements established by each school for the degree they are seeking. Degree requirements in the Graduate School include both the Graduate School's general requirements and any special requirements set by the relevant department or program. In all cases the Honors requirement must be fulfilled in non-research courses offered primarily for Graduate School students, taken after matriculation in the Graduate School.

In addition to the J.D./Ph.D., J.D./M.A., and M.D./Ph.D. programs described below, joint-degree programs with other professional schools have been approved for students in European and Russian Studies, International Relations, and International and Development Economics. These programs are described in the individual departmental statements.

J.D./PH.D. AND J.D./M.A. PROGRAMS

Admission to the Graduate School joint-degree programs with the Law School, described below, requires separate admission to both schools as well as approval by the appropriate associate dean in each school, and by the director of graduate studies in the student's Graduate School department. Students must apply for admission to a joint program no later than their first year of study in a J.D., Ph.D., or two-year M.A. program, and must matriculate in the joint program no later than the beginning of their second year. Students wishing to pursue a J.D./M.A. in a one-year M.A. program must apply for admission no later than their first year of study in the J.D. program and must matriculate in the M.A. program as a joint-degree candidate.

In the J.D./Ph.D. program, the first year of study is spent principally in the Law School. The second and third years are combined according to the interest of the student. As many as six term courses, designated by the student at the beginning of the term, may be counted toward both degrees. During this time all course work and language requirements for the Ph.D. program are normally completed. The J.D. should be completed by the end of the fourth year. During the fifth year the student is expected to complete all remaining predissertation requirements and be admitted to candidacy. The teaching requirement for the Ph.D. will normally be completed by this time. Any exception to this pattern of study must be approved by the appropriate associate dean.

The minimum residence requirement in the J.D./Ph.D. program is four years. The tuition requirement is two and one-half years in the Law School and three and one-half years in the Graduate School. Financial aid is provided by each school according to its own criteria, typically for two and one-half years in the Law School and three and one-half years in the Graduate School, and is awarded by each school during the terms in which the student pays tuition in that school. Students are not eligible for financial aid from the Graduate School during terms in which they are registered at another school.

In the J.D./M.A. program, the J.D. and M.A. degrees are awarded simultaneously at the end of the fourth year of study in one-year M.A. programs and at the end of four and one-half years of study in two-year M.A. programs. The Graduate School tuition requirement for J.D./M.A. students in one-year M.A. programs is one year of tuition; students in two-year M.A. programs have a one and one-half year tuition requirement in the Graduate School. In all cases students pay three years of tuition in the Law School. Students in J.D./M.A. programs, like other students in M.A. programs, are not ordinarily eligible for University Fellowship aid through the Graduate School. Students usually enroll in the Law School during the first year of study. The pattern of enrollment in subsequent years depends on whether the M.A. program is a one-year or a two-year program. No more than two Law School courses may be counted toward the M.A.

M.D./PH.D. PROGRAM

This program is sponsored jointly by the Graduate School and the School of Medicine. Applications for admission to the joint program are reviewed by a committee composed of faculty members and deans from both schools. Normally, admission to the program includes simultaneous admission to both schools. However, students may apply to the joint program by October 15 of their second year of study in either the M.D. or Ph.D. program, and they must matriculate in the joint program no later than the beginning of the following year.

Students request affiliation with a particular department or program in the Graduate School by the middle of their third year of study in the joint program, after their course and research interests have been defined. Although students usually pursue their research in one of the biological sciences, those interested in earning the Ph.D. through work in another department may do so under certain circumstances, with the approval of the M.D./Ph.D. committee.

The residence requirement in this program is seven years. The full-tuition requirement is three and one-half years in the School of Medicine and two and one-half years in the Graduate School. To qualify for the M.D. and Ph.D. degrees, students must satisfy all degree requirements of both schools. Normally, a student admitted to this joint program must satisfy the Graduate School Honors requirement by the end of the second year of study and must complete all remaining predissertation requirements within four terms of affiliation with the Ph.D. department. This schedule may be adjusted for students who have been enrolled in either the School of Medicine or the Graduate School before admission to the M.D./Ph.D. program.

PH.D./M.B.A.

The joint degree combines the two-year M.B.A. degree from the School of Management (SOM) with the six-year Ph.D. It would allow its students to complete requirements for both degrees in roughly seven years rather than the eight or more years that would be required if the degrees were pursued separately. Both degrees will be awarded simultaneously once the student has fulfilled the degree requirements of both programs. Like all graduate students, joint-degree students will receive a full financial aid package from the Graduate School during the terms registered there. For students in the humanities and social sciences, this includes four years of tuition, five years of stipend, and health insurance for each term registered. Funding for students in the sciences will mirror standard, departmental packages. Students will pay one and a half years of tuition for the three terms registered at SOM.

The School of Management and the Graduate School will use independent admissions processes and make independent admissions decisions. Applicants must take both the GRE tests and the GMAT. Prospective students who are currently enrolled neither in the Graduate School nor at SOM may apply to both schools simultaneously. Students already enrolled at the Graduate School normally apply to SOM after taking one course at SOM for matriculation any time after they have passed their Ph.D. qualifying examinations at the Graduate School but prior to beginning the fifth year of study. This pattern, however, is flexible, and students interested in the joint degree should consult the Web pages of their departments or programs for further information. Students registered in SOM may apply to the Graduate School during the first year of study at SOM. Following admission to both programs, each student must complete a form requesting joint-degree status. The form must be signed by the appropriate associate dean at the Graduate School and at SOM and the student's director of graduate studies.

A student in the Graduate School who wishes to pursue the joint degree will normally be required to take one course in SOM before applying there. The student will need to obtain the permission of the SOM instructor and state his or her intention to apply to the joint-degree program. The Graduate School will waive one course during the term in which the student takes this preliminary course at SOM. For students in some disciplines,

this prerequisite to admission will be waived. The student is expected to complete the qualifying exams and prospectus according to the standard schedule set by the Graduate School. The student will normally begin study at SOM after completing the departmental Ph.D. qualifying examinations at the Graduate School, but there are exceptions to this pattern described on the departmental Web sites. Upon admission to SOM, the joint-degree student will register at SOM for the first-year core of courses. Students may not fulfill any Graduate School requirements during this time, nor may they serve as teaching fellows in the Graduate School in any capacity. The student must register for a third term at SOM and complete four additional courses, normally prior to the beginning of the sixth year of study at the Graduate School. Depending on the schedule of individual students, they may or may not complete all four of these remaining courses within a single term at SOM. If they do not, they may complete outstanding courses while registered at the Graduate School, but in all circumstances, students are required to pay a third term of tuition to SOM.

A student who has been admitted to the Graduate School while completing the first-year core at SOM may begin course work in the Graduate School the following year. Once a joint-degree student has matriculated at the Graduate School, it is expected that the student remain registered continuously until completing the qualifying exams. During this time, the student may undertake limited course work at SOM, but may not register there for the third and final term until he or she has passed the departmental exams at the Graduate School. Prospective students who apply simultaneously may start the joint degree at either school and follow the schedules outlined above.

All joint-degree students are subject to the codes of conduct published in the bulletins of their respective programs. Joint-degree students will receive separate transcripts from SOM and the Graduate School. Each transcript will list the courses required for the respective school's portion of the joint degree. Each course taken may be counted toward one degree only. The transcripts will reflect the joint-degree status. If a joint-degree student decides not to complete both degrees, he or she may petition both schools to receive a single degree if the requirements for the single degree, including the two-year tuition requirement at SOM, are met.

Petitioning for Degrees

Graduate School degrees are awarded twice each year, at Commencement in May and in the fall (normally in December, depending on the schedule of the Yale Corporation). Degrees are not granted automatically. Students must file a petition for each degree by the appropriate date (see Schedule of Academic Dates and Deadlines). Petitions that have received favorable recommendations from the student's department are reviewed by the appropriate degree committee. When the degree committee has given its approval, the petition is forwarded to the faculty of the Graduate School and then to the Yale Corporation. If the petition is successful, the student will be notified in writing by the dean of the Graduate School.

Students enrolled in Ph.D. programs should not petition for M.A./M.S. and M.Phil. degrees until the end of the term in which requirements for the degree are completed (e.g., students completing degree requirements during the spring term should petition for award of the degree the following fall). At the time of advancement to candidacy,

students who have not petitioned for or received en route degrees (e.g., M.A., M.S., M.Phil.) will automatically be considered for such degrees. Students in terminal M.A./M.S. programs may petition for their degrees in the term in which they expect to complete them.

Dissertation Submission

In accord with the traditional scholarly ideal that the candidate for a doctorate must make a contribution to knowledge, all dissertations that have been accepted by the Graduate School are made available in the University library and published on microfilm (UMI Company). The only required fee associated with submission is \$20 for binding of the library copy of the dissertation. UMI charges authors \$65 if they wish to register a copyright. Publication on microfilm does not prevent the author from publishing the dissertation in another format at any time. Fees are subject to change.

Dissertations must be written in and submitted in English except in some disciplines where there are strong academic reasons for the submission of a dissertation in a foreign language. At the time of the submission of their prospectus, students must petition for permission to submit all or a portion of their dissertations in a foreign language. The petition should be submitted in the form of a letter explaining the academic reasons for using a foreign language and will be evaluated by the DGS and the appropriate associate dean. Petitions for writing and submitting a dissertation in a foreign language will not be accepted after students have advanced to candidacy.

The Graduate School requires that each dissertation be read by at least three persons but not more than five, at least two of whom are ladder or ladder-track faculty members at Yale. All readers must hold the Ph.D. degree as well as a faculty position or be considered otherwise qualified to evaluate the dissertation.

The Graduate School does not require departments to evaluate the dissertations of degree candidates who are no longer registered. In practice, however, departments normally agree to evaluate these dissertations. In the event that a dissertation is evaluated as failing, departmental practice determines the number of re-evaluations normally permitted.

Commencement

www.yale.edu/graduateschool/academics/commencement.html
GScommencement@yale.edu

There is only one University Commencement ceremony each year, in May. All degrees awarded for both December and May of each academic year are presented at the May ceremony.

ACADEMIC REGULATIONS

Registration

Only registered students may attend classes, receive financial aid, or use the facilities of the University. Students must register every term for the duration of their degree program (normally six years or less for Ph.D. programs and one or two years for students in

M.A./M.S. programs). This regulation applies to all students, whether engaged in course work, preparation for qualifying examinations, or dissertation research and, in the case of students in Ph.D. programs, whether study is in residence or in absentia. Students who do not register for any term for which they have not been granted a leave of absence (see Leaves of Absence, under Registration Status and Leaves of Absence, below) will be considered to have withdrawn from the Graduate School. Privileges associated with registered status (i.e., library privileges, health care coverage, and e-mail accounts) will likewise be withdrawn.

No student may register for any term unless he or she is making satisfactory progress toward the degree and has been cleared by the Office of Student Financial Services to register. In compliance with Connecticut state law, no student will be allowed to register unless satisfactory evidence of immunity to measles and rubella has been presented to the Yale University Health Service (see Required Immunizations, under Health Services).

Satisfactory progress means that the student has met all Graduate School and departmental requirements normally expected for each stage of the student's program. For Ph.D. students before admission to candidacy and for M.A./M.S. students, this includes satisfactory completion of courses from the preceding term(s). As indicated in the sections on Course and Honors Requirements and Admission to Candidacy, students in Ph.D. programs must satisfy the Honors requirement before beginning the fifth term of study and must be admitted to candidacy by the appropriate time. In addition to satisfying these general Graduate School requirements, students must meet any additional requirements specified by their departments. Ph.D. students who have been admitted to candidacy must continue to demonstrate satisfactory progress toward the degree in the annual dissertation progress report. Students who fail to meet departmental or Graduate School requirements by the designated deadlines, and students who have been admitted to candidacy who fail to submit the annual dissertation progress report, will be administratively withdrawn.

Students must register each term until the dissertation is submitted or until six years (twelve terms) of study have been completed. Registered students who submit dissertations will remain registered until the end of the term (i.e., through December or May) and will retain all privileges of registration (e.g., library privileges, health care coverage, and e-mail accounts). Students who complete all Ph.D. requirements within four continuous years of full-time study in the Ph.D. program will be registered and charged full tuition only through the term in which the dissertation is submitted. Students who have registered part time or taken a leave of absence must complete the four-year, full-tuition obligation, regardless of when they submit the dissertation.

Students who have not yet submitted the dissertation by the end of the sixth year of study may do so subsequently without registering or request a period of extended registration by submitting the petition for extended registration, which includes the standard Dissertation Progress Report that is required annually by May 1 of all students admitted to candidacy. Before a seventh year of registration is approved, the student and his or her adviser, as well as the director of graduate studies, must complete a report that specifies the progress the student has already made in writing the dissertation and that also includes a detailed plan for completing the dissertation in the seventh year. In addition to this requirement, students seeking an eighth year of registration must

demonstrate serious circumstances beyond their control that have prevented them from completing the dissertation by the end of the seventh year of study. Students who receive extended registration must register online each term and are normally expected to be in residence.

Noncumulative registration In certain areas of study it may be necessary for a registered student to acquire an academic skill (typically, knowledge of a foreign language) that is essential for a degree requirement or for research in a particular field and for the overall progress of the dissertation but is not an inherent part of the dissertation itself. A student in this situation may request up to one year of “noncumulative registration.” It is important to note that general study in a field related to or parallel with the topic of the dissertation is not appropriate for noncumulative registration.

A student who wishes to have a specific period of study designated as “noncumulative” should discuss the reasons for such a period of study with and secure prior approval from his or her associate dean. If prior authorization has been given by the Graduate School, the period of time spent in acquiring the necessary academic skill will not be counted as part of the student’s six-year period of candidacy. Noncumulative registration does not change the four-year full-tuition obligation. The tuition charge and any University Fellowship aid will be postponed if a student registers noncumulatively before the four-year full-tuition obligation has been satisfied. While registered noncumulatively, students pay the Continuous Registration Fee and doctoral students continue to receive the Health Award from the Graduate School.

Part-time study Students in Ph.D. programs are expected to register for full-time study. In extraordinary circumstances a student may petition the Graduate School for permission to register as a half-time student for a limited period. Students may not register for half-time study for more than three of the first four academic years they are enrolled. Thereafter they must register full time until the four-year tuition obligation has been satisfied. Any Ph.D. student who registers half time at any point in his or her graduate program must fulfill the four-year tuition obligation to receive the Ph.D. (see below). Ph.D. students may not register less than half time.

Students who wish to study part time should consult with their director of graduate studies and the appropriate associate dean to develop a proposed plan of study, so that both the student and the Graduate School have a common understanding about the time by which the requirements leading to admission to candidacy must be completed. Such a plan of study may be modified with the consent of the director of graduate studies and the associate dean.

Course Enrollment

Any student who wishes to enroll in courses during a term must register through the Online Course Selection (OCS) process. The deadlines for registration each term are listed in the Schedule of Academic Dates and Deadlines. Students who submit course enrollment forms after the appropriate deadline will be assessed a fee.

No student may attend any class unless officially registered in the course. No credit will be given for work done in any course for which a student is not officially registered, even if the student entered the course with the approval of the instructor and the director

of graduate studies. Graduate students who wish to register for courses that are offered on both the graduate and undergraduate levels must register with the graduate-level course number (i.e., 500 or higher) in order to receive credit toward their degrees. In rare instances, a graduate student may be granted permission to register for an undergraduate course that will count toward the fulfillment of course requirements for the student's graduate degree. In such cases, the student must file an approved Graduate Credit Request form (www.yale.edu/graduateschool/academics/forms/Credit_Request_Form.pdf) with the Office of the Graduate Registrar by the end of the registration period. Students enrolling in courses offered by a Yale professional school are subject to all policies and deadlines of both the professional school and the Graduate School. Graduate students taking a course through the School of Management and the Law School must also obtain written permission from the respective schools' registrars to be officially enrolled. Permission must be obtained within two weeks of the close of registration at the Graduate School.

A student who wishes to audit a course must receive permission from the instructor (as not all faculty permit auditors in their classes) and register for the course as an auditor. The minimum general requirement for auditing is attendance in two-thirds of the class sessions; instructors may set additional requirements for auditing their classes. Audited courses appear on the student's transcript.

COURSE CHANGES

Once the Online Course Selection (OCS) process has closed for a given term, all subsequent changes must be made using the Course Schedule Change Notification Form, approved by the student's director of graduate studies and then filed with the registrar. If a student is enrolled in a professional school course, all changes in enrollment status must be reported to the registrar of that school as well as to the Graduate School. Forms for reporting changes to the Graduate School are available at the Graduate School Student Information Office, 113 HGS, through the student's department, or online at www.yale.edu/graduateschool/forms.

The dates for changing enrollment in a course from Credit to Audit or Audit to Credit and for withdrawing from a course are listed in the Schedule of Academic Dates and Deadlines. If a student stops attending a course in which he or she is enrolled for credit but does not file a course change form with the registrar, a permanent "Incomplete" will be recorded on the student's record for that course. Similarly, if a student attends a course, for credit or audit, that was not listed on the student's approved course enrollment form for that term, the course will not be entered in the student's record and credit for the course will not be given.

Grades

The grades assigned in the Graduate School are:

H	Honors
HP	High Pass
P	Pass
F	Fail
TI	Temporary Incomplete
I	Incomplete

A mark of “Y” is assigned as the grade for the first term of a full-year course and will be converted to a standard grade once both terms are completed, depending on the number of credits the course fulfills.

Marks of Satisfactory/Unsatisfactory may be assigned only when the department sponsoring the course has designated such marks. In such cases, the grading mode is the same for all students enrolled in the course.

The Graduate School does not calculate grade-point averages nor does it assign numerical or letter equivalents to Graduate School grades. Grades assigned according to grading scales other than those described above will be returned to the instructor for conversion.

The Schedule of Academic Dates and Deadlines indicates the dates on which grades are due for the current year. Instructors have the responsibility for assigning dates for submission of course work to meet these grade deadlines. If a student and instructor have agreed that an extension is appropriate, the student must submit to the Office of the Graduate Registrar a request for the Temporary Incomplete (TI) (available on the Graduate School Web site at www.yale.edu/graduateschool/forms) with the intended completion date, signed by the instructor and the director of graduate studies. Only one TI in a single term is permitted. Temporary Incompletes received in an academic year must be converted to final grades by October 1 of the following academic year. If a grade is not received by the registrar by this date, the TI will be converted to a permanent Incomplete (I) on the student's record.

In certain extraordinary circumstances, such as serious illness or a family emergency, and on the recommendation of the student's department, the associate dean may grant an additional extension. A written request for such an extension must be made by the director of graduate studies on the student's behalf within two weeks of the grade submission deadline. The request should indicate the special circumstances and suggest a date by which the student will complete the work. If the request is approved, the associate dean will inform the student and instructor. If the grade is submitted to the registrar by the new deadline approved by the associate dean, it will replace the Temporary Incomplete. If a grade is not received by the registrar by this date, a Temporary Incomplete (TI) will be converted to a permanent Incomplete (I) on the student's record.

“Provisional” or “temporary” grades (as opposed to Incompletes) are not permitted. Once submitted to the Office of the Registrar, a grade may be changed only in cases of arithmetical or clerical error on the part of the instructor and only with the approval of the appropriate associate dean.

Students are reminded that the policies stated above are the Graduate School minimum general requirements. Departments or individual instructors may have more stringent policies, and students should consult their departmental handbooks or directors of graduate studies about such requirements.

Registration Status and Leaves of Absence

REGISTRATION IN RESIDENCE

Students who are studying on campus, attending classes, and using University facilities are considered to be in residence. All M.A./M.S. and nondegree (DSR) students must register in residence each term, as do most students in Ph.D. programs (see also

Registration in Absentia and Continuous Registration Fee, below). Students who will be in residence during any term are required to register through the Online Course Selection process during the normal registration period at the beginning of that term (see the Schedule of Academic Dates and Deadlines).

A fee will be charged to students who register in residence after the close of the registration period but within the first ten days of the term. Registration after the tenth day of the term requires the permission of the director of graduate studies, the registrar, and, in some instances, the appropriate associate dean. Additional fees may be imposed for registration after the tenth day of the term. Late fees may be waived only if the registrar receives written notification from the student or director of graduate studies before the start of the registration period that the student will register late because of participation in an academic program, such as a summer language course or professional meeting, that coincides with the registration period. A student who cannot register during the registration period because of a sudden serious illness or family emergency should contact the deputy registrar (113 HGS) as soon as possible.

REGISTRATION IN ABSENTIA

Ph.D. students who have not yet completed the four-year full-tuition requirement and whose program of study requires full-time dissertation research, full-time field work, or full-time study at another academic institution outside the New Haven area, may request to be registered in absentia. Such registration requires the recommendation of the director of graduate studies and the approval of the appropriate associate dean. Forms for requesting registration in absentia may be obtained at the Graduate School Student Information Office reception desk or online at www.yale.edu/graduateschool/forms and should be filed at least one month before the beginning of the term during which the student expects to be studying away from New Haven. A student who has not completed the three-year residence requirement will be permitted to register in absentia for compelling academic reasons only, and normally only if the student has completed all other predissertation requirements. Registration in absentia does not reduce the four-year full-tuition or three-year residence requirements. After eight terms of study, students are no longer required to register in absentia when studying away from New Haven. They must, however, continue to register each term through the standard online process, specifying Dissertation Research in Absentia (DISA 999). For additional information, see Eligibility for Fellowships under Financing Graduate School.

Students who are enrolled in the Yale Health Plan and are registering in absentia should consult the staff of the Member Services department at the University Health Services about the policies governing coverage while they are away from New Haven.

CONTINUOUS REGISTRATION FEE

Ph.D. students who have completed the tuition and residence requirements described above must continue to register each term through the sixth year whether in residence or in absentia, or until they submit the dissertation, whichever occurs first. Students who have met the tuition requirement are charged a Continuous Registration Fee (CRF) for each term in which they remain registered. Students who are granted permission to register beyond the sixth year are also charged this fee.

SUMMER REGISTRATION

Ph.D. students receive funding and are expected to continue full-time independent study or research during the summer. Continuing students who were registered during the preceding spring term remain registered through August 31. Ph.D. students who wish to interrupt their studies during the summer (e.g., to accept an internship) must notify their associate dean prior to May 15.

Many M.A./M.S. students continue full- or half-time independent study or research during the summer. Continuing students who were registered during the preceding spring term remain registered through August 31.

Students can obtain verification of summer registration from the Office of the Graduate Registrar.

LEAVES OF ABSENCE

Students who wish or need to interrupt their study temporarily may request a leave of absence. There are three types of leave – personal, medical, and parental – all of which are described below. The general policies that apply to all types of leave are:

1. All leaves of absence must be approved by the appropriate associate dean on the recommendation of the department. Medical leaves also require the recommendation of a Yale Health Plan (YHP) physician, as described below; see Medical Leave of Absence.
2. Students in Ph.D. programs may be granted a leave for one term or one academic year. A leave extends the eligibility for fellowship aid by a time equal to the duration of the leave, but not for partial terms. The expected last date of registration will be adjusted by one term for each term of the leave.

Students in one-year M.A./M.S. programs may be on leave for a maximum of one term. Students in two-year M.A./M.S. programs may be on leave for a maximum total of one year.

In exceptional circumstances renewal of one term or one year leave, to a cumulative maximum total of two years of personal and medical leave, may be granted for students in Ph.D. programs. Leaves of absence for students in M.A./M.S. programs are not renewable. The duration of a parental leave is one term or one year, renewable for each birth event. Students who fail to register for the term following the end of the approved leave will be considered to have withdrawn from the Graduate School.

3. Students on leave may complete outstanding work in courses for which they have been granted approved Incompletes. They may not, however, fulfill any other degree requirements during the time on leave. (Students who intend to work toward the degree while away from the University must request registration in absentia.) Students who in fact make progress toward the degree while on leave will have their registration changed retroactively to in absentia for the period of the leave.
4. A leave of absence does not exempt the student from meeting the tuition requirement (payment of eight terms of full tuition in Ph.D. programs, or the appropriate established tuition charge in M.A./M.S. programs) or from paying the Continuous Registration Fee (if appropriate), but merely postpones the required charges.
5. Students on leave of absence do not have to file a formal application for readmission. However, they must notify the registrar in writing of their intention to return.

Such notification should be given at least six weeks prior to the end of the approved leave.

6. Students living in University housing units are encouraged to review their housing contract and the related policies of the Graduate Housing Office before applying to the Graduate School for a leave of absence.
7. International students who apply for a leave of absence should consult with OISS with regard to their visa status.

Personal leave of absence A student who is current with his or her degree requirements and who wishes to interrupt study temporarily because of personal exigencies may request a personal leave of absence. The general policies governing leaves of absence are described above. Students are eligible for personal leaves after satisfactory completion of at least one term of study. Normally, students in Ph.D. programs are not eligible for personal leaves after the fourth year of study. In certain exceptional cases, however, personal leaves may be granted to students beyond the fourth year of study. Personal leaves cannot be granted retroactively and normally will not be approved after the tenth day of a term.

To request a personal leave of absence, the student must complete the appropriate form (available online at www.yale.edu/graduateschool/forms) before the beginning of the term for which the leave is requested, explaining the reasons for the proposed leave and stating both the proposed start and end dates of the leave and the address at which the student can be reached during the period of the leave. If the dean finds the student to be eligible and the department approves, the leave will be granted. In any case the student will be informed in writing of the action taken. Students who do not apply for a leave of absence, or who apply for a leave but are not granted one, and who do not register for any term, will be administratively withdrawn from the Graduate School.

Students on a personal leave of absence are not eligible for financial aid, including loans, or for the use of University facilities normally available to registered students. Students granted a personal leave may continue to be enrolled in the Yale Health Plan (YHP) by purchasing coverage through the Student Affiliate Coverage plan. In order to secure continuous YHP coverage, enrollment in this plan must be requested prior to the beginning of the term in which the student will be on leave or, if the leave commences during the term, within thirty days of the date when the leave is granted. Coverage is not automatic; enrollment forms are available from the Member Services department of the Yale Health Service, 17 Hillhouse Avenue, 203.432.0246.

Medical leave of absence A student who must interrupt study temporarily because of illness or injury may be granted a medical leave of absence with the approval of the appropriate associate dean, on the written recommendation of a physician on the staff of the University Health Services and of the student's department. Final decisions concerning requests for medical leaves will be communicated to students by their associate dean in writing.

The Graduate School reserves the right to place a student on a medical leave of absence when, on the recommendation of the director of the University Health Services or the chief of the Division of Mental Hygiene, the dean of the Graduate School determines that the student is a danger to self or others because of a serious medical problem.

The general policies governing all leaves of absence are described above. A student who is making satisfactory progress toward his or her degree requirements is eligible for a medical leave any time after matriculation. Students who are placed on a medical leave during any term will have their tuition adjusted according to the same schedule used for withdrawals (see Schedule of Academic Dates and Deadlines). Before re-registering, a student on medical leave must secure written permission to return from the appropriate physician at the University Health Services. Advanced Ph.D. students may return at any time during the term with the permission of the Yale Health Plan. Forms for requesting a medical leave of absence are available at the Graduate School Student Information Office and online at www.yale.edu/graduateschool/forms.

Students on medical leave of absence are not eligible for financial aid, including loans, or for the use of University facilities normally available to registered students. Health coverage options during a leave of absence are described under Health Services, below. Eligible Ph.D. students will receive a Health Award from the Graduate School to cover the cost of the Student Affiliate Coverage Plan for the remainder of the term in which the leave is started, if they apply for this coverage through the Yale Health Plan within thirty days of the start of their leave. Coverage is not automatic; enrollment forms are available from the Member Services department of the Yale University Health Services, 17 Hillhouse Avenue, 203.432.0246.

Leave of absence for parental responsibilities A student who is making satisfactory progress toward his or her degree requirements and wishes to, or must, interrupt study temporarily for reasons of pregnancy, maternity or paternity care, may be granted a leave of absence for parental responsibilities. Any student planning to have or care for a child is encouraged to meet with his or her director of graduate studies and appropriate associate dean to discuss leaves and other short-term arrangements. For many students short-term arrangements, rather than a leave of absence, are possible. The general policies governing all leaves of absence are described above, including information about health coverage. A student who is making satisfactory progress toward his or her degree requirements is eligible for a leave of absence for parental responsibilities any time after matriculation.

Students on leave of absence for parental responsibilities are not eligible for financial aid, including loans, or for the use of University facilities normally available to registered students. Health coverage options during a leave of absence are described under Health Services, below. Eligible Ph.D. students will receive a Health Award from the Graduate School to cover the cost of the Student Affiliate Coverage Plan for the remainder of the term in which the leave is started, if they apply for this coverage through the Yale Health Plan within thirty days of the start of their leave. Coverage is not automatic; enrollment forms are available from the Member Services department of the Yale Health Service, 17 Hillhouse Avenue, 203.432.0246.

Students granted parental leave may continue to reside in University housing to the end of the academic term for which the leave was first granted, but no longer.

PARENTAL SUPPORT AND RELIEF

Registered Ph.D. students who wish to modify their academic responsibilities because of the birth or adoption of a child may request parental support and relief during or following the term in which the birth or adoption occurs. For the whole of the term in which

the support and relief are requested, the student's academic clock stops, effectively adding an additional term to the total time to degree. During this period, students remain registered, receive the full financial aid package as specified in their letter of admission, and will have departmental academic expectations modified to best suit the specific situation. The precise nature of the academic responsibilities undertaken or suspended during this period should be a matter of consultation among the adviser, the student, and the Graduate School, with the understanding that students are entitled to full relief for at least an eight-week period. Students who take only eight weeks of relief during the semester in which, or just after, a birth or adoption occurs may receive an additional eight weeks of stipend funded by the Graduate School in a later semester. Parental relief may not be combined with other funding. To arrange for parental relief, a student should contact the appropriate associate dean four months prior to the birth or adoption.

Graduate students in terminal M.A./M.S. programs may modify their academic responsibilities because of the birth or adoption of a child. They should contact their associate dean the term before the planned modifications would occur.

WITHDRAWAL AND READMISSION

A student who wishes to terminate his or her program of study should confer with the director of graduate studies and the appropriate associate dean regarding withdrawal; their signatures on an official withdrawal form (available on the Graduate School Web site at www.yale.edu/graduateschool/forms) are required for withdrawal in good standing. The associate dean will determine the effective date of the withdrawal, upon consultation with the department. The University identification card must be submitted with the approved withdrawal form in order for withdrawal in good standing to be recorded.

Students who fail to meet departmental or Graduate School requirements by the designated deadlines will be administratively withdrawn, unless an extension or exception has been granted by the appropriate dean or degree committee. Students who do not register for any fall or spring term, and for whom a leave of absence has not been approved by the appropriate associate dean, will be withdrawn from the Graduate School.

A student who discontinues his or her program of study during the academic year without submitting an approved withdrawal form and the University identification card will be liable for the tuition charge (or Continuous Registration Fee) for the term in which the withdrawal occurs. Tuition charges for students who withdraw in good standing will be adjusted as described in the Schedule of Academic Dates and Deadlines. The Continuous Registration Fee for the term is not canceled if a student withdraws after the fourteenth day of the term. Health service policies related to withdrawal and readmission are described under Health Services, below.

A student who has withdrawn from the Graduate School in good standing and who wishes to resume study at a later date must apply for readmission. Normally, students seeking readmission must do so within three years of the original withdrawal. Neither readmission nor financial aid is guaranteed to students who withdraw. The deadline for making application for readmission is six weeks prior to the term in which the student wishes to return to the Graduate School. The student's application will be considered by the department, which will make a recommendation for review by the appropriate

associate dean. The student's remaining tuition obligation will be determined at the time of readmission. Ph.D. students who withdraw after completion of the full tuition requirement and who are subsequently readmitted will be charged the accumulated CRF up to a maximum of four terms. Students may seek readmission no more than once. If subsequent to a readmission they must again withdraw, they are ineligible for readmission.

Personal Conduct

Yale University is an academic community dedicated to the advancement of learning. Its members freely associate themselves with the University and in doing so affirm their commitment to a philosophy of tolerance and respect for all members of the community. They pledge to help sustain the intellectual integrity of the University and to uphold its standards of honesty, free expression, and inquiry. They are expected to abide by the regulations of the University. They are also expected to obey local, state, and federal laws, and violations of these may be cause for discipline by the Graduate School.

The Graduate School specifically prohibits the following forms of behavior by graduate students:

1. Cheating on examinations, problem sets, and any other form of test; also, falsification and/or fabrication of data.
2. Plagiarism, that is, the failure in a dissertation, essay, or other written exercise to acknowledge ideas, research, or language taken from others.
3. Misuse of the materials or facilities of the University library.
4. Unauthorized use of University services, equipment, or facilities, such as telephones and photocopying equipment.
5. Violation of University rules for using information technology services and facilities, including computers, the University network, and electronic mail. (See Policies for Use of Information Technology Services Facilities.)
6. Assault on, or coercion, harassment, or intimidation of, any member of the University community, including harassment on the basis of race, religion, gender, ethnicity, or sexual orientation; sexual harassment; or the use of a teaching position to harass or intimidate another student.
7. Engaging in a relationship with a student while serving as the student's teaching fellow or in any other direct supervisory role over the student (as outlined in the University's policy prohibiting "Teacher-Student Consensual Relationships").
8. Disruption of a legitimate function or activity of the University community, including disrupting classes and meetings, blocking entrances and exits to University buildings, unauthorized occupation of any space on the Yale campus, or preventing the free expression or dissemination of ideas. (See Freedom of Expression, below.)
9. Refusal to comply with the direction of a University police officer or other University official, including a member of faculty, acting in the performance of her or his duties.
10. Misuse, alteration, or fabrication of University credentials or documents, such as an identification card or a transcript or grade list, including grade lists submitted by teaching fellows.
11. Misrepresentation or lying during a formal inquiry by University officials.
12. Misrepresentation in applying for admission or financial aid.

13. Theft, misuse of funds, or willful damage of University property.
14. Trespassing on University property to which access is prohibited.
15. Possession or use of explosives, incendiary devices, or weapons on or about the campus.
16. Interference with the proper operation of safety or security devices, including fire alarms, electronic gates, and sprinkler systems.
17. Unlawful manufacture, possession, use, or distribution of illicit drugs or alcohol on University property or as part of any University activity.

Violations of any of the above regulations will be referred to the Graduate School Committee on Regulations and Discipline, composed of three graduate students, three faculty members, normally one from each division, and an associate dean. Students found guilty of such violations will be subject to one or more of the following penalties:

- Reprimand
- Probation
- Suspension
- Dismissal
- Fines
- Restriction

Penalties of suspension or dismissal will be noted on the student's transcript. Pending disciplinary charges will be noted on a student's transcript if he or she withdraws from the Graduate School after being formally charged but before such charges have been resolved. A student who has been dismissed for a disciplinary violation may petition for a degree, to be awarded at the discretion of the Degree Committee, based on work completed before the infraction occurred. A student dismissed for academic misconduct will not receive a degree from the Graduate School regardless of requirements fulfilled before the infraction occurred. In addition to imposing these penalties for offenses subject to disciplinary action, the University may refer students for prosecution, and students found guilty of unlawful possession, use, or distribution of illicit drugs or alcohol on University property or as part of any University activity may be required to complete an appropriate rehabilitation program.

Copies of the procedures of the Committee on Regulations and Discipline may be obtained from the office of each of the associate deans of the Graduate School or via the Graduate School Web site (www.yale.edu/graduateschool/policies). The deans may be consulted for further information and advice. A copy of the procedures is sent automatically to any student who is charged with a violation of the Graduate School's regulations.

Grievance Procedures

To address complaints and grievances of various kinds, the Graduate School maintains a set of procedures. Copies of the grievance procedures of the Graduate School may be obtained from the office of each of the associate deans of the Graduate School or via the Graduate School Web site: www.yale.edu/graduateschool/policies. The deans may be consulted for further information and advice.

COMPLAINTS OF SEXUAL HARASSMENT

A standing committee reviews complaints of sexual harassment brought by graduate students against administrators, faculty of the Graduate School of Arts and Sciences, other instructors of graduate students, postdoctoral appointees, or other graduate students.

THE GRADUATE SCHOOL PROCEDURE FOR STUDENT COMPLAINTS

This procedure governs any case in which a student has a complaint, including but not limited to a complaint of discrimination on the basis of race, sex, color, religion, national or ethnic origin, sexual preference, or handicap, against a member of the faculty or administration of the Graduate School. Complaints that involve a misapplication of Graduate School policy are also appropriate for consideration by the Dean's Advisory Committee on Student Grievances. Complaints that require an emendation of policy will be referred to the Graduate School Executive Committee.

PROVOST'S PROCEDURE

The Provost's Procedure governs cases in which a student has a complaint, including but not limited to a complaint of sexual harassment or of discrimination on the basis of race, sex, color, religion, national or ethnic origin, sexual preference, or handicap, against a faculty member who is not a member of the Faculty of Arts and Sciences, or against an employee who is not an administrator in the Graduate School or who is not subject to discipline by the student's dean.

Freedom of Expression

The Yale faculty has formally endorsed as an official policy of Yale University the following statement from the Report of the Committee on Freedom of Expression at Yale, published in January 1975.

The primary function of a university is to discover and disseminate knowledge by means of research and teaching. To fulfill this function a free interchange of ideas is necessary not only within its walls but with the world beyond as well. It follows that the university must do everything possible to ensure within it the fullest degree of intellectual freedom. The history of intellectual growth and discovery clearly demonstrates the need for unfettered freedom, the right to think the unthinkable, discuss the unmentionable, and challenge the unchallengeable. To curtail free expression strikes twice at intellectual freedom, for whoever deprives another of the right to state unpopular views necessarily also deprives others of the right to listen to those views.

We take a chance, as the First Amendment takes a chance, when we commit ourselves to the idea that the results of free expression are to the general benefit in the long run, however unpleasant they may appear at the time. The validity of such a belief cannot be demonstrated conclusively. It is a belief of recent historical development, even within universities, one embodied in American constitutional doctrine but not widely shared outside the academic world, and denied in theory and in practice by much of the world most of the time.

Because few other institutions in our society have the same central function, few assign such high priority to freedom of expression. Few are expected to. Because no

other kind of institution combines the discovery and dissemination of basic knowledge with teaching, none confronts quite the same problems as a university.

For if a university is a place for knowledge, it is also a special kind of small society. Yet it is not primarily a fellowship, a club, a circle of friends, a replica of the civil society outside it. Without sacrificing its central purpose, it cannot make its primary and dominant value the fostering of friendship, solidarity, harmony, civility, or mutual respect. To be sure, these are important values; other institutions may properly assign them the highest, and not merely a subordinate, priority; and a good university will seek and may in some significant measure attain these ends. But it will never let these values, important as they are, override its central purpose. We value freedom of expression precisely because it provides a forum for the new, the provocative, the disturbing, and the unorthodox. Free speech is a barrier to the tyranny of authoritarian or even majority opinion as to the rightness or wrongness of particular doctrines or thoughts.

If the priority assigned to free expression by the nature of a university is to be maintained in practice, clearly the responsibility for maintaining that priority rests with its members. By voluntarily taking up membership in a university and thereby asserting a claim to its rights and privileges, members also acknowledge the existence of certain obligations upon themselves and their fellows. Above all, every member of the university has an obligation to permit free expression in the university. No member has a right to prevent such expression. Every official of the university, moreover, has a special obligation to foster free expression and to ensure that it is not obstructed.

The strength of these obligations, and the willingness to respect and comply with them, probably depend less on the expectation of punishment for violation than they do on the presence of a widely shared belief in the primacy of free expression. Nonetheless, we believe that the positive obligation to protect and respect free expression shared by all members of the university should be enforced by appropriate formal sanctions, because obstruction of such expression threatens the central function of the university. We further believe that such sanctions should be made explicit, so that potential violators will be aware of the consequences of their intended acts.

In addition to the university's primary obligation to protect free expression there are also ethical responsibilities assumed by each member of the university community, along with the right to enjoy free expression. Though these are much more difficult to state clearly, they are of great importance. If freedom of expression is to serve its purpose and thus the purpose of the university, it should seek to enhance understanding. Shock, hurt, and anger are not consequences to be weighed lightly. No member of the community with a decent respect for others should use, or encourage others to use, slurs and epithets intended to discredit another's race, ethnic group, religion, or sex. It may sometimes be necessary in a university for civility and mutual respect to be superseded by the need to guarantee free expression. The values superseded are nevertheless important, and every member of the university community should consider them in exercising the fundamental right to free expression.

We have considered the opposing argument that behavior which violates these social and ethical considerations should be made subject to formal sanctions, and

the argument that such behavior entitles others to prevent speech they might regard as offensive. Our conviction that the central purpose of the university is to foster the free access of knowledge compels us to reject both of these arguments. They assert a right to prevent free expression. They rest upon the assumption that speech can be suppressed by anyone who deems it false or offensive. They deny what Justice Holmes termed “freedom for the thought that we hate.” They make the majority, or any willful minority, the arbiters of truth for all. If expression may be prevented, censored or punished, because of its content or because of the motives attributed to those who promote it, then it is no longer free. It will be subordinated to other values that we believe to be of lower priority in a university.

The conclusions we draw, then, are these: even when some members of the university community fail to meet their social and ethical responsibilities, the paramount obligation of the university is to protect their right to free expression. This obligation can and should be enforced by appropriate formal sanctions. If the university’s overriding commitment to free expression is to be sustained, secondary social and ethical responsibilities must be left to the informal processes of suasion, example, and argument.

Financing Graduate School

TUITION AND FEES, 2009–2010

Tuition^{*}

Full-time study, per term	\$16,250
Full-time study in IDE, per term	16,750
Full-time study in Urban Education, per term	16,350
Half-time study, per term	8,125
Master's programs, less than half time per term	
One-quarter time study, per term	4,063
Division of Special Registration (DSR, nondegree study)	
Course work, per course, per term (including audited courses)	4,063
Visiting Affiliated Research Graduate Students, per term	16,250
Visiting Assistants in Research, per term	2,042
Visiting Assistants in Research appointed for the summer only	1,021

Fees[†]

Continuous Registration Fee (CRF), per term [‡]	\$340
Special in absentia registration, per term [‡]	340
YHP Hospitalization/Specialty Coverage, twelve months [§]	1,338
YHP Prescription Plus Coverage, twelve months	514

^{*}It is anticipated that tuition will be increased in subsequent years.

[†]It is anticipated that the Continuous Registration Fee will be increased in subsequent years.

Other fees are subject to change without notice. For fees relating to registration and course enrollment, see Course Enrollment, under Academic Regulations.

[‡]See Registration Status and Leaves of Absence, under Academic Regulations

[§]Hospitalization fees are for single students. Rates are higher for students needing dependent coverage.

Appointment to a University post does not exempt a student from registration and payment of other fees. Full-time (and certain part-time) Yale managerial and professional employees and their spouses, as well as the spouses of Yale faculty, are eligible for a tuition reduction in the DSR and master's programs. They should consult the Department of Human Resources for details. Full-time faculty members and their spouses, emeritus faculty and their spouses, and University employees may audit courses without charge.

Candidates for degrees in the Graduate School, nondegree students paying full tuition, and spouses of full-time candidates for degrees in the Graduate School may audit courses without charge provided that they have received the approval of the course instructor.

STUDENT ACCOUNTS AND BILLS

Student accounts, billing, and related services are administered through the Office of Student Financial Services, which is located at 246 Church Street. The telephone number is 203.432.2700.

Bills

Yale University's official means of communicating monthly financial account statements is electronically through the University's Internet-based system for electronic billing and payment, Yale University eBill-ePay.

Student account statements are prepared and made available twelve times a year at the beginning of each month. Payment is due in full by 4 p.m. Eastern Standard Time on the first business day of the following month. E-mail notifications that the account statement is available on the University eBill-ePay Web site (www.yale.edu/sis/ebep) are sent to all students who have activated their official Yale e-mail accounts and to all student-designated authorized payers. It is imperative that all students activate and monitor their Yale e-mail accounts on an ongoing basis.

Bills for tuition, room, and board are available to the student during the first week of July, due and payable by August 1 for the fall term; and during the first week of November, due and payable by December 1 for the spring term. The Office of Student Financial Services will impose a late charge if any part of the term bill, less Yale-administered loans and scholarships that have been applied for on a timely basis, is not paid when due. The late charge will be imposed as follows:

<i>If fall-term payment in full is not received</i>	<i>Late charge</i>
by August 1	\$110
by September 1	\$220
by October 1	\$330
<i>If spring-term payment in full is not received</i>	<i>Late charge</i>
by December 1	\$110
by January 2	\$220
by February 1	\$330

Nonpayment of bills and failure to complete and submit financial aid application packages on a timely basis may result in the student's involuntary withdrawal from the University.

No degrees will be conferred and no transcripts will be furnished until all bills due the University are paid in full. In addition, transcripts will not be furnished to any student or former student who is in default on the payment of a student loan.

The University may withhold registration and certain University privileges from students who have not paid their term bills or made satisfactory payment arrangements by the day of registration. To avoid delay at registration, students must ensure that payments reach Student Financial Services by the due dates.

Charge for Rejected Payments

A processing charge of \$25 will be assessed for payments rejected for any reason by the bank on which they were drawn. In addition, the following penalties may apply if a payment is rejected:

1. If the payment was for a term bill, a \$110 late fee will be charged for the period the bill was unpaid.

2. If the payment was for a term bill to permit registration, the student's registration may be revoked.
3. If the payment was given to settle an unpaid balance in order to receive a diploma, the University may refer the account to an attorney for collection.

Yale University eBill-ePay

There are a variety of options offered for making payments. Yale University eBill-ePay is the preferred means for payment of bills. It can be found at www.yale.edu/sis/ebep/. Electronic payments are easy and convenient—no checks to write, no stamps, no envelopes, no hassle. Payments are immediately posted to the student's account. There is no charge to use this service. Bank information is password protected and secure, and there is a printable confirmation receipt. Payments can be made twenty-four hours a day, seven days a week, up to 4 p.m. Eastern Standard Time on the due date to avoid late fees. (The eBill-ePay system will not be available when the system is undergoing upgrade, maintenance, or repair.) Students can authorize up to three authorized payers to make payments electronically from their own computers to the student's account using Yale's system.

Use of the student's own bank payment service is not authorized by the University because it has no direct link to the student's Yale account. Payments made through such services arrive without proper account identification and always require manual processing that results in delayed crediting of the student's account, late fees, and anxiety. Students should use Yale eBill-ePay to pay online. For those who choose to pay by check, remittance advice with mailing instructions is available on the Web site.

Yale Payment Plan

The Yale Payment Plan (YPP) is a payment service that allows students and their families to pay tuition, room, and board in ten equal monthly installments throughout the year based on individual family budget requirements. It is administered by the University's Office of Student Financial Services. The cost to enroll in the YPP is \$100 per contract. The deadline for enrollment is June 19. For additional information, please contact Student Financial Services at 203.432.2700 and select "Press 3" from the Main Menu. The enrollment form can be found online in the Yale Payment Plan section of the Student Accounts Web site: www.yale.edu/sfas/financial/accounts.html#payment.

TRANSCRIPTS

Transcripts may be ordered online at www.yale.edu/sis, in writing at the Office of the Registrar for the Faculty of Arts and Sciences (246 Church Street, third floor), or by fax, with a signature, to 203.432.2334. For 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 for the same address. Normally a transcript order is processed within forty-eight hours after receipt. In some circumstances it may be possible to provide a transcript within twenty-four hours after receipt of the order, or on the same day; there is an additional charge (\$10 or \$20, respectively) for such requests. For overnight delivery, additional charges may be imposed. www.yale.edu/sfas/registrar/

FINANCIAL AID

Financial assistance is provided in the form of Yale University Fellowships, tuition fellowships, teaching fellowships, traineeships, and research assistantships. The nature of the assistance varies among the divisions and departments. In most departments and programs, doctoral students are guaranteed five years of 12-month stipend and tuition support. Applicants for admission to Ph.D. programs will automatically be considered for all Yale fellowships, traineeships, research assistantships, and teaching fellowships for which they are eligible. These awards of financial aid are announced in letters of admission, which are usually mailed during the month of March. Applicants for admission to nondegree and terminal master's programs are required to complete the financial statement contained in the application brochure. Students are strongly encouraged to seek financial support from external sources (see External Fellowships and Combined Award Policy, below).

In addition to grants and fellowships for tuition and living costs, Yale Health Plan Basic Coverage is provided at no cost to students enrolled at least half time in M.A., M.S., and Ph.D. programs. Eligible Ph.D. students also receive a Health Award, which covers the full cost of single-student Yale Health Plan Hospitalization/Specialty Coverage, half the cost of two-person coverage, and the full cost for family coverage. Students who do not participate in the Yale Health Plan Hospitalization/Specialty Coverage will not be provided with Health Awards. Yale Health Plan Prescription Plus Coverage is an option that eligible students may choose to purchase for themselves and their dependents. The Prescription Plus plan is not covered by the Health Award. (For further information regarding health care options through the Yale Health Plan, see Health Services.)

University Fellowships

The Graduate School provides all Ph.D. students with a minimum level of support for five years upon admission. Fellowships are awarded at admission to entering students on the basis of merit and recommendations made by individual departments. In most departments the source of stipend support will change after the first or second year of study to a teaching fellowship or research assistantship. Students who teach in their first or second year when such teaching is not part of the standard departmental pattern defer their University Fellowships to a later year and do not receive more than the standard departmental stipend while teaching.

Students awarded a University Fellowship may not accept any other award without the permission of the appropriate associate dean. The Graduate School is the final authority on University Fellowships and any combination of University funding with other sources of financial aid (see External Fellowships and Combined Award Policy, below).

Dissertation Fellowships

The Graduate School offers University Dissertation Fellowships as part of its five-year financial aid package to eligible advanced graduate students in the humanities and social sciences once they have advanced to doctoral candidacy. These awards are made when a student's adviser and director of graduate studies certify that the student will be engaged

full time in research and writing, is making satisfactory progress toward the degree, and has a reasonable schedule for the timely completion of the dissertation. The University Dissertation Fellowship is usually taken in consecutive terms (beginning in either the fall or spring term) and must be completed by the end of the sixth year of study. With the permission of the Graduate School, it may be interrupted in certain circumstances when recommended by the department. It may never be held concurrently with a teaching fellowship of any kind. Students who accept a teaching position in the fall or spring of the year of final eligibility will forfeit that term's dissertation fellowship amount. Prize dissertation fellowships awarded by the Graduate School, such as the Whiting and Leylan fellowships, replace the University Dissertation Fellowship. Students receiving external funding for dissertation research or writing may be eligible for a combined award and should consult the External Fellowships and Combined Award policy. Application materials and additional information can be obtained online at www.yale.edu/graduateschool/funding or from the appropriate associate dean.

Teaching Fellowships

TEACHING AND ADMISSION OFFERS

Because the Graduate School considers teaching experience to be an integral part of graduate education, doctoral students receive financial aid packages that include teaching fellowships. In many programs there are specific years when students are expected to teach. For example, most humanities and social science students will teach in their third and fourth years. In the natural sciences, the timing of teaching is earlier or is flexible across several years. When requested by the student for compelling academic reasons, these patterns may be adjusted with the permission of an associate dean and the DGS contingent on the student's satisfactory academic progress and on sufficient course enrollment.

When students are teaching as specified in their letters of admission, teaching assignments will not be adjusted in response to changes in course enrollments. Appointments for these students will change only if a course is canceled or if the student, course instructor, and DGS all agree upon a reassignment. The Graduate School provides a supplementary fellowship in cases where the teaching fellowship is less than the standard departmental stipend. If an associate dean and DGS determine that no suitable teaching is available in a term in which a student is expected to teach, the student will continue to receive his or her standard departmental stipend that term. Stipend support will be withheld if a student elects not to teach as outlined in the student's offer of admission.

ACCESS TO TEACHING FELLOWSHIPS

When departments are considering applications for teaching fellowships, priority is given to qualified graduate students who are expected to teach as indicated in their letter of admission (usually in years three and four in the humanities and social sciences). Students in their fifth or sixth year of study may teach if enrollments permit and as long as they have been admitted to candidacy and do not currently hold a dissertation fellowship. Students who are permitted to register beyond the sixth year of study may be appointed as TFs or PTAs, but only if there is no other qualified candidate available in the first six years of study in any department or program of the Graduate School. In cases where an

appointing department must choose between two or more graduate students who are each well qualified to teach a particular course, the student or students who have not yet had a chance to teach or who have taught the least should be given preference.

LIMITS ON TEACHING

Except when specified in their letters of admission, first-year and second-year doctoral students may be appointed as teaching fellows only in exceptional cases, and only after prior approval by their DGS, the appropriate associate dean, and the director of the TFP. In any year of study, the maximum amount of teaching a student may do is four TF units or one PTAI per term. Students may not serve as faculty lecturers while registered in the Graduate School.

Students with outside fellowships are eligible to serve as TFs according to the policies of the Graduate School and the conditions of their outside awards.

APPOINTMENT LETTERS

The Graduate School expects that each term departments and programs will send letters of appointment to graduate students, signed by both the department and the TFP director, indicating the course in which a graduate student is expected to teach and the level of the assignment. An appointment is not official until the appointment letter has been prepared by the department or program, reviewed by the TFP, and sent to the student.

TEACHING FELLOW LEVELS

There are five levels of TFs at Yale. They are distinguished from one another by several considerations, including the kind or kinds of activity required, the approximate hours per week, and the number of students taught. For example, courses in which TFs are expected to provide frequent and intensive writing criticism, to grade problem sets or vocabulary tests frequently, or to prepare especially complicated visual or laboratory materials, may be accorded a higher-level teaching fellowship than courses that do not carry such an expectation. A graduate student's teaching assignment is measured in terms of teaching fellow units (one unit for a term as TF 1, two units for a term as TF 2, and so on).

Teaching Fellow 1 The responsibilities of a TF 1 are primarily (a) grading, (b) a combination of the following: attending class, reading, advising undergraduates, offering an occasional discussion section, helping to set up a lab, or assisting in the administrative details of the course, (c) in non-language courses providing Language-across-the-Curriculum one-on-one language tutoring, or (d) in language courses providing one-on-one tutoring sessions. A TF 1 does not engage in regular classroom teaching. Approximate weekly effort, 5 hours. The 2009–2010 teaching fellowship is \$2,408 per term.

Teaching Fellow 2 A TF 2 typically leads and grades one discussion or laboratory section of up to 20 students in courses in the natural sciences and some social sciences, tutors in language courses, or combines responsibilities (a) and (b) as described under TF1. A TF2 also may lead a Language-across-the-Curriculum session for courses with fewer than 30 students and no other sections. Approximate weekly effort, 10 hours. The 2009–2010 teaching fellowship is \$4,816 per term.

Teaching Fellow 3 Depending on department policy, the duties of a TF 3 may include leading and grading one or two lab or discussion sections, as in Chemistry. Alternatively, a TF 3 may be appropriate for a combination of duties that might include attending lectures, office hours and consultations, and grading, as in Psychology. Approximate weekly effort, 15 hours. The 2009–2010 teaching fellowship is \$7,224 per term.

Teaching Fellow 3.5 This appointment is appropriate for TFs who lead and grade one section in English, History of Art, the Literature major, in any literature course in the national language departments that may conform to the same mode of teaching, in courses double titled with these departments and programs, and in a few designated courses. Discussion section leaders are appointed for lecture courses with 30 or more students; a section size is expected not to exceed 18 students, with 20 the absolute maximum. This appointment is also used for Writing Requirement TFs and Language-across-the-Curriculum section leaders. Approximate weekly effort, 17.5 hours. The 2009–2010 teaching fellowship is \$8,428 per term.

Teaching Fellow 4 This appointment is appropriate for TFs in humanities and social science departments where teaching fellows usually lead and grade two sections. Discussion section leaders are appointed for lecture courses with 30 or more students; a section size is expected not to exceed 18 students, with 20 the absolute maximum. Approximate weekly effort, 20 hours. The 2009–2010 teaching fellowship is \$9,632 per term.

PART-TIME ACTING INSTRUCTORS

Graduate students appointed as part-time acting instructors (PTAIs) conduct sections of introductory courses or advanced seminars, normally seminars in their special fields. Even in the case of seminars, PTAIs are supervised by faculty. In the case of multisection introductory courses, this may include the use of a common syllabus and examinations. No student should teach more than one PTAI course per term. PTAIs who teach advanced seminars must have satisfied all predissertation requirements (including the dissertation prospectus) and must be registered full time to be eligible for the appointment. Hours of effort for PTAIs will vary from one individual to another. The 2009–2010 teaching fellowship is \$9,732 per term.

Traineeships and Assistantships in Research

Traineeships (National Research Service Awards) from the National Institutes of Health are available in most of the biological sciences and in some other departments. These awards support full-time Ph.D. study by U.S. citizens, noncitizen nationals of the United States, and permanent residents. In combination with University and departmental supplements, they provide payment of tuition, a monthly stipend, and the hospitalization premium. Federal rules require that trainees pursue their research training on a full-time basis. In some instances, there is a federal payback provision, which is ordinarily satisfied by serving in health-related research or teaching at the conclusion of training. Information about this obligation and other matters relating to traineeships is available from the director of graduate studies or the principal investigator of the specific training grant in question.

Research Appointments

Doctoral students in departments where the faculty receive research grants or contracts may be eligible for appointments as assistants in research (AR). In most of the science departments, advanced Ph.D. students are normally supported as ARs by individual faculty research grants. An assistantship in research provides a monthly salary at a rate agreed upon by the department and the Graduate School. It is understood that the work performed not only is part of the faculty principal investigator's research project but also is the student's dissertation research and therefore in satisfaction of a degree requirement. For a standard AR appointment, in addition to the salary, the grant pays half of the tuition or all of the CRF. When the appointee is eligible for a University Fellowship, the other half of tuition is covered by a fellowship.

An appointment as a project assistant (PA) is intended for a student who performs services for a research project that are not a part of the student's degree program. A project assistant may normally work no more than ten hours per week. The rate of compensation is based on the department-approved rate paid to assistants in research. With the permission of the director of graduate studies and the appropriate associate dean, a student may receive a combination of project assistant and assistant in research appointments.

Questions about AR or PA appointments should be directed to the director of graduate studies or the appropriate associate dean in the Graduate School.

EXTERNAL FELLOWSHIPS AND COMBINED AWARD POLICY

To benefit both their current work and their future career prospects, students are strongly encouraged to seek funding from external agencies through grants. These awards, sponsored by both public and private agencies, confer distinction on a student who wins an award in a national competition. They are often more generous than the fellowships the University is able to provide.

Students receiving external awards have two options. They may either (1) hold the outside awards in conjunction with University stipends (including research and teaching fellowships) up to the total of the standard department/program stipend plus \$4,000 or (2) defer financial support awarded in their admission offer for up to one year. Students must report to their associate dean any scholarship/fellowship received from an outside agency or organization. The dean will then assist students in considering the benefits of each option.

Option 1: Supplementation of an External Fellowship

During the twelve-month academic year (September 1–August 31), the Graduate School's stipend award, made at the time of admission, may be used to supplement the sum of all external stipend awards to a maximum stipend equal to the total of the standard department/program stipend plus \$4,000. If the sum of the Graduate School's initial stipend award and all outside awards exceeds this limit, the Graduate School's stipend award will be reduced accordingly. In instances where an external award does not cover the full twelve-month academic year, the combined award will be determined by prorating the combined award over the period when the internal and external awards overlap.

Students who receive external fellowships providing yearly stipends that are more than the total of the standard department/program stipend plus \$4,000 will retain the full external fellowship funding and will receive no university supplement.

Option 2: Deferral of Graduate School Funding

Students receiving external awards in years one through five of study may defer for up to one year the Graduate School's stipend award made at the time of admission. Stipend awards may not be deferred beyond the sixth year of study.

ELIGIBILITY FOR FELLOWSHIPS

Students who hold Yale-administered fellowships are required to be in residence and engaged in full-time study. Permission to hold a fellowship in absentia must be obtained from the appropriate associate dean. A student who leaves New Haven, except for short vacation periods, without having such permission may have the fellowship canceled. No fellowships will be paid for any period when a student is not registered.

Students are not eligible for stipend support from the Graduate School after six years of study, but they remain eligible for student loans as long as they are enrolled at least half time.

A fellowship will be withdrawn and a stipend withheld if the recipient's activities become prejudicial to the purpose for which the fellowship was granted or if a student becomes ineligible to register for any reason.

OTHER MEANS OF FINANCING GRADUATE EDUCATION

Part-Time Employment

Study toward the Ph.D. degree is expected to be a full-time activity and is funded accordingly. Part-time employment for compensation, at the University or elsewhere, should not conflict with the obligations of the Ph.D. program or interfere with academic progress. International students must consult the Office of International Students and Scholars (OISS) regarding their eligibility for employment while in the United States.

Part-time employment beyond an average of ten hours per week requires permission of the director of graduate studies, who will inform the appropriate associate dean.

Students who hold student loans must report all part-time employment earnings to the Office of Financial Aid. Failure to do so may result in cancellation of the loan(s).

Loans and Work-Study

U.S. citizens may be eligible to borrow through federally subsidized loan programs. Eligibility is based on federal regulations and University policies. Information is available from the Financial Aid Office, 129 HGS.

Eligible students in the Graduate School may be able to borrow from the following federal student loan programs: Federal Stafford Loans and Federal Perkins Loans.

The College Work-Study (CWS) program, which is federally funded, enables eligible graduate students to meet a portion of their academic year financial need through part-time employment.

All students applying for any of these federal programs must fill out a Free Application for Federal Student Aid (FAFSA). Information on loan and work-study programs is contained in *Financial Information for Entering Graduate Students*, included with the student's letter of admission. These documents are available from the Office of Financial Aid. Information and FAFSA applications are also available at the Web site of the United States Department of Education (www.fafsa.ed.gov/).

International and U.S. students are eligible to borrow from the GATE Y-Loan, which does not require a co-signer. This program will allow students to borrow the full cost of their education less any other financial aid they receive. Features of the GATE Y-Loan include a low variable interest rate, no fees, a six-month grace period, a standard twenty-year level repayment stream, and no prepayment penalty. Information is available from the Financial Aid Office, 129 HGS.

TWO FEDERAL REGULATIONS GOVERNING TITLE IV FINANCIAL AID PROGRAMS

Satisfactory Academic Progress

Federal regulations require that students be making satisfactory academic progress each year in order to be eligible for Title IV funding (i.e., federal loans, Javits Fellowships, and College Work-Study). The standards by which satisfactory academic progress is measured are determined by the Graduate School and by individual departments. Verification of satisfactory progress is based on annual student evaluations from the directors of graduate studies and, for students in the dissertation stage, on a statement of progress from the student, the dissertation adviser, and the director of graduate studies.

Department of Education Refund Policy

Students receiving Title IV financial assistance who withdraw during a term and are entitled to a refund of any University charges will have their Title IV assistance adjusted according to a formula specified by the Department of Education. Please consult the Financial Aid Office in 129 HGS.

University Services and Facilities

LIVING ACCOMMODATIONS

Graduate Housing—On Campus

www.yale.edu/gradhousing/

The Graduate Housing Department has dormitory and apartment units for a small number of graduate and professional students. The Graduate Dormitory Office provides dormitory rooms of varying sizes and prices for single occupancy only. The Graduate Apartments Office provides unfurnished apartments consisting of efficiencies and one-, two-, and three-bedroom apartments for singles and families. Both offices are located in Helen Hadley Hall, a graduate dormitory at 420 Temple Street, and have office hours from 9 a.m. to 4 p.m., Monday through Friday.

Applications for 2009–2010 are available as of April 1 online and can be submitted directly from the Web site (www.yale.edu/gradhousing/). For new students at the University, a copy of the letter of acceptance from Yale will need to be submitted to the address on the application form. The Web site is the venue for graduate housing information and includes procedures, facility descriptions, floor plans, and rates. For more dormitory information, contact grad.dorms@yale.edu, tel. 203.432.2167, fax 203.432.4578. For more apartment information, contact grad.apts@yale.edu, tel. 203.432.8270, fax 203.432.4578.

Off-Campus Listing Service

www.yale.edu/offcampushousing

The University's Off-Campus Housing service, limited to current or incoming members of the Yale community, is located at Helen Hadley Hall, 420 Temple Street, and is open from 9 a.m. to 3:30 p.m., Monday through Friday. The listings may also be accessed from any computer at Yale at www.yale.edu/offcampushousing.

University Properties

www.yale.edu/universityproperties

University Properties owns and operates Yale University's nonacademic, off-campus properties in New Haven. The office is committed to enhancing the quality of life at Yale and in downtown New Haven through the development of unique retail and office environments and the revitalization of surrounding neighborhoods.

University Properties offers a variety of quality market-rate housing options to the Yale community and provides high-quality commercial space to businesses. Properties are managed by contracted management companies chosen for their professionalism and ability to work effectively with the Yale community. Several apartment properties are leased exclusively to graduate students. Applications are accepted via the Web site listed above. As these properties are in high demand, early application is encouraged.

HEALTH SERVICES

www.yale.edu/yhp/

Yale University Health Services (YUHS) is located on campus at 17 Hillhouse Avenue. YUHS offers a wide variety of health care services for students and other members of the Yale community. Services include student medicine, gynecology, mental health, pediatrics, pharmacy, laboratory, radiology, a seventeen-bed inpatient care facility (ICF), a round-the-clock urgent care clinic, and such specialty services as allergy, dermatology, orthopedics, and a travel clinic. YUHS also includes the Yale Health Plan (YHP), a health coverage option that coordinates and provides payment for the services outlined above, as well as for emergency treatment, off-site specialty services, inpatient hospital care, and other ancillary services. YUHS's services are detailed in the *YHP Student Handbook*, available through the YHP Member Services Department, 203.432.0246, or on the YHP Web site at www.yale.edu/yhp/.

Eligibility for Services

All full-time Yale degree-candidate students who are paying at least half tuition are enrolled automatically for YHP Basic Coverage. YHP Basic Coverage is offered at no charge and includes preventive health and medical services in the departments of Student Medicine, Internal Medicine, Gynecology, Health Education, and Mental Health & Counseling. In addition, treatment for urgent medical problems can be obtained twenty-four hours a day through Urgent Care.

Students on leave of absence or on extended study and paying less than half tuition are not eligible for YHP Basic Coverage but may enroll in YHP Student Affiliate Coverage. Students enrolled in the Division of Special Registration as nondegree special students or visiting scholars are not eligible for YHP Basic Coverage but may enroll in the YHP Billed Associates Plan and pay a monthly premium. Associates must register for a minimum of one term within the first thirty days of affiliation with the University.

Students not eligible for YHP Basic Coverage may also use the services on a fee-for-service basis. Students who wish to be seen fee-for-service must register with the YHP Member Services Department. Enrollment applications for the YHP Student Affiliate Coverage, Billed Associates Plan, or Fee-for-Service Program are available from the YHP Member Services Department.

All students are welcome to use specialty and ancillary services at YUHS. Upon referral, YHP will cover the cost of these services if the student is a member of YHP Hospitalization/Specialty Coverage (see below). If the student has an alternate insurance plan, YHP will assist in submitting the claims for specialty and ancillary services to the other plan and will bill through the Office of Student Financial Services for noncovered charges and services.

Health Coverage Enrollment

The University also requires all students eligible for YHP Basic Coverage to have adequate hospital insurance coverage. Students may choose YHP Hospitalization/Specialty Coverage or elect to waive the plan if they have other hospitalization coverage, such as

coverage through a spouse or parent. The waiver must be renewed annually, and it is the student's responsibility to confirm receipt of the waiver form by the University's deadlines noted below.

YHP HOSPITALIZATION/SPECIALTY COVERAGE

For a detailed explanation of this plan, see the *YHP Student Handbook*, which is available online at www.yale.edu/yhp/pdf/studenthb.pdf.

Students are automatically enrolled and charged a fee each term on their Student Financial Services bill for YHP Hospitalization/Specialty Coverage. Students with no break in coverage who are enrolled during both the fall and spring terms are billed each term and are covered from August 1 through July 31. For students entering Yale for the first time, readmitted students, and students returning from a leave of absence who have not been covered during their leave, YHP Hospitalization/Specialty Coverage begins on the day the dormitories officially open. A student who is enrolled for the fall term only is covered for services through January 31; a student enrolled for the spring term only is covered for services through July 31.

Waiving the YHP Hospitalization/Specialty Coverage Students are permitted to waive YHP Hospitalization/Specialty Coverage by completing an online waiver form at www.yhpstudentwaiver.yale.edu that demonstrates proof of alternate coverage. It is the student's responsibility to report any changes in alternate insurance coverage to the YHP Member Services Department. Students are encouraged to review their present coverage and compare its benefits to those available under the YHP. The waiver form must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only.

Revoking the waiver Students who waive YHP Hospitalization/Specialty Coverage but later wish to be covered must complete and send a form voiding their waiver to the YHP Member Services Department by September 15 for the full year or fall term, or by January 31 for the spring term only. Students who wish to revoke their waiver during the term may do so, provided they show proof of loss of the alternate insurance plan and enroll within thirty days of the loss of this coverage. YHP premiums will not be prorated.

YHP STUDENT TWO-PERSON AND FAMILY PLANS

A student may enroll his or her lawfully married spouse or same-gender domestic partner and/or legally dependent child(ren) under the age of nineteen in one of two student dependent plans: the Two-Person Plan or the Student Family Plan. These plans include services described in both the YHP Basic Coverage and the YHP Hospitalization/Specialty Coverage. YHP Prescription Plus Coverage may be added at an additional cost. Coverage is not automatic and enrollment is by application. Applications are available from the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp) and must be renewed annually. Applications must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

YHP STUDENT AFFILIATE COVERAGE

Students on leave of absence or extended study, students paying less than half tuition, or students enrolled in the Eli Whitney Program prior to September 2007 may enroll in YHP Student Affiliate Coverage, which includes services described in both the YHP Basic and the YHP Hospitalization/Specialty Coverage. Prescription Plus Coverage may also be added for an additional cost. Applications are available from the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp) and must be received by September 15 for full-year or fall-term coverage, or by January 31 for spring-term coverage only.

YHP PRESCRIPTION PLUS COVERAGE

This plan has been designed for Yale students who purchase YHP Hospitalization/Specialty Coverage and student dependents who are enrolled in either the Two-Person Plan, the Student Family Plan, or Student Affiliate Coverage. YHP Prescription Plus Coverage provides protection for some types of medical expenses not covered under YHP Hospitalization/Specialty Coverage. Students are billed for this plan and may waive this coverage. The online waiver (www.yhpstudentwaiver.yale.edu) must be filed annually and must be received by September 15 for the full year or fall term or by January 31 for the spring term only. For a detailed explanation, please refer to the *YHP Student Handbook*.

Eligibility Changes

Withdrawal A student who withdraws from the University during the first ten days of the term will be refunded the premium paid for YHP Hospitalization/Specialty Coverage and/or YHP Prescription Plus Coverage. The student will not be eligible for any YHP benefits, and the student's YHP membership will be terminated retroactive to the beginning of the term. The medical record will be reviewed, and any services rendered and/or claims paid will be billed to the student on a fee-for-service basis. At all other times, a student who withdraws from the University will be covered by YHP for thirty days following the date of withdrawal or to the last day of the term, whichever comes first. Premiums will not be prorated or refunded. Students who withdraw are not eligible to enroll in YHP Student Affiliate Coverage.

Leaves of absence Students who are granted a leave of absence are eligible to purchase YHP Student Affiliate Coverage during the term(s) of the leave. If the leave occurs during the term, YHP Hospitalization/Specialty Coverage will end on the date the leave is granted and students may enroll in YHP Student Affiliate Coverage. Students must enroll in Affiliate Coverage prior to the beginning of the term during which the leave is taken or within thirty days of the start of the leave. Premiums paid for YHP Hospitalization/Specialty Coverage will be applied toward the cost of Affiliate Coverage. Coverage is not automatic and enrollment forms are available at the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp). Premiums will not be prorated or refunded.

Extended study or reduced tuition Students who are granted extended study status or pay less than half tuition are not eligible for YHP Hospitalization/Specialty Coverage and YHP Prescription Plus Coverage. They may purchase YHP Student Affiliate Coverage

during the term(s) of extended study. This plan includes services described in both the YHP Basic and the YHP Hospitalization/Specialty Coverage. Coverage is not automatic and enrollment forms are available at the YHP Member Services Department or can be downloaded from the YUHS Web site (www.yale.edu/yhp). Students must complete an enrollment application for the plan prior to September 15 for the full year or fall term, or by January 31 for the spring term only.

For a full description of the services and benefits provided by YHP, please refer to the *YHP Student Handbook*, available from the YHP Member Services Department, 203.432.0246, 17 Hillhouse Avenue, PO Box 208237, New Haven CT 06520-8237.

Required Immunizations

Measles (rubeola) and German measles (rubella) All students who were born after December 31, 1956, are required to provide proof of immunization against measles (rubeola) and German measles (rubella). Connecticut state law requires two doses of measles vaccine. The first dose must have been given after January 1, 1969, *and* after the student's first birthday. The second dose must have been given after January 1, 1980. These doses must be at least 30 days apart. Connecticut state law requires proof of one dose of rubella vaccine administered after January 1, 1969, *and* after the student's first birthday. The law applies to all students unless they present (a) a certificate from a physician stating that such immunization is contraindicated, (b) a statement that such immunization would be contrary to the student's religious beliefs, or (c) documentation of a positive blood titer for measles and rubella.

Meningococcus (meningitis) All students living in on-campus housing must be vaccinated against meningococcal disease. The law went into effect in September 2002, meaning that all returning students who plan to live in University housing must be immunized or show proof of immunization within the last five years. Students who are not compliant with this law will not be permitted to register for classes or move into the dormitories for the fall term, 2009. Please note that the State of Connecticut does not require this vaccine for students who intend to reside off campus.

Note: Students who have not met these requirements prior to arrival at Yale University must receive the immunizations from YHP and will be charged accordingly.

COMPUTING AND TELECOMMUNICATIONS

www.yale.edu/its/

Information Technology Services (ITS), located at 175 and 221 Whitney Avenue, is the central computing and communications services organization for the University, providing academic computing, data networking, telephone services, voice and video networking, computer sales, training, printing and copying services, and general user support (www.yale.edu/its/).

Cluster Support Services (CSS) and Student Technology Collaborative (STC), units of ITS, partner to furnish and support general purpose computing clusters at many locations on campus (www.yale.edu/cluster), including the Graduate School's McDougal

Center and the graduate student residences (Helen Hadley Hall and the Hall of Graduate Studies), where the computing facility is accessible to residents twenty-four hours a day (www.yale.edu/its/stc/). Windows and Apple computers and laser printers are available for open use by the Yale community at Connecticut Hall, Bass Library, Dunham Laboratories, Kline Biology Tower, the Social Sciences Statistical Laboratory, and the Sterling Chemistry Laboratory.

The online purchasing site (www.yale.edu/eportal/) sells computers, networking cards, modems, and printers, as well as software and supplies. Apple, Lenovo, and Dell now support direct purchase of computers over the Internet, with systems properly configured for the Yale network. See the student computing site (www.yale.edu/its/stc/purchase) for more information and recommendations for purchasing computer supplies. Up-to-date information on pricing and ordering can be found at the ePortal Web site (www.yale.edu/eportal/).

Graduate students in Arts and Sciences receive free technical support on their personal computers through the Student Technology Collaborative (www.yale.edu/its/stc). Certified technicians provide warranty support on Dell and Apple computers. Students should bring all of their supporting documentation for their computers with them to campus (especially software CDs and DVDs), to facilitate necessary repairs.

Network Access to Yale Services and Beyond

www.yale.edu/its/telecom

ITS Network Services manages Yale's voice and data networks, including long distance, voice mail, operator services, cellular phones, video conference services, Internet and Internet 2 connectivity, and all the related cable and distribution facilities on Central Campus and in the Medical Center. The University provides a large, central system for e-mail, Web page hosting, and other services for the Graduate School, Yale College, and selected professional schools.

Use of many of Yale's network resources requires a NetID and password. All new graduate students are automatically assigned a NetID, and all students in the Graduate School are provided with e-mail accounts.

Most rooms in on-campus residences, offices, and laboratories are equipped with Ethernet data outlets. Students need to register their computers (www.yale.edu/netreg) to use their computers on the Yale network.

To enhance support for graduate student research activities, the University provides network roaming access for laptop computers. Laptop Ethernet ports and wireless Ethernet access sites are available in on-campus residences, in public areas of HGS, including the Dining Hall, the McDougal Center Common Room, and 119 HGS, in the Sterling Memorial Library (SML) reading room and, for doctoral students, in the SML carrels. Wireless access points are available in many buildings on campus. Registered users can access network resources through wired or wireless connections (www.yale.edu/its/network/wireless/).

ITS Network Services provides on-campus telecommunications services, including local and long-distance phone service, voice mail, and operator services, as well as basic cable TV service in on-campus residences. Long-distance service for telephones

on campus is available through the University's private network, YALENET. On-campus long-distance or toll calls require a toll authorization number (TAN), which can be arranged through the telecommunications office as well as through departmental offices. Phone cards and personal calling cards may also be used. YALENET calling cards are available to address off-campus needs.

OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS

International Center for Students and Scholars, 421 Temple Street
www.oiss.yale.edu/

The Office of International Students and Scholars (OISS) coordinates services and support for Yale's international students, faculty, staff, and their dependents. OISS assists members of the Yale international community with all matters of special concern to them and serves as a source of referral to other university offices and departments. OISS staff provide assistance with employment, immigration, personal and cultural adjustment, and family and financial matters, as well as serve as a source of general information about living at Yale and in New Haven. In addition, as Yale University's representative for immigration concerns, OISS provides information and assistance to students, staff, and faculty on how to obtain and maintain legal status in the United States, issues the visa documents needed to request entry into the U.S. under Yale's immigration sponsorship, and processes requests for extensions of authorized periods of stay, school transfers, and employment authorization. All international students and scholars must register with OISS as soon as they arrive at Yale, at which time OISS will provide information about orientation activities for newly arrived students, scholars, and family members. OISS programs, like the international coffee hours, Community Friends hosting program, daily English conversation groups and conversation partners program, U.S. culture workshops, and receptions for newly arrived graduate students, postdocs, and visiting scholars, provide an opportunity to meet members of Yale's international community and become acquainted with the many resources of Yale University and New Haven. OISS welcomes volunteers from the Yale community to serve as hosts and as English conversation partners. Interested individuals should contact OISS at 203.432.2305.

OISS maintains an extensive Web site (www.oiss.yale.edu) with useful information for students and scholars prior to and upon arrival in New Haven. As U.S. immigration regulations are complex and change rather frequently, we urge international students and scholars to visit the office and check the Web site for the most recent updates.

International students, scholars, and their families and partners can connect with OISS and the international community at Yale by subscribing to the following e-mail lists. OISS-L is the OISS electronic newsletter for Yale's international community. *YaleInternational E-Group* is an interactive list through which over 3,000 international students and scholars connect to find roommates, rent apartments, sell cars and household goods, find companions, and keep each other informed about events in the area. Spouses and partners of international students and scholars will want to get involved with the organization called International Spouses and Partners at Yale (ISPY), which organizes

a variety of programs for the spouse and partner community. The *ISPY E-Group* is an interactive list of over 300 members to connect spouses, partners, and families at Yale. To subscribe to any list, send a message to oiss@yale.edu.

Housed in the International Center for Yale Students and Scholars at 421 Temple Street, the Office of International Students and Scholars is open Monday through Friday from 8:30 a.m. to 5 p.m., except Tuesday, when the office is open from 10 a.m. to 5 p.m.; tel. 203.432.2305.

INTERNATIONAL CENTER FOR YALE STUDENTS AND SCHOLARS

The International Center for Yale Students and Scholars, located at 421 Temple Street, across the street from Helen Hadley Hall, offers a central location for programs that both support the international community and promote cross-cultural understanding on campus. The center, home to OISS, provides a welcoming venue for students and scholars who want to peruse resource materials, check their e-mail, and meet up with a friend or colleague. Open until 9 p.m. on weekdays during the academic year, the center also provides office and meeting space for student groups, and a space for events organized by both student groups and University departments. In addition, the center has nine library carrels that can be reserved by academic departments for short-term international visitors. For more information about the International Center, call 432.2305 or visit the center at 421 Temple Street.

INTERNATIONAL STUDENT LIFE

In addition to the standard funding package for Ph.D. candidates, the Graduate School provides a number of resources specifically to international students. Among the most important of these is improved language training, both oral and written. The English Language Institute (www.yale.edu/eli) currently offers a six-week intensive summer language program in English as a Second Language (ESL). The School has also expanded the total number of ESL courses available throughout the academic year, including a conversation partners program and an advanced writing program, as well as the number of language fellowships available to graduate students interested in this program.

The McDougal Graduate Student Center (www.yale.edu/graduateschool/studentLife) provides services, programs, and facilities for all graduate students and facilitates student services that are particularly helpful for international students adjusting to life in New Haven. The center provides an extensive weeklong orientation program for all new students, including several events for new international students in cooperation with the Office of International Students and Scholars. The center's staff and McDougal graduate fellows also provide special programs of interest to international students throughout the year, including cultural and social events, family programs and events, arts and music outings, workshops on cultural adjustment, safety, and health, and professional development seminars on careers, teaching, and writing. The McDougal Graduate Student Life Office co-sponsors and supports the activities of many graduate student nationality groups and intercultural performance groups.

RESOURCE OFFICE ON DISABILITIES

www.yale.edu/rod

The Resource Office on Disabilities facilitates accommodations for undergraduate and graduate and professional school students with disabilities who register with and have appropriate documentation on file in the Resource Office. Early planning is critical. Documentation may be submitted to the Resource Office even though a specific accommodation request is not anticipated at the time of registration. It is recommended that matriculating students in need of disability-related accommodations at Yale University contact the Resource Office by June 5. Special requests for University housing need to be made in the housing application. Returning students must contact the Resource Office at the beginning of each term to arrange for course and exam accommodations.

The Resource Office also provides assistance to students with temporary disabilities. General informational inquiries are welcome from students and members of the Yale community and from the public. The mailing address is Resource Office on Disabilities, Yale University, PO Box 208305, New Haven CT 06520-8305. The Resource Office is located in William L. Harkness Hall (WLH), Rooms 102 and 103. Access to the Resource Office is through the Cross Campus entrance to WLH. Office hours are Monday through Friday, 8:30 a.m. to 4:30 p.m. Voice callers may reach staff at 203.432.2324; TTY/TDD callers at 203.432.8250. The Resource Office may also be reached by e-mail (judith.york@yale.edu) or through its Web site (www.yale.edu/rod).

The Work of Yale University

The work of Yale University is carried on in the following schools:

Yale College Est. 1701. Courses in humanities, social sciences, natural sciences, mathematical and computer sciences, and engineering. Bachelor of Arts (B.A.), Bachelor of Science (B.S.).

For additional information, please write to the Office of Undergraduate Admissions, Yale University, PO Box 208234, New Haven CT 06520-8234; tel., 203.432.9300; e-mail, student.questions@yale.edu; Web site, www.yale.edu/admit

Graduate School of Arts and Sciences Est. 1847. Courses for college graduates. Master of Arts (M.A.), Master of Engineering (M.Eng.), Master of Science (M.S.), Master of Philosophy (M.Phil.), Doctor of Philosophy (Ph.D.).

For additional information, please visit www.yale.edu/graduateschool, write to graduate.admissions@yale.edu, or call the Office of Graduate Admissions at 203.432.2771. Postal correspondence should be directed to the Office of Graduate Admissions, Yale Graduate School of Arts and Sciences, PO Box 208323, New Haven CT 06520-8323.

School of Medicine Est. 1813. 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 program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Master of Health Science (M.D./M.H.S.). Courses in public health for qualified students. Master of Public Health (M.P.H.), Master of Medical Science (M.M.Sc.) from the Physician Associate Program.

For additional information, please write to the Director of Admissions, Office of Admissions, Yale School of Medicine, 367 Cedar Street, New Haven CT 06510; tel., 203.785.2643; fax, 203.785.3234; e-mail, medical.admissions@yale.edu; Web site, <http://info.med.yale.edu/education/admissions>

For additional information about the School of Public Health (est. 1915), please write to the Director of Admissions, Yale School of Public Health, PO Box 208034, New Haven CT 06520-8034; e-mail, eph.admissions@yale.edu; Web site, <http://publichealth.yale.edu>

Divinity School Est. 1822. Courses for college graduates. Master of Divinity (M.Div.), Master of Arts in Religion (M.A.R.). Individuals with an M.Div. degree may apply for the program leading to the degree of Master of Sacred Theology (S.T.M.).

For additional information, please write to the Admissions Office, Yale Divinity School, 409 Prospect Street, New Haven CT 06511; tel., 203.432.5360; fax, 203.432.7475; e-mail, divinity.admissions@yale.edu; Web site, www.yale.edu/divinity. Online application, <https://apply.divinity.yale.edu/apply>

Law School Est. 1824. Courses for college graduates. Juris Doctor (J.D.). For additional information, please write to the Admissions Office, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.4995; e-mail, admissions.law@yale.edu; Web site, www.law.yale.edu

Graduate Programs: Master of Laws (LL.M.), Doctor of the Science of Law (J.S.D.), Master of Studies in Law (M.S.L.). For additional information, please write to Graduate Programs, Yale Law School, PO Box 208215, New Haven CT 06520-8215; tel., 203.432.1696; e-mail, gradpro.law@yale.edu; Web site, www.law.yale.edu

School of Art Est. 1869. Professional courses for college and art school graduates. Master of Fine Arts (M.F.A.).

For additional information, please write to the Office of Academic Affairs, Yale School of Art, PO Box 208339, New Haven CT 06520-8339; tel., 203.432.2600; e-mail, artschool.info@yale.edu; Web site, <http://art.yale.edu>

School of Music Est. 1894. Graduate professional studies in performance, composition, and conducting. Certificate in Performance, Master of Music (M.M.), Master of Musical Arts (M.M.A.), Artist Diploma, Doctor of Musical Arts (D.M.A.).

For additional information, please write to the Yale School of Music, PO Box 208246, New Haven CT 06520-8246; tel., 203.432.4155; fax, 203.432.7448; e-mail, gradmusic.admissions@yale.edu; Web site, www.music.yale.edu

School of Forestry & Environmental Studies Est. 1900. Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.), Doctor of Philosophy (Ph.D.).

For additional information, please write to the Office of Admissions, Yale School of Forestry & Environmental Studies, 195 Prospect Street, New Haven CT 06511; tel., 800.825.0330; e-mail, fesinfo@yale.edu; Web site, <http://environment.yale.edu>

School of Architecture Est. 1916. Courses for college graduates. Professional degree: Master of Architecture (M.Arch.); nonprofessional degree: Master of Environmental Design (M.E.D.).

For additional information, please write to the Yale School of Architecture, PO Box 208242, New Haven CT 06520-8242; tel., 203.432.2296; e-mail, gradarch.admissions@yale.edu; Web site, www.architecture.yale.edu

School of Nursing Est. 1923. Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Philosophy (Ph.D.).

For additional information, please write to the Yale School of Nursing, PO Box 9740, New Haven CT 06536-0740; tel., 203.785.2389; Web site, <http://nursing.yale.edu>

School of Drama Est. 1955. 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.).

For additional information, please write to the Admissions Office, Yale School of Drama, PO Box 208325, New Haven CT 06520-8325; tel., 203.432.1507; e-mail, ysd.admissions@yale.edu; Web site, www.drama.yale.edu

School of Management Est. 1976. Courses for college graduates. Master of Business Administration (M.B.A.).

For additional information, please write to the Admissions Office, Yale School of Management, PO Box 208200, New Haven CT 06520-8200; tel., 203.432.5635; fax, 203.432.7004; e-mail, mba.admissions@yale.edu; Web site, <http://mba.yale.edu>

YALE UNIVERSITY CAMPUS NORTH



Continued on next page

The map illustrates the Yale University campus in New Haven, CT, with a focus on the area around the Old Campus and New Haven Green. Key features include:

- Streets:** Elm Street, Chapel Street, College Street, North Frontage Road, South Frontage Road, Howard Avenue, Ward Street, and others.
- Buildings and Landmarks:**
 - Old Campus:** Includes the Yale Library, Yale Art Gallery, and various lecture halls.
 - New Haven Green:** A large open space with several buildings.
 - Cross Campus:** Includes the Sterling Hall of Medicine and the Harkness Auditorium.
 - Medical Center:** Includes the Yale-New Haven Hospital, Children's Hospital, and the School of Nursing.
 - Air Rights Parking Facility:** A large parking area near the Medical Center.
- Other Features:**
 - Yale Athletic Fields:** Located near the Elm Street and Chapel Street intersection.
 - Yale School of Nursing:** Located near the Howard Avenue and Ward Street intersection.
 - Yale-New Haven Hospital:** A large medical facility near the Howard Avenue and Ward Street intersection.

The map also shows the location of the Yale University Press and the Yale University Library. The map is oriented with North at the top.

The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons of diverse backgrounds. In accordance with this policy and as delineated by federal and Connecticut law, Yale does not discriminate in admissions, educational programs, or employment against any individual on account of that individual's sex, race, color, religion, age, disability, status as a special disabled veteran, veteran of the Vietnam era, or other covered veteran, or national or ethnic origin; nor does Yale discriminate on the basis of sexual orientation or gender identity or expression.

University policy is committed to affirmative action under law in employment of women, minority group members, individuals with disabilities, special disabled veterans, veterans of the Vietnam era, and other covered veterans.

Inquiries concerning these policies may be referred to the Office for Equal Opportunity Programs, 104 William L. Harkness Hall, 203.432.0849.

In accordance with both federal and state law, the University maintains information concerning current security policies and procedures and prepares an annual crime report concerning crimes committed within the geographical limits of the University. In addition, in accordance with federal law, the University maintains information concerning current fire safety practices and prepares an annual fire safety report concerning fires occurring in on-campus student housing facilities. Upon request to the Office of the Secretary of the University, PO Box 208230, New Haven CT 06520-8230, 203.432.2310, the University will provide such information to any applicant for admission.

In accordance with federal law, the University prepares an annual report on participation rates, financial support, and other information regarding men's and women's intercollegiate athletic programs. Upon request to the Director of Athletics, PO Box 208216, New Haven CT 06520-8216, 203.432.1414, the University will provide its annual report to any student or prospective student..

Offices Serving Graduate Students

POLICE EMERGENCY Dial 911 from any University telephone.

HEALTH EMERGENCY 432.0123

GRADUATE HOUSING OFFICE 432.2167, 420 Temple Street,
www.yale.edu/gradhousing/

GRADUATE-PROFESSIONAL STUDENT CENTER 432.2638, 204 York Street,
www.yale.edu/gpss/GPSCY_Bar/gryphons.html

GRADUATE-PROFESSIONAL STUDENT SENATE 204 York Street,
www.yale.edu/gpss/

GRADUATE STUDENT ASSEMBLY 432.8893, www.yale.edu/gsa

GRADUATE STUDENT DOSSIER SERVICE 432.8850, 320 York Street,
www.yale.edu/graduateschool/careers/dossier.html

OFFICE OF INTERNATIONAL STUDENTS AND SCHOLARS 432.2305, 421 Temple Street,
www.yale.edu/oiss/

STUDENT EMPLOYMENT OFFICE 432.0167, 246 Church Street,
www.yalestudentjobs.org/

UNIVERSITY HEALTH SERVICE 432.0246, 17 Hillhouse Avenue, www.yale.edu/yhp/

UNIVERSITY POLICE 432.4400, Headquarters–Rose Center, 101 Ashmun Street

(A student arrested by the New Haven Police Department for anything other than a minor traffic violation should immediately contact the Chief of the University.)

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