

Graduate School of Arts and Sciences

Programs and Policies

2002 – 2003



bulletin of yale university

Series 98 Number 10 August 20, 2002

Bulletin of Yale University

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

PO Box 208230, New Haven CT 06520-8230
Periodicals postage paid at New Haven, Connecticut

Issued sixteen times a year: one time a year in May, November, and December; two times a year in June and September; three times a year in July; six times a year in August

Managing Editor: Linda Koch Lorimer
Editor: David J. Baker
Editorial and Publishing Office: 175 Whitney Avenue, New Haven, Connecticut
Publication number (usps 078-500)

Printed in Canada

The closing date for material in this bulletin was June 10, 2002.
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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Cover: Hall of Graduate Studies. Photo by Harold Shapiro

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Copies of this publication may be obtained from Graduate School Student Services and Reception Office, Yale University, PO Box 208236, New Haven CT 06520-8236. Cost is \$5.00 (U.S.), prepaid.

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The President and Fellows of Yale University

President

Richard Charles Levin, b.a., b.litt., ph.d.

Fellows

His Excellency the Governor of Connecticut, *ex officio*.

Her Honor the Lieutenant Governor of Connecticut, *ex officio*.

George Leonard Baker, Jr., b.a., m.b.a., *Palo Alto, California*.

Edward Perry Bass, b.s., *Fort Worth, Texas*.

Roland Whitney Betts, b.a., j.d., *New York, New York (June 2005)*.

Benjamin Solomon Carson, Sr., b.a., m.d., *Upperco, Maryland (June 2003)*.

Gerhard Casper, ll.m., ph.d., *Atherton, California*.

Susan Crown, b.a., m.a., *Chicago, Illinois*.

Charles Daniel Ellis, b.a., m.b.a., ph.d., *New Haven, Connecticut*.

Holcombe Tucker Green, Jr., b.a., ll.b., *Atlanta, Georgia*.

Maya Ying Lin, b.a., m.arch., d.f.a., *New York, New York (June 2008)*.

Linda Anne Mason, b.a., m.b.a., *Belmont, Massachusetts (June 2004)*.

The Rt. Rev. Victoria Matthews, b.a., m.div., th.m., *Edmonton, Alberta, Canada*.

Barrington Daniel Parker, Jr., b.a., ll.b., *Stamford, Connecticut*.

John Ennis Pepper, Jr., b.a., m.a., *Cincinnati, Ohio*.

Theodore Ping Shen, b.a., m.b.a., *Brooklyn Heights, New York (June 2007)*.

Janet Louise Yellen, b.a., ph.d., *Berkeley, California (June 2006)*.

The Officers of Yale University

President

Richard Charles Levin, b.a., b.lit., ph.d.

Provost

Alison Fettes Richard, m.a., ph.d.

Vice President and Secretary

Linda Koch Lorimer, b.a., j.d.

Vice President and General Counsel

Dorothy Kathryn Robinson, b.a., j.d.

Vice President for Development

Charles James Pagnam, b.a.

Vice President and Director of New Haven and State Affairs

Bruce Donald Alexander, b.a., j.d.

Vice President for Finance and Administration

Robert Loren Culver, b.a., m.a., m.p.a.

The Administration of the Graduate School

Susan Hockfield, ph.d., *Dean of the Graduate School*

Pamela Schirmeister, ph.d., *Associate Dean of the Graduate School*

Richard Sleight, ph.d., *Associate Dean of the Graduate School*

Thomas Burns, ph.d., *Assistant Dean of the Graduate School*

Liza Cariaga-Lo, ed.d., *Assistant Dean of the Graduate School and Director,
Office for Diversity and Equal Opportunity*

Diana Cordova, ph.d., *Assistant Dean of the Graduate School*

Lisa Brandes, ph.d., *Director, Student Life, McDougal Graduate Student Center*

Jennifer Brinley, b.s., *Associate Director, Finance and Financial Aid*

Robert Colonna, m.b.a., *Director of Admissions*

Stephen Goot, m.a., *Deputy Registrar, Faculty of Arts and Sciences*

Judith Dozier Hackman, ph.d., *Director, Teaching Fellow Program*

Mary Johnson, ph.d., *Director, Graduate Career Services, McDougal Center*

Barry S. Kane, m.s.w., *Registrar, Faculty of Arts and Sciences*

Alice Oliver, *Director, Finance and Administration*

William C. Rando, ph.d., *Director, Teaching Fellow Preparation and Development*

Calendar*

fall 2002

August 26	Monday	New student orientation begins
August 28	Wednesday	Matriculation ceremony
August 29	Thursday	SPEAK test for new international students in Ph.D. programs
August 30	Friday	Registration and orientation in departments for <i>all</i> new students begins
September 3	Tuesday	Registration and fall ID validation for returning students begins
<i>September 4</i>	<i>Wednesday</i>	<i>Fall-term classes begin, 8.30 A.M.</i>
September 18	Wednesday	Registration ends, 4.30 p.m.
October 25	Friday	Midterm
November 22	Friday	Fall recess begins, 5.20 p.m.
December 2	Monday	Classes resume, 8.30 a.m.
<i>December 21</i>	<i>Saturday</i>	<i>Fall term ends</i> Winter recess begins

spring 2003

January 13	Monday	Spring-term registration begins <i>Spring-term classes begin, 8.30 A.M.</i>
March 7	Friday	Midterm Spring recess begins, 5.20 p.m.
March 24	Monday	Classes resume, 8.30 a.m.
<i>May 13</i>	<i>Tuesday</i>	<i>Spring term ends</i>
May 25	Sunday	Graduate School Convocation
May 26	Monday	University Commencement

*A more extensive Schedule of Academic Dates and Deadlines is presented on pages 415–18.

A Message from the Dean

Graduate education offers challenges and rewards that differ from those of undergraduate study. The goal of graduate education is to prepare a scholar to contribute to the advancement of human knowledge. A graduate student will explore one field in depth, will gain mastery of a specialized subject matter, and will learn to communicate knowledge in the classroom. To study a subject in depth in the free and open environment of a great university is an exhilarating opportunity. Each department and graduate program at Yale has its own community of scholars—distinguished faculty and talented students—who share a common interest in learning about a particular discipline. These discipline-based communities are enriched by the range of scholarly activity throughout the University. Our students gain immeasurably from working with the faculty and from interacting with their fellow students. Their education is facilitated by Yale's laboratories and the rich resources of its library and museum collections.

Graduate study at Yale University prepares students for careers in teaching and research, and for a wide variety of leadership positions. The contours of graduate education at Yale have changed over the years as intellectual inquiry has evolved. New disciplines have formed, traditional disciplines have taken on new life, and the knowledge base in all fields has grown rapidly. In recent years, new departments and programs have been established, and the Graduate School has continued to refine and improve degree programs in all areas.

This book, *Programs and Policies*, describes all the graduate programs currently available at Yale. It also contains practical information about registration and financial aid, and the full range of services available to our students. I encourage you to use this book as a guide to the activities of the Graduate School. Please never hesitate to contact the staff of the Graduate School with any questions you may have. All of us wish you fulfillment and success in your chosen programs of study.

Susan Hockfield

The Graduate School of Arts and Sciences

The Yale Graduate School of Arts and Sciences is one of twelve schools composing Yale University and the only one that awards the degrees of Doctor of Philosophy, Master of Philosophy, Master of Arts, and Master of Science. The work of the Graduate School is carried on in the divisions of the Humanities, Social Sciences, and Biological and Physical Sciences. The divisions encompass seventy-four departments and programs, fifty-six of which offer courses of study leading to the Ph.D. degree. There are currently twenty-five 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 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 2,300 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 350 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 in which an unusually intimate exchange of ideas takes place.

resources for research and study

Yale's outstanding facilities for research and study include a university library system of more than ten million volumes, the Beinecke Rare Book and Manuscript Library, the Yale University Art Gallery, the Yale Center for British Art, the Office of Information Technology Services, departmental libraries and collections, and the extensive resources of the professional schools. The collections and services of the Research Libraries Group, which consists of Columbia, Harvard, and Yale universities and the New York Public Library, are also available to students.

Special research facilities for the sciences include the Bass Center for Molecular and Structural Biology, Josiah Willard Gibbs Research Laboratories, the Kline Geology Laboratory, the Sterling Chemistry Laboratory, the fourteen-story Kline Biology Tower, the Becton Engineering and Applied Science Center, the Peabody Museum of Natural History, the Arthur W. Wright Nuclear Structure Laboratory, Arthur K. Watson Hall for computer science, the Boyer Center for Molecular Medicine, and the many other science laboratories throughout the campus.

the dean

Susan Hockfield, 112 HGS, 432.2733, susan.hockfield@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.

the associate deans

The associate 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. Their current responsibilities are as follows:

Pamela Schirmeister, 136 HGS, 432.7598, pamela.schirmeister@yale.edu

Ph.D. and terminal master's programs in African American Studies; African Studies; American Studies; Archaeological Studies; Classics; Comparative Literature; East Asian Languages and Literatures; East Asian Studies; Economics; English Language and Literature; 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; Russian and East European Studies; Slavic Languages and Literatures; Sociology; and Spanish and Portuguese

Richard G. Sleight, 132 HGS, 432.2744, richard.sleight@yale.edu

Ph.D. and terminal master's programs in Anthropology; Applied Mathematics; Astronomy; Biological and Biomedical Sciences; Biostatistics; Cell Biology; Cellular and Molecular Physiology; Chemistry; Computer Science; Ecology and Evolutionary Biology; Engineering and Applied Science (Applied Physics, Chemical Engineering, Electrical 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; Pathology; Pharmacology; Physics; Psychology; and Statistics

the assistant deans

The assistant deans help the associate deans fulfill all their duties and responsibilities.

Diana Cordova, Assistant Dean, Humanities and Social Sciences, 135 HGS, 436.2628, diana.cordova@yale.edu

Thomas Burns, Assistant Dean, Sciences, 133 HGS, 432.1884, thomas.burns@yale.edu

Liza Cariaga-Lo, Assistant Dean, Director, Office for Diversity and Equal Opportunity, 127 HGS, 436.1301, liza.cariaga-lo@yale.edu

office for diversity and equal opportunity

Liza Cariaga-Lo, Assistant Dean, Director, 127 HGS, 432.0763, liza.cariaga-lo@yale.edu

The Office for Diversity and Equal Opportunity's mission is to expand the diversity within the student body and to enhance the intellectual experience of the entire scholarly community. The office coordinates efforts to recruit and retain minority students, women, and other underrepresented 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, Post-Baccalaureate Research Education Program (PREP), oversees Minority Recruitment Days, writes and administers grants, and provides reports on the Graduate School's progress in recruiting and retaining underrepresented 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 minority scholars, and social and cultural events. An Advisory Committee, appointed by the dean, meets regularly to discuss and review the office's programmatic efforts.

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.

teaching

The Teaching Fellow Program

Judith Dozier Hackman, Director, 139 HGS, 432.2757, judith.hackman@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.

the mcdougal graduate student center

Hall of Graduate Studies, 432.11ue (2583)

www.yale.edu/graduateschool/mcdougal/

Facilities and Services

A generous gift from Mr. Alfred McDougal, 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.

The facilities of the McDougal Center, which is housed in HGS, enhance student life in many ways. The restored Common Room has a lounge with comfortable furnishings and the student-run Blue Dog Cafe, which serves coffee and light foods. Other center facilities include large meeting rooms, a seminar room, a recreation room, an ITS student computing cluster with printer and copier, telephones, information kiosks, lockers, and vending machines, and the Resource Library. The center also has offices for the McDougal Fellows and Working at Teaching graduate student staff, the Graduate Student Assembly, as well as the directors and staff of Student Life, Graduate Career Services, and Teaching Fellow Preparation and Development, described below.

The McDougal Center, which is open days, evenings, and weekends during the academic term, provides members of the Graduate School community with a place of their own on campus. The center also welcomes postdoctoral appointees, faculty, staff, and alumni/ae of the Graduate School, as well as members of the larger Yale graduate and professional school community. Graduate student groups and departments may request to reserve space by contacting the center office.

Office of Student Life

Lisa Brandes, Director

HGS 122, 432.2583

mcdougal.center@yale.edu

www.yale.edu/graduateschool/mcdougal/student_affairs/index.html

The Office of Student Life is responsible for student life programs in the McDougal Center and student services in the Graduate School. McDougal Graduate Fellows produce a wide array of Student Life programs, including fellowship and dissertation workshops, coffeehouses, arts and cultural events, health and wellness sessions, outings, community service opportunities, monthly happy hours, and events for various student groups. Student Life provides advice and support to graduate student organizations, which sponsor events at the center. Activities are announced in the weekly e-mail McDougal Notes (www.yale.edu/graduateschool/mcdougal), through specialized e-mail lists, and on the McDougal Center Student Life Web site listed above.

The Office of Student Life also coordinates general campus services for graduate students, serving as the student advocate and departmental liaison for graduate housing, dining services, health services, athletics, security, and parking and transit. The director 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. This office maintains a Web site of information and links about graduate student services (www.yale.edu/graduateschool/services/). The Student Life office also organizes recruitment activities, new student orientation, dean's events, Commencement, and other events for the Graduate School community.

Office of Teaching Fellow Preparation and Development

William C. Rando, Director, 125 HGS, 432.2583, william.rando@yale.edu
www.yale.edu/graduateschool/mcdougal/tfpd/

The Office of Teaching Fellow Preparation and Development enhances the preparation of Yale graduate students for their current and future teaching responsibilities. The director collaborates with academic departments to expand pedagogical training; organizes programs at the McDougal Center; advises Working at Teaching, a teacher preparation program led by graduate students; and provides one-on-one consultation and classroom observations for teaching fellows and other members of the Yale community.

Office of Graduate Career Services

Mary Johnson, Director, 124 HGS, 432.2583, graduate.career.services@yale.edu,
www.yale.edu/graduatechool/mcdougal/gcs

Graduate Career Services (GCS) is a comprehensive career center for students and alumni/ae of the Graduate School and for postdoctoral fellows. Through individual counseling, a full schedule of programs each term, videotaped mock interviews, and a library of print resources as well as career-related Web links, the office assists graduate students and alumni/ae with career decision making and planning. It helps them think about what they want to do, know what is out there, make career decisions, and know how to search for a job. For graduate students considering nonacademic careers, the director initiates programs and develops links with employers who seek graduate students' skills. 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. GCS encourages students 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.

Dossier Service

126 HGS, McDougal Center, 432.8850, fax 432.8356, graduate.career.services@yale.edu
www.yale.edu/graduateschool/mcdougal/dossier.html

Students and alumni/ae applying for academic or nonacademic positions may use the dossier service. The dossier contains students' letters of recommendation and an official transcript of Yale graduate work. On request, a dossier will be sent to employers, agencies, and schools considering a student or alumnus/a for permanent or short-term positions, and for grants and fellowships. The director of Graduate Career Services oversees the Dossier Service.

Resource Library

121 HGS, McDougal Center
www.yale.edu/graduateschool/mcdougal/resource.html

The Resource Library, a self-service facility, provides information for graduate students, postdoctoral appointees, and faculty on fellowships, research and travel funding, and information on teaching, careers, writing, and professional development. The Fellowship Collection of the library contains copies of the Graduate School Fellowship Guide, grant directories and fellowship announcements, and an online site of links, announcements, and searchable databases. Materials may be consulted in the library or checked out for use in the center.

office of finance and administration

Alice Oliver, Director, 131 HGS, 432.2739, alice.oliver@yale.edu
www.yale.edu/graduateschool/financial/

The Office of Finance and Administration helps students with their financial questions and works with the dean to develop and manage the budgets of the Graduate School. The office oversees and maintains financial and data management systems. The office is a resource to students, departments, and outside organizations needing advice or assistance with statistical information, administration of external fellowships, student loan programs, and financial aid policies.

office of graduate admissions

Robert Colonna, Director, 117B HGS, 203.432.2773, 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.

registrar's office

Stephen Goot, Deputy Registrar, 142 HGS, 432.2743, stephen.goot@yale.edu
www.yale.edu/graduateschool/academics/registrar.html

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 address, to request transcripts, or to certify their enrollment in the Graduate School.

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 the description of grievance procedures on page 388).

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 the description of grievance procedures on page 388).

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 pages 386–88).

graduate student assembly

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

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, and nominates the student members of all Graduate School standing committees. 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.

Departments and Programs

This section provides information on all departments and programs of the Graduate School. Each listing provides a roster of faculty, special admissions and degree requirements for that department or program, and the courses offered in 2002–2003. 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, on pages 370–79. 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 the Graduate School's publication *2002 Fall Term Course Offerings*, or 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. Course information is also available at www.yale.edu/courseinfo/.

african american studies

493 College, 432.1170
M.A., M.Phil., Ph.D.

Chair

Paul Gilroy

Director of Graduate Studies

Matthew Jacobson (493 College, matthew.jacobson@yale.edu)

Professors

Hazel Carby, William Foltz, Glenda Gilmore, Paul Gilroy, Ezra Griffith, Matthew Jacobson, Gerald Jaynes, Vera Kutzinski, Christopher L. Miller, Joseph Roach, Robert Stepto, John Szwed, Robert Thompson

Associate Professors

Elizabeth Alexander, Jonathan Holloway, Serene Jones, David Krasner, Patricia Pessar

Assistant Professors

Jennifer Baszile, Alicia Schmidt Camacho, Kamari Clarke, Nadine George, Kellie Jones, Naomi Pabst, Diana Paulin, Michael Veal

Lecturers

Alondra Nelson, Flemming Norcott, Gerald Thomas

Fields of Study

African American Studies offers a combined Ph.D. with a number of other departments and programs. Departments and programs which currently offer a combined Ph.D. with African American Studies are: American Studies, Anthropology, English, 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 African American Studies as your “Proposed Department/Program of Study” and then indicate *one* of the participating departments/programs listed above as your “Combined Program/Specialty/Subfield/Track.” Additionally, please indicate African American Studies as your “Proposed Department/Program of Study” 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 the Racial Formation of the United States in the Late Twentieth Century (AFAM 505a), which is a required course for all *first-year* graduate students in the combined program; (2) Readings in Twentieth-Century American Political and Social History (AFAM 706b/AMST 714b/HIST 735b) and/or Readings in African American History since 1865 (AFAM 710a/AMST 742a/HIST 740a); (3) Modernity and Its Others: Self, Subject, and Cultural Differences (AFAM 712b/SOCY 650b); (4) Research Workshop (AFAM 895). After completion of course work, students will be required to attend the one-year research workshop during their third year. This research 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 research 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. 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 in this publication). 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, page 375.

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, pages 370–79.

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, Theorizing the Racial Formation of the United States in the Late Twentieth Century. Paul Gilroy.

t 9.30–11.20

A designated core course for students in the joint Ph.D. program; also open to students in American Studies. The interdisciplinary seminar includes readings from the fields of anthropology, critical legal studies, cultural studies, literary history, history, politics, and sociology. Also *AMST 643a*.

[AFAM 516b, Deconstructing Black Identities: Methods from the Humanities and Social Sciences.]

AFAM 525b^u, Psychosocial Study of Black Autobiography. Ezra Griffith.

w 2.30–4.20

Autobiographies of black men and women analyzed especially for an understanding of their coping mechanisms, with attention to problems, satisfactions, disappointments, grief, and fulfillments.

AFAM 542a^u, Comparative Approaches to Recounting Stories of Black Lives. Ezra Griffith.

w 2.30–4.20

A comparative analysis of several methodologies used by writers to recount the story of a black life. Systematic attention is given to the framework established by Erik Erikson and Daniel Levinson to study single life development. Then this framework is applied to the study of black autobiographies, biographies (e.g., Charles Hamilton's *Adam Clayton Powell, Jr.*), and other genres of storytelling as seen, for example, in Sarah Lawrence-Lightfoot's *I've Known Rivers*, James Comer's *Maggie's American Dream*, and James McBride's *The Color of Water*. The strengths and weaknesses of these different techniques of black single life study are considered.

AFAM 557a^u, Introduction to Jazz Studies. John Szwed.

th 1.30–3.20

An overview of the music and its cultural history, with consideration of the influence of jazz on the visual arts, dance, literature, and film; an introduction to the scholarship and methods of jazz studies. *Also AMST 703a^u, ANTH 681a^u.*

AFAM 562a^u, Miles Davis. John Szwed.

t 1.30–3.20

A survey of the life and music of Miles Davis, examining the social history and musical traditions that shaped his work and exploring his influence on music, literature, and society. *Also ANTH 535a^u.*

AFAM 563a^u, Ralph Ellison in Context. Robert Stepto.

w 3.30–5.20

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 American 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, 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*. This course is open to senior majors. *Also AMST 921a^u, ENGL 921a^u.*

AFAM 568a, Race, Nation, and American Modernisms. Vera Kutzinski.

m 3.30–5.20

Examination of the intimate and vexed relations between modernism and its cultural others in early to mid-twentieth-century literature from the United States. We read select fiction and poetry from this period in order both to question and to understand the different ways in which U.S. American writers tackled, or evaded, politically and socially pressing (and thus anxious) questions of difference relative to gender, sexuality, race, and class, as they struggled to articulate a viable national identity and/or poetics. *Also AMST 766a, ENGL 923a.*

[AFAM 573a, Transnationalism, Modernity, and Diaspora.]**AFAM 588b^u, Autobiography in America. Robert Stepto.**

m 1.30–3.20

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. *Also AMST 710b^u.*

[AFAM 590b, Race, Gender, and the Culture Industry in Twentieth-Century America.]**AFAM 595a, Problems in the Study of African American Literature.****Elizabeth Alexander.**

t 1.30–3.20

This course focuses on poetry, reading the complete works of selected African American poets and doing extensive bibliographic research toward original scholarship on the work of several authors – Wheatley, Dunbar, Hughes, Brown, Brooks, Baraka, Sanchez, Clifton, Lorde, Harper, Wright, Komunyakaa, Dove – as well as looking at very contemporary poets of the present so-called New Negro Renaissance. In-class reports, library exercises, and a major seminar paper. *Also AMST 640a, ENGL 940a.*

[AFAM 632b, **Race and Memory.**]

[AFAM 656b^U, **Social Change and Popular Culture in Sub-Saharan Africa.**]

[AFAM 673a, **Roots and Routes: Identity and Travel in African American Political Culture.**]

[AFAM 683b^U, **Recasting Gender: Religion, Science, and the Body.**]

AFAM 687a, Race and Races in American Studies. Matthew Jacobson.

t 1.30–3.20

This reading-intensive seminar examines influential scholarship across the discipline on “the race concept” and racialized relations in American culture and society. Rather than attempting vainly to cover the field exhaustively, the focus here is upon selected themes, approaches, methods, debates, and problems in a variety of scholarly genres. Major topics include the cultural construction of race; race as both an instrument of oppression and an idiom of resistance in American politics; the centrality of race in literary, anthropological, and legal discourse; the racialization of U.S. foreign policy; “race mixing” and “passing,” vicissitudes of “whiteness” in American politics; the centrality of race in American political culture; and “race” in the realm of popularly cultural representation. Writings under investigation include classic formulations by scholars like Winthrop Jordan and Ronald Takaki, as well as more recent efforts by Cheryl Harris, Kevin Gaines, Tomas Almaguer, and Louise Newman. Seminar papers give students an opportunity to explore in depth the themes, periods, and methods which most interest them. *Also AMST 701a, HIST 751a.*

AFAM 706b, Readings in Twentieth-Century American Political and Social History. Glenda Gilmore.

w 10.30–12.20

Recent trends in American political history from the 1800s, with an emphasis on the social analysis of mass politics and reform. *Also AMST 714b, HIST 735b.*

[AFAM 709b, **Research in Twentieth-Century American Political and Social History.**]

AFAM 710a, Readings in African American History since 1865. Glenda Gilmore.

w 10.30–12.20

An introduction to major primary and secondary scholarship in twentieth-century African American history. Critical analyses of social movements and gender, culture, and class politics. Methodological issues of particular importance to minority populations are also explored. *Also AMST 742a, HIST 740a.*

AFAM 712b, Modernity and Its Others: Self, Subject, and Cultural Differences.

Paul Gilroy.

t 9.30–11.20

This social theory course explores aspects of the political, philosophical, and sociological debates that have emerged around the concept of modernity. It looks particularly at articulations of modernity and “race” following four interlinked lines of inquiry: how has the subject of modernity been imagined and articulated; what attributes and experiences have qualified that subject as properly human and rational; where has identity been recognized as coming from, culturally and materially; and where has cosmopolitan loyalty emerged as a demand to see and act beyond the boundaries of immediate particularity? *Also SOCY 650b.*

AFAM 728b^U, From West Africa to the Black Americas. Robert Thompson.

tth 11.30–12.45

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. *Also HSAR 778b^U.*

AFAM 729a^u, New York Mambo: Microcosm of Black Creativity. Robert Thompson.

tth 11.30–12.45

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. *Also HSAR 779a^u.*

[AFAM 73ob, The Face of the Gods: Icons and Architecture of the Black Atlantic World.]**AFAM 739a,b, Problem and Theory in Afro-Atlantic Architecture.****Robert Thompson.**

th 3.30–5.20

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 – Ituri Forest and Namibian spatial solutions, Berber casbah architecture and its interactions with the Jews on Djerba isle and in Morocco, the concept of the Muslim *assatayab* creolized into the Iberia *azotea* and the spread of this terrace-roof style throughout Latin America. Topics include the architecture of Djenne, 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. The seminar ends with the shrine architecture of New World adherents of the classical religions of Dahomey. *Also HSAR 781a,b.*

[AFAM 746a, Race and Representation in U.S. Literature and Culture.]**[AFAM 758b, Readings in African American History to Emancipation.]****[AFAM 759b, Magic Realism in the Americas.]****[AFAM 768b, Issues in Performance Art.]****[AFAM 772a, African, Oceanic, and Native American Perceptions of “Primitivist Modernism”: Challenging the West as Arbiter of Art.]****AFAM 789a, Music of Sub-Saharan Africa. Michael Veal.**

m 1.30–3.20

An introduction to the music of Sub-Saharan Africa, through a focus on several regional, national, and/or local cultures. The seminar provides an overview of the musicological and critical issues fundamental to the study of African music and surveys several scholarly approaches to this music both within and outside of Africa. *Also AFST 830a, MUSI 930a.*

AFAM 839b, Postcolonial Drama: From Shaw to Soyinka. Joseph Roach.

w 1.30–3.20

The course explores works of anglophone playwrights from different colonial and postcolonial situations on the Atlantic rim – Nigeria, England, Trinidad, Ireland, South Africa, and the United States – with particular attention to the cultural work that such texts do both as literature and as blueprints for performance. In addition to the play texts, readings include critical essays by leading theorists of postcoloniality and drama, including prefaces and manifestos by the dramatists themselves. *Also ENGL 946b.*

AFAM 846a, Postcolonial Theory and Its Literature. Christopher L. Miller.

th 10.30–12.20

A survey of theories relevant to colonial and postcolonial literature and culture. Focus on theoretical models (Orientalism, hybridity, *métissage*, *créolité*, “minor literature”), but also on the literary texts from which they are derived (francophone and anglophone). Readings from Said, Bhabha, Spivak, Mbembe, Amselle, Glissant, Deleuze, Guattari. In English. *Also AFST 746a, CPLT 725a, FREN 946a.*

[AFAM 854b, The French Atlantic Triangle and the Literature of the Slave Trade.]

AFAM 880a or b, Directed Reading.

By arrangement with faculty.

AFAM 895, Research Workshop. Faculty.

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

142 Luce Hall, 34 Hillhouse, 432.3436
M.A.

Chair

Robert Harms (*History*)

Director of Graduate Studies

Ann Biersteker (*Linguistics*) (432.9902, ann.biersteker@yale.edu)

Director of Program in African Languages

Sandra Sanneh (432.1179, sandra.sanneh@yale.edu)

Professors

Lea Brilmayer (*Law School*), Hazel Carby (*African American Studies*), Owen Fiss (*Law School*), William Foltz (*Political Science*), Robert Harms (*History*), Andrew Hill (*Anthropology*), Christopher L. Miller (*French; African American Studies*), Curtis Patton (*Epidemiology*), Lamin Sanneh (*History; Divinity School*), Ian Shapiro (*Political Science*), Robert Thompson (*History of Art*), Christopher Udry (*Economics*), Robin Winks (*History*)

Associate Professors

Ann Biersteker (*Adjunct; Linguistics*), David Watts (*Anthropology*), Eric Worby (*Anthropology*)

Assistant Professors

Kamari Clarke (*Anthropology*), David Graeber (*Anthropology*), Lawrence King (*Sociology*), Michael Mahoney (*History*), Michael Veal (*Music*)

Senior Lector

Sandra Sanneh (*African Languages*)

Lector

Kiarie Wa’Njogu (*African Languages*)

Lecturers

Anne-Marie Foltz (*Epidemiology & Public Health*), Peter Marris (*Sociology*), Gerald Thomas (*African American Studies; History*)

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. In addition, the Program in African Studies offers two interdisciplinary seminars to create dialogue and to integrate approaches across disciplines.

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

Special Admissions Requirements

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; economics; sociology; arts and literatures; languages and linguistics; religion; environmental and developmental studies.

The program requires sixteen courses: two compulsory introductory interdisciplinary seminars, Research Methods in African Studies (AFST 501a) and Africa and the Disciplines (AFST 764a), four courses of instruction in an African language, four courses in one of the above areas of concentration, five 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 upon 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 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; african.studies@yale.edu.

Courses

AFST 501a, 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.

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

th 1.30–3.20

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.

AFST 598^U, Introduction to an African Language. Sandra Sanneh and staff.

5 htba

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. Individualized or small-group instruction.

AFST 600^U, Elementary Kiswahili. Kiarie Wa’Njogu.

mtwthf 9.30–10.20

Beginning course with intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on the spoken language and conversation. During the second term students read texts that provide an introduction to Kiswahili culture and literature.

AFST 601^U, Intermediate Kiswahili. Kiarie Wa’Njogu.

mtwthf 10.30–11.20

Refinement of the student’s speaking, listening, reading, and writing skills. Prepares the student 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 cultural documents including literary and nonliterary texts. After AFST 600.

AFST 603^U, Advanced Kiswahili. Kiarie Wa’Njogu.

3 htba

An advanced course intended to improve the student’s aural and reading comprehension as well as speaking and writing skills. Emphasis on acquiring a command of idiomatic usage and stylistic nuance. Reading assignments include materials on cultural, political, and social topics. After AFST 601.

AFST 604a^U or b^U, Topics in Kiswahili Literature. Ann Biersteker.

3 htba

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.

AFST 610^U, Elementary Yoruba. Staff.

mtwthf 9.30–10.20

Intensive training and practice in speaking, listening, reading, and writing. Initial emphasis is on spoken language and conversation. During the second term students read and listen to texts that provide an introduction to Yoruba culture.

AFST 611^U, Intermediate Yoruba. Staff.

mtwthf 11.30–12.20

Refinement of the student’s speaking, listening, reading, and writing skills. Prepares the student for further work in literary, language, and cultural studies as well as for a functional use of Yoruba. Study of structure and vocabulary is based on a variety of cultural documents including literary and nonliterary texts. After AFST 610.

AFST 612^u, Advanced Yoruba. Staff.

3 htba

An advanced course intended to improve the student's aural and reading comprehension as well as speaking and writing skills. Emphasis on acquiring a command of idiomatic usage and stylistic nuance. Reading assignments include materials on cultural, political, and social topics. After AFST 611.

AFST 614^u, Elementary Zulu. Sandra Sanneh.

mw 11:30–12:20, tth 11:30–12:45

A beginner's course in conversational IsiZulu. The fall term emphasizes the sounds of the language, including clicks and tonal variation, and the words and structures needed for initial social interaction. The spring term develops communicative skills through dialogues and role-plays, and reading skills with texts drawn from traditional and popular literature and songs. Documentaries, movies, and local television programs add a diversity of images of contemporary Zulu culture.

AFST 615^u, Intermediate Zulu. Sandra Sanneh.

5 htba

Development of speaking, listening, reading, and writing skills with an emphasis on fluency. Readings, viewings, and role-play situations are drawn from folk and popular culture and from mass media. Grammar review as necessary. Prepares the student for research involving interviewing and discussion, and for study of oral and literary genres. After AFST 614.

AFST 616^u, Advanced Zulu. Sandra Sanneh.

3 htba

Refinement of listening, speaking, and writing skills using excerpts from oral genres such as praise poetry of kings and of commoners, from short stories and novels, and from dramas made for television. Survey of language use in South Africa. After AFST 615.

AFST 620, Second Year in an African Language.

By arrangement with faculty.

AFST 621, Third Year in an African Language.

By arrangement with faculty.

AFST 623, Fourth Year in an African Language.

By arrangement with faculty.

AFST 638a, Discourse Analysis of Politics. David Apter.

t 4–6

This seminar examines the “discursive” turn in political analysis. While discourse theory can be applied to the role of authority and state power, the emphasis here is on confrontational situations, protest, and violence. Particularly useful in analyzing some of the factors which lead people to try to change their political circumstances by interpreting and reinterpreting their experiences, part one examines the diverse theoretical strands and components making up contemporary political discourse theory as compared to other approaches, and an intellectual pedigree (much of it drawn from related fields) is mapped. Part two develops hypotheses derived from discourse theory as an analytical approach to show the kinds of questions with which it can be expected to deal. In part three a model framework for analysis is offered while students are expected to develop their own. In part four these frameworks are applied to relevant comparative and case materials. *Also PLSC 570a, SOCY 538a.*

AFST 647b^u, Structure of Swahili. Ann Biersteker.

tth 4–5.15

Study of Swahili grammar. Phonology, morphology, and syntax of Swahili examined in detail. Topics also include Swahili dialects, history of Swahili, and comparison with other Bantu languages. *Also LING 647b^u.*

[AFST 684b, The Ritualization of Power in Africa.]**AFST 746a, Postcolonial Theory and Its Literature. Christopher L. Miller.**

th 10.30–12.20

A survey of theories relevant to colonial and postcolonial literature and culture. The course focuses on theoretical models (Orientalism, hybridity, *métissage*, *créolité*, “minor literature”), but also gives attention to the literary texts from which they are derived (francophone and anglophone). Readings from Said, Bhabha, Spivak, Mbembe, Amselle, Glissant, Deleuze, Guattari. Taught in English. *Also AFAM 846a, CPLT 725a, FREN 946a.*

AFST 748b, From One Congo to Another: Literature and Culture in Central Africa. Christopher L. Miller.

th 10.30–12.20

An interdisciplinary approach to two nations, with a primary focus on literature but with reference to history, anthropology, film, and other fields. How the two Congos evolved side by side, through a history of genocide, colonialism, dictatorship, and war; the emergence of a rich literary tradition. Readings of Conrad, Tintin, Gide, Bemba, Dongala, Lopes, Sony Labou Tansi, Tchicaya, Mudimbe, Ngal. *Also FREN 948b.*

AFST 764a^U, Africa and the Disciplines. William Foltz.

t 1.30–3.20

The seminar is designed to introduce students to the study of Africa. The main emphasis is on how each discipline reconceptualizes the field and also on the ways in which each discipline draws from others in the process. The course combines basic information with some of the dominant and changing ideas embodied in each of the major disciplines represented. *Also PLSC 784a^U.*

AFST 830a, Music of Sub-Saharan Africa. Michael Veal.

m 1.30–3.20

An introduction to the music of Sub-Saharan Africa, through a focus on several regional, national, and/or local cultures. The seminar provides an overview of the musicological and critical issues fundamental to the study of African music and surveys several scholarly approaches to this music both within and outside of Africa. *Also AFAM 789a, MUSI 930a.*

AFST 841b, The Culture of Colonialism in African History. Michael Mahoney.

t 1.30–3.20

This course examines the intersection of political economy and culture during the colonial era in African history, from 1885 to 1960. The central question for the course is, how did the colonial state manage to stay in power? Through its use of symbolic power and representation? Through the cultivation of legitimacy or hegemony? Or simply by coercion and domination alone? Topics include education, medicine, religion, the civilizing mission, indirect rule, and the psychology of colonialism. We consider the work of such Africanists as Ranger, Cooper, Glassman, the Comaroffs, and Fanon, as well as such non-Africanists as Foucault, Stoler, Scott, Mitchell, and Said. *Also HIST 841b.*

[AFST 843b, Ethnicity and Tradition in African History.]**[AFST 849b, African Historiography: The Agrarian History of Africa.]****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. (Note: defense of thesis proposal required at end of program's third term.)

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

By arrangement with faculty.

american studies

231 Hall of Graduate Studies, 432.1186

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

Chair

Jean-Christophe Agnew

Director of Graduate Studies

John Mack Faragher (230 HGS, john.faragher@yale.edu)

Professors

Jean-Christophe Agnew, Richard Brodhead, Jon Butler, Hazel Carby (*on leave* [Sp]), Edward Cooke, Jr., Michael Denning (*on leave* [Sp]), Wai Chee Dimock (*on leave* [Sp]), Kathryn Dudley (*on leave* [Sp]), John Mack Faragher, Glenda Gilmore, Dolores Hayden, Matthew Jacobson, Vera Kutzinski, Charles Musser, Alexander Nemerov, Michael Roemer (*Adjunct*), Stephen Skowronek, Robert Stepto, Harry Stout, John Swzed, John Harley Warner, Laura Wexler (*on leave* [F])

Associate Professors

Joshua Gamson, Thomas Otten, Patricia Pessar (*Adjunct*)

Assistant Professors

Jennifer Baszile (*on leave*), Elizabeth Dillon, Jonathan Holloway, Amy Hungerford, Guillermo Irizarry (*on leave*), Robert Johnston, Mary Lui, Sanda Lwin, Diana Paulin (*on leave*), Stephen Pitti, Alicia Schmidt Camacho, Steven Stoll, Michael Trask, Vron Ware, Kariann Yokota

Lecturers

Wes Davis, 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 writing sample of reasonable length 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 either proficiency in one language tested in two successive stages, or proficiency in two languages each tested once. After completing both parts of the language requirement, a student should schedule the oral

qualifying examinations in four fields, in the fifth term of study. Preparation, submission, and approval of the dissertation prospectus are normally completed by the end of the sixth term with a final deadline at the end of the seventh term. Students are admitted to candidacy for the Ph.D. at the end of the third year, upon completion of all predissertation requirements, including the prospectus. Students in American Studies teach in the third and fourth years of study.

Combined Ph.D. Programs

american studies and african american studies

The American Studies Program 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. For further details, see African American Studies.

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 on page 164. 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 Graduate School requirements, page 375.

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 first part of the language requirement. It can be petitioned for in the term following completion of the requirements.

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 first stage 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 632a, Cultural Theory. Michael Denning.

W 1.30–3.20

An exploration of modern theories of culture, including modernization, Marxism, cultural studies, world-systems theory, subaltern studies, and globalization theory.

AMST 640a, Problems in the Study of African American Literature.**Elizabeth Alexander.**

t 1.30–3.20

This seminar examines both nineteenth- and twentieth-century African American literary texts, and while students gain a comprehensive understanding of the breadth of the field, we focus on several key issues or “problems” central to the study of African American literary history. We read variously from slave narratives, autobiographies, poetry, novels, nonfiction essays, and anthologies, joining close readings of literary texts with the interdisciplinary contexts of history, cultural criticism and theory, and other art forms. *Also AFAM 595a, ENGL 940a.*

[AMST 641a, Twentieth-Century African American Poetry.]**AMST 643a, Theorizing the Racial Formation of the United States in the Late Twentieth Century. Paul Gilroy.**

t 9.30–11.20

This interdisciplinary seminar includes readings from the fields of anthropology, critical legal studies, cultural studies, literary history, history, politics, and sociology. *Also AFAM 505a.*

AMST 700a, Introduction to the Historiography of the United States.**John Mack Faragher.**

tth 10.30–12.20

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. *Also HIST 700a.*

AMST 701a, Race and Races in American Studies. Matthew Jacobson.

t 1.30–3.20

This reading-intensive seminar examines influential scholarship across the discipline on “the race concept” and racialized relations in American culture and society. Rather than attempting vainly to cover the field exhaustively, the focus here is upon selected themes, approaches, methods, debates, and problems in a variety of scholarly genres. Major topics include the cultural construction of race; race as both an instrument of oppression and an idiom of resistance in American politics; the centrality of race in literary, anthropological, and legal discourse; the racialization of U.S. foreign policy; “race mixing” and “passing,” vicissitudes of “whiteness” in American politics, the centrality of race in American political culture; and “race” in the realm of popularly cultural representation. Writings under investigation include classic formulations by scholars like Winthrop Jordan and Ronald Takaki, as well as more recent efforts by Cheryl Harris, Kevin Gaines, Tomas Almaguer, and Louise Newman. Seminar papers give students an opportunity to explore in depth the themes, periods, and methods which most interest them. *Also AFAM 687a, HIST 751a.*

AMST 703a^U, Introduction to Jazz Studies. John Szwed.

th 1.30–3.20

An overview of the music and its cultural history, with consideration of the influence of jazz on the visual arts, dance, literature, and film; an introduction to the scholarship and methods of jazz studies. *Also AFAM 557a^U, ANTH 681a^U.*

[AMST 704a, Religion and Modernity in Europe and America, 1850–2000.]**[AMST 706b, Readings in African American History to Emancipation.]****AMST 710b^U, Autobiography in America. Robert Stepto.**

m 1.30–3.20

At least a dozen North American autobiographies, mostly from the “American Renaissance” to the present, studied. 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. *Also AFAM 588b^U.*

AMST 714b, Readings in Twentieth-Century American Political and Social History.
Glenda Gilmore.

W 10.30–12.20

Recent trends in American political history from the 1800s, with an emphasis on the social analysis of mass politics and reform. *Also AFAM 706b, HIST 735b.*

AMST 718a, American Novel 1895–1910. **Alexander Nemerov.**

Th 1.30–3.20

In this seminar we read works by Kate Chopin, Stephen Crane, Harold Frederic, Henry James, Jack London, and Frank Norris. We also consult secondary scholarship by authors such as Bill Brown, Michael Fried, Amy Kaplan, and Mark Seltzer. Our aim is twofold: first, to develop skills of literary interpretation; and second, to use the literature to open new ways of understanding the era's visual arts. *Also HSAR 718a.*

AMST 719b, The Sense of Place in American Art. **Alexander Nemerov.**

Th 3.30–5.20

Place is both ubiquitous and invisible in studies of American art. So many works of American art deal centrally with place — Church's *Mt. Ktaadn*, Thayer's *Mt. Monadnock*, Homer's Prout's Neck paintings, Bingham's Missouri pictures, to name just a few. Others concern a sense of place more obliquely: de Kooning's paintings in (and maybe of) the Hamptons, for example, or de Kooning's and Kline's in (and of) New York. Still further, we as art historians routinely speak of paintings being located in certain museums in certain cities, and we travel to see them there: in some way, the actual painting's physical location is also about a poetics of place. Yet for the most part these locations remain unstudied. In this seminar, we theorize the role of place in poetry and painting, and build historically specific readings of certain American meditations on place, dating from the early nineteenth century through the work of the abstract expressionists. *Also HSAR 719b.*

AMST 721a, Research Seminar in U.S. and European History. **Jon Butler.**

T 10.30–12.20

This research seminar focuses on the craft/art of writing an article. Students may write on any subject in U.S. and early social, political, and religious history in the early modern to modern era. *Also HIST 721a, RLST 524a.*

[**AMST 723b, Language and Landscape: Rhetorics of American Painting 1848–1870.**]

[**AMST 730a, The Home Front: American Visual Culture 1941–1945.**]

AMST 737b, Craft and Design in Post-World War II America. **Edward Cooke, Jr.**

W 3.30–5.20

In the two decades after World War II economic prosperity and cultural optimism led to the golden age of American industrial design and the expansion of craft education programs in the universities. The term designer/craftsman was a respected label. Yet, by the 1970s, crafts, design, and art were three separate spheres. This seminar draws on period writings and artifactual examination to explore the interconnections of craft and design in the 1950s, their subsequent fragmentation, and recent attempts to build connections. *Also HSAR 737b.*

[**AMST 738a, Reading and Research in Western and Frontier History.**]

AMST 742a, Readings in African American History since 1865. **Glenda Gilmore.**

W 10.30–12.20

An introduction to major primary and secondary scholarship in twentieth-century African American history. Critical analyses of social movements and gender, culture, and class politics. Methodological issues of particular importance to minority populations are also explored. *Also AFAM 710a, HIST 740a.*

AMST 755a, Economy and Culture in America. Kathryn Dudley.

W 9.30–11.20

This course examines authoritative and folk models of economic change, class identity, and social mobility in popular media, social science theory, and ethnographic documentary, focusing on the post-WWII period to the present.

AMST 759a, Chicano Historiography. Stephen Pitti.

Th 1.30–3.20

A review of the major texts relevant to the historical study of Mexican Americans in the United States. Themes include gender, labor, immigration, citizenship, community formation, transnationality, and the border. Assigned readings are in English. *Also HIST 762a.*

AMST 763b^U, The Anthropology of Sound. John Szwed.

Th 1.30–3.20

The socially mediated nature of sound, and the cultural consequences of technologies of sound transmission, modification, and recording. Topics include the pre- and postindustrial soundscapes; audio ethnography; the art of noise; synesthesia; problems of originality and plagiarism (covers, sampling, mixing, machine music, etc.); world music; audio imperialism and terrorism, musical utopias; imaginary soundscapes. *Also ANTH 587b^U.*

AMST 766a, Race, Nation, and American Modernisms. Vera Kutzinski.

M 3.30–5.20

Examination of the vexed relations between modernism and its cultural others in early to mid-twentieth century literature from the United States. We read select fiction and poetry from this period in order both to question and to understand the different ways in which writers such as James, Faulkner, Fitzgerald, Hemingway, Toomer, Stein, Wharton, Eliot, and Williams tackled, or evaded, pressing questions of difference relative to gender, sexuality, race, and class, as they struggled to articulate a national identity and/or poetics. *Also AFAM 568a, ENGL 923a.*

[AMST 767b, Magic Realism in the Americas.]**AMST 768b, Asian American History and Historiography. Mary Lui.**

W 3.30–5.20

This reading and discussion seminar examines new trends in Asian American history through a selection of recently published texts and other “classics” from the field. Major topics include the racial formation of Asian Americans in U.S. culture, politics, and law; U.S. imperialism; U.S. capitalist development and Asian labor migration; and transnational and local ethnic community formations. Consideration of both the political and academic roots of the field and its evolving relationship to “mainstream” American history. *Also HIST 768b.*

AMST 775a, Culture in U.S. International and Transnational Histories. Seth Fein.

M 1.30–3.20

Reading seminar that examines interdisciplinary approaches to the study of “culture” in relations between, within, and among the United States and other nations (mainly since 1900). Discussions and papers focus on comparing methodologies, using theory, doing research, writing history. Topics include globalization, Americanization, transnationalism, and hybridity; gender, national identity, international relations, and state formation; imperialism, post-colonialism, hegemony, and resistance; mass culture, political economy, foreign policy, and postmodernity. *Also HIST 757a.*

AMST 790b, Narrative, and Other, Histories. John Demos.

W 3.30–5.20

An exploration, through readings and discussion, of the recent “literary turn” in historical scholarship. Readings include history, fiction, and some theory. In addition, a month-long “practicum” focuses on writings by course participants. *Also HIST 790b.*

[AMST 793b, Power: Historical and Theoretical Approaches.]

AMST 799b, The American Century: 1941–1961. Jean-Christophe Agnew.

W 10.30–12.20

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. *Also HIST 799b.*

AMST 811b^U, Classical Hollywood Cinema. Charles Musser.

W 1.30–3.20

Examination of American cinema in the period from 1925 to 1950 through a focus on the Hollywood studio system, with Warner Brothers as a case study. Consideration of the ways in which Warner Brothers and Hollywood impacted on American culture, as well as the ways their films were shaped by Wall Street financing, the introduction of recorded sound, the production code, and such larger social and cultural forces as radio and the Great Depression. *Also FILM 731b^U.*

AMST 813b^U, Contemporary Documentary Film and Video. Charles Musser.

M 6.30–10

Examination of documentary and related nonfiction forms in the last three decades. Explores such issues as film truth, performance, ethics, race and gender or multiculturalism, and the filmmaker as participant-observer. Filmmakers studied include Frederick Wiseman, William Greaves, Chris Choy, Errol Morris, Lourdes Portilla, Trin T, Minh-Ha, Sue Friedrich, and Marlon Riggs. *Also FILM 736b^U.*

AMST 824b, Research on Early American History. John Demos.

W 1.30–3.20

Projects to be chosen from the “colonial” period, 1492–1763. *Also HIST 705b.*

AMST 825a, Readings in Early American History. John Demos.

W 1.30–3.20

Reading and discussion of the scholarly literature. *Also HIST 704a.*

AMST 828b, American Political Development. Stephen Skowronek.

W 3.30–5.20

Examination of the broad patterns of political change and institutional development in American national government from 1789, with particular attention to recurrent problems of party building and state building. *Also PLSC 828b.*

AMST 869b, Research Colloquium in Women’s and Gender Studies. Laura Wexler.

An interdisciplinary research seminar investigating contemporary theory and methods in women’s and gender studies. Requirements include a research paper, works-in-progress presentations, peer reviews, and reviews of the critical literature in a variety of humanities and social science fields. *Also WGST 900b.*

AMST 914b, Built Environments and the Politics of Place. Dolores Hayden.

W 9.30–11.20

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 on American built environments of the twentieth century emphasizes readings on urban history as well as on narrative strategies for interpreting spaces and places. They

include J. B. Jackson, *Landscape in Sight: Looking at America*, Dolores Hayden, *The Power of Place: Urban Landscapes as Public History*, Anne Spirn, *The Language of Landscape*, Greg Hise, *Magnetic Los Angeles*, Michael Sorkin, ed., *Variations on a Theme Park*, Karal Ann Marling, *As Seen on TV*, William Leach, *Country of Exiles: The Destruction of Place in American Life*, Robert Fogelson, *Downtown: Its Rise and Fall*, and Lisabeth Cohen, *A Consumers' Republic*. The importance of place-based scholarship for public history, preservation, and design is discussed. Participants present papers or other projects. *Also ARCH 914b*.

AMST 921a^U, Ralph Ellison in Context. Robert Stepto.

W 3.30–5.20

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, 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*. *Also AFAM 563a^U, ENGL 921a^U*.

AMST 922a, Gender, Territory, and Space. Dolores Hayden.

W 9.30–11.20

The seminar explores gender and territory as they affect women's and men's everyday experiences of built environments and the city. We consider how gender (along with race, class, age, and sexual orientation) affects the design and use of a range of spaces from the most private to the most public. The main focus is on the United States from the late nineteenth century to the present, but we look at other countries for examples of built projects fostering full citizenship and integration into urban life, or for practices of spatial segregation that deny basic civil rights. Readings are drawn from architecture, history, gender studies, and geography and include Ryan, *Women in Public*, Hayden, *Redesigning the American Dream*, Forsyth on Noho (lesbian and gay gentrification), Rothschild, ed., *Design and Feminism: Re-Visioning Spaces, Places, and Everyday Things*, and Rendell, ed., *Gender, Space, Architecture*. Participants develop papers. *Also ARCH 922a*.

anthropology

51 Hillhouse, Rm 2A, 432.3665

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

Chair

Andrew Hill

Director of Graduate Studies

Helen Siu [F] (Rm 4, 158 Whitney Avenue, 432.3680)

David Watts [Sp] (B19, 175 Whitney Avenue, 432.9597)

Professors

Arjun Appadurai, Richard Burger, Michael Dove (*Forestry & Environmental Studies*), Kathryn Dudley, J. Joseph Errington, Andrew Hill, Frank Hole, William Kelly, Enrique Mayer, Alison Richard (*Provost*), Harold Scheffler, James Scott (*Political Science*), Helen Siu, John Szwed, David Watts, Harvey Weiss (*Near Eastern Languages & Civilizations*)

Associate Professors

Nora Groce (*Epidemiology & Public Health*), Anastasia Karakasidou, Patricia Pessar (*Adjunct, American Studies*), Linda-Anne Rebhun

Assistant Professors

Bernard Bate, Richard Bribiescas, Marcello Canuto, Kamari Maxine Clarke, David Graeber, Eric Sargis, Thomas Tartaron, Eric Worby

Lecturers

Guillaume Boccara (*Visiting*), Carol Carpenter (*Forestry & Environmental Studies*), Ilana Gershon (*Visiting*), Christina Katsougiannopoulou Ewald, Michael Kral (*Visiting*), Ktherine Rupp (*Visiting*)

Fields of Study

The department has four subfields. 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 Graduate School requirements, page 375.

M.A. This degree is intended for students not continuing in the Ph.D. program. Requirement is satisfactory completion of at least one year in that program. Special attention is given to the quality of papers submitted in course work. Applications for a terminal master's degree are not accepted.

Program materials are available upon request to the Director of Graduate Studies, Department of Anthropology, Yale University, PO Box 208277, New Haven CT 06520-8277; 203.432.3665; e-mail, anthropology@yale.edu; Web site, <http://www.yale.edu/anthropology/>.

Courses

ANTH 500a, Seminar in Sociocultural Anthropology. Arjun Appadurai, William Kelly.

th 9–12

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.

ANTH 510b, Resistance, Rebellion, and Survival Strategies in Rural Latin America. Gilbert Joseph, Patricia Pessar.

w 3.30–5.20

An interdisciplinary examination of new conceptual and methodological approaches to such phenomena as peasants in revolution, millenarianism, “banditry,” refugee movements, and transnational migration. *Also HIST 807b.*

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

t 1.30–3.20

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.”

ANTH 515b^U, Culture and Political Economy. Helen Siu.

w 1.30–3.20

A critical introduction to anthropological formulations of the junctures of meaning, interest, and power. Readings include classical and contemporary ethnographies that are theoretically informed and historically situated. Enrollment limited to twenty-four.

ANTH 524a^U, Cultures, Histories, and Passions in Southeast Europe.

Anastasia Karakasidou.

th 1.30–3.20

This course familiarizes students with the “ethnographic islands” within the “currents of history” situated in the southeast corner of Europe. The course is also dedicated to an anthropological analysis of a number of different genres (books of travel, fiction, history, etc.) that describe and represent the region.

ANTH 535a^U, Miles Davis. John Szwed.

t 1.30–3.20

A survey of the life and music of Miles Davis, examining the social history and musical traditions that shaped his work and exploring his influence on music, literature, and society. *Also AFAM 562a^U.*

ANTH 541a, Agrarian Societies: Culture, Society, History, and Development.

Robert Harms, Steven Stoll, Michael Dove, Enrique Mayer.

m 1.30–5.20

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. *Also F&ES 753a, HIST 965a, PLSC 779a.*

ANTH 550b, Anthropology and History. Guillaume Boccara.

t 9.30–11.20

Introduction to the epistemological issues linked to the combination of methods and perspectives of anthropology and history. We examine the ways indigenous societies' sociohistorical processes and cultural dynamics have been analyzed. Through the exploration of indigenous narrative and ritual (mostly from the American continent), we rethink the analytical distinction between myth and history. We then tackle the issue of the relationship between "Indians' histories" and "histories of Indians," and assess to what extent it is possible to reconcile "native auto-histories" with comparative indigenous histories on the one hand, and structural history on the other.

ANTH 552a, Globalization and Violence: Interdisciplinary Perspectives.**Arjun Appadurai.**

w 3.30–5.20

This seminar uses the close reading of eight or nine monographs as the basis for intensive discussion of ethnic violence in the era of globalization. The course is concerned with the general methodological problem of relating scales to forms in social life, and with the related problem of the historical breaks implied by the idea of "globalization." Readings and class discussions deliberately focus on problems that cut across the social sciences, such as those of state cultures, crowd dynamics, genocidal stereotyping, and the making of modern minorities. A cultural perspective — one focusing on various dimensions of contextual meaning — serves to probe the limits of various disciplinary languages and images in regard to the politics of violence. *Also PLSC 768a.*

ANTH 569b^U, Economic Anthropology. Enrique Mayer.

w 1.30–3.20

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

ANTH 571a^U, Ethnogenesis, Resistance, and Miscegenation in America.**Guillaume Boccara.**

t 9.30–11.20

Introduction to ethnohistoriographical issues and anthropological interpretations of the sociocultural dynamics and historical processes that developed within the American fringes between the sixteenth and nineteenth centuries. The first part of the course is dedicated to the definition and critique review of key concepts such as frontier, borderland, ethnogenesis, ethnification, resistance, acculturation, and *mestizaje*. The second part of the seminar examines in detail some specific processes of ethnogenesis and *mestizaje* on the South, Central, and North American frontiers.

ANTH 575a^U, Urban Anthropology and Global History. Helen Siu.

t 1.30–3.20

The seminar explores urbanization processes in different historical times and places. Using a combination of literary works, historical narratives, and ethnographies, it analyzes how migrants and urbanites with their unique cultural histories confront changes in the macro political economies that encapsulate them. The seminar focuses on the nature of migration, adaptive strategies, ethnicity, and political symbolism, the myth of marginality, the language of class, and culture conflict.

ANTH 576a^U, Anthropology of the Object. Eric Worby.

tth 1.30–3.20

An exploration of the culturally variable means through which value and significance are attributed to objects. Topics for discussion include gift-giving and commodity exchange; the classification collection, and display of art and artifacts; the gendered and racialized body as object for self and other; advertising, consumption, and commodity fetishism; concepts of property; the politics of value.

ANTH 578b^U, Gender and Social Change in Southeast Asia. J. Joseph Errington.

th 1.30–3.20

A survey of problems and approaches to modernization in Southeast Asian locales, mostly Indonesian and Malaysian, centering on pivotal issues of gender. Emphasis in reading is on book-length ethnographies.

ANTH 580a^U, Language and Political Practice. Bernard Bate.

th 2.30–4.20

An exploration of the relationship between language and politics in a number of societies. The course examines how language use, as both mode of social practice and object of ideology and political organization, is constitutive of political relations and social organization generally. Topics include the relationship of ideologies and aesthetics of language to broader political economies; speech genre and the performance of self and social organization; and oratory and its relationship to the constitution of the social field as an integral element of political praxis.

ANTH 581a, Society and Environment: Introduction to Theory and Method.

Michael Dove.

th 2.30–5.20

Critical issues in the analysis of relations between society and environment. Topics include: (1) the identification of environmental “problems,” focusing on the rationale of development intervention and failure, and the study of environmental discourse; (2) conceptual boundaries in resource-use systems and in conceptions of nature and culture; (3) conceptual boundaries in environmental relations between center and periphery and between the local and the global; (4) the sociology of science of environmental relations, encompassing views of indigenous knowledge, objective distance, scientific “forgetfulness,” and relations between the natural and social sciences; and (5) the implications of the foregoing for current critiques of science. *Also F&ES 747a.*

ANTH 587b^U, The Anthropology of Sound. John Szwed.

th 1.30–3.20

The socially mediated nature of sound, and the cultural consequences of technologies of sound transmission, modification, and recording. Topics include the pre- and postindustrial soundscapes; audio ethnography; the art of noise; synesthesia; problems of originality and plagiarism (covers, sampling, mixing, machine music, etc.); world music; audio imperialism and terrorism; musical utopias; imaginary soundscapes. *Also AMST 763b^U.*

ANTH 592a, Anthropology and Classical Social Theory. David Graeber.

w 1.30–3.20

The course is meant not only to introduce anthropology students to the founding works of Western social theory — the big names like Marx, Weber, and Durkheim — but also to place these authors in the context of the Western intellectual and cultural tradition from which they emerged and to discuss their ongoing relevance to anthropological thought. A central goal of the seminar is to identify ways of disarticulating the production of gender by examining how these roles are both naturalized and disrupted in local and global spheres.

ANTH 594b, Theories of Value in Anthropology. David Graeber.

W 3.30–5.20

There is a broad feeling in anthropology that there is some level at which “values” in the sociological sense, “value” in the economic sense, and linguistic “value” in the Saussurean sense all come down to the same thing — and that a theory of value based on this insight holds out the promise of resolving many of the stickiest outstanding problems in social theory: most notably, the relation of individual desire and action with cultural meaning and social form. But it’s not at all clear whether such a theory actually exists. In this course, students examine some contenders and work on developing such a theory.

ANTH 644a^U, Globalization, Bilingualism, and Endangered Languages.**J. Joseph Errington.**

t 9.30–11.20

A review of sociolinguistic concomitants of modernization. Emphasis is on transitional bilingualism in marginal communities, politics of language, and problems of language loss.

ANTH 681a^U, Introduction to Jazz Studies. John Szwed.

th 1.30–3.20

An overview of the music and its cultural history, with consideration of the influence of jazz on the visual arts, dance, literature, and film; an introduction to the scholarship and methods of jazz studies. *Also AFAM 557a^U, AMST 703a^U.*

ANTH 700a^U, Archaeological Method and Theory I. Frank Hole.

t 9.30–11.20

Theoretical approaches and methods used in the design and implementation of archaeological field research and laboratory analysis. *Also ARCG 700a^U.*

ANTH 702b^U, Archaeological Method and Theory II. Marcello Canuto.

t 9.30–11.20

The principles archaeologists use to explain human cultural development from the material record of the past. Questions considered include: What is archaeology and what are its aims? Is there or is there not a coherent body of archaeological theory to which most archaeologists subscribe? What appear to be the most productive theoretical approaches for understanding and interpreting the past? *Also ARCG 702b^U.*

ANTH 705Lb^U, Archaeology Laboratory II. Thomas Tartaron.

W 1–4

Practical experience in preparation, analysis, and interpretation of artifacts and nonartifactual archaeological data. Students undertake term projects. *Also ARCG 705Lb^U.*

ANTH 709b^U, Climate, Society, and Causality. Harvey Weiss.

th 1.30–3.20

Analysis of (1) palaeoclimate proxy and instrumental data for abruptness, magnitude, and duration of Holocene climate changes, and (2) archaeological and historical records for adaptive social responses in Africa, Asia, Europe, and the Americas. The webs of causality are disentangled when the resolution of the palaeoclimate and archaeohistorical records are re-examined. *Also ARCG 709b^U.*

ANTH 712b^U, Ancient Civilizations of Mesoamerica. Marcello Canuto.

tth 11.30–12.45

The Indian civilizations of Mexico and Central America from earliest times through the Spanish conquest. *Also ARCG 712b^U.*

ANTH 713b^U, Birth, Baptism, Marriage, Death: Aspects of Byzantine and Modern Greek Private Life. Christina Ewald.

th 3.30–5.20

A general introduction to rituals and ceremonies of private life in Byzantine and early modern Greek culture (fourth to nineteenth century). *Also ARCG 713b^U.*

ANTH 728a^U, Archaeology of the Incas. Staff.

th 9.30–11.20

Examination of Inca society and culture, with an emphasis on the contribution made by archaeological research. Consideration of the relationship between the historical sources and archaeological evidence, along with the more general methodological problem of the study of prehistoric conquest states. *Also ARCG 728a^U.*

ANTH 733a^U and 733La^U, Archaeological Field Techniques and Archaeology Lab I. Thomas Tartaron.

tth 9–10.15, Lab sa 9–5

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. *Also ARCG 733a^U and 733La^U.*

ANTH 737b^U, Archaeological Research Design. Frank Hole.

mw 1–2.15

Various approaches to designing archaeological research are presented and discussed through the use of case studies. As final projects students design and present their own research proposals. *Also ARCG 737b^U.*

ANTH 738b^U, Ethnoarchaeology. Frank Hole.

tth 9–10.15

A survey and critical examination of the uses of ethnographic, experimental, and replication studies for the archaeological interpretation of material culture and patterns of behavior. *Also ARCG 738b^U.*

ANTH 740a^U, Topics in Maya Archaeology. Marcello Canuto.

w 1.30–3.20

Examination of current problems in Maya archaeology, epigraphy, iconography, and ethnohistory. Topics include the preclassic, classic, and postclassic periods, the development and collapse of classic Maya civilization, economic and political organization, warfare, and external relations. *Also ARCG 740a^U.*

ANTH 746a^U, Topics in Greek Prehistory. Thomas Tartaron.

w 3.30–5.20

A detailed examination of current topics in the archaeology of Neolithic and Bronze Age Greece, including the transition to agriculture, the rise of complex society, seafaring and trade, and the emergence and collapse of Mycenaean “palatial” systems. *Also ARCG 746a^U.*

ANTH 747a^U, The Archaeology of Households and Daily Life. Marcello Canuto.

w 1.30–3.20

Undeniably, households and everyday life are at the core of human existence. Despite the inescapable pervasiveness of these arenas of daily life in the study of human societies, social scientists have assigned everyday life a passive position in human societies. This course examines households in past and present societies throughout the world in order to discuss how people in their households and throughout their everyday lives experience and construct the world around them. *Also ARCG 747a^U.*

ANTH 753a^U, Early Prehistory. Frank Hole.

tth 1–2.15

The formation of modern society began with the beginning of food production and the establishment of permanent settlements. Triggered by climatic and environmental factors, the Neolithic Revolution led to innovations in architecture, art, metallurgy, religion, diet, technology, trade, and social organization that provided the foundations for the earliest civilizations. This course focuses on the Neolithic period in the region including the Eastern Mediterranean, Turkey, Iraq, and western Iran. *Also ARCG 753a^U.*

ANTH 763b^U, Archaeologies of Empire. Harvey Weiss.

t 2.30–4.20

Comparative study of origins, structures, efficiencies, and limitations of imperialism, ancient and modern, in the Old and New Worlds, from Akkad to “Indochina,” 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. *Also ARCG 763b^U.*

ANTH 773a^U, Civilizations and Collapse. Harvey Weiss.

th 3.30–5.20

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. *Also ARCG 773a^U, NELC 588a^U.*

ANTH 777b^U, The Origins of Agriculture. Frank Hole.

tth 1–2.15

The concepts and processes of domestication are examined in the context of archaeological examples from several regions of the world. *Also ARCG 777b^U.*

ANTH 803b, Reproductive Ecology of Humans and Nonhuman Primates.**Richard Bribiescas.**

t or w 1.30–3.20

Survey of the current understanding of the physiology of reproductive function within the control of evolutionary and life history theory. Emphasis on population variation in female and male reproductive endocrinology as well as the sources of that variation.

ANTH 815b, Primate Functional Morphology. Eric Sargis.

Examination of the form and function of primate cranial, dental, and postcranial morphology. Includes the relationship between diet and body size, as well as locomotion and body size; craniodental adaptations in relation to dietary differences; postcranial adaptations in relation to differential substrate use; and postcranial adaptations for various locomotor modes. Paleobiological implications for fossil primates are also considered.

ANTH 822b, Topics and Issues in Human Evolution. Andrew Hill.

w 2.30–4.20

Topics from the span of primate evolution are covered: the early primates, origin of modern type primates, anthropoid origins, monkey and hominoid evolution. Readings and discussions focus on issues of taxonomy — judging morphological similarities and differences among fossils. Specific attention paid to traits paleontologists use to assign fossils to species and functional/behavioral significance of those traits. Lectures and lab use of fossils provide background on fossil evidence.

ANTH 829a^U, Primate Evolution. Eric Sargis.

mw 1–2.15

Exploration of the evolutionary history of the order Primates from its origins through the Miocene epoch. Focus is on controversies in taxonomy, systematics, and functional morphology in the primate fossil record.

ANTH 849b, Primate Models in Human Evolution. David Watts.

t 1.30–3.20

ANTH 851a, Topics and Issues in Evolutionary Theory. Eric Sargis, Richard Bribiescas.

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.

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

th 1.30–3.20

If human evolutionary change has been determined or affected by ecological factors, like changes in climate, competition with other animals, 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. An examination of methods of obtaining data relevant to this, by evaluating the techniques and results of such other fields as geology, paleobotany, and paleozoology. It also surveys ethnographic, primatological, and other biological models of early human behavior.

ANTH 864b, Human Osteology. Eric Sargis.

tth 11.30–12.45

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

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

By arrangement with faculty.

ANTH 952a or b, Directed Research in Linguistics.

By arrangement with faculty.

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

By arrangement with faculty.

ANTH 965a or b, Directed Research in Physical Anthropology.

By arrangement with faculty.

applied mathematics

A. K. Watson Hall, 432.1278
M.S., M.Phil., Ph.D.

Chair and Director of Graduate Studies

Steven A. Orszag (AKW 101, 432.6433, steven.orszag@yale.edu)

Professors

Andrew Barron (*Statistics*), Richard Beals (*Mathematics*), Donald Brown (*Economics*), Ronald Coifman (*Mathematics; Computer Science*), Eric Denardo (*Operations Research*), Stanley Eisenstat (*Computer Science*), Michael Fischer (*Computer Science*), John Hartigan (*Statistics*), Roger Howe (*Mathematics*), Peter Jones (*Mathematics*), Ravindran Kannan (*Computer Science; Applied Mathematics*), Steven Orszag (*Mathematics; Applied Mathematics*), David Pollard (*Statistics*), Vladimir Rokhlin (*Computer Science; Mathematics*), Herbert Scarf (*Economics*), Martin Schultz (*Computer Science*), Mitchell Smooke (*Mechanical Engineering; Applied Physics*), Katepalli Sreenivasan (*Mechanical Engineering; Applied Physics*), Steven Zucker (*Computer Science; Electrical Engineering*)

Associate Professor

Joseph Chang (*Statistics*)

Assistant Professors

James Aspnes (*Computer Science*), Nicolas Hengartner (*Statistics*), Marten Wegkamp (*Statistics*)

Fields of Study

The graduate program in Applied Mathematics comprises mathematics and its applications to a range of areas, to the mathematical sciences (including computer science and statistics), and to the other sciences and engineering. 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.

Special Requirements for the Ph.D. Degree

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; (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 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.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see page 373).

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.

applied physics

Dunham Laboratory, 432.4250

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

Chair

A. Douglas Stone

Professors

William Bennett, Jr. (*Emeritus*), Richard Chang, Michel Devoret, Joseph Dillon, Jr. (*Adjunct*), Paul Fleury, Steven Girvin, Robert Grober, Victor Henrich, Arvid Herzenberg (*Emeritus*), Pierre Hohenberg (*Adjunct*), Mark Kasevich, Marshall Long, Tso-Ping Ma, Daniel Prober, Nicholas Read, Mark Reed, Subir Sachdev, Ramamurty Shankar, Mitchell Smooke, Katepalli Sreenivasan, A. Douglas Stone, John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*), Jerry Woodall

Associate Professor

Sean Barrett

Assistant Professors

Charles Ahn, Janet Pan, Robert Schoelkopf

Fields of Study

Fields include areas of theoretical and experimental condensed-matter physics, optical and laser physics, and material physics. Specific programs include surface science, microlithography and quantum transport, optical properties of micro-cavities, spectroscopy at the nanoscale, near-field microscopy, atomic force microscopy and ferro-electronic materials, molecular beam epitaxy, mesoscopic physics, and medical instrumentation.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science, pages 123–35.

archaeological studies

51 Hillhouse, 432.3772

M.A.

Chair and Director of Graduate Studies

Frank Hole (*Anthropology*)

Professors

Richard Burger (*Anthropology*), Edward Cooke, Jr. (*History of Art*), Robert Gordon (*Geology & Geophysics*), Andrew Hill (*Anthropology*), Frank Hole (*Anthropology*), Diana Kleiner (*Classics*), Mary Miller (*History of Art*), William Simpson (*Near Eastern Languages & Civilizations*), Ronald Smith (*Geology & Geophysics*), Karl Turekian (*Geology & Geophysics*), Harvey Weiss (*Near Eastern Languages & Civilizations*)

Assistant Professors

Marcello Canuto (*Anthropology*), John Darnell (*Near Eastern Languages & Civilizations*), Björn Ewald (*Classics*), Thomas Tartaron (*Anthropology*)

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; World Prehistory, Origins of Western Civilizations, or Introduction to Archaeology; at least one laboratory course; a course related to archaeology in each of the following groups: Anthropology; Classics, History of Art, or Near Eastern Languages & Civilizations; Ecology & Evolutionary Biology, Forestry & Environmental Studies, or Geology & Geophysics; and two 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.

Program materials are available upon request to the Director of Graduate Studies, Archaeological Studies, Department of Anthropology, Yale University, PO Box 208277, New Haven CT 06520-8277; e-mail, anthropology@yale.edu; Web site, <http://www.yale.edu/archaeology/>.

Courses

ARCG 700a^U, Archaeological Method and Theory I. Frank Hole.

t 9.30–11.20

Theoretical approaches and methods used in the design and implementation of archaeological field research and laboratory analysis. *Also ANTH 700a^U.*

ARCG 702b^U, Archaeological Method and Theory II. Marcello Canuto.

t 9.30–11.20

The principles archaeologists use to explain human cultural development from the material record of the past. Questions considered include: What is archaeology and what are its aims? Is there or is there not a coherent body of archaeological theory to which most archaeologists subscribe? What appear to be the most productive theoretical approaches for understanding and interpreting the past? *Also ANTH 702b^U.*

ARCG 705Lb^U, Archaeology Laboratory II. Thomas Tartaron.

w 1–4

Practical experience in preparation, analysis, and interpretation of artifacts and nonartificial archaeological data. Students undertake term projects. *Also ANTH 705Lb^U.*

ARCG 709b^U, Climate, Society, and Causality. Harvey Weiss.

th 1.30–3.20

Analysis of (1) palaeoclimate proxy and instrumental data for abruptness, magnitude, and duration of Holocene climate changes, and (2) archaeological and historical records for adaptive social responses in Africa, Asia, Europe, and the Americas. The webs of causality are disentangled when the resolution of the palaeoclimate and archaeohistorical records are re-examined. *Also ANTH 709b^U.*

ARCG 712b^U, Ancient Civilizations of Mesoamerica. Marcello Canuto.

tth 11.30–12.45

The Indian civilizations of Mexico and Central America from earliest times through the Spanish conquest. *Also ANTH 712b^U.*

ARCG 713b^U, Birth, Baptism, Marriage, Death: Aspects of Byzantine and Modern Greek Private Life. Christina Ewald.

th 3.30–5.20

A general introduction to rituals and ceremonies of private life in Byzantine and early modern Greek culture (fourth to nineteenth century). *Also ANTH 713b^U.*

ARCG 728a^U, Archaeology of the Incas. Staff.

th 9.30–11.20

Examination of Inca society and culture, with an emphasis on the contribution made by archaeological research. Consideration of the relationship between the historical sources and archaeological evidence, along with the more general methodological problem of the study of prehistoric conquest states. *Also ANTH 728a^U.*

ARCG 733a^U and 733La^U, Archaeological Field Techniques and Archaeology Lab I. Thomas Tartaron.

tth 9–10.15, Lab sa 9–5

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. *Also ANTH 733a^U and ANTH 733La^U.*

ARCG 737b^U, Archaeological Research Design. Frank Hole.

mw 1–2.15

Various approaches to designing archaeological research are presented and discussed through the use of case studies. As final projects students design and present their own research proposals. *Also ANTH 737b^U.*

ARCG 738b^U, Ethnoarchaeology. Frank Hole.

tth 9–10.15

A survey and critical examination of the uses of ethnographic, experimental, and replication studies for the archaeological interpretation of material culture and patterns of behavior. *Also ANTH 738b^U.*

ARCG 740a^U, Topics in Maya Archaeology. Marcello Canuto.

w 1.30–3.20

Examination of current problems in Maya archaeology, epigraphy, iconography, and ethnohistory. Topics include the preclassic, classic, and postclassic periods, the development and collapse of classic Maya civilization, economic and political organization, warfare, and external relations. *Also ANTH 740a^U.*

ARCG 746a^U, Topics in Greek Prehistory. Thomas Tartaron.

w 3.30–5.20

A detailed examination of current topics in the archaeology of Neolithic and Bronze Age Greece, including the transition to agriculture, the rise of complex society, seafaring and trade, and the emergence and collapse of Mycenaean “palatial” systems. *Also ANTH 746a^U.*

ARCG 747a^U, The Archaeology of Households and Daily Life. Marcello Canuto.

w 1.30–3.20

Undeniably, households and everyday life are at the core of human existence. Despite the inescapable pervasiveness of these arenas of daily life in the study of human societies, social scientists have assigned everyday life a passive position in human societies. This course examines households in past and present societies throughout the world in order to discuss how people in their households and throughout their everyday lives experience and construct the world around them. *Also ANTH 747a^U.*

ARCG 753a^U, Early Prehistory. Frank Hole.

tth 1–2.15

The formation of modern society began with the beginning of food production and the establishment of permanent settlements. Triggered by climatic and environmental factors, the Neolithic Revolution led to innovations in architecture, art, metallurgy, religion, diet, technology, trade, and social organization that provided the foundations for the earliest civilizations. This course focuses on the Neolithic period in the region including the Eastern Mediterranean, Turkey, Iraq, and western Iran. *Also ANTH 753a^U.*

ARCG 763b^U, Archaeologies of Empire. Harvey Weiss.

t 2.30–4.20

Comparative study of origins, structures, efficiencies, and limitations of imperialism, ancient and modern, in the Old and New Worlds, 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. *Also ANTH 763b^U.*

ARCG 773a^u, Civilizations and Collapse. Harvey Weiss.

th 3.30–5.20

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. *Also ANTH 773a^u, NELC 588a^u.*

ARCG 777b^u, The Origins of Agriculture. Frank Hole.

tth 1–2.15

The concepts and processes of domestication are examined in the context of archaeological examples from several regions of the world. *Also ANTH 777b^u.*

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

By arrangement.

Related Courses

ARCG 171b, Great Discoveries in Archaeology.

ARCG 232a, Ancient Civilizations of the Andes. Richard Burger.

G&G 465a, Archaeometallurgy. Robert Gordon.

HSAR 236a, The Art of Ancient Palaces. Karen Foster.

HSAR 746a, Art and Architecture of Mesoamerica A.D. 800–1000. Mary Miller.

NELC 510a^u, Conflicts that Shaped Pharaonic Egypt. John Darnell.

astronomy

J.W. Gibbs Laboratories, 432.3000

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

Chair

Charles Bailyn

Director of Graduate Studies

Sarbani Basu (274 JWG, 432.3028, sarbani.basu@yale.edu)

Professors

Charles Bailyn, Charles Baltay (*Physics*), Pierre Demarque (*Emeritus*), Jeffrey Kenney, Richard Larson, Peter Parker (*Physics*), Sabatino Sofia, Megan Urry (*Physics*), William van Altena, Robert Zinn

Associate Professor

Paolo Coppi

Assistant Professors

Sarbani Basu, Priya Natarajan

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 should have a strong undergraduate preparation in physics and mathematics. Although some formal training in astronomy is useful, it is by no means required for admission. Applicants should take the GRE Subject Test in Physics.

Special Requirements for the Ph.D. Degree

A typical program of study includes twelve courses during the first four terms, of which at least four must be in astronomy. At least two courses (and no more than four) must be research credits, each earned by working in close collaboration with a faculty member. The choice of the remaining courses depends on the candidate's interests and background. Students are encouraged to take graduate courses in physics or other related fields. No individual course is required, but students normally take the core courses (Stellar Populations, Stellar Astrophysics, Interstellar Matter and Star Formation, Stellar Dynamics, Galaxies, Cosmology), which provide a basic preparation in astronomy, and additional courses related to their research interests. 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 the standard courses. To achieve both breadth and depth in their education, students are encouraged to take a few courses or seminars

beyond their second year of study. During the course of their first year of graduate studies, students who have had little or no previous training in astronomy must demonstrate in an examination their knowledge of general astronomy at the undergraduate level. There is no foreign-language requirement. An oral and 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. Satisfactory performance in this examination, 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 important, 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 9 TF units. Both the levels of teaching assignments and the scheduling of teaching are flexible. By the end of the third term, however, most students will have completed 6 TF units. The additional 3 TF units will normally be carried out with a different professor than the earlier position to provide broader teaching experience.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see page 373).

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

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. The department requires, in addition, that at least one of the courses taken during the year be a research course.

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. Robert Zinn.

3 htba

The stellar population of our galaxy and the galaxies of the local group. The properties of stars and star clusters, stellar evolution, and the structure and evolution of our galaxy.

[ASTR 518a^U, Stellar Dynamics.]

ASTR 520a^U, Computational Methods for Astrophysics. Paolo Coppi.

3 htba

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

ASTR 530a^u, Galaxies. Jeffrey Kenney.

tth 10.30–11.20, 1 htba

The structure, contents, dynamics, and evolution of galaxies. The properties and evolution of active galactic nuclei.

ASTR 540a^u, Radiative Processes in Astrophysics. Sarbani Basu.

mw 10.30–11.20, 1 htba

Applications to astrophysics of the theory of radiation fields. Specific examples from stellar physics, stellar atmospheres, the interstellar medium, and high-energy astrophysics.

ASTR 550b^u, Stellar Astrophysics. Sarbani Basu.

mw 10.30–11.20, 1 htba

An introduction to the physics of stellar atmospheres and interiors. The basic equations of stellar structure, nuclear processes, stellar evolution, white dwarfs, and neutron stars.

ASTR 555a^u, Observational Techniques. William van Altena.

mw 1–2.15

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^u, Interstellar Matter and Star Formation.]**ASTR 570b^u, High-Energy Astrophysics. Charles Bailyn.**

3 htba

A survey of current topics in high-energy astrophysics, including accreting black holes, black holes and neutron stars, relativistic jets, gamma-ray bursts, and ultra-high energy cosmic rays. The basic physical processes underlying the observed high-energy emission are also covered. *Also PHYS 570b^u.*

ASTR 575b, Topics in Astrometry. William van Altena.

Dramatic improvements made in the technologies of measurement and computation over the past few years have made it possible to use astrometric techniques to investigate current problems in astronomy and astrophysics. In this seminar we develop the astrometric techniques required to study the cosmological distance scale, the spatial and kinematic structure of our galaxy, and the stellar mass-luminosity relation.

ASTR 580a or b, Research.

By arrangement with faculty.

[ASTR 600, Cosmology.]**ASTR 705b, Research Seminar in Stellar Population. Robert Zinn.**

The techniques and results of investigating the stellar populations of Local Group Galaxies.

ASTR 710a or b, Professional Seminar. Faculty.

A seminar covering science and professional issues in astronomy.

atmospheric science

Advisory Committee

Donald Aylor (*Forestry & Environmental Studies*)

Gary Haller (*Chemical Engineering; Chemistry*)

Xuhui Lee (*Forestry & Environmental Studies*)

Daniel Rosner (*Chemical Engineering; Mechanical Engineering*)

Steven Sherwood (*Geology & Geophysics*)

Ronald Smith (*Geology & Geophysics*)

Sabatino Sofia (*Astronomy*)

Jan Stolwijk (*Epidemiology & Public Health*)

Karl Turekian (*Geology & Geophysics*)

John Wettlaufer (*Geology & Geophysics*)

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. 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, 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, and the departments of Epidemiology & Public Health and Engineering & Applied Science (which includes the programs of Applied Physics, Chemical Engineering, Electrical 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-200 Sterling Hall of Medicine, 785:3735

Director

Lynn Cooley (lynn.cooley@yale.edu)

Fields of Study

As the broad field of biological and biomedical sciences has become more exciting, it has also become more complex and demanding. The successful scientist today can no longer be an expert in only one area or one technique, but must be able to make use of information, technologies, and experimental strategies that ignore the boundaries defined by traditional university departments. In the coming decades, opportunities for research and scientific discovery will be greater, but also more challenging, than ever before. A student interested in pursuing a career in science should receive a breadth and depth of training in graduate school that will define his or her ultimate goal, whether he/she chooses to enter academia, industry, education, or any of the many other career opportunities that will be available to young scientists.

To help meet this challenge, Yale faculty have reorganized their approach to graduate education and formed the interdepartmental Combined Program in the Biological and Biomedical Sciences (BBS). Unique among graduate programs, BBS gives entering students access to more than 250 Yale biological science faculty in all departments, both at the School of Medicine and on the main university campus.

The primary purpose of BBS is to provide an environment for graduate education in modern biological and biomedical sciences that is both broad in scope and rigorous in depth. BBS serves as a focal point for research, education, and career development in the biological sciences and sponsors exciting initiatives, including new courses (like genomics and informatics; and laboratory practicals in confocal microscopy, immunocytochemistry, and molecular biology); informal scientific exchanges (the Invertebrate Breakfast); the annual student-run Graduate Student Research Symposium; career counseling and development; and numerous social activities.

BBS is composed of the faculty in the departments of Cell Biology; Cellular and Molecular Physiology; Experimental Pathology; Genetics; Immunobiology; the Interdepartmental Neuroscience Program; Microbial Pathogenesis; Molecular Biophysics and Biochemistry; Molecular, Cellular, and Developmental Biology; Neurobiology; and Pharmacology; and it draws relevant faculty from various clinical departments. The program is divided into several interest-based tracks whose identity may change with the changing interests of faculty. Beginning in the fall of 2003, the tracks will be: (1) Bioinformatics and Computational Biology; (2) Molecular Cell Biology, Genetics and Development; (3) Immunology; (4) Microbiology; (5) Molecular Biophysics and Biochemistry; (6) Neuroscience; (7) Pharmacological Sciences and Molecular Medicine; and (8) Physiology and Integrative Medical Biology. Each track draws its faculty from several departments and has a specific set of recommended courses and activities for first-year students.

Entering students apply to and then affiliate with a track, which places them with the group of students and faculty that most closely reflects their interests. Nevertheless, the courses, faculty, students, and, most important, laboratory research opportunities in all tracks remain completely available at all times, regardless of a student's primary track.

Entering students are admitted to Yale University as members of the BBS program and generally affiliate with the track to which they initially applied. The total number of students admitted each year is approximately sixty-five to seventy-five, with between five and fifteen being admitted to any one track, depending on the interests and quality of the applicant pool. A student remains a member of the track for his or her first year and generally takes courses (with the advice of the track adviser or director) and performs at least three three-month rotations in a laboratory at Yale. At the end of the first year students generally select an adviser and also a department or academic program in which they take a qualifying examination in the second year and through which they eventually will earn a Ph.D. Advisers may be any full-time or affiliated Yale faculty member, regardless of their department or the student's track.

For the duration of their studies all students receive a stipend, which increases yearly, full tuition, health coverage, and a yearly allotment for travel to scientific meetings or courses. Financial support comes from university fellowships, National Institutes of Health (NIH) Training Grants, grants from foundations and companies, and from the Bristol-Myers Squibb Educational Alliance.

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.

bioinformatics and computational biology

A strong background in the basic sciences, along with computer training, is expected.

molecular cell biology, genetics and development

No additional requirements or recommendations.

immunology

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. In special cases, Medical College Admission Test (MCAT) scores may be substituted for the GRE General Test scores.

microbiology

No additional requirements or recommendations.

molecular biophysics and biochemistry

Actual course requirements in a student's background area are flexible. Desirable courses include biology; biochemistry; general, organic, and physical chemistry; physics; and math.

neuroscience

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. Laboratory research experience is beneficial but is not a formal requirement. Medical College Admission Test (MCAT) scores may be substituted for the GRE General Test scores.

pharmacological sciences and molecular medicine

No additional requirements or recommendations.

physiology and integrative medical biology

No additional requirements or recommendations.

Program materials and applications are available by request to John Alvaro, Administrative Director, BBS Program, Yale University, PO Box 208084, New Haven CT 06520-8084; telephone 203.785.3735; telefax 203.785.3734; e-mail, bbs@yale.edu; Web site, info.med.yale.edu/bbs/.

biology

Kline Biology Tower, 432.2538

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

Directors of Graduate Study

Margaret Riley (*Ecology & Evolutionary Biology*)

Ronald Breaker (*Molecular, Cellular & Developmental Biology*)

In the 1998–99 academic year, the Department of Biology reorganized to form the Department of Ecology and Evolutionary Biology (EEB) and the Department of Molecular, Cellular, and Developmental Biology (MCDB). The graduate program in Biology will continue to exist until all of its current students complete the program. No additional students will be admitted into the Biology graduate program. New students will be admitted into one of the new departments.

biomedical engineering

Dunham Laboratory, 432.4250

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

Professors

Robert Apfel, James Duncan, Robert Grober, Csaba Horváth, Steven Segal, Mark Saltzman, Fred Sigworth, Steven Zucker

Associate Professors

Lawrence Staib, Hemant Tagare

Assistant Professor

Jacek Cholewicki

Fields of Study

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

For admissions and degree requirements, and for course listings, see Engineering and Applied Science, pages 123–35.

biostatistics

60 College Street, 785.2844
M.S.

Division Head

Robert Makuch

Director of Graduate Studies

Nancy Ruddle (785.2915)

Fields Of Study

The faculty of the Department of Epidemiology and Public Health offers a two-year terminal Master of Science degree in Biostatistics. Fields include clinical trials, epidemiologic methodology, statistical genetics, and mathematical models for infectious diseases. A Ph.D. program in Biostatistics is also available. See Epidemiology and Public Health, pages 144–57, for further details on the Ph.D. program and on courses available.

Special Admissions Requirements

Applicants should have a strong background in mathematics, and undergraduate course work in the biological and social sciences is recommended. The GRE General Test is required.

Special Requirements for the M.S. Degree

A minimum of twelve courses must be completed, and a grade of Honors achieved in at least two courses. An acceptable master's thesis must be submitted.

Program materials are available upon request from the EPH Admissions Office, Epidemiology and Public Health, Yale University, PO Box 208034, New Haven CT 06520-8034; e-mail, norman.silliker@yale.edu.

cell biology

C-443 Sterling Hall of Medicine, 785.4302
M.S., M.Phil., Ph.D.

Chair

Ira Mellman

Director of Graduate Studies

Susan Ferro-Novick (254B BCMM, 737.5207, susan.ferronovick@yale.edu)

Professors

Norma Andrews (*Microbial Pathogenesis*), Roland Baron (*Orthopaedics*), Lynn Cooley (*Genetics*), Pietro De Camilli, Susan Ferro-Novick, Jorge Galán (*Microbial Pathogenesis*), Fred Gorelick (*Internal Medicine*), James Jamieson, Keith Joiner (*Internal Medicine*), Thomas Lentz, Vincent Marchesi, Ira Mellman, Mark Mooseker (*Molecular, Cellular & Developmental Biology*), Peter Novick, Tom Pollard (*Molecular, Cellular & Developmental Biology*), Elisabetta Ullu (*Internal Medicine*), Graham Warren

Associate Professors

Carl Hashimoto, Michael Nathanson (*Internal Medicine*), Sandra Wolin

Assistant Professors

Karin Reinisch, Peter Takizawa

Fields of Study

Fields include membrane biology of eukaryotic cells (molecular mechanisms of membrane biogenesis, traffic, and fusion; organelle biogenesis), intracellular transport of membrane and secretory proteins, receptor-mediated endocytosis, generation of transmembrane signals, epithelial cell polarity and the extracellular matrix, protein folding, membrane function in the nervous system (synapse formation and function), developmental genetics, cell biology of protozoan parasites and of pathogen/host interactions, cell biology of the immune response, mRNA and protein localization, cell biology of bone remodeling and of the cytoskeleton. Approaches to these topics include biochemistry, molecular biology, and macromolecular crystallography; yeast and *Drosophila* genetics; immunocytochemistry and electron microscopy; cell fractionation; and live cell imaging.

Special Admissions Requirements

An undergraduate major in biology, biophysics, molecular biology, or biochemistry is recommended; the GRE General Test is required; a relevant GRE Subject Test is encouraged.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences (see pages 59–61).

Special Requirements for the Ph.D. Degree

Five courses are required: CBIO 602a, 603a, 606b, 727b and MB&B 743b, in addition to one elective. Students plan their courses in consultation with the director of graduate studies to meet individual needs and interests. During the first year, students are also required to 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 a written and oral qualifying examination at the end of the fourth term. In order to be admitted to candidacy, students must have met the Graduate School Honors requirement, maintained a better than passing record in the area of concentration, passed the qualifying examination, and submitted an approved prospectus. 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 level. 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. Requirements for the M.Phil. degree are the same as for admission to candidacy (see above).

M.S. See Graduate School requirements, page 375; this degree is normally granted only to students who are withdrawing from the Ph.D. program.

Program materials are available upon request to the Director of Graduate Studies, Department of Cell Biology, Yale University, PO Box 203333, New Haven CT 06520-3333.

Courses

CBIO 502, The Cellular Basis of Human Biology. James Jamieson, 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 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; and endocrine and reproductive cell biology. 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 the light microscope for exploring cell and tissue structure.

CBIO 503, Histology Laboratory. Thomas Lentz and staff.

A laboratory in microscopic anatomy to be taken in conjunction with CBIO 502.

CBIO 520, Research in Cell Biology and Molecular Physiology. Catherine Berlot.

Three ten-week periods of directed research/reading in selected laboratories. For first-year graduate students in the Cell Biology and Molecular Physiology track.

CBIO 601, The Molecular and Cellular Basis of Human Disease. Pietro De Camilli, Fred Gorelick, and staff.

An exploration of primary literature and critical assessment of the data that form a basis for understanding human disease. A series of human genetic diseases, whose mechanisms have been identified as a result of sequencing of the human genome, are explored. Students are required to search out supportive data, discuss it with the session leader, and present it to the group. This course runs in parallel with CBIO 502.

CBIO 602a and 603a, Molecular Cell Biology and Tutorial. Sandra Wolin, Graham Warren, Tom Pollard.

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.

CBIO 606b, Advanced Molecular Cell Biology. Peter Novick.

This seminar course, which meets once a week, covers several topics in Modern Cell Biology. It should serve to introduce students to areas they might not have considered in prior courses.

CBIO 676b, Responsible Conduct of Research. Lynne Regan and staff.

f 4

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 during the spring term, run in a seminar/discussion format. *Also MB&B 676b.*

CBIO 727b, Advanced Seminar Course. Susan Ferro-Novick.

This seminar course, which meets once a week, covers several topics suggested by the second-year cell biology students. It should serve to introduce students to areas they might not have considered in prior courses. Each topic is spread over 3–6 sessions, starting with an introductory overview and followed by detailed analysis of key papers.

cellular and molecular physiology

B-147 Sterling Hall of Medicine, 737.2215

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

Chair

Steven Hebert

Director of Graduate Studies

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

Professors

Peter Aronson (*Internal Medicine/Nephrology*), Henry Binder (*Internal Medicine/Endocrinology*), Walter Boron, Emile Boulpaep, Thomas Brown (*Psychology*), Michael Caplan, W. Knox Chandler, Lawrence Cohen, Arthur DuBois (*Epidemiology*), Barbara Ehrlich (*Pharmacology*), Bliss Forbush III, Gerhard Giebisch, Steven Goldstein (*Pediatrics*), Gabriel Haddad (*Pediatrics*), Steven Hebert, Joseph Hoffman, Leonard Kaczmarek (*Pharmacology*), Edward Moczydlowski (*Pharmacology*), Steven Segal, Gerald Shulman (*Internal Medicine/Endocrinology*), Fred Sigworth, Carolyn Slayman (*Genetics*), Clifford Slayman, John Stitt (*Epidemiology*), Fred Wright (*Internal Medicine/Nephrology*)

Associate Professors

Catherine Berlot, Cecilia Canessa, Marie Egan (*Pediatrics*), George Richerson (*Neurology*)

Assistant Professors

Reiko Maki Fitzsimonds, P. Darrell Neufer, Vincent Pieribone, David Zenisek

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 (see pages 59–61).

Special Requirements for the Ph.D. Degree

Formal requirements for the Ph.D. include two or three terms of course work, a qualifying examination taken by the end of the second year, submission of a thesis prospectus, 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 CMP 550a and CMP 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. There is no foreign-language requirement. The qualifying examination, which must be passed by the end of the student's second year, will cover areas of physiology that complement the student's major research interest. After passing the qualifying examination and submitting a satisfactory thesis prospectus, students are admitted to candidacy and begin research on their thesis. The completed dissertation must describe original research making a significant contribution to knowledge.

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. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school level. 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.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see page 373).

Master's Degrees

No students are admitted for master's degrees. Under certain circumstances continuing or transferring students may become eligible for the M.S. or M.Phil. degree. See Graduate School requirements, page 375.

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

Courses

C&MP 550a, Physiological Systems. Steven Segal and staff.

mwf 9.30–10.20

We develop a foundation in human physiology, the regulation of homeostasis, 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.

Regulation of cardiac output, blood flow, and vascular exchange are integrated in light of exercise performance. Respiratory physiology explores the mechanics of ventilation, gas diffusion, and acid-base balance. Renal physiology explores the formation and composition of urine and the regulation of electrolyte, fluid, and acid-base balance. Organs of the digestive system are developed from the perspective of substrate metabolism and energy balance. Hormonal regulation is applied to metabolic control and to calcium, water, and electrolyte balance. The special senses are considered in light of signaling processes inherent to the nervous system. 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. *Also ENAS 550a^{II}, MCDB 550a^{II}.*

C&MP 56ob, Cell and Molecular Physiology from Fundamental Mechanisms to Human Disease. Michael Caplan, Emile Boulpaep, Mark Mooseker.

mwf 9.30–10.20

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 upon 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. *Also MCDB 560b^{II}.*

[C&MP 61ob, Neurophysiology: Theory and Practice.]

C&MP 71ob, Electron Cryo-Microscopy for Protein Structure Determination.

Vinzenz Unger, Fred Sigworth.

Understanding cellular function requires structural and biochemical studies at an ever-increasing level of complexity. 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. *Also MB&B 710b4.*

chemical engineering

Dunham Laboratory, 432.4250

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

Chair

Lisa Pfefferle

Professors

Daniel Crothers (*Adjunct*), Menachem Elimelech, Thomas Graedel, Gary Haller, William Hancock (*Adjunct*), Csaba Horváth, Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, John Walz, L. Lee Wikstrom (*Adjunct*), Kurt Zilm (*Adjunct*)

Associate Professors

Eric Altman, Gaboury Benoit, Michael Loewenberg

Assistant Professor

Roger Ely

Fields of Study

Fields include combustion, separation processes, catalysis, statistical mechanics of adsorption, high-temperature chemical reaction engineering, convective heat and mass transfer, chromatography, biochemical and biomedical 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, pages 123–35.

chemistry

Sterling Chemistry Laboratory, 432.3913
M.S., Ph.D.

Chair

Andrew Hamilton

Director of Graduate Studies

Mark Johnson

Professors

Sidney Altman (*Molecular, Cellular & Developmental Biology*), Jerome Berson (*Emeritus*), Gary Brudvig, William Chupka (*Emeritus*), Robert Crabtree, R. James Cross, Jr., Donald Crothers, John Faller, Gary Haller (*Engineering & Applied Science*), Andrew Hamilton, John Hartwig, Francesco Iachello (*Physics*), Mark Johnson, William Jorgensen, Philip Lyons (*Emeritus*), J. Michael McBride, Peter Moore, Lynne Regan (*Molecular Biophysics & Biochemistry*), Martin Saunders, Alanna Schepartz, Robert Shulman (*Molecular Biophysics & Biochemistry*), Oktay Sinanoglu (*Emeritus*), Dieter Söll (*Molecular Biophysics & Biochemistry*), Thomas Steitz (*Molecular Biophysics & Biochemistry*), Julian Sturtevant (*Emeritus*), John Tully, Patrick Vaccaro, Harry Wasserman (*Emeritus*), Kenneth Wiberg (*Emeritus*), John Wood, Frederick Ziegler, Kurt Zilm

Associate Professors

David Austin, Craig Crews (*Molecular Biophysics & Biochemistry*), Charles Schmuttenmaer, Scott Strobel (*Molecular Biophysics & Biochemistry*)

Assistant Professors

Victor Batista, J. Patrick Loria, Ann Valentine

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).

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 520^u, Advanced Organic Chemistry. Martin Saunders [F], David Austin [Sp].
mwf 9.30–10.20

A discussion of structure and mechanism in organic chemistry. Fall: bonding, structure and strain; carbanions, carbocations, and carbenes. Spring: conjugated systems, aromaticity, orbital symmetry, and pericyclic reactions; free radicals, biradicals, carbonyl group reactions, and photochemistry.

CHEM 522a^u, Chemical Biology II. Alanna Schepartz.
tth 9–10.15

A comprehensive introduction to the origins and emerging frontiers of chemical biology. This course develops the fundamental chemistry of molecules found in nature, a quantitative description of their interactions with themselves and each other, and subsequent effects on biological function. Topics include protein design, molecular evolution, chemical genetics, metabolic engineering, and methods in genomics and proteomics research.

CHEM 523^u, Synthetic Methods in Organic Chemistry. David Austin [F],
John Wood [Sp].
mwf 10.30–11.20

Modern methods of design in synthetic organic chemistry with an emphasis on natural products. Structural-type recognition, stereochemistry, mechanism and function group transformations in multifunctional group molecules are covered.

CHEM 525b^u, Spectroscopic Methods of Structure Determination. Martin Saunders.
tth 10.30–11.20, 1 htba

A discussion of the use of nuclear magnetic resonance spectroscopy, vibrational spectroscopy, optical spectroscopy, electron-spin resonance spectroscopy, and other physical techniques to determine structural and dynamic properties of organic molecules.

CHEM 526a^U, Computational Chemistry and Biochemistry. William Jorgensen.

tth 9–10.15

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

mwf 9.30–10.20

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.

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

mwf 8.30–9.20

The basic quantum mechanics of spectroscopy including the use of angular momentum operators, matrix methods, and time-dependent quantum mechanics. Applications from magnetic resonance.

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

mwf 10.30–11.20

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.

CHEM 547b, Electron Paramagnetic Resonance. Gary Brudvig.

tth 10.30–11.45

A quantum mechanical treatment of magnetic resonance aimed at providing an understanding of the fundamentals of EPR spectroscopy. Topics include solution and solid-state measurements of radicals and spin labels, triplet states, transition metals, pulsed and double-resonance methods, and applications to biological systems.

[CHEM 548b, Nuclear Magnetic Resonance in Liquids.]**CHEM 549b^U, Biophysical Chemistry. Peter Moore.**

tth 9–10.15

Discussion of several important experimental techniques used to study the properties of biological macromolecules, such as calorimetry, optical spectroscopy, X-ray scattering and diffraction, and sedimentation. Emphasis is on the physical chemistry that underlies both the execution of such experiments and the interpretation of the resulting data. This course is intended primarily for first-year graduate students and capable advanced undergraduates. Prerequisites: physical chemistry (CHEM 330a&b or CHEM 332a&b) and at least one term of biochemistry.

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

tth 9–10.15

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.

CHEM 552a^U, Organometallic Chemistry. Robert Crabtree.

tth 9–10.15

A general introduction to organometallic chemistry, mostly of the transition metal elements. Topics include bonding, structure, and reactivity of transition metal organometallic compounds, ligand substitution reactions, oxidative addition/reductive elimination reactions, insertion reactions, reactions of coordinated ligands, applications to catalytic processes, and organic synthesis.

CHEM 553b, Main Group Chemistry. Robert Crabtree.

tth 10.30–11.45

Main group chemistry has influenced heavily inorganic, organic, and industrial chemistry and is assuming increasing importance in biochemistry. The basic principles are discussed including periodic trends, hypervalency, and the distinctions between electron-deficient, electron-precise, and electron-rich elements. Examples of useful or interesting applications are considered, such as silicones, alumoxanes, MOCVD routes to materials, and nanoparticles. Organolithium, organomagnesium, and organoboron reagents are discussed in relation to their utility in organic chemistry as well as the structural puzzles they pose. Main group clusters are considered in relation to multicenter bonding and Wades' rules. Interactions between main group and transition elements are covered. Finally, bioinorganic applications are discussed, such as neutron capture therapy, Si biochemistry, and bone mineralization.

CHEM 554b, Bio-Inorganic Chemistry. Ann Valentine.

mwf 11.30–12.20

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.

CHEM 555a, Transition Metal Reaction Mechanisms. John Hartwig.

mw 9–10.15

A discussion of contemporary mechanistic problems in transition metal chemistry. The course presents fundamental physical organic principles, such as reaction kinetics, isotope effects, substituent effects, solvent effects, acidity, and their application to problems in coordination chemistry, bioorganic chemistry, and organometallic chemistry.

CHEM 556a, Biochemistry Rates and Mechanisms. Patrick Loria.

mwf 9.30–10.20

The fundamental basis of and methods for studying enzyme function. Topics include transition state theory, pre-steady-state and steady-state enzyme kinetics, and allostereism. The physical principles underlying enzymatic rate enhancements are discussed using examples from the primary literature.

CHEM 557a^U, Modern Coordination Chemistry. Ann Valentine.

tth 11.30–12.45

The structure of the atom, molecular topologies, ionic bonding, covalent bonding, chemical forces, reaction pathways; fundamental concepts for transition metal complexes; coordination chemistry; structural aspects, isomerism, electron transfer reactions, substitution reactions, molecular rearrangements, and reactions of coordinated ligands; transition metal clusters, multiple bonding between transition metal atoms.

CHEM 560L, Advanced Physical Methods in Molecular Science. Patrick Vaccaro [F], Charles Schmuttenmaer [Sp].

f 3–4

A laboratory course introducing physical chemistry tools used in the experimental and theoretical investigation of large and small molecules. Modules include machining materials, electronics, vacuum technology, magnetic resonance, optical spectroscopy and lasers, computational aids, and molecular modeling.

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 565a, Computational Chemistry.]

[CHEM 567a^u, Topics in Chemical Biology.]

[CHEM 568a, Applications of Molecular Orbital Theory.]

[CHEM 569a, Molecular Modeling.]

CHEM 570a^u, Introductory Quantum Chemistry. Victor Batista.

tth 9–10.15

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.

[CHEM 572b^u, Advanced Quantum Mechanics.][CHEM 580b^u, Bio-Organic Chemistry.]**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 Graduate Students. Gary Brudvig.**CHEM 720, Current Topics in Organic Chemistry.**

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

CHEM 730, Molecular Science Seminar.

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

Chair

Victor Bers (*Acting*)

Director of Graduate Studies

Susanna Morton Braund (*Acting*)

Professors

Robert Babcock (*Adjunct, Beinecke Library*), Victor Bers, Susanna Morton Braund, Donald Kagan, Diana Kleiner, John Matthews, William Metcalf (*Adjunct, Art Gallery*)

Associate Professors

Stephen Colvin, Elizabeth Tylawsky

Assistant Professors

Michael Anderson, Björn Ewald, Carlos Noreña, Corinne Pache, Shilpa Raval, Celia Schultz

Lecturers

Judith Barringer, Kim Bowes, Christopher Glover, Veronika Grimm

Senior Research Scholar/Lecturer

Ann Ellis Hanson

Affiliated Faculty

Susanne Bobzien (*Philosophy*), Tad Brennan (*Philosophy*), Maria Georgopoulou (*History of Art*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Bentley Layton (*Religious Studies*), Dale Martin (*Religious Studies*), David Quint (*Comparative Literature*), Barbara Shailor (*Beinecke Library*)

Fields of Study

The degree program in Classics 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.

Special Admissions Requirements

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

Special Requirements for the Ph.D. Degree

(1) Passing sight translation examinations in Greek and Latin by the end of the first year in residence; (2) passing departmental reading examinations in French and German by the beginning of the second year in residence; (3) completing fourteen term courses

which must include two outside the strict limits of classics, one being either in ancient history or in classical art and archaeology; three seminars (two in one language and one in the other); four courses in the history of Greek and Latin literature, or a reasonable equivalent; and one course in historical or comparative linguistics; (4) satisfaction of the departmental composition requirement in Greek and Latin; (5) translation examinations in Greek and Latin, and general oral examinations in Greek and Latin literature by the end of the fifth term; (6) a special oral and/or written examination, to be taken by the end of the sixth term of residence, consisting of two areas of special concentration in each language to be selected by the candidate with the approval of the director of graduate studies; (7) a dissertation prospectus to be submitted and approved by the end of the seventh term of residence; (8) 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 pre-dissertation requirements, including the prospectus, 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 **ancient history**

The Ph.D. program in Ancient History is offered in collaboration with the Department of History and may be pursued in either department. In the Classics department, the course of study has two components: (1) a program of at least six term courses and the same first-year sight translation examinations and translation and general oral examinations in *either* Greek or Latin language and literature described above (Special Requirements for the Ph.D. Degree), except that the course in historical or comparative linguistics may be omitted; (2) six term courses in Greek and Roman history and, normally, two in another period of history, three of which must be appropriate graduate seminars, and by the end of the fifth term of residence a translation examination in the other ancient language, based on a one-thousand-page reading list approved by the director of graduate studies, and an oral examination in Greek and Roman history. Modern foreign language and dissertation requirements are the same as those described above under Special Requirements for the Ph.D. Degree.

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. The required fourteen

courses will roughly be divided between the two departments, but distribution may be adjusted to suit the interests of individual students. Students are admitted to candidacy by passing a written and oral comprehensive examination in classical art and archaeology and securing acceptance of their dissertation prospectus. Students must pass departmental reading examinations in German and one other modern language, usually French or Italian. Further details should be obtained from Professor D. Kleiner or the director of graduate studies.

classics and comparative literature

Students may be admitted to this joint program after consultation with the director of graduate studies of each department, normally during the first term. Fourteen courses are to be taken, not fewer than seven in the Classics department (including two seminars, two terms of the history of Greek or Latin literature, and a term course in historical or comparative linguistics. In Comparative Literature students must take at least four courses on postclassical European literature and two on literary theory or methodology. Students must pass entrance examinations in both classical languages and either the Greek or Latin translation and literature examinations. In addition, an oral examination should be taken during the third year on eight topics appropriate to both disciplines, selected in consultation with the directors of graduate studies. The modern language requirements (French or German) are the same as for students in Comparative Literature.

classics and philosophy

Students who have had at least three years of college Greek and two of philosophy may be admitted to a joint program offered in collaboration with the Department of Philosophy. Further details should be obtained from the director of graduate studies of either department.

classics and renaissance studies

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

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

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 710b^U, Plato's *Republic*. Michael Anderson.

tth 1–2.15

A detailed study of Plato's *Republic*, with attention to the author's conception of justice, the soul, and the city; his theory of forms; criticisms of poetry; methods of argumentation; and use of myth.

GREK 720a^U, Sophocles. Corinne Pache.

tth 11.30–12.45

Close readings of selected plays of Sophocles. Attention to literary, dramatic, and cultural aspects of the plays, with emphasis on myth and ritual, and the role of the chorus in Athenian drama.

GREK 738b^U, The Greek Dialects. Stephen Colvin.

mwf 1.30–2.20

Introduction to the dialects of ancient Greek, including a basic review of Greek historical phonology and morphology. Study of a range of epigraphic and literary texts, with attention to sociolinguistic context and conventions of literary dialect.

GREK 743b^U, Homer's *Iliad*. Corinne Pache.

mw 2.30–3.45

Reading of the complete *Iliad* in translation, and close reading of selections in the ancient Greek. Special emphasis on narrative techniques and oral poetics.

GREK 755a^U, Athenian Law Courts. Victor Bers.

tth 9–10.15

Rhetoric and law, procedural and substantive, in the Athenian courts of the fifth and fourth centuries B.C. as seen in forensic speeches, discursive treatments, and as satirized in Aristophanes' *Wasps*.

GREK 790a^U, Syntax and Stylistics. Stephen Colvin.

tth 1–2.15, 1 htba

A review of accident 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, and composition in various styles. Prerequisite: previous familiarity with Greek prose beyond the elementary level, or permission of instructor.

GREK 798a^U and 799b^U, History of Greek Literature. Michael Anderson [F], Victor Bers [Sp].

tth 11.30–12.45 [F], tth 9–10.15 [Sp]

A comprehensive treatment of Greek literature from Homer to the Imperial period. The student is expected to read extensively in the original language, working toward familiarity with the range and variety of the literature.

LATN 713a^U, Latin Lyric Poetry: Catullus and Horace. Christopher Glover.

mwf 1.30–2.20

A study of the poetry of Catullus and Horace with particular attention to issues of poetic persona, gender, politics, and literary history.

LATN 721b^U, Vergil's *Aeneid*. Celia Schultz.

tth 2.30–3.45

An in-depth study of Vergil's *Aeneid* within its political context.

LATN 736a^u, Cicero's Letters. William Metcalf.

tth 11.30–12.45

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.

LATN 751b^u, Latin Love Elegy. Christopher Glover.

mwf 1.30–2.20

Extensive readings of the Latin love elegists with attention to their social, historical, and political context.

LATN 763b^u, Roman Invective. Elizabeth Tylawsky.

mwf 10.30–11.20

Allegations of public and private depravity in Cicero, Catullus, Sallust, early orators, inscriptions, and graffiti.

LATN 767b^u, Apuleius's *Apologia*. Carlos Noreña.

tth 9–10.15

A close reading of Apuleius's speech of self-defense on the charge of "magic" (c. A.D. 158). Central topics include Apuleius's rhetorical style and self-representation as a Latin sophist, social relations and culture in Roman North Africa during the High Empire, and the practice of Roman law in a provincial setting.

LATN 790a^u, Latin Syntax and Style. Ann Ellis Hanson.

tth 1–2.15

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

LATN 798a^u/799b^u, History of Latin Literature. Susanna Braund, Marcus Wilson [F]; Susanna Braund [Sp].

tth 11.30–12.45 [F], tth 11.30–12.45 [Sp]

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. In the fall term, the "public" voices of Latin literature (epic, historiography, oratory). In the spring term, some alternative voices, including the exile, the lover, the philosopher, the satirist, and the poetic inventor. Diachronic, synchronic, generic, and topical models of organization.

CLSS 601a, Latin Paleography: First Century B.C.E. to the Ninth Century C.E.**Robert Babcock.**

w 2.30–4.20

Latin paleography from the Roman period through the Carolingian (first century B.C.E. through ninth century C.E.), focusing on Latin scripts from ancient cursive through Caroline minuscule, and forms of Latin writing important for the transmission of classical, biblical, and early Christian literature. Topics include papyrus and parchment books, the history of libraries, and the circulation and transmission of literary works. Prerequisites: proficiency in Latin; reading knowledge of French, German, or Italian.

CLSS 605b, Greek Papyrology. Ann Ellis Hanson.

w 2.30–4.20

Literary and documentary papyri of Greek and Roman Egypt, concentrating on documents housed in the Beinecke Library from the late Ptolemaic and Roman periods. Topics include

using papyri as sources for social and other histories; gaining familiarity with the language of the papyri; and the reading of literary and documentary hands. Prerequisites: proficiency in Greek; reading knowledge of German and French.

CLSS 621b, Latin Paleography: Ninth to Fifteenth Centuries. Robert Babcock.

th 2.30–4.20

Latin paleography from the ninth century through the fifteenth, focusing on Caroline, Gothic, and humanist scripts; training in reading, transcribing, dating, and localizing manuscripts. Topics include monastic scriptoria and libraries, and the rise of university and lay production of manuscripts during the high Middle Ages. Prerequisites: proficiency in Latin; reading knowledge of French, German, or Italian.

CLSS 645b, Numismatics. William Metcalf.

t 2.30–4.20

An introduction to the history of ancient coinage and the modern methodology of numismatic study. Brief consideration of the Greek background followed by detailed treatment of the Roman Republic and Empire. Prerequisites: proficiency in Greek and Latin; reading knowledge of French, German, or Italian.

CLSS 802a, Hellenistic Art. Judith Barringer.

w 2.30–4.20

This seminar considers major issues and problems in Hellenistic art (sculpture, mosaics, painting, and “minor” arts) and architecture with an emphasis on historical, political, and religious considerations. Topics to be addressed include: Alexander’s image and its impact, the Attalid kingdom of Pergamon, Ptolemaic Alexandria, “Graeco-Roman” art, the appeal and function of exotic and erotic sculpture, Athens as a Classical memory and as a Hellenistic reality, and the impact of Rome as conquering power and voracious art collector. *Also HSAR 575a.*

CLSS 822b, Herodotus. William Desmond.

m 4–6

A detailed study of Herodotus’ *History* with particular focus upon the text itself and more recent scholarship. Topics include Herodotus’ sources, veracity, and methods of composition; relation to epic and Attic tragedy; early anthropology and Greek views of the “other”; religious elements; and Herodotus’ philosophy of history.

CLSS 823a, Sallust. Celia Schultz.

m 2.30–4.20

A study of the history of the late Roman Republic through a close reading of the extant works of C. Sallustius Crispus. Attention is also paid to literary and stylistic considerations.

CLSS 844b, Roman Imperial Art. Björn Ewald.

th 2.30–4.20

A course on Roman Imperial art, comprising the period from Augustus to Constantine (late first century B.C. to fourth century A.D.). The focus is on the so-called historical reliefs which once adorned or still adorn public buildings (e.g., triumphal arches) and monuments (e.g., the Ara Pacis). They are part of an elaborate visual system of official art which served to praise Imperial virtues and to imprint the Imperial accomplishments on the “collective memory” of Roman society. *Also HSAR 577b.*

CLSS 850b, Topics in Roman History and Culture. Carlos Noreña, Celia Schultz.

f 4–6

A weekly program of research papers on various topics, given by faculty members, graduate students, and visitors to Yale, followed by formal and informal discussion. Graduate students may acquire a course credit by presenting a paper to the seminar or by writing a term paper on one of the topics chosen, together with regular participation and contributions to discussion. Suggestions for and offers of papers are welcome. *Also HIST 525b.*

CLSS 856a, Rewriting the Roman Past. Susanna Braund, Marcus Wilson.

t 2.30–4.20

Consideration of how the Roman past is represented in two major literary traditions during the early empire: historical drama (*fabula praetexta*) and historical epic. Special attention to Silius Italicus's treatment of Hannibal's attempt on Rome in the *Punica*, on the treatment of civil war in Lucan and Petronius, and on the excesses of Nero's court in the historical drama *Octavia*. Texts are studied in English with specific assignments in Latin.

CLSS 885b, Aristotle's *Athenaion Politeia*. Donald Kagan.

th 1.30–3.20

A study of the historical portion of Aristotle's *Constitution of the Athenians*. Also HIST 512b.

CLSS 900a or b, Directed Reading.

By arrangement with faculty.

CLSS 910a or b, Directed Research.

By arrangement with faculty.

comparative literature

451 College, Rm 202, 432.2760

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

Chair

Michael Holquist

Director of Graduate Studies

Cyrus Hamlin (cyrus.hamlin@yale.edu)

Professors

Dudley Andrew, Peter Brooks, Katerina Clark, Shoshana Felman, Roberto González Echevarría, Cyrus Hamlin, Benjamin Harshav, Michael Holquist, Carol Jacobs, David Quint, Katie Trumpener

Associate Professors

Ann Gaylin, Pericles Lewis

Assistant Professors

Ala Alryyes, Vilashini Cooppan, Catherine Labio

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 history, culture, language, 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 upon admission. The GRE General Test is required. A ten- to twenty-page writing sample 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, Sanskrit, Provençal, or Biblical Hebrew). 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 in two parts, 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 first part consists of six topics that include texts from three national literatures and several historical periods (at least one modern and one before the Renaissance). The topics should also include representatives of the three traditional literary genres (poetry, drama, narrative fiction) and one question on theory or criticism. The second part consists of the student's presentation of a topic based on his or her original work.

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 the faculty in the course of 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 on page 164. 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 Graduate School requirements, page 375. Alternatively, the Department of Comparative Literature offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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.

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 the Theory of Literature. Pericles Lewis.

mw 11.30–12.20, 1 htba

An examination of concepts and assumptions present in contemporary views of literature. Theory of meaning, interpretation, and representation. Critical analysis of formalist, psychoanalytic, structuralist, post-structuralist, Marxist, and feminist approaches to theory and literature.

CPLT 541a, Complexity: Theory of Meaning and the Literary Text.

Benjamin Harshav.

m 1.30–3.20

The course presents a comprehensive and systematic theory of works of literature as the highest sign-complexes in human culture. Departing from the basic concepts of meaning and reference in linguistics and philosophy of language, a theory of semantic integration is developed. Departing from the basic assumptions of narratology and the philosophy of fictional worlds, a theory of works of literature as complex and open-ended constructs is offered. The theoretical framework includes all their aspects: from metaphor to ideology, and from verse and style to the interaction between internal and external fields of reference. Illustrations from modern fiction, poetry, drama, and film. *Also PHIL 704a.*

CPLT 589b, Fictions of Interpretation: The Work of Franz Kafka.

Benjamin Harshav.

th 3.30–5.20

A close reading of the major works of Franz Kafka: ideas and poetics. Interpretations as protagonists in fiction. Competing interpretations of Kafka's fictional worlds. Literary predecessors (Gogol, Dostoevsky). The theory of Minor Literature (Deleuze/Guattari). Reading knowledge of German welcome but not required.

CPLT 611a^u, Goethe's *Faust* in Its European Context. Cyrus Hamlin.

mw 1–2.15

Close study of Goethe's *Faust*, Parts I and II. History of composition, reception, and performance of the drama, traditions of the Faust legend, philosophical theories of tragedy in German Idealism, and Romantic theories of myth and history in drama. Weekly lecture in English for all students in the course; discussion in German for German-speaking students, in English for those reading in translation. Readings in English and German. *Also GMAN 661a^u.*

CPLT 630b^u, German Literature, Thought, and Culture in the Age of Goethe.**Cyrus Hamlin.**

tth 1–2.15

Interdisciplinary survey of German culture, literature, philosophy, music, and the arts during the Romantic era (1770–1830). Focus on concepts of the individual and self-consciousness, freedom and self-development, the rise of alienation, pessimism, and despair in the early nineteenth century. Among authors to be studied: Kant, Goethe (*Werther* and *Faust*), Mozart (*Magic Flute*), Schiller, and Hölderlin; music by Beethoven and Schubert; Romantic literary criticism and theory (the Schlegels, Novalis); painting by C. D. Friedrich and architecture by C. F. Schinkel; philosophy of Hegel and Schopenhauer. No prerequisites. Readings and discussion in English. *Also GMAN 630b^u.*

CPLT 694b, Studies in Lyric Poetry of the Renaissance. David Quint.

th 10.30–12.20

A study of several lyric poets writing in Italian, French, and English during the Renaissance, probably including Petrarch, Labé, Ronsard, Du Bellay, Wyatt, Sidney, Shakespeare, and Donne. The stress falls upon textual analysis, although some general perspectives on Renaissance literature are also introduced. *Also ENGL 578b, RNST 510b.*

CPLT 725a, Postcolonial Theory and Its Literature. Christopher L. Miller.

th 10.30–12.20

A survey of theories relevant to colonial and postcolonial literature and culture. Focus on theoretical models (Orientalism, hybridity, *métissage*, *créolité*, “minor literature”), but also on the literary texts from which they are derived (francophone and anglophone). Readings from Said, Bhabha, Spivak, Mbembe, Amselle, Glissant, Deleuze, Guattari. In English. *Also AFAM 846a, AFST 746a, FREN 946a.*

CPLT 743a, Aesthetics of Horror and Disgust. Winfried Menninghaus.

t 3.30–5.20

Outline of some major theoretical models of how art can transform horror into a source of pleasure. Focus on a widely neglected topos of aesthetics: that of *Ekel* (disgust), which in Mendelssohn, Lessing, and Kant demarcates those border phenomena which resist any transformation into aesthetic pleasure. Readings also include Dubos, Nietzsche, Baudelaire, Lovecraft, Freud, and Sartre. *Also GMAN 695a^u.*

CPLT 762b, The Enlightenment and Its Legacy. Catherine Labio.

m 1.30–3.20

Seminar devoted to the French Enlightenment in its broader Euro-American context. Particular attention is paid to its epistemological organization, questions pertaining to the nature of civil society, ties with England and North America, the French Revolution and the reactions to it both in France and abroad, and the Counter-Enlightenment, as well as to the applicability of Enlightenment thought to key contemporary social, political, and economic issues. Works by Montesquieu, Condillac, Voltaire, Diderot, Rousseau, the physiocrats, Lacos, Kant, Gouges, Horkheimer, Foucault, and Lyotard, among others. In French and English. *Also FREN 862b.*

CPLT 763b, Questioning the Enlightenment. Carol Jacobs.

th 1.30–3.20

This is not a course that systematically introduces the basic tenets of the Enlightenment. The seminar proceeds, rather, by close readings of individual works whose performances leave the concept of *basic tenets* uncertain. We explore a number of texts historically rooted in the period and others that appear as commentaries, declared and undeclared, on the way in which language, knowledge, reason, and power interact in the writings of the authors we read (Hamann, Herder, Shelley, Novalis, Horkheimer and Adorno, Foucault, Plato). *Also GMAN 607b.*

CPLT 784b, Literature and Psychoanalysis. Shoshana Felman.

w 1.30–3.20

How has psychoanalysis revolutionized our conception of knowledge and of man? What are the psychoanalytic concepts that inform modern culture? How does psychoanalysis give us tools for understanding and interpreting literary works? The course explores these questions through selected readings in Freud, Lacan, Winnicott, Klein, Kohut, and others. Emphasis on Freud's and Lacan's understanding of the self as well as of society and culture, through an illumination of the relation of desire to repression, of life to death, of fiction to reality. Among the notions discussed are theories of sexuality, narcissism, identification, dreams, repetition, death drive, mourning, trauma, memory, and history. In English. *Also FREN 784b.*

CPLT 814a, The Prose and Thought of a Poet: Giacomo Leopardi. Paolo Valesio.

w 3.30–5.20

Leopardi's crucial importance as one of the founders of modern poetry on the international scene is in large part due to the depth of his philosophical thought and to the brilliant counterpart and context in prose of his output in verse. We study his dramatic dialogues (*Operette morali*), his critical and social essays, and his uniquely rich journal (*Zibaldone*), with reference to other philosophical-poetical experiences, like those represented by English Romantic writings and by Soeren Kierkegaard's *Journals*. *Also ITAL 761a^U.*

CPLT 863b^U, Richard Wagner and the Theater of Modernism. Cyrus Hamlin.

mw 1–2.15

Introduction to the life, thought, and work of Richard Wagner, with close study of selected musical dramas including *Tannhäuser*, *The Ring of the Nibelung*, *The Mastersingers of Nuremberg*, and *Parsifal*. Particular focus on his concept of theater, drama, and opera (*Gesamtkunstwerk*) and its realization through performance, above all in the context of the Bayreuth Festival. Consideration of Wagner's European influence (especially on Nietzsche and G. B. Shaw) and the production history of his work to the present. *Also GMAN 651b^U.*

CPLT 864a, "Character"–"Person"–"Identity." Peter Brooks.

t 1.30–3.20

The course attempts to talk about what we mean by "character," in relation to such other terms as "subject," "person," "identity," "self." It draws on some material from linguistics, psychoanalysis, moral philosophy, and law. Readings are mainly narratives, eighteenth to twentieth century, and will probably include: Rousseau, *Confessions*; Nathalie Z. Davis, *The Return of Martin Guerre*; Balzac, *Le Colonel Chabert*; Wilkie Collins, *The Woman in White*; Gustave Flaubert, *L'Education sentimentale*; George Eliot, *Daniel Deronda*; Henry James, *The Beast in the Jungle* and *The Jolly Corner*; and Marguerite Duras, *Le ravissement de Lol V. Stein*. In English. *Also FREN 895a.*

CPLT 900, Directed Reading. Faculty.**CPLT 901, Individual Research. Faculty.****CPLT 912b, European Literature without the Nation: Regionalism, Dialect, "Minor" Literature. Katie Trumpener.**

m 10.30–12.20

University study of European literatures (and with it, comparative literature itself) often presupposes the nation-state as a unit of organization. Yet throughout the modern period, important literary texts, figures, and circles have positioned themselves outside, beneath, or beyond the nation, championing regional customs and concerns, or identifying with the transnational multiculturalism of Europe's internal empires. Through readings of eighteenth-, nineteenth-, and twentieth-century texts, this course explores Enlightenment vernacular revivals; nineteenth-century linguistic and cultural centralization; modernist rediscoveries of folklore; dialect literature; "minor" writing; and the influence of debates over tradition on genres like

the fantastic tale. Probable readings include works by Johann Herder, Robert Burns, Richard and Maria Edgeworth, George Sand, Prosper Mérimée, Franz Kafka, Robert Musil, Federico Garcia Lorca, Libuše Moníková, Erich Auerbach, Michel de Certeau, Renée Balibar, Giles Deleuze and Felix Guattari, Tom Nairn. *Also ENGL 892b.*

CPLT 913a, Empire and Its Double. Sara Suleri Goodyear.

W 3.30–5.20

A course that concentrates on readings of Empire as a “secret sharer” of nineteenth- and twentieth-century British narrative. Rather than solely focusing on images of Orientalism, we examine infiltrations of alterity that lie too close for comfort. While attempting to undo the idea of exoticism, we simultaneously address what E. M. Forster calls “aspects of the novel” in order to consider the question, What does the novel want? Texts include Edmund Burke’s story-telling in Parliamentary debate, Dickens, Austen, Wilkie Collins, Kipling, Forster, Salman Rushdie, Bapsi Sidhwa, Agha Shahid Ali. Our examination of Conrad’s trope of the secret sharer causes us to question the singularity of imperial stories and their slippage into theories of nation. *Also ENGL 913a.*

CPLT 917a, Films and Their Study. Dudley Andrew.

T 10.30–12.20

“Films and their Study” sets in place some undergirding for graduate students in various disciplines who plan to develop a subspecialty or who want to anchor their particular film interest to something like the “professional discourse” of this field. Providing a coordinated set of topics under the rubrics of (a) spectacle, (b) narrative, (c) realism, and (d) signification, the flow of this survey is interrupted first by the often discordant relation of history to theory and second by the obtuseness of the films examined each week. As the title of this seminar is meant to convey, films themselves take the lead in our discussions. *Also FILM 601a.*

CPLT 923b, Modernist Fiction: The Seen and the Unseen. Pericles Lewis.

F 9.30–11.20

This seminar surveys a range of modernist stories and novels that describe the interaction between the visible world — of objects, bodies, and the natural and social environment — and the invisible world — of mental states, unconscious desires, unseen social forces, and the occult. Authors considered include Henry James, Marcel Proust, Franz Kafka, James Joyce, Virginia Woolf, and Samuel Beckett. Also, readings from early twentieth-century social scientists such as Durkheim, Freud, and Weber. *Also ENGL 964b.*

CPLT 931a, Literature, Film, and Justice. Shoshana Felman.

W 1.30–3.20

A study of scenes of judgment in literature, film, and history, focusing on literature’s ways of dealing with injustice in various legal, historical, political, and/or psychoanalytic circumstances. Topics include the opposition between legal justice and literary justice, and the relation between evidence, truth, and judgment. The course also looks at some historical trials reflected on by literary writers. Texts by poets, storytellers, and dramatists such as Kleist, Balzac, Flaubert, Zola, Mallarmé, Celan, Camus, Blanchot, Beckett, Brecht, Melville, Forster, Woolf, and Morrison, and critics such as Benjamin, Arendt, Derrida, Lyotard, Foucault, Barthes, Levinas, and Lanzmann. Films such as *Night and Fog*, *The Sorrow and the Pity*, *Shoah*. In English. *Also FREN 788a.*

CPLT 941a, Fiestas cubanas. Roberto González Echevarría.

Tth 2.30–3.45

A study of the feasts marking the Cuban calendar from the nineteenth century to the present, how they respond to cultural and political transformations, and how they are inscribed in literature, particularly the narrative. The feast as the representation of time and social and political change. The work of anthropologists and theorists of literature such as Claude Lévi-Strauss, Marcel Mauss, Arnold van Gennep, and Michail Bachtine, along with that of Latin

American and Cuban anthropologists and writers like Fernando Ortiz, Lidia Cabrera, José Arrom, Manuel Moreno Fragnals, Miguel Barnet, and Octavio Paz. Fiction by Cirilo Villaverde, Alejo Carpentier, José Lezama Lima, Severo Sarduy, Reinaldo Arenas, Daina Chaviano, and others. In Spanish. *Also SPAN 942a^{II}*.

CPLT 951a, Venus and Adonis: Beauty in Art and the Cult of the Beautiful Body.
Winfried Menninghaus.

m 3.30–5.20

Taking the myth of Venus and Adonis as its point of departure, the seminar offers a multifaceted approach to dealing with the power and failures of beauty. Readings include Shakespeare's "Venus and Adonis" and other versions of the myth by Ronsard, Friedrich Schlegel, d'Annunzio, John Cheever; philosophical accounts of beauty (Plato, Baumgarten, Burke, Kant, and Nietzsche); as well as the "theories" of beauty in evolutionary biology, psychoanalysis (Freud), and recent empirical psychology. *Also GMAN 707a*.

CPLT 979b^U Text, Memory, Identity. Michael Holquist.

tth 11.30–12.45

The course examines three key concepts that are increasingly used in literary and cultural studies. We analyze relations between them as they work together to authorize religions, create works of art, national imaginaries, and personal identities. Readings are divided between two kinds of works, theoretical and exemplary. First group includes Plato, Hegel, Freud, Bakhtin; second includes selections from the Bible, stories by Kleist, Gogol, Kafka, and samples of nationalist ideology (Fichte, Dostoevsky, Emerson).

computer science

A. K. Watson Hall, 432.1246
M.S., M.Phil., Ph.D.

Chair

Paul Hudak (*on leave*)

Director of Graduate Studies

Drew McDermott (508 AKW, 432.1283, drew.mcdermott@yale.edu)

Professors

Dana Angluin, Ronald Coifman (*Mathematics*), Stanley Eisenstat, Joan Feigenbaum, Michael Fischer, David Gelernter, Paul Hudak (*on leave*), Ravindran Kannan, Drew McDermott, A. Stephen Morse (*Electrical Engineering*), Martin Schultz, Steven Zucker

Associate Professors

James Aspnes, Zhong Shao

Assistant Professors

Daniel Friendly (*Electrical Engineering*), Mark Gerstein (*Molecular Biophysics & Biochemistry*), Dana Henry (*Electrical Engineering*), Arvind Krishnamurthy, Yorgis Makris (*Electrical Engineering*), Brian Scassellati, Carsten Schürmann, Yang Richard Yang

Fields of Study

Artificial intelligence (vision, robotics, planning, computational neuroscience, neural networks); programming languages and systems (functional programming, parallel languages and architectures, programming environments, formal semantics, software engineering, compilation techniques, modern computer architecture, theorem proving and proof assistants, type theory/systems, logical frameworks, and meta-programming); 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, distributive 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 Sun SPARCstations and Workstation PCs (NT and/or Linux). A vision laboratory contains specialized equipment for 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 twelve courses (including CPSC 690 or 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) successfully complete a research project in CPSC 690, 691, and submit a written report on it to the faculty; (3) pass written comprehensive examinations covering basic material in the major subareas of computer science; (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. At least six courses and two parts of the comprehensive examination must be completed by the end of the first year, and the remainder of the first four requirements must normally be completed by the end of the second year. 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 Graduate School requirements, page 375.

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.

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. Zhong Shao.**

mwf 1.30–2.20

Compiler organization and implementation: lexical analysis, formal syntax specification, parsing techniques, execution environment, storage management, code generation and optimization, procedure linkage, and address binding. The effect of language-design decisions on compiler construction.

CPSC 522b^u, Operating Systems. Arvind Krishnamurthy.

mwf 1.30–2.20

The design and implementation of operating systems. Topics include synchronization, deadlocks, process management, storage management, file systems, security, protection, and networking.

CPSC 524a^u, Parallel Programming Techniques. Arvind Krishnamurthy.

mwf 11.30–12.20

Software structures, architectures, and algorithms for parallel and distributed applications, focusing on coordination frameworks for asynchronous concurrency (on the code that creates and manages multiple processes and performs the interprocess communication necessary to create integrated ensembles). Coordination languages and program-development environments. The fast-changing WAN-software picture. Parallel and distributed programming exercises on LANs. (Taught in alternate years.)

[CPSC 525a^u, Distributed Computing.]**CPSC 529a^u, Functional Programming. Carsten Schürmann.**

mwf 9.30–10.20

Methods for synthesizing functional programs from formal specifications and verifying correctness properties of programs. Topics include higher-order functions, pattern matching, abstract algebraic datatypes, polymorphic types, advanced typing issues such as type classes and higher-order modules, lazy/eager evaluation, equational reasoning, and realization of effects via continuations and monads. The functional languages Haskell and/or ML are used in the course. (Taught in alternate years.)

[CPSC 530^u, Formal Semantics.]**CPSC 533b, Computer Networks. Yang Richard Yang.**

mwf 9.30–10.20

An introduction to computer networks with emphasis in the Internet. Topics include network and protocol architectures; communication and switching techniques; link layer and local area networks; performance analysis; network layer and routing; multimedia and integrated services; flow and congestion control; and network security. (Not taught every year.)

CPSC 537b^u, Introduction to Databases. Michael Fischer.

mwf 10.30–11.20

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.

CPSC 539b^u, Computer Systems. Daniel Friendly.

mw 2.30–3.45

The organization of computer systems as hardware and software systems. Instruction-set architecture, assembly programming, computer arithmetic, data-path architecture and control, pipelining, memory hierarchy. Concepts illustrated by exploration of an instructional RISC microprocessor. *Also ENAS 907b^u.*

CPSC 540a^u, Numerical Computation I. Martin Schultz.

tth 1–2.15

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.

CPSC 555b^u, Economics and Computation. Joan Feigenbaum.

tth 2.30–3.45

A mathematically rigorous investigation of the interplay of economic theory and computer science with an emphasis on the relationship of incentive-compatibility and algorithmic efficiency. Particular attention is paid to the formulation and solution of mechanism-design problems that are relevant to data networking and Internet-based commerce. Suitable for advanced undergraduates and beginning graduate students. Familiarity with basic microeconomics and game theory is desirable but not required. (Not taught every year.)

CPSC 560b^u, Theoretical Methods in Computer Science. Rene Peralta.

tth 2.30–3.45

This course offers an introduction to the main areas of theoretical computer science and provides a theoretical background for research in computer science. Topics from three areas: (1) complexity theory: review of machine models (Turing and RAM machines), basic complexity classes (polynomiality, nondeterminism, randomization, parallel models), measures of complexity (computational, communicational, informational); (2) algorithms and their analysis (fundamental algorithms in graph theory, number theory, sorting, and searching); (3) data structures and their role in the efficient implementation of algorithms.

CPSC 567a^u, Cryptography and Computer Security. Rene Peralta.

mwf 10.30–11.20

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. The main focus is on technology, but the course also considers such societal issues as balancing individual privacy concerns against the needs of law enforcement, vulnerability of societal institutions to electronic attack, export regulations and international competitiveness, and development of secure information systems.

CPSC 569a^u, Randomized Algorithms. Ravindran Kannan.

tth 10.30–11.45

Beginning with an introduction to tools from probability theory including some inequalities like Chernoff bounds, the course covers randomized algorithms from several areas; graph algorithms, algorithms in algebra, approximate counting, probabilistically checkable proofs, and matrix algorithms. (Not taught every year.)

CPSC 570a^u, Artificial Intelligence. Brian Scassellati.

mwf 2.30–3.20

An introduction to artificial intelligence research, focusing on reasoning and perception. Topics include knowledge representation, predicate calculus, temporal reasoning, vision, robotics, planning, and learning.

CPSC 572a, AI Programming Techniques. Drew McDermott.

mwf 10.30–11.20

CPSC 573b, Intelligent Robotics. Brian Scassellati.

mwf 11.30–12.20

An introduction to the basic principles of building a purposeful autonomous robotic system, with an emphasis on human-machine interaction and cognitive modeling. (Not taught every year.)

CPSC 574b, Autonomous Systems. Drew McDermott.

mwf 2.30–3.20

The basic principles of building a purposeful autonomous robotic system. Lectures cover the theory and practice of control systems, sensors, representation of the environment, and planning. Students construct a simulated autonomous system, and are given the opportunity to work with a real mobile robot. (Taught in alternate years.)

CPSC 575b, Computational Vision and Biological Perception. Steven Zucker.

tth 1–2.15

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. *Also ENAS 575b^U.*

CPSC 576b^U, Computer Vision.

Computational accounts of visual perception: image formation, image transformations, line and curve extraction, segmentation, shape, stereo, motion, texture, and model-based object recognition. A review of relevant mathematical tools, algorithms, and results from studies of human vision.

CPSC 577a^U, Neural Networks. Willard Miranker.

tth 11.30–12.45

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 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

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

Chair

Edward Kamens

Director of Graduate Studies

John Whittier Treat [F] (307 HGS, 432.2864, john.treat@yale.edu)

Kang-i Sun Chang [Sp] (306 HGS, 432.2865, kang-i.chang@yale.edu)

Professors

Kang-i Sun Chang, Edward Kamens, Hugh Stimson, John Whittier Treat, Stanley Weinstein

Associate Professor

Charles Laughlin

Assistant Professor

Christopher Hill

Senior Lectors

Anton Chen, Wen-tao Cheng, Seungja Choi, Koichi Hiroe, Zhengguo Kang, Yoshiko Maruyama, John Montanaro, Ling Mu, Michiaki Murata, Masahiko Seto, Jae-hoon Shim, Mari Stever, Wei Su, William Zhou

Lectors

Ninghui Liang, Hiroyo Nishimura, Li-li Teng, Peisong Xu

Lecturer

Pauline Lin

Fields of Study

Fields for doctoral study are Chinese literature and Japanese literature. 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 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 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. Two of these courses must be seminars or tutorials taken in the third year of study. (If a student's qualifying exam is scheduled in the sixth term, both of the third-year courses should be taken in the fifth term.) Students concentrating in Chinese or Japanese literature are encouraged to take at least one term course in Western literature or literary theory. All students must prove their proficiency in French, German, Russian, or another European language that the director of graduate studies deems appropriate by the beginning of their second year. In some cases, with the approval of the director of graduate studies, students in Japanese literature may substitute Chinese (modern or literary Chinese) for one of the European languages.

At the end of each academic year until a student is admitted to candidacy, a faculty committee will review the student's progress.

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. The faculty will also conduct a review of each student's progress and promise by the end of the second year. By the end of the third year, students specializing in Chinese must pass a reading test in Japanese; students specializing in premodern Japanese literature must pass a reading test in literary Chinese. Ideally, by the end of the sixth term, but in no case later than the end of the seventh term, each student will be required to complete a dissertation prospectus and two research papers, and submit them for review by the faculty as part of a qualifying oral examination ranging over the entire field (Chinese language and literature or Japanese language and literature), with emphasis on the student's area of concentration, dissertation topic, and course work.

In order to be admitted to candidacy for the Ph.D. (normally by the end of the third year), students must earn at least four grades of Honors during the first two years of study and must complete all predissertation requirements, including the prospectus.

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.

Joint Ph.D. Program

The Department of East Asian Languages and Literatures also offers, in conjunction with the Program in Film Studies, a joint Ph.D. in East Asian Languages and Literatures and Film Studies. For further details, see Film Studies on page 164. Applicants to the joint 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.

Program materials are available upon request to the Director of Graduate Studies, Department of East Asian Languages and Literatures, Yale University, PO Box 208236, New Haven CT 06520-8236, and at the department Web site, www.yale.edu/eall/.

Courses

CHNS 500a^U, Man and Nature in Chinese Poetry. Kang-i Sun Chang.

tth 1–2.15

An exploration of concepts of man and nature in traditional Chinese poetry and criticism, with special attention to historical contexts and cultural meanings. Topics include the centrality of lyricism and Taoism; depictions of nature and self-cultivation; travel in literature; the relation of poetry to painting; images of utopian communities as compared to the Western notion of Utopia; poets' strategies of self-canonization and identity. All readings are in translation; no knowledge of Chinese is assumed. For those who read the language, additional readings in Chinese are assigned.

CHNS 501b^U, Men, Women, and Gender in Chinese Poetry. Kang-i Sun Chang.

tth 1–2.15

A study of women poets in traditional China, with some attention to representation of women in male poetry as well. Issues include literary canon and traditions; feminine voice and allegory; the abandoned woman; women in exile; the dichotomy of “yin” and “yang”; gender and genre; body and sexuality; notions of love; aesthetics of illness; and the function of memory. All readings are in translation; no knowledge of Chinese is assumed. For those who can read the language, additional readings in Chinese are assigned.

CHNS 515^U, Elementary Modern Chinese. William Zhou and staff.

515-1: mtwthf 9.30–10.20

515-2: mtwthf 9.30–10.20

515-3: mtwthf 10.30–11.20

515-4: mtwthf 10.30–11.20

515-5: mtwthf 11.30–12.20

515-6: mtwthf 11.30–12.20

An intensive course with emphasis on spoken language and drills. Pronunciation, grammatical analysis, conversation practice, and introduction to the reading and writing of Chinese characters. To be followed by CHNS 530.

CHNS 518^U, Elementary Modern Chinese for Advanced Learners. William Zhou and staff.

mtwthf 8.30–9.20

First level of the advanced learner sequence. Intended for students with intermediate oral proficiency but elementary knowledge of reading and writing. The course aims to standardize students' verbal expression and pronunciation, bringing oral proficiency to an advanced level while accelerating their reading and writing skills to at least an intermediate level. To be followed by CHNS 533. Prerequisite: Chinese conversational ability and some knowledge of reading and writing.

CHNS 530^U, Intermediate Modern Chinese. Ling Mu and staff.

530-1: mtwthf 10.30-11.20

530-2: mtwthf 10.30-11.20

530-3: mtwthf 11.30-12.20

530-4: mtwthf 11.30-12.20

An intermediate course that continues intensive training in listening, speaking, reading, and writing, and consolidates what students have achieved in the first year of study, allowing students to improve oral fluency, study more complex grammatical structures, and enlarge both reading and writing vocabulary. Prerequisite: CHNS 515 or equivalent.

CHNS 533^U, Intermediate Modern Chinese for Advanced Learners. Ling Mu and Staff.

533-1: mtwthf 8.30-9.20

533-2: mtwthf 9.30-10.20

The second level of the advanced learner sequence. Intended for students with intermediate to advanced oral proficiency and intermediate reading and writing proficiency. Students receive intensive training in listening, speaking, reading, and writing, supplemented by audio and video materials. The objective of the course is to balance these four skills and attain an advanced level in all of them. To be followed by CHNS 553. Prerequisite: CHNS 518 or equivalent.

CHNS 545^U, Cantonese. Wei Su.

mwf 9.30-10.20

Introduction to the Cantonese language for learners of (Mandarin) Chinese. Expands students' knowledge of the Chinese language through study of one of its most influential regional variations. Focus on listening and speaking skills, from practical daily communication to the discussion of topics of general interest. Prerequisite: CHNS 530, CHNS 518, or equivalent.

CHNS 548, Directed Reading of Scholarly Materials. Wen-tao Cheng.

For Ph.D. students working toward dissertations or master's candidates working on special interests that involve original materials from classical Chinese, as well as modern sources.

CHNS 550^U, Advanced Modern Chinese. Li-li Teng.

550-1: mtwthf 10.30-11.20

550-2: mtwthf 11.30-12.20

Third level of the standard foundational sequence of modern Chinese language study in the areas of speech, listening, reading, and writing. Use of audio-visual materials, oral presentations, skits, and longer and more frequent writing assignments helps students assimilate more sophisticated grammatical structures. Introduction to a wide variety of written forms and styles. Use of both traditional and simplified forms of Chinese characters. After CHNS 530.

CHNS 551b^U, Chinese Modernism. Charles Laughlin.

mw 1-2.15

Exploration of modernist and avant-garde literature in China, characterized by themes of alienation in industrial urban settings as well as by technical experimentation and a departure from mainstream social realism. Discussion of issues of translation and modernity in a global context. The course covers fiction, poetry, drama, and film from the 1920s to the 1990s. Authors from China, Taiwan, and Hong Kong include Ding Ling, Shi Zhecun, Eileen Chang, Xi Xi, Yu Hua, Can Xue, Liu Suola, Zhang Dachun, Zhu Tianwen, and Gao Xingjian. Films by Huang Jianxin, Chen Kaige, and Wong Kar-wai. Prerequisite: CHNS 574b or permission of instructor.

CHNS 553^U, Advanced Modern Chinese for Advanced Learners. Zhengguo Kang.

553-1: mwf 9.30-10.20

553-2: mwf 10.30-11.20

Completes the advanced learner sequence in Chinese. Intended for students with strong speaking and listening skills. Completes in one year the transition from simplified to authentic texts accomplished over the third and fourth years of the standard track (CHNS 550 and 556). Readings and exercises on contemporary Chinese social life supplemented with documents, published articles, and excerpts from television broadcasts and films. Use of both simplified and traditional forms of Chinese characters. After CHNS 533.

CHNS 556^U, Readings in Contemporary Chinese Texts. Wei Su.

556-1: mw 11.30-12.45

556-2: tth 11.30-12.45

Completes the standard sequence in Chinese. Selected readings in Chinese fiction, essays, and articles of the past twenty years. Lectures, discussion, and written work in Chinese aim at integrated mastery of the modern language. Prerequisite: CHNS 550 or equivalent.

CHNS 557^U, Readings in Modern Chinese Short Stories. Wen-tao Cheng and Charles Laughlin.

tth 9-10.15

An advanced language course designed to further develop students' overall language skills through reading and discussion of modern short stories. Focus on Lu Xun, Lao She, Shen Congwen, and Zhang Ailing. Conducted in Chinese. Prerequisite: CHNS 550 or equivalent.

CHNS 560^U, Introduction to Literary Chinese. Hugh Stimson.

mwf 10.30-11.20

Reading and interpretation of texts in various styles of literary Chinese (*wenyan*), with attention to basic problems of syntax and literary style. Prerequisite: CHNS 530 or equivalent.

CHNS 561^U, Literary Chinese through Modern Chinese. Zhengguo Kang.

tth 2.30-3.45

Integrates the learning of literary Chinese (*wenyan*) with acquisition of modern language skills, with attention to basic problems of syntax and literary style. Conducted in Chinese. Prerequisite: CHNS 530 or equivalent.

CHNS 562^U, Intermediate Literary Chinese: Old Chinese Prose and Poetry. Hugh Stimson.

Close reading of texts of the first millennium B.C.E. with attention to syntax and style. Prerequisite: CHNS 560 or equivalent.

[CHNS 574b^U, The Revolutionary Tradition in Modern Chinese Literature.]

[CHNS 575, Wenxin Diaolong: Literary and Cultural Readings.]

[CHNS 578a, *Shishuo xinyu* and Six Dynasties Aesthetics.]

[CHNS 580, Chinese Poetry from Ancient Times to the Song Dynasty.]

[CHNS 600, Seminar in Tang Poetry.]

CHNS 605a, Materials and Methods for Research in Chinese Literature and Art. Pauline Lin.

w 3.30-5.20

This course is designed for students interested in conducting in-depth research on any aspect of Chinese literature or art. We discuss methods and approaches to Chinese literature and art, and learn to navigate primary sources in Sinological studies, while acquiring basic information on the history of Chinese imperial and private book collections. Materials include classical and

modern bibliographies, bibliophiles' notes, dictionaries and concordances, literary anthologies, art catalogues, Buddhist and Daoist sources, dynastic histories, and Web-based resources. Prerequisites: One year of literary Chinese, or permission of the instructor.

[CHNS 634, **The Canon of Poetry (Shi Jing).**]

[CHNS 635, **The Tradition of the Song Lyric (Ci).**]

[CHNS 638b, **Chinese Love Poetry: From Six Dynasties to the Qing.**]

CHNS 670, **Advanced Literary Chinese.** Hugh Stimson.

CHNS 671b, **Anti-Romanticism: The Tradition of Irony in Twentieth-Century Chinese Women's Writing.** Charles Laughlin.

th 2.30–4.20

A critical survey of Eileen Chang's principal novellas, contemporary reactions, and writers in postwar Taiwan, Hong Kong, and China who have responded to her influence.

CHNS 672a, **Modern and Contemporary Chinese Poetry.** Charles Laughlin.

th 2.30–4.20

An overview of principal movements, trends, and authors. Emphasis on reading and interpretation, with reference to the influence of Western and traditional Chinese poetry and poetics. Evaluation is based on translation exercises, oral presentation, and a term paper.

CHNS 689b, **Middle Chinese Phonology.** Hugh Stimson.

The sound system of seventh-century Chinese as presented in the *Guang Yun* and its development into the sounds of modern Mandarin.

CHNS 692a, **Rereading the Six Dynasties Anthology, the *Wen Xuan*.**

Kang-i Sun Chang.

m 10:30–12:30

A close reading of selected works from the monumental *Wen Xuan* (or *Refined Literature*), which was compiled and edited by Xiao Tong (501–531). The course examines the relationship of canon formation to anthology making, as well as other topics concerning the evolution of literary genres, the functions of expression and description in poetry, the notion of *wen* in refined literature, and the historical and cultural backgrounds for major texts.

CHNS 693b, **Seminar on Anthologies of Tang and Song Poetry.** Kang-i Sun Chang.

m 10:30–12:30

Readings of a variety of Tang and Song works drawn from traditional poetry anthologies such as *Tang Shi sanbai shou* (*Three Hundred Poems of the Tang*) and *Qian jia shi* (*Poems by a Thousand Poets*). Other anthologies are discussed and explored, with attention to editorial strategies of selection, aesthetic and political concerns of the editors, the contexts of literary criticism, gender considerations, and questions of identity.

[CHNS 695a, **The Poetics of Place in Modern Chinese Literature.**]

[CHNS 696a, **Chinese Literary Criticism.**]

[CHNS 697b, **Critical Debates in Modern Chinese Literary Studies.**]

[CHNS 698, **Women Poets of the Qing: Methodological and Critical Inquiry.**]

[CHNS 704, **Ming-Qing Literary Theory and Poetics.**]

[CHNS 706b, **Du Fu: Poetic Innovations and Influences.**]

[CHNS 707a, **Literature, Culture, and Myth in Ancient China: From *Chuci* to Han Poetry.**]

[CHNS 728, Six Dynasties Poetry.]

[CHNS 840, Seminar in Qing Poetry.]

CHNS 900a, Chinese Seminar. Hugh Stimson.

[JAPN 501b^u, *The Tale of Genji* and *The Pillow Book*.]

JAPN 515^u, Elementary Japanese. Michiaki Murata, Mari Stever.

515-1: mtwthf 8.30-9.20

515-2: mtwthf 8.30-9.20

515-3: mtwthf 8.30-9.20

515-4: mtwthf 9.30-10.20

515-5: mtwthf 9.30-10.20

An introductory course in spoken Japanese. Drills in pronunciation and conversation; lectures on grammar; and an introduction to reading and writing, including *hiragana*, *katakana*, and 200 *kanji*.

JAPN 540^u, Intermediate Japanese. Masahiko Seto, Yoshiko Maruyama, and staff.

540-1: mtwthf 9.30-10.20

540-2: mtwthf 9.30-10.20

540-3: mtwthf 9.30-10.20

540-4: mtwthf 10.30-11.20

540-5: mtwthf 10.30-11.20

The course emphasizes continued development in both written and spoken Japanese while reinforcing the previously learned patterns and structures. Besides the text, teaching materials include audio and video tapes for listening comprehension and speaking practice. Multi-media materials are also provided to facilitate the student's learning. Prerequisite: JAPN 515 or equivalent.

JAPN 550^u, Advanced Japanese. Koichi Hiroe and staff.

mwf 1-2.15

An advanced Japanese language course designed to develop further students' aural and reading comprehension, as well as speaking and writing skills. Reading and discussion of short stories, essays, and journal articles. Listening and discussion of television and radio broadcasts. Writing practice includes diary, letters, essays, and criticism. Prerequisite: JAPN 540 or equivalent.

[JAPN 551b^u, Japanese Literature after 1970.]

JAPN 552a^u, The Atomic Bombings of Japan in World Culture. John Whittier Treat.

tth 11.30-12.45

This course surveys the literary and artistic responses from around the world, but principally Japan, to the nuclear destruction of Hiroshima and Nagasaki in 1945. Genres include fiction, poetry, theater, and film. Attendance at occasional evening screenings is required. No knowledge of Japanese required.

JAPN 553a^u, Modern Japanese Fiction and Its Margins. Christopher Hill.

tth 2.30-3.45

The mainstream and the margins of modern Japanese fiction from the turn of the century to the 1970s. Readings include canonical authors and works by members of ethnic minorities, women, and self-declared decadents. No knowledge of Japanese required.

JAPN 557^u, Readings in Contemporary Media and Literature. Masahiko Seto, Christopher Hill.

tth 1–2.15

Close reading in modern Japanese writings in current affairs, social science, cultural history, and modern literature. Students develop their speaking, listening, and writing skills through discussion and written exercises. Conducted in Japanese. After JAPN 550 or equivalent.

[JAPN 559a^u, Readings in Literature and the Humanities.]**JAPN 560a^u, Introduction to Literary Japanese. Edward Kamens.**

mw 2.30–3.45

Introduction to the grammar and style of the premodern literary language (*bungotai*) through a variety of texts. Prerequisite: JAPN 550 or equivalent.

JAPN 561b^u, Readings in Literary Japanese. Edward Kamens.

w 1.30–3.20

Close analytical readings of a sequence of selections from texts of the Nara through Tokugawa periods: prose, poetry, and various genres. Prerequisite: JAPN 560 or equivalent.

JAPN 565b, Literary Chinese (*Kambun*) for Students of Japanese. Stanley Weinstein.

An introduction to the traditional Japanese method of reading literary Chinese texts. Selections from the dynastic histories and pre-Ch'in philosophers.

[JAPN 576b^u, Popular Culture from Late Edo to the Present.]**[JAPN 578a^u, Modern Japanese Fiction in Translation.]****JAPN 700, Readings in Premodern Japanese Literature. Edward Kamens.**

f 9.30–11.20

Close reading of Japanese prose and/or poetry of various periods; research in traditional commentary and contemporary criticism.

JAPN 830b, Literature, Culture, and Thought in Modern Japan. Christopher Hill.

t 3.30–5.20

The transformations of literature and thought in the Meiji period. Topics include vernacularization, urban growth, and the representation of space, gender, and nationalism.

JAPN 885a, Modern Japanese Novel. John Whittier Treat.

w 2–4.30

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.

[KREN 500a^u, Premodern Korea in the East Asian Context.]**[KREN 501a^u, Modern Korea in the World.]****KREN 501b^u, Modern Korea in the World. Jae-hoon Shim.**

t 3.30–5.20

Korean history from the fourteenth century to the present. Emphasis on the formation and development of the Yi dynasty (1392–1910), the emergence of modern Korea and its transformation, and Korea's interaction with foreign powers.

KREN 515^u, Elementary Korean. Seungja Choi and staff.

515-1: mtwthf 9.30–10.20

515-2: mtwthf 9.30–10.20

A beginning course in modern Korean. Drills in oral expression, lectures on grammar, and an introduction to the writing system (*Hankul*).

KREN 535^U, Intermediate Korean. Seungja Choi and staff.

535-1: mtwthf 10.30-11.20

535-2: mtwthf 10.30-11.20

Continued development of skills in modern Korean, spoken and written, leading to intermediate-level proficiency. Prerequisite: KREN 515 or permission of instructor.

KREN 550^U, Advanced Modern Korean. Jae-hoon Shim.

tth 11.30-12.45

An advanced Korean language course designed to further develop students' aural and reading comprehension, as well as speaking and writing skills. Reading and discussion of short stories, essays, and journal articles. Writing practice includes letters and essays. After KREN 535 or equivalent.

east asian studies

320 Luce Hall, 34 Hillhouse, 432.3426
M.A.

Chair

Mimi Yiengpruksawan (*History of Art*) (205 OAG, 56 High Street, 432.2682,
mimi.yiengpruksawan@yale.edu)

Director of Graduate Studies

John Treat (307 HGS, 432.2864, john.treat@yale.edu)

Professors

Richard Barnhart (*Emeritus, History of Art*), Beatrice Bartlett (*History*), Kang-i Sun Chang (*East Asian Languages & Literatures*), James Crowley (*Emeritus, History*), Deborah Davis (*Sociology*), Koichi Hamada (*Economics*), Valerie Hansen (*History*), Edward Kamens (*East Asian Languages & Literatures*), William Kelly (*Anthropology*), Edwin McClellan (*Emeritus, East Asian Languages & Literatures*), Frances Rosenbluth (*Political Science*), Helen Siu (*Anthropology*), Jonathan Spence (*History*), Hugh Stimson (*East Asian Languages & Literatures*), Conrad Totman (*Emeritus, History*), John Whittier Treat (*East Asian Languages & Literatures*), Stanley Weinstein (*East Asian Languages & Literatures; Religious Studies*), Mimi Yiengpruksawan (*History of Art*)

Associate Professor

Charles Laughlin (*East Asian Languages & Literatures*)

Assistant Professors

Michael Auslin (*History*), Christopher Hill (*East Asian Languages & Literatures*), Sharon Kinsella (*Sociology*), Pierre-François Landry (*Political Science*)

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 the Chinese or Japanese people, their culture, historical development, and contemporary problems. This program is designed for students wishing to go on to the doctorate in one of the disciplines listed above, 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

Except under exceptional circumstances, 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 or Japanese 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 and would 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. A program of study for completion of the degree in two years would normally include four terms of language study and additional courses, as described above, totaling fourteen courses. It is very likely that students who have taken the undergraduate major in Chinese or Japanese or in East Asian Studies at Yale, or a comparable course of study elsewhere, will be able to complete their M.A. program in one year.

Course of Study for the Joint Degree in East Asian Studies and Management

The joint master's degree program in East Asian Studies and Management is designed for students considering careers in public or private organizations that deal with East Asia. Normally a three-year program, it awards a master's degree in business administration and a Master of Arts degree in East Asian studies.

Special Requirements for the M.A. Degree

The course of study consists of (1) courses in Chinese or Japanese language (at least through Yale's third-year advanced level or its equivalent) and (2) an approved group of courses relating to China or Japan (and, where appropriate, to the theoretical and methodological tools of a discipline in which the student may plan to earn a Ph.D.) sufficient in number to reach a total of at least eight term courses for a program to be completed in one year. Students must earn two Honors grades ("H") over the course of their two terms at Yale. Those students who require a second year of study to earn their degree must earn two Honors grades in each academic year in order to graduate. Under no circumstances will any student who fails to earn two Honors grades in the first year be allowed to enroll for a second; nor can Honors grades earned in any Chinese or Japanese language class be counted toward satisfying this requirement, except with the permission of the director of graduate studies.

Special Requirements for the Joint Degree

The East Asian component of this degree is the same as that of the regular M.A. program except that the time period for the completion of the degree is extended to accommodate work at the School of Management. The Management component of this degree requires joint-degree candidates to complete thirteen courses at the School of Management. These include nine in the disciplines essential to management and three in integrative management courses.

Program materials are available upon request to the Council on East Asian Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; Web site, www.yale.edu/yacias/ceas/. Applications are available from the Admissions Office, Graduate School, Yale University, PO Box 208236, New Haven CT 06520-8236; e-mail, graduate.admissions@yale.edu.

ecology and evolutionary biology

Osborn Memorial Laboratories, 432.3837, www.eeb.yale.edu
M.S., Ph.D.

Chair

Stephen Stearns

Director of Graduate Studies

Günter Wagner

Professors

Leo Buss, Michael Donoghue, Jacques Gauthier (*Geology & Geophysics*), Willard Hartman (*Emeritus*), Vivian Irish (*Molecular, Cellular & Developmental Biology*), Gene Likens (*Cary Arboretum*), Alvin Novick, Jeffrey Powell, Charles Remington (*Emeritus*), Oswald Schmitz (*Forestry & Environmental Studies*), Stephen Stearns, J. Rimas Vaisnys (*Electrical Engineering*), Günter Wagner

Associate Professors

Junhyong Kim, Sean Rice, Margaret Riley, Anne Yoder

Assistant Professors

David Post, David Skelly (*Forestry & Environmental Studies*), Paul Turner

Lecturers

Adalgisa Caccone, Ashley Carter, Theodora Pinou, Nancy Rosenbaum, Marta Martinez Wells

Fields of Study

The Department of Ecology and Evolutionary Biology (EEB) 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. Each student is required to undertake laboratory research in the

form of two research rotations in the first year. Students must also attend a survey course in methods and research design and participate in (1) a program of ethics of research and authorship; (2) weekly EEB seminars; and (3) symposia of faculty and graduate student research. In addition, graduate students must enroll in a minimum of three additional graduate-level courses (numbered 500 and above) during their first two years of study. All students are required to teach two courses during their first two years of study.

In the third term of study each student takes a comprehensive examination in ecology and evolutionary biology. By the end of the third term, each student organizes a formal preprospectus consultative meeting with his/her advisory committee to discuss the planned dissertation research. By the end of the fourth 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 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.

Teaching experience is regarded as an integral part of the graduate training program. All students are required to serve as teaching fellows for two terms, normally at the Teaching Fellow 2 level. This teaching is typically done during the first two years of 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 EEB 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 Maureen Cunningham, Office of the Director of Graduate Studies, Department of Ecology and Evolutionary Biology, Yale University, PO Box 208106, New Haven CT 06520-8106 (maureen.cunningham@yale.edu).

Courses

E&EB 501a, Methods and Research Design. Staff.

3 htba

This course provides an introduction to the methods and approaches generic to most research in the biological sciences. Topics include quantification and measurement, data analysis, sequence analysis, phylogenetic reconstruction and the comparative method, morphometrics, experimental design, presentation of results, and grant writing. This course is required for all first-year EEB students.

E&EB 510a^U, Introduction to Statistics: Life Sciences. Joseph Chang, Ashley Carter.

tth 1–2.15

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. *Also STAT 501a^U.*

E&EB 515a^U, Conservation Biology and the Environment. Jeffrey Powell, David Skelly, Stephen Stearns.

mw 10.30–11.20, 1 htba

An introduction to the basic ecological and evolutionary principles underpinning efforts to conserve the earth's biodiversity. These principles are then examined in the context of efforts to halt the rapidly increasing disappearance of both plants and animals. Case studies are examined in detail. While some sociological and economic issues are discussed, the emphasis is on the biological aspects of these crucial problems.

E&EB 520a^U, Population Ecology. Ashley Carter.

mwf 10.30–11.20

An introduction to the theoretical context and empirical grounding of the science of population ecology. Emphasis is placed on the determinants of patterns of distribution and abundance from demographic and population perspectives. Animal behavior is treated in an ecological context, as exemplars of life history consequences of demography, and as modulators of competitive and predatory responses.

E&EB 530b^U, Evolutionary Biology. Jeffrey Powell, Paul Turner, Günter Wagner.

mwf 9.30–10.20

An introduction to the study of evolution from both a macro- and microevolutionary perspective. Principles of population genetics, systematics, paleontology, and molecular evolution are addressed as well as application of evolutionary thinking to issues in animal behavior, ecology, and molecular biology.

E&EB 526Lb^U, Laboratory for Evolutionary Biology. Marta Martinez Wells.

th 1

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.

E&EB 530a^U, Field Ecology. Theodora Pinou.

th 1–5

A field-based introduction to methodology used by ecologists in field studies. Descriptive studies, comparative analysis, modeling, and experimental approaches are explored using class or small-group projects relevant to major topics in ecology.

E&EB 540a^U, AIDS and Society. Alvin Novick.

mwf 10.30–11.20

The natural history, biology, and epidemiology of AIDS; social, ethical, public policy, and political aspects of AIDS and of the ways societies address a medical crisis.

E&EB 540b^U, Animal Behavior. Marta Martinez Wells.

mw 11.30–12.45

An introduction to animal behavior, including proximate causes, development, and control of behavior; communication; mating systems and sexual selection; and the evolution of social systems.

E&EB 545b^u, Problems in Bioethics.

tth 9–10.15

A consideration of social and ethical problems raised by advances in biological and medical research. Several timely topics examined in depth, with frequent student oral reports.

E&EB 550a^u, Biology of Terrestrial Arthropods. Marta Martinez Wells.

tth 11.30–12.45

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).

E&EB 551La^u, Laboratory for Biology of Terrestrial Arthropods.

Marta Martinez Wells.

w 1.30

E&EB 555b^u, The Invertebrates. Leo Buss.

tth 11.30–12.45

The biology and paleobiology of invertebrates, including the diversity of body plans, comparative development, phylogeny, and functional morphology.

E&EB 556Lb^u, Laboratory for the Invertebrates. Leo Buss.

t 1.45

Comparative functional morphology of selected invertebrate phyla, with demonstrations of diversity within phyla.

[**E&EB 560b^u, The Vertebrates.**]

[**E&EB 561Lb^u, Laboratory for the Vertebrates.**]

[**E&EB 565a^u, The Biology of Birds.**]

[**E&EB 566La^u, Laboratory for the Biology of Birds.**]

[**E&EB 570b^u, Herpetology.**]

[**E&EB 571Lb^u, Laboratory for Herpetology.**]

E&EB 575b^u, Evolution of the Mammals. Anne Yoder.

tth 2–3.45

Review of the evolutionary history and defining characteristics of mammals. Topics include the fossil record, phylogenetic reconstruction, morphological transitions, and ecological and physiological specializations. Topics are viewed in a synthetic context that presents mammalian characteristics as solutions to a variety of evolutionary challenges.

E&EB 576Lb^u, Laboratory for Evolution of the Mammals. Anne Yoder.

w 1.30

Review of the morphological characteristics of living mammals. Examinations of representative skeletons and skins for all major mammalian groups. A comparative study of morphological transitions and specializations within and among groups.

E&EB 601a, Biocomplexity. Günter Wagner.

m 4–5.30

This course provides an introduction into the emerging field of biocomplexity in a mixed lecture/seminar format. Biocomplexity combines insights from biological research with model-

ing approaches and ideas from computer science and physics to gain a better understanding of the organization and dynamics of biological systems. The main emphasis in this course is on the following topics: complexity and predictability, measurement theory, modularity and decomposability of complex systems, landscape theory, and theory of complex adaptations.

[E&EB 61ob^u, Evolutionary Genetics.]

E&EB 615Lb^u, Laboratory in Molecular Systematics. Adalgisa Caccone.

t 1.30–5.30

A practical introduction to molecular techniques used in systematics (DNA extraction, PCR, sequencing) and their application to field studies in natural history, population genetics, mating systems, paternity, and the historical analysis of lineages. Research projects apply the methodologies.

E&EB 620a^u, Seminar in Conservation Genetics. Adalgisa Caccone.

t 3.30–5.30

Provides an introduction to conservation genetics for advanced undergraduates and graduate students. The goal is to provide students with an understanding of the importance of genetic diversity and the means for preserving it. *Also F&ES 588a^u.*

[E&EB 628a^u, Comparative Physiology.]

[E&EB 629La^u, Laboratory for Comparative Physiology.]

[E&EB 650b^u, Plant Ecology.]

[E&EB 651Lb^u, Laboratory for Plant Ecology.]

E&EB 660b^u, Wildlife Conservation Ecology. Oswald Schmitz.

The study of wildlife ecology from an evolutionary ecological perspective to understand the behavior and life history of animals. The course explores how behavior and life history evolve and what factors ultimately shape population demography. The course examines behavioral and evolutionary ecological theories like optimal activity budgets; optimal foraging; and habitat choice in the context of age and stage-based models of population dynamics. The course links an understanding of animal behavior and life history to solving current conservation problems related to wildlife habitat loss and population viability. Three hours lecture and one hour discussion. *Also F&ES 560b^u.*

E&EB 665a^u, Landscape Ecology. David Skelly.

An introduction to the study of large-scale ecological patterns and processes. Through lectures and the completion of a project, students learn how to integrate a spatial perspective into consideration of major ecological questions. *Also F&ES 760a^u.*

E&EB 670a^u, Aquatic Ecology. David Skelly.

t 1–2.30

An intensive introduction to the ecology of populations and communities in freshwater systems. The aim is to learn the concepts, patterns, and organisms important in lakes and streams along with the major techniques of information collection and analysis. Weekly field trips are used to gather data that form the basis of lab exercises and research projects. The course presumes familiarity with ecological concepts and terminology. Permission of the instructor required. *Also F&ES 509a^u.*

E&EB 671La^u, Laboratory for Aquatic Ecology. David Skelly.

th 1–5

[E&EB 675a^u, Molecular Approaches to Systematics, Conservation Genetics, and Behavioral Ecology.]

E&EB 680a, Advanced Introduction to Evolutionary Theory. Stephen Stearns.

tth 10.30–11.20, 1 htba

Advanced discussion of life history evolution, sex allocation theory, the evolution of sex, the evolution of phenotypic plasticity, and evolutionary conflict theory. Instructors give introductory lectures; students pick topics and present lectures themselves.

E&EB 685b^U, Evolutionary Developmental Biology. Günter Wagner, Vivian Irish, Michael Donoghue.

tth 1–2.15

This course is an introduction into an emerging biological discipline, evolutionary developmental biology. The course provides an introduction to the evolutionary biology of developmental processes as well as the developmental underpinnings of major evolutionary transformations. Topics include the evolution of Hox genes and other developmental genes, the origin of multicellular organisms, the evolution of flowers, and the origin of the arthropod and vertebrate Bauplan. The course has a mixed lecture/seminar format and thus engages the student to do independent study and prepare papers. Entering graduate students are expected to complete a unique research project and present in a lecture format to the class. *Also MCDB 685b^U.*

[E&EB 800b, Computational Analysis of Biological Information.]**[E&EB 808a, Topics in the Statistical Analysis of Genomic Data.]****E&EB 810a, Dynamics of Evolving Systems. J. Rimas Vaisnys.**

tth 11.30–12.45

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.

[E&EB 827b, Advanced Topics of Computational Biology: Emergence and Evolutionary Innovation.]**[E&EB 845a, Advanced Evolutionary Theory.]****E&EB 900a–b, First-Year Introduction to Research and Rotations. Margaret Riley.****E&EB 950a or b, Second-Year Research.**

By arrangement with faculty.

economic history

Graduate Adviser

Timothy Guinnane

The program in economic history is designed to train a limited number of students who desire to be well grounded in the concepts of both history and economics and also of other relevant areas of social science in order to carry on research and teaching in economic history. Studies encompass (1) the economic development of Europe from the medieval period to the present; (2) the development of the American economy; and (3) the evolution of selected non-Western economies and their relation to the West.

Special Admissions Requirements

GRE scores in accordance with the requirements of either the Economics or the History department must be submitted as part of the application for admission.

Special Requirements for the Ph.D. Degree

In addition to the dissertation and language requirements (at least one European language is required), candidates must satisfy the course requirements and the qualifying examinations of either the Economics or the History department and must complete the equivalent of one additional year's work in the other discipline. Interested students should apply as regular Ph.D. candidates in either History or Economics, indicating on their application their interest in the program. Admission to this Ph.D. program is normally offered midway during a student's second year. In recognition of the student's extra year of graduate study, the Graduate School charges five years of tuition but also considers the Economic History student eligible to apply for five years of financial aid. The Ph.D. degree is awarded by the department in which the student has been admitted for that degree.

The course program is chosen by the student in consultation with the Graduate Adviser. Courses are selected from the offerings of the Economics and History departments in accordance with the requirements of the program selected by the student.

economics

28 Hillhouse, 432.3575

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

Chair

David Pearce (28 Hillhouse, 432.3571)

Director of Graduate Studies

Donald Brown (30 Hillhouse, Rm 36, 432.6934, donald.brown@yale.edu)

Professors

Joseph Altonji, Donald Andrews, Dirk Bergemann, Steven Berry, Truman Bewley, William Brainard, Donald Brown, Eduardo Engel, Robert Evenson, Ray Fair, John Geanakoplos, Pinelopi Goldberg, Timothy Guinnane, Koichi Hamada, Gerald Jaynes, Michael Keane, Alvin Klevorick, Richard Levin, Robert Mendelsohn, Stephen Morris, Barry Nalebuff, William Nordhaus, David Pearce, Peter Phillips, Benjamin Polak, Gustav Ranis, John Roemer, Herbert Scarf, T. Paul Schultz, Robert Shiller, Martin Shubik, T. N. Srinivasan, Christopher Udry

Associate Professors

Philip Levy, Martin Pesendorfer

Assistant Professors

Patrick Bayer, Hanming Fang, Donato Gerardi, Galina Hale, George Hall, Ann Huff-Stevens, Stefan Krieger, Carolyn Moehling, Giuseppe Moscarini, Christopher Timmins

Fields of Study

Fields include economic theory, including microeconomics, macroeconomics, mathematical economics; econometrics; economic history; labor economics; market organization; money and banking; financial economics; economics of the public sector; international trade and finance; economic development; demography; history of economic thought; comparative economic systems.

Special Admissions Requirements

The GRE General Test is required of all applicants to the program. Students whose native language is not English must take the Test of English as a Foreign Language (TOEFL).

Special Requirements for the Ph.D. Degree

The following requirements must be satisfied in addition to those prescribed by the Graduate School.

1. *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 two times.

2. *Prior to Registration for the Third Year.* (a) Students must have met the two Honors requirement specified by the Graduate School. (b) 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. (c) 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.

3. *Admission to Candidacy.* The Graduate School requires that students 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 vote of department faculty after having completed department requirements (1) and (2) above, the Graduate School's prospectus requirement, and the following additional requirements: (a) Students must have completed two one-term prospectus workshops. Prospectus workshops have the word "prospectus" in their title. (There are other workshops.) If students can find no workshop corresponding to their interests, they may substitute other workshops for this requirement. 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. In the paper, the student should (i) specify an economic model useful for the investigation of an interesting economic problem, (ii) select data and econometric methods appropriate to the question, (iii) conduct proper statistical analysis, and (iv) interpret the results in an intelligent way. (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.

4. *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, on request of the committee chair, 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 on page 377 of this publication.

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 on page 217 of this publication.

Program materials are available on our Web site: www.econ.yale.edu/

Courses

ECON 500a, General Economic Theory: Microeconomics. Dirk Bergemann, Benjamin Polak.

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. Stephen Morris.

General equilibrium and welfare economics. Allocation involving time. Public sector economics. Uncertainty and the economics of information. Introduction to social choice.

ECON 510a, General Economic Theory: Macroeconomics. Robert Shiller, Eduardo Engel.

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. George Hall, Stefan Krieger.

Theories of saving, investment, portfolio choice, and financial markets. Longer-run developments; economic growth, capital accumulation, income distribution.

ECON 520a, Advanced Microeconomic Theory I. Dirk Bergemann, Donato Gerardi.

A formal introduction to game theory and information economics. Alternative noncooperative solution concepts are studied and applied to problems in oligopoly, bargaining, auctions, strategic social choice, and repeated games.

ECON 521b, Advanced Microeconomic Theory II. Attila Ambrus, Itzak Gilboa.

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, Topics in Game Theory. Stephen Morris.

A forum for advanced students to examine critically recent papers in the literature and present their own work.

ECON 524a, Behavioral Applied Theory. Dilip Abreu.

This course discusses models of bounded rationality that respond to some of the behavioral regularities established by experimenters in economics and psychology. The phenomena con-

sidered include reciprocity, overconfidence, time inconsistency and imperfect sophistication of various kinds, with applications drawn from consumer theory, financial economics, industrial organization, and bargaining.

ECON 525a, Advanced Macroeconomics: I. Eduardo Engel, Robert Shiller.

Aggregation, inventory models, externalities, spillovers, information and adjustment. Time series models, expectations, models of financial markets, risk management, monetary policy, term structure of interest rates.

ECON 526b, Advanced Macroeconomics: II. William Brainard, Stefan Krieger.

Selected empirical topics.

ECON 530a, Equilibrium Analysis on Finite Data Sets. Donald Brown.

mW 1–2.15

This course investigates the central issues in the theory of competitive markets, i.e., existence, uniqueness, and tatonment stability of market clearing prices. We consider both the Walrasian and Marshallian theory of general economic equilibrium. The analysis differs from the traditional approach to these topics in that we restrict attention to propositions derivable from finite data sets. These properties include counterfactuals, i.e., global comparative statics of market economics. *Also MATH 530a.*

ECON 531b, Mathematical Economics: II. John Geanakoplos.

Primary focus on general equilibrium analysis. Topics include consumer preference theory, demand functions, fixed-point theorems and their application to demonstrating the existence of competitive equilibria, the computation of equilibrium prices, Pareto optimality, the core of an economy, and related topics in n-person game theory.

[ECON 532a^U, General Equilibrium under Uncertainty.]

[ECON 533a and b, Workshop on Discrete Mathematics and Applications.]

ECON 537a and 538b, Microeconomic Theory Workshop. Staff.

Presentations by research scholars and participating students.

ECON 540a and 541b, Workshop in International and Macroeconomics. Staff.

A course for third- and fourth-year students doing research in macroeconomics 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, Economic Analysis. Cheryl Doss.

mW 9–10.15

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. *Also INRL 560a.*

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. Shin-ichi Fukuda.

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. Donald Brown.

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.

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.]**ECON 555b, Applied Econometrics II: Microeconometrics. Michael Boozer.**

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 557b, Time Series Econometrics II: Unit Roots and Co-Integration.]**ECON 558a, Statistics and Econometrics. Michael Boozer.**

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 567a and 568b, Econometrics Workshop. Donald Andrews, Peter Phillips.

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. Donald Andrews, Peter Phillips.

A course for third- and fourth-year students doing research in econometrics to prepare their prospectus and present dissertation work.

[ECON 580b, General Economic History: Western Europe.]

ECON 581a, American Economic History. Carolyn Moehling.

This course studies the process of economic growth as it has occurred in the American economy.

ECON 582b, General Economic History: Latin America. Noel Maurer.

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.

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 neo-classical theories. Then turns to a detailed examination of the determinants and consequences of industrial market structure.

ECON 601b, Industrial Organization II. Judith Chevalier, Gautam Gowrisankaran.

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 Microeconomics. 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, Workshop in Applied Microeconomics. 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. Joseph Altonji, Ann Stevens.

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. Michael Keane.

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 exposit their research plans and findings. Discussions encompass empirical microeconomic research relating to both high- and low-income countries.

ECON 670a, Financial Economics I. Jonathan Ingersoll.

Theory of single-period financial models. Risk aversion, stochastic dominance, the canonical portfolio problem, the fundamental theorem of asset pricing, mean-variance analysis and its uses, mutual fund separation theory, arbitrage pricing theory, asset pricing in complete markets, and selected empirical topics. *Also MGMT 740a.*

ECON 671b, Financial Economics II. 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. *Also MGMT 741b.*

ECON 680a, Public Finance: I. Christopher Timmins.

Theoretical and empirical topics in public finance. Some emphasis on the relation between taxation and the following problems: efficiency, equity, and income distribution, uncertainty in capital markets, and aggregate capital accumulation.

ECON 681b, Public Finance: II. Hanming Fang, William Brainard.

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 700b, International Economics: Trade. Pinelopi Goldberg.

Pure theory of international trade covering the following topics: classical theory of comparative advantage and its modern counterpart, neoclassical theory (Heckscher-Ohlin-Samuelson model); recent models of trade with scale economies, product differentiation, and monopolistic competition; models of trade investment, innovation, and growth; gains from trade, commodity price-factor relations, theory of commercial policy.

ECON 701a, International Economics: Finance. Giancarlo Corsetti, Galina Hale.

International monetary economics covering the following topics: the balance of payments and the foreign exchange market; the elasticities, absorption, and monetary approaches to the foreign exchange market; the elasticities, absorption, and monetary approaches to the adjustment mechanism; long-term and short-term capital flows; Euro-dollars, portfolio and asset market approaches, policies for internal balance, flexible exchange rates, international reserves, and the monetary system.

ECON 702b, International Economics. Koichi Hamada.

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 708b, International Economic Analysis. Cheryl Doss.

III 1–3.20

A continuation of ECON 544a/INRL 560a. It extends the use of economic analysis to international trade and monetary policy including exchange rates and balance of payments with an emphasis on their relation to international trade, cross-border capital flows, and national economic policies. Introduction to quantitative tools and analysis as a way to determine the effects of various policies, building on concepts introduced in ECON 544a and the first part of this course. *Also INRL 561b.*

[ECON 709a, International Economics and Open Economy Macroeconomics.]**ECON 730a, Economic Development. 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. Christopher Udry.

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. Robert Evenson.

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 737b^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/b, Workshop on Environmental and Natural Resources.

William Nordhaus, Christopher Timmins, and 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 776b^u, Economics of Population. T. Paul Schultz.

Analysis of economic aspects of population change, including fertility, mortality and health, composition of households, migration, and labor force behavior. Microeconomic models of household behavior and demographic measurement theory used to account for economic and demographic behavior of persons in low- and high-income countries.

ECON 788a, Political Competition. John Roemer.

w 9–12

Political competition in democracies is party competition. We develop, from the formal viewpoint, theories of party competition in democracies. The familiar “median voter theorem” of A. Downs is the simplest example of such a theory, but it is inadequate in several ways. We develop a theory in which parties: (1) compete over *several* issues, not just one issue, as in Downs; (2) are *uncertain* about how citizens will respond to platforms; and (3) represent interest groups in the population. Applications, particularly to the theory of income distribution and taxation, are studied. *Also PLSC 575a.*

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

Tso-Ping Ma

Professors

Richard Barker (*Emeritus*), Andrew Barron, Richard Chang, W. J. Cunningham (*Emeritus*), James Duncan, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), J. Rimantas Vaisnys, Jerry Woodall, Steven Zucker

Associate Professors

Jung Han, Lawrence Staib, Hemant Tagare

Assistant Professors

Daniel Friendly, Dana Henry, Richard Lethin (*Adjunct*), Yiorgos Makris, Janet Pan, Edmund Yeh

Fields of Study

Fields include control systems, neural networks, communications and signal processing, wireless networks, intelligent sensors, biomedical image processing, microelectronic materials and semiconductor devices, nanoelectronic science and technology, optoelectronic materials and devices, computer engineering, computer architecture, VLSI design and testing, and computer vision.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science, pages 123–35.

engineering and applied science

Dunham Laboratory, 432.4250

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

Dean

Paul Fleury

Director of Graduate Studies

To be announced (grad-engineering@yale.edu)

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 Faculty of Engineering.

Applied Physics

Chair

A. Douglas Stone

Professors

William Bennett, Jr. (*Emeritus*), Richard Chang, Michel Devoret, Joseph Dillon, Jr. (*Adjunct*), Paul Fleury, Steven Girvin, Robert Grober, Victor Henrich, Arvid Herzenberg (*Emeritus*), Pierre Hohenberg (*Adjunct*), Mark Kasevich, Marshall Long, Tso-Ping Ma, Daniel Prober, Nicholas Read, Mark Reed, Subir Sachdev, Ramamurty Shankar, Mitchell Smooke, Katepalli Sreenivasan, A. Douglas Stone, John Tully, Robert Wheeler (*Emeritus*), Werner Wolf (*Emeritus*), Jerry Woodall

Associate Professor

Sean Barrett

Assistant Professors

Charles Ahn, Janet Pan, Robert Schoelkopf

fields of study

Fields include areas of theoretical and experimental condensed-matter physics, optical and laser physics, and material physics. Specific programs include surface science, microlithography and quantum transport, optical properties of micro-cavities, spectroscopy at the nanoscale, near-field microscopy, atomic force microscopy and ferro-electronic materials, molecular beam epitaxy, mesoscopic physics, and medical instrumentation.

Biomedical Engineering

Professors

Robert Apfel, James Duncan, Robert Grober, Csaba Horváth, Steven Segal, Mark Saltzman, Fred Sigworth, Steven Zucker

Associate Professors

Lawrence Staib, Hemant Tagare

Assistant Professor

Jacek Cholewicki

fields of study

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

Chemical Engineering

Chair

Lisa Pfefferle

Professors

Daniel Crothers (*Adjunct*), Menachem Elimelech, Thomas Graedel, Gary Haller, William Hancock (*Adjunct*), Csaba Horváth, Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, John Walz, L. Lee Wikstrom (*Adjunct*), Kurt Zilm (*Adjunct*)

Associate Professors

Eric Altman, Gaboury Benoit, Michael Loewenberg

Assistant Professor

Roger Ely

fields of study

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

Electrical Engineering

Chair

Tso-Ping Ma

Professors

Richard Barker (*Emeritus*), Andrew Barron, Richard Chang, W. J. Cunningham (*Emeritus*), James Duncan, Peter Kindlmann (*Adjunct*), Roman Kuc, Tso-Ping Ma, A. Stephen Morse, Kumpati Narendra, Mark Reed, Peter Schultheiss (*Emeritus*), J. Rimas Vaisnys, Jerry Woodall, Steven Zucker

Associate Professors

Jung Han, Lawrence Staib, Hemant Tagare

Assistant Professors

Daniel Friendly, Dana Henry, Richard Lethin (*Adjunct*), Yiorgos Makris, Janet Pan, Edmund Yeh

fields of study

Fields include control systems, neural networks, communications and signal processing, wireless networks, intelligent sensors, biomedical image processing, microelectronic materials and semiconductor devices, nanoelectronic science and technology, optoelectronic materials and devices, computer engineering, computer architecture, VLSI design and testing, and computer vision.

Mechanical Engineering

Chair

Marshall Long

Professors

Robert Apfel, Ira Bernstein, Boa-Teh Chu (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, Robert Gordon, Amable Liñan-Martinez (*Adjunct*), Marshall Long, Lisa Pfefferle, Daniel Rosner, Ronald Smith, Mitchell Smooke, Katepalli Sreenivasan, George Veronis, Peter Wegener (*Emeritus*), Forman Williams (*Adjunct*)

Associate Professors

Udo Schwarz, Wei Tong

Assistant Professors

Jerzy Blawdziewicz, David Wu, Bjong Yeigh (*Adjunct*)

Lecturers

Beth Anne Bennett, Natalie Jeremijenko, Kailasnath Purushothaman, Glenn Weston-Murphy

fields of study

Mechanics of Fluids: Acoustics and bioeffects of ultrasound; bulk and surface properties of liquids (including metastable liquids, radiation-induced bubble formation, and surfactant-induced effects); dynamics and stability of drops and bubbles; experimental, theoretical, and computational studies of turbulence; chaos; fractals; aerodynamics; kinetic theory of gases and mixtures; electrospray theory and characterization; combustion and flames; computational methods for fluid dynamics and reacting flows; laser diagnostics of reacting and nonreacting flows; atmospheric turbulence, climate, theoretical and laboratory modeling of large-scale ocean circulation.

Mechanics of Solids/Material Science: Mechanisms of deformation, mass transport, and nucleation within material systems through experimental, analytic, and computational studies. Examples of projects include mechanical testing of small-scale structures; characterization of microscale inhomogeneities in plastic flow; impact loading of materials; diffusion of dopants within semiconductor films; evolution of surface roughness during plastic deformation; ion implantation–induced disorder in crystalline films; incorporation of microstructural information into constitutive laws; biomechanics of the heart; electromigration in metallic interconnects; and transient nucleation in multicomponent systems.

Program in Environmental Engineering

Professors

Gaboury Benoit, Robert Berner, F. Peter Boer (*Adjunct*), Menachem Elimelech, Thomas Graedel, Lisa Pfeifferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, Karl Turekian, John Walz

Associate Professor

James Saiers

Assistant Professors

Ruth Blake, Roger Ely

Lecturers

Sheryl Stuart, James Wallis

fields of study

Fields include physical and chemical processes for water quality control, aquatic and environmental chemistry, transport and fate of contaminants in the environment, colloidal and interfacial phenomena in aquatic systems, environmental engineering microbiology, membrane separation processes, biological processes and bioremediation, aerosol science and technology, incineration of toxic wastes, industrial ecology, geochemistry and bio-geochemistry, adsorption and desorption of organic pollutants in soils and groundwater, geochemical cycles and the global environment, and chemical reactions at the mineral-water interface.

Special Requirements for the Ph.D. Degree

A pamphlet titled *Qualification Procedures for a Ph.D. Degree in Engineering and 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, normally completed in the first two years. Mastery of the mathematical topics, as covered, for example, in ENAS 500a, is expected and generally required (for exceptions, consult the individual department/program). Students may take an examination to place out of ENAS 500a. Placing out of the course will meet the mathematical topics requirement but will not reduce the total number of required courses. In addition, core courses, as identified by each department/program, should be taken in the first year. No more than two courses should be Special Investigations, and at least two should be outside the area of the dissertation. The student will take a competence examination in departmentally specified core areas by the end of September in the third term. If the student passes, with a grade of Honors, the relevant course(s) in a given core area and if there is unanimous approval of the student's advisory committee, the DGS may waive the portion of the competence examination requirement in that particular core area. Periodically, the faculty reviews the overall performance of the student to determine whether he/she may

continue for the Ph.D. degree. At the end of the first year, a faculty member typically agrees 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.

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 Graduate School requirements, page 375.

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. 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.

Master of Engineering. This degree is designed to be taken in conjunction with Yale undergraduate B.S. degrees in Engineering. For details please see the Engineering entry in the *Yale College Programs of Study*, and www.eng.yale.edu/Select/.

Program materials are available upon request to the Director of Graduate Studies, Engineering and Applied Science, Yale University, PO Box 208267, New Haven CT 06520-8267; e-mail, engineering@yale.edu; Web site, www.eng.yale.edu/.

Courses

The list of courses may be slightly modified by the time term begins. Please check the Web site www.eng.yale.edu/GIF/grad/courses.html for the most updated course listing.

ENAS 500a, Mathematical Methods I. Staff.

tth 10.30–12

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 transforms, Fourier integrals in one and more dimensions, optimization, elements of ODE).

ENAS 501b, Mathematical Methods II. Juan de la Mora.

tth 1–2.20

Special functions, the Laplace transformations, Fourier series, Fourier integrals, and partial differential equations including separation of variables, methods of characteristics, variational techniques, and the brief discussion of numerical methods.

ENAS 502b^U, Stochastic Processes. Staff.

tth 10.30–11.45

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.

ENAS 506a^U, Basic Quantum Mechanics. Daniel Prober.

tth 9–10.15

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.

ENAS 507b^U, Digital Systems Testing and Design for Testability. Yiorgos Makris.

mw 2.30–3.45

Introduction to the fundamental concepts, algorithms, and design techniques for testing digital systems. Topics include: test issues and economics, fault modeling, logic and fault simulation, test generation algorithms for combinational and sequential circuits, testability analysis, design for testability, built-in self-test, delay fault test, functional test, and case studies (memory test, FPGA test, system-on-chip test, etc.). Lab work consists of projects employing logic and fault simulation, automatic test pattern generation, and design for testability software tools. Prerequisite: EENG 462a/CPSC 338a. Understanding of algorithms and data structures is desirable but not essential.

ENAS 509a^U, Electronic Materials: Fundamentals and Applications. Jung Han.

mw 11.30–12.45

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.

ENAS 511b^U, Physics and Devices of Optical Communication. Jung Han.

mw 11.30–12.45

A survey of the enabling components and devices that constitute modern optical communication systems. Focus on the physics and principles of each functional unit, its current technological status, design issues relevant to overall performance, and future directions. Permission of instructor required.

[ENAS 521a, Classical and Statistical Thermodynamics.]**ENAS 550a^U, Physiological Systems. Steven Segal and staff.**

mwf 9.30–10.20

Regulation and control in biological systems, emphasizing human physiology and principles of feedback. Biomechanical properties of tissues emphasizing the structural basis of physiological control. Conversion of chemical energy into work in light of metabolic control and temperature regulation. *Also C&MP 550a, MCDB 550a^U.*

ENAS 554b^U, Biochemical Engineering: Biotechnology. Csaba Horváth.

Biotechnology treated from the point of view of chemical engineering. Basics of microbiology, microbial genetics and control, and genetic engineering, followed by enzyme kinetics and

biochemical reactors. Fermentation technologies: biochemical separation processes with emphasis on chromatography. Field trips to fermentation facilities.

ENAS 557b^U, Biomechanics. Jacek Cholewicki.

tth 2.30–3.45

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.

ENAS 575b^U, Computational Vision and Biological Perception. Steven Zucker.

tth 1–2.15

An overview of computational vision with a biological emphasis suitable as a 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. *Also CPSC 575b.*

ENAS 580a^U, Seminars in Biomedical Engineering. Staff.

Tutorial seminars illustrating applications of physics and engineering to biomedical problems. Students are required to attend the seminars, to do the readings assigned after each seminar, to ask questions, and to participate in the discussions. Four to five short papers are required on issues arising from selected topics. The final papers may be presented to the rest of the class.

[ENAS 589a, Introduction to Information Technology for Management.]

[ENAS 600a^U, Computer-Aided Engineering.]

ENAS 602a, Chemical Reaction Engineering. Drago Ciuparu.

m 4–6.30

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.

ENAS 603b, Energy Mass and Momentum Processes. Daniel Rosner.

m 5–7.30

Application of continuum mechanics approach to the understanding and prediction of fluid flow systems that may be chemically reactive, turbulent, or multiphase.

[ENAS 607b^U, Microhydrodynamics.]

ENAS 608b, Surface and Surface Processes. Eric Altman.

tth 9–10.45

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.

ENAS 611a^U, Separation Processes. Daniel Rosner.

mw 2.30–3.45

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.

[ENAS 612a, Colloidal Separations.]

[ENAS 614a, Surface Spectroscopy.]

ENAS 618b, Catalysis: An Integrated Approach. Gary Haller.

tth 1–2.15

An historical survey of catalytic processing and chemical kinetics of catalyzed reactions, followed by fundamentals of bonding to surfaces, elementary steps in heterogeneous and homogeneous catalysis, a brief survey of biocatalysis, and finally applied catalysis including reaction engineering, catalyst preparation, and catalyst characterization by physical, chemical, and spectroscopic methods.

[ENAS 619b, Advanced Transport: Topics in Multiphase Chemical Reaction Engineering.]**ENAS 626a^u, Chemical Engineering Process Control. Staff.**

mw 1–2.15

Modeling of steady- and unsteady-state behavior of chemical processes; optimal control strategies for processes of particular interest to chemical engineers; discussion of both classical and modern control theory, with applications.

ENAS 640b, Aquatic Chemistry. Gaboury Benoit.

tth 10–11.20

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. *Also F&ES 544b.*

[ENAS 641a, Biological Processes in Environmental Engineering.]**ENAS 642a, Physical and Chemical Processes in Environmental Engineering. Menachem Elimelech.**

tth 2.30–3.45

Fundamental and applied concepts of physical and chemical (“physicochemical”) processes relevant to water quality control. Topics include chemical reaction engineering, overview of water and wastewater 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.

ENAS 643a, Transport and Fate of Organic Chemicals in the Environment. Joseph Pignatello.

tth 4–5.15

Fundamental chemical and physical processes controlling the distribution, transport, and transformation of anthropogenic organic chemicals in aqueous environments including soils, sediments, and groundwater. The course provides basic knowledge about the following: (1) the use of chemical and physical principles to quantify the thermodynamics and kinetics of individual processes, (2) the use of chemical structure to understand these processes at the molecular level, and (3) a framework for evaluating the relative importance of these processes so that the fate of a particular chemical in a particular environment may be predicted.

[ENAS 644b, Geographic Information Systems (GIS) in Water Resources and Environmental Engineering.]

ENAS 645b, Industrial Ecology. Thomas Graedel, Marian Chertow.

mw 1–2.20

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. *Also F&ES 501b.*

ENAS 646a, Environmental Hydrology. Jeffrey Albert.

mw 11.30–12.50

An introduction to the essential elements of hydrogeologic processes. Course topics include groundwater flow, occurrence and movement of water in the vadose zone, streamflow 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. *Also F&ES 540a.*

ENAS 647b, Hydrological Modeling. James Saiers.

mw 10–11.20

Application of computer models to solve problems related to water movement and chemical migration in subsurface environments. Unsaturated and saturated flow phenomena are considered, and the role of geochemical and microbiological processes in chemical fate and transport are examined.

[ENAS 649a, Selected Topics in Environmental Engineering Science.]**ENAS 650a^U, Instrumentation and Product Design. Peter Kindlmann.**

wf 2.30–3.45

Survey of broadly applicable design methods with initial emphasis on analog electronics: review of op amps and other integrated circuits and their specifications, data conversion fundamentals, the use of simulation and an online engineering database, exposure to such broader issues as user-interface design, user participation in design, and the transforming role of products at work and in the home.

ENAS 704a^U, Theoretical Fluid Dynamics. Ira Bernstein.

tth 1–2.15

Derivation of the equations of fluid motion from basic principles. Potential theory, viscous flow, with vorticity. Topics in hydrodynamics, gas dynamics, stability, and turbulence.

[ENAS 708b, Fundamentals of Combustion.]**ENAS 709a, Special Topics in Combustion. Staff.**

tth 2.30–3.45

An advanced course in combustion with an emphasis on turbulent combustion in both premixed and non-premixed systems. We review modern approaches to the subject including both experimental and theoretical aspects. Prerequisite: ENAS 708b.

[ENAS 713a^U, Acoustics.]**ENAS 718a^U, Heterojunction Devices. Mark Reed.**

tth 9–10.15

Survey of the physics, technology, and fabrication of semiconductor heterojunction materials and devices. Topics include contemporary compound semiconductor material properties and epitaxial growth techniques; high-speed analog and digital devices; microwave and millimeter wave devices for radar and wireless communications; the physics and device properties of

quantum wells and superlattices; HEMTs and modulation-doped structures; resonant tunneling physics and devices; and device modeling using computer simulation tools. Lab includes fabrication of GAAs, FETs, and HBTs; fabrication and measurement of quantum Hall effect standards; LEDs; and resonant tunneling devices.

[ENAS 745a, Optical Diagnostics for Reacting and Nonreacting Flows.]

ENAS 747a^U, Applied Numerical Methods I. Beth Anne Bennett.

tth 2.30–3.45

A variety of numerical methods applied to problems in engineering and applied science. Topics include solutions of linear and nonlinear equations, interpolation and approximation, eigenvalue determination, and numerical integration.

[ENAS 748b^U, Applied Numerical Methods II.]

ENAS 750b^U, Mechanics of Deformable Solids. Staff.

Unified presentation of the equilibrium behavior of structural and machine elements, including the solution of a variety of representative engineering problems. Tensorial description of stress and strain. Elementary introduction to elastic, plastic, and viscoelastic behavior of solids. Failure theories. Two-dimensional boundary value problems in elasticity. Energy methods in solid mechanics. Stability problems.

[ENAS 751a, Vibration Problems in Engineering.]

ENAS 761a, Introduction to Continuum Mechanics. Staff.

tth 9–10.15

Foundations of fluid and solid mechanics presented from a unified viewpoint. Usefulness and limitations of continuum approximation. A review of types of mechanical behavior. Ideal and real substances. Mathematical preliminaries: vector and tensor calculus. Kinematics of deformation. Basic thermodynamics. Conservative laws. Relation to particle mechanics and the kinetic theory of matter. Modeling of real systems. Constitutive equations and their formulation. Selected applications: waves and heat transfer in fluids and solids.

[ENAS 763a, Introduction to Polymer Science and Engineering.]

[ENAS 785a^U, Microstructural Development of Materials.]

[ENAS 789a, Turbulence and Related Problems.]

ENAS 810b, Nonlinear Optics. Staff.

tth 2.30–3.45

Fundamental aspects of laser interaction with matter, including both linear and nonlinear optical responses. Actual electro-optical and magneto-optical devices (such as harmonic doublers, parametric oscillators, modulators, and isolators) are introduced and analyzed.

[ENAS 815b, Detection of Radiation.]

[ENAS 818b, Mesoscopic Physics.]

[ENAS 821b^U, Physics of Medical Imaging.]

**ENAS 850a^U and 851b^U, Solid State Physics I and II. A. Douglas Stone [F],
Simon Mochrie [Sp].**

tth 1–2.15

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. *Also PHYS 548a^U and 549b^U.*

ENAS 852b, Many-Body Theory of Solids. A. Douglas Stone.

tth 10.30–12

Solids as many-particle systems. Second quantization. Green's functions, quantum statistical mechanics, linear response theory. Hartree-Fock theory, perturbation theory, Feynman diagrams at finite temperature. Theory of the electron gas, electron-phonon coupling, BCS theory of superconductivity. *Also PHYS 610b.*

ENAS 856a and 857b, Theory of Solids I and II. Simon Mochrie [F], Staff [Sp].

mw 9–10.30 [F], mth 1–2.30 [Sp]

Theoretical techniques for the study of the structural and electronic properties of solids, with applications. Topics include band structure, phonons, defects, transport, magnetism, and superconductivity. *Also PHYS 650a and 651b.*

[ENAS 858a, Asymptotic Methods.]**ENAS 859a, Special Topics in Optics. Richard Chang.**

tth 2.30–3.45

A survey of the principles of optics. Topics include geometrical optics, optical imaging, interference, and diffraction. The course is taught from the experimentalist perspective and emphasizes real applications.

ENAS 863b, Introduction to Superconductivity. Daniel Prober.

tth 2.30–3.45

The fundamentals of superconductivity, including both theoretical understandings of basic mechanism, and description of major applications. Topics include historical overview, Ginzburg-Landau (mean field) theory, critical currents and fields of type II superconductors, BCS theory, Josephson junctions and microelectronic and quantum-bit devices, and high T_c oxide superconductors.

[ENAS 866a, MOS Device Physics and Technology.]**ENAS 875a^u, Introduction to VLSI System Design. Richard Lethin.**

th 1.30–3.20

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 student. Prerequisite: circuits at the level of introductory physics and computer programming.

ENAS 902a, Linear Systems. A. Stephen Morse.

mw 1.30–3

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.

ENAS 907b^u, Computer Systems. Daniel Friendly.

mw 2.30–3.45

The organization of computer systems as hardware and software systems. Instruction-set architecture, assembly programming, computer arithmetic, data-path architecture and control, pipelining, memory hierarchy. Concepts illustrated by exploration of an instructional RISC microprocessor. *Also CPSC 539b^u.*

ENAS 908a, Advanced Topics in Computer Architecture. Daniel Friendly.

tth 1–2.15

Survey and critical review of the state of the art in microprocessor design. Topics include instruction level parallelism, dependency analysis, instruction fetch, branch prediction and predication, trace caches, instruction scheduling, memory bandwidth, cache organization, value and dependence prediction, and prefetching.

[ENAS 910a, Adaptive Control and Neural Networks.]**ENAS 912a^u, Digital Image Processing. James Duncan.**

tth 9–10.15

Concepts and techniques of enhancement, image restoration, image reconstruction from projections, scene analysis, and image understanding.

[ENAS 913a, Advanced Topics in Medical Imaging and Computer Vision.]**ENAS 917b^u, Optical Properties of Semiconductors. Richard Chang.**

Comprehensive treatment of the optical and electronic properties of semiconductor alloys and quantum structures. Physical models of blackbody radiation, spontaneous emission, stimulated emission, absorption, and polarization. Quantitative analysis of the effects of temperature, pressure, stress fields, and electric and magnetic fields.

[ENAS 918b, Data/Telecommunication Technology.]**[ENAS 928b, Compound Semiconductor Materials Science, Processing, Devices, and Characterization.]****[ENAS 929b, Advanced Semiconductors and Related Devices.]****ENAS 936b^u, Systems and Control. Kumpati Narendra.**

tth 2.30–3.45

State-variable analysis of linear time-invariant systems formulated in both continuous and discrete time. Topics include model building, state-space diagrams, equilibrium, stability, controllability, observability, transfer functions, various kinds of transformations. Several exercises use a digital computer.

ENAS 944b^u, Modern Communications Systems. Edmund Yeh.

mw 1–2.15

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.

ENAS 986b^u, Semiconductor Silicon Devices and Microelectronics. Tso-Ping Ma.

mw 9–10.15

Fundamentals of 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.

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 995b, Technology Management Seminar Series.]

ENAS 996a and b, SynThesis: Product Design for Entrepreneurial Teams.

Robert Apfel, Natalie Jeremijenko.

tth 2.30–4

The SynThesis course is a product-based graduate course in product design and the management of innovation. During the two terms of the course the students work in entrepreneurial teams to research, develop, create, and market a viable, real-world product. The teams consist of exceptional Engineering students, drawn primarily from the Select Program, as well as School of Management students. The entrepreneurial teams work independently — with the guidance of industry mentors, faculty coaches, and a user community — to develop their prototypes, business plans, and final product. The teams are assessed by juries composed of industry representatives, venture capitalists, and product development experts.

english language and literature

Linsly-Chittenden Hall, 432.2233

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

Chair

Ruth Bernard Yeazell

Director of Graduate Studies

Jill Campbell (107A LC, 432.2226, jill.campbell@yale.edu)

Professors

Harold Bloom, Leslie Brisman, Richard Brodhead, David Bromwich, Jill Campbell, Janice Carlisle (*Visiting*), Michael Denning, Wai Chee Dimock, John Felstiner (*Visiting* [F]), Roberta Frank, Paul Fry, Sara Suleri Goodyear, Langdon Hammer, Margaret Homans, Vera Kutzinski, Traugott Lawler, Lawrence Manley, J. D. McClatchy (*Adjunct*), Annabel Patterson, Lee Patterson, Linda Peterson, David Quint, Claude Rawson, Joseph Roach, John Rogers, Robert Stepto, Katie Trumpener, Alexander Welsh, Ruth Bernard Yeazell

Associate Professors

Murray Biggs (*Adjunct*), David Krasner, Pericles Lewis, Thomas Otten, Marc Robinson (*Adjunct*)

Assistant Professors

Nigel Alderman, Ala Alryyes, Jennifer Baker, Jessica Brantley, Wes Davis, William Deresiewicz, Elizabeth Dillon, Laura Frost, El Mokhtar Ghambou, Matthew Giancarlo, Blair Hoxby, Amy Hungerford, James Kearney, Sanda Lwin, Stefanie Markovits, Christopher R. Miller, Diana Paulin, Lloyd Pratt, Nicole Rice, Michael Trask, Elliott Visconsi

Fields of Study

Fields include English from Old English to the present and American literature and language.

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. The requirement can be satisfied in two ways and is to be completed by the end of the second year.

The two-language option: two languages, one to be completed by passing two advanced literature courses (graduate or undergraduate courses 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. One of these two to be Latin or Greek. Students specializing in periods after 1750 may, with the permission of the director of graduate studies, substitute a second modern language.

The three-language option: three languages, all to be passed by departmental exam (in the case of the ancient language, by exam or by a year of successful Yale course work), selected from among 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. Students specializing in periods after 1750 may, with the permission of the director of graduate studies, 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 English Language) may be substituted for selection (c). The three-language requirement is to be completed by passing two exams by the end of the first year and the third by the end of the second year.

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 (depending on when these were taken).

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. Consult departments for details.

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 Graduate School requirements, page 375. Alternatively, the Department of English Language and Literature offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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, ancient or modern, by departmental examinations.

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.

Program materials are available upon request to the Graduate Registrar, English Department, Yale University, PO Box 208302, New Haven CT 06520-8302.

Courses

ENGL 500a, Old English. Traugott Lawler.

mw 9–10.20

Introduction to Old English language and style as well as reading and critical analysis of representative Old English poems (heroic narratives, elegies, religious meditations) and a few prose selections.

ENGL 500b, *Beowulf*. Roberta Frank.

mw 9–10.20

A close reading of the Old English poem *Beowulf* and related verse such as *Deor* and *The Finnsburg Fragment*. Attention is given to the general qualities of the Northern heroic tradition, and class members are asked to sample *Beowulf* scholarship and criticism, early and late. The course includes a final examination and a short paper.

ENGL 546b, Chaucer, *The Canterbury Tales*. Jessica Brantley.

t 1.30–3.20

A reading of *The Canterbury Tales* that places them in the contexts of both medieval culture and modern critical and editorial practices.

ENGL 577b^u, Lyric Genres. Christopher R. Miller.

tth 11.30–12.45

A study in the definition and evolution of lyric genres, including the sonnet, ode, elegy, and epistle. Supplementary readings in genre theory from the Renaissance to the present and in major twentieth-century critical movements, including formalism, feminism, post-structuralism, and new historicism.

ENGL 578b, Studies in Lyric Poetry of the Renaissance. David Quint.

th 10.30–12.20

A study of several lyric poets writing in Italian, French, and English during the Renaissance, probably including Petrarch, Labé, Ronsard, Du Bellay, Wyatt, Sidney, Shakespeare, and Donne. The stress falls upon textual analysis, although some general perspectives on Renaissance literature are also introduced. *Also CPLT 694b, RNST 510b.*

ENGL 623b, Jacobean Shakespeare. Lawrence Manley.

w 3.30–5.20

A study of Shakespeare's later plays, emphasizing form and dramaturgy, in relation to works by his contemporaries and to the institutions of the Jacobean theater. Nine plays by Shakespeare and masques and plays by Marston, Middleton, Chapman, Tourner, Webster, and Beaumont and Fletcher.

ENGL 627b, John Donne and Andrew Marvell: Texts and Contexts.**Annabel Patterson.**

t 10–12.20

The goals are to provide students with an account of seventeenth-century poetry that is neither mere survey nor single-author course. Starting with Donne's satires of the 1590s and ending with Marvell's of the 1660s and 1670s, the course embraces all the poetic genres used by these two very different writers, against a background of Stuart and Commonwealth history. The large matter of Donne's sermons and Marvell's prose tracts is at least broached, if only to put their poetry in what they themselves would have considered its proper place.

ENGL 673b, Milton and His Contemporaries. John Rogers.

th 1.30–3.20

This course studies Milton's major poems and some of the prose, with a focus on their relation to a range of seventeenth-century texts by writers as varied as Herbert, Hobbes, Marvell, Bunyan, and Margaret Cavendish. Special attention is paid to the way in which the writing of Milton and his contemporaries responds to some of the century's most fractious religious, social, and political controversies.

ENGL 716a, Pope, Lady Mary, and the Augustan Age. Jill Campbell.

w 10.30–12.20

A study of the writings of Alexander Pope, Lady Mary Wortley Montagu, and members of their literary circles, including Finch, Swift, Gay, Addison and Steele, and Fielding. Readings in a variety of genres — poetry, essays, drama, prose fiction, and personal letters, with a particular emphasis on poetry. Some sampling of work by members of the preceding generation (Rochester, Dryden) and by the contemporaries Pope named dunces (Cibber, Haywood). Particular attention to the lived connections among the writers we consider; practices of manuscript circulation and literary correspondence; the interactions of gender and authorship; and the emerging institutions of print culture.

ENGL 748b, The Life of the Author. Langdon Hammer.

m 1.30–3.20

The emergence of the author's life as a matter for literary representation and as a new kind of literary project in its own right. Our approach is a selective historical survey of ideas of the author's life from the eighteenth century to the twentieth (roughly from Samuel Johnson's *Lives of the Poets* to Marcel Proust's *Contre Sainte-Beuve*), exploring a number of literary forms en route: for example, Keats's letters, Gaskell's *Life of Charlotte Brontë*, Wilde's *Picture of Dorian Gray*. Practical and theoretical commentary on literary biography and on the relationship between lives and literary works by Michel Foucault, Roland Barthes, William Wimsatt, Virginia Woolf, Pierre Bourdieu, and others.

ENGL 770a^u, Romanticism and History. Leslie Brisman.

tth 11.30–12.45

Wordsworth and Blake and the history of the self as an alternative to preoccupation with political history. The Wordsworth reading includes *The Prelude* in its entirety, with special emphasis on the French Revolution books. The Blake selection includes *The French Revolution* and *Milton*. Some attention to the question of history in major poems and drama of Shelley and Byron.

ENGL 806b, Dickens. Alexander Welsh.

t 1.30–3.20

Selected novels by Dickens, their nineteenth-century contexts, and approaches to reading them today.

ENGL 814b, Nineteenth-Century Women Writers: Myths, Memoirs, Marketplace.**Linda Peterson.**

W 10.30–12.20

This seminar explores the work — and theorizations of work — of nineteenth-century women authors. Readings include autobiographies and autobiographical fictions by and about women artists and authors, including Mary Robinson's *Memoirs*, Margaret Oliphant's *Autobiography*, Harriet Martineau's *Autobiography*, Geraldine Jewsbury's *The Half Sisters*, Elizabeth Barrett Browning's *Aurora Leigh*, Elizabeth Gaskell's *Life of Charlotte Brontë*, and Mary Cholmondeley's *Red Pottage*. The course is concerned with the material and social contexts in which women worked, with the actual products they created, and with the myths of authorship that sustained or impeded their work.

ENGL 848b^U, Lincoln: Principle, Statesmanship, Persuasion. David Bromwich, Steven Smith.

M 1.30–3.20

An inquiry into the problem of statesmanship as epitomized by the career of Abraham Lincoln. *Also PLSC 597b^U.*

ENGL 892b, European Literature without the Nation: Regionalism, Dialect, “Minor” Literature. Katie Trumpener.

M 10.30–12.20

University study of European literatures (and with it, comparative literature itself) often presupposes the nation-state as a unit of organization. Yet throughout the modern period, important literary texts, figures, and circles have positioned themselves outside, beneath, or beyond the nation, championing regional customs and concerns, or identifying with the transnational multiculturalism of Europe's internal empires. Through readings of eighteenth-, nineteenth, and twentieth-century texts, this course explores Enlightenment vernacular revivals; nineteenth-century linguistic and cultural centralization; modernist rediscoveries of folklore; dialect literature; “minor” writing; and the influence of debates over tradition on genres like the fantastic tale. Probable readings include works by Johann Herder, Robert Burns, Richard and Maria Edgeworth, George Sand, Prosper Mérimée, Franz Kafka, Robert Musil, Federico Garcia Lorca, Libuše Moníková, Erich Auerbach, Michel de Certeau, Renée Balibar, Giles Deleuze and Felix Guattari, Tom Nairn. *Also CPLT 912b.*

ENGL 902a, The Modernist and Late-Modernist Long Poem. Nigel Alderman.

Th 3.30–5.20

Although the history of twentieth-century poetry is littered with monumental failures and ruins, poets continue in their attempt to construct larger poetic forms. This course begins with the high modernist exemplars of Eliot and Pound, before examining how these forms devolved and expanded into different regions of the British archipelago especially after World War II. We are also concerned with twentieth-century literary theory, especially in relation to genre, to the concept of difficulty or “literariness,” and to theories of modernity, modernism, and the modern. Poetry includes Pound, Eliot, Auden, Macdiarmid, and Braithwaite. Criticism by Shklovsky, Jakobson, Benjamin, Anderson, Jameson, and others.

ENGL 913a, Empire and Its Double. Sara Suleri Goodyear.

W 3.30–5.20

A course that concentrates on readings of Empire as a “secret sharer” of nineteenth- and twentieth-century British narrative. Rather than solely focusing on images of Orientalism, we examine infiltrations of alterity that lie too close for comfort. While attempting to undo the idea of exoticism, we simultaneously address what E. M. Forster calls “aspects of the novel” in order to consider the question, What does the novel want? Texts include Edmund Burke's story-telling in Parliamentary debate, Dickens, Austen, Wilkie Collins, Kipling, Forster,

Salman Rushdie, Bapsi Sidhwa, Agha Shahid Ali. Our examination of Conrad's trope of the secret sharer causes us to question the singularity of imperial stories and their slippage into theories of nation. *Also CPLT 913a.*

ENGL 921a^U, Ralph Ellison in Context. Robert Stepto.

W 3.30–5.20

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*. *Also AFAM 563a^U, AMST 921a^U.*

ENGL 923a, Race, Nation, and American Modernisms. Vera Kutzinski.

M 3.30–5.20

Examination of the vexed relations between modernism and its cultural others in early to mid-twentieth-century literature from the United States. We read select fiction and poetry from this period in order both to question and to understand the different ways in which writers such as James, Faulkner, Fitzgerald, Hemingway, Toomer, Stein, Wharton, Eliot, and Williams tackled, or evaded, pressing questions of difference relative to gender, sexuality, race, and class as they struggled to articulate a national identity and/or poetics. *Also AFAM 568a, AMST 766a.*

ENGL 927a, Contemporary American Drama. Marc Robinson.

Th 12–2

A seminar on American drama from 1960 to the present. Among the playwrights to be considered are Albee, Shepard, Kennedy, Baraka, Fornes, Mamet, A. Wilson, Kushner, Shawn, and Parks. *Also DRAM 366a.*

ENGL 940a, Problems in the Study of African American Literature.

Elizabeth Alexander.

T 1.30–3.20

This course focuses on poetry, reading the complete works of selected African American poets and doing extensive bibliographic research toward original scholarship on the work of several authors – Wheatley, Dunbar, Hughes, Brown, Brooks, Baraka, Sanchez, Clifton, Lorde, Harper, Wright, Komunyakaa, Dove – as well as looking at very contemporary poets of the present so-called New Negro Renaissance. In-class reports, library exercises, and a major seminar paper. *Also AFAM 595a, AMST 640a.*

ENGL 946b, Postcolonial Drama: From Shaw to Soyinka. Joseph Roach.

W 1.30–3.20

Inheriting both formal structures and critical stances from modern European drama, post-colonial drama has grown into a contemporary global network of local theatrical production. Significant in itself, this phenomenon also illuminates (and sometimes contradicts) the arguments of postcolonial theorists – Fanon, Said, Bhabha, and Spivak. This seminar engages the theory and practice of postcolonial performance, including its debt to Shavian anti-imperialism in *John Bull's Other Island*, *Captain Brassbound's Conversion*, and *Heartbreak House*. Readings are selected from among the plays of Wole Soyinka, Femi Osofisan, Derek Walcott, Ama Ata Aidoo, Kee Thuan Chye, Manjula Padmanabhan, Victoria Nalani Kneubuhl, Thomson Highway, and Guillermo Verdecchia, supplemented by key essays in postcolonial theory. *Also AFAM 839b.*

ENGL 964b, Modernist Fiction: The Seen and the Unseen. Pericles Lewis.

f 9.30–11.20

This seminar surveys a range of modernist stories and novels that describe the interaction between the visible world – of objects, bodies, and the natural and social environment – and the invisible world – of mental states, unconscious desires, unseen social forces, and the occult. Authors considered include Henry James, Marcel Proust, Franz Kafka, James Joyce, Virginia Woolf, and Samuel Beckett. Also, readings from early twentieth-century social scientists such as Durkheim, Freud, and Weber. *Also CPLT 923b.*

ENGL 984a^U, Literary Translation. John Felstiner.

m 1.30–3.20

A seminar/workshop in and on the art of translating literary texts with attention to language and theory. Writers include Whitman, Neruda, Williams, Drummond de Andrade, Violeta Parra, Paz, Baudelaire, Celan, Frost, Dickinson, Rilke, Yeats, and Eliot. Knowledge of a foreign language required.

ENGL 990a, The Teaching of English. John Rogers.

th 1.30–3.20

An introduction to the teaching of literature and composition. Weekly seminars address a series of practical problems connected with teaching: preparing syllabi and lesson plans; generating and guiding classroom discussion; lecturing and serving as a teaching assistant; introducing students to various literary genres; formulating aims and assignments in composition classes; grading and commenting on students' papers. Continuing attention to important theoretical issues: e.g., how the study of literature and writing can be related to study in the humanities at large; how the increasingly abstruse methodologies of current criticism can be adapted for use at more elementary levels of inquiry; and what linguistic and social assumptions underlie various approaches to the teaching of composition. Occasional guest speakers provide information on teaching practices and related issues. Some assigned reading in teaching methods, pedagogical theory, and consideration of the relation of teaching and scholarship.

Students enrolled in this course are affiliated with a section of one of the freshman literature or composition courses. This arrangement enables them to observe a class in action and to confer with an experienced teacher on classroom strategies. In addition, with the agreement and supervision of the instructor, students teach the class themselves once or twice during the term, grade some papers, and hold tutorials.

Because this course requires the full involvement of everyone who participates in it, no auditors can be accepted. Enrollment limited, with priority given to students in the Department of English. Satisfactory/Unsatisfactory only.

ENGL 995a/b, Directed Reading and Research. 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.

program in environmental engineering

Dunham Laboratory, 432.4250

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

Professors

Gaboury Benoit, Robert Berner, F. Peter Boer (*Adjunct*), Menachem Elimelech, Thomas Graedel, Lisa Pfefferle, Joseph Pignatello (*Adjunct*), Daniel Rosner, Karl Turekian, John Walz

Associate Professor

James Saiers

Assistant Professors

Ruth Blake, Roger Ely

Lecturers

Sheryl Stuart, James Wallis

fields of study

Fields include physical and chemical processes for water quality control, aquatic and environmental chemistry, transport and fate of contaminants in the environment, colloidal and interfacial phenomena in aquatic systems, environmental engineering microbiology, membrane separation processes, biological processes and bioremediation, aerosol science and technology, incineration of toxic wastes, industrial ecology, geochemistry and bio-geochemistry, adsorption and desorption of organic pollutants in soils and groundwater, geochemical cycles and the global environment, and chemical reactions at the mineral-water interface.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science, pages 123–35.

epidemiology and public health

60 College Street, 785.3862

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

Chair

Michael Merson

Director of Graduate Studies

Nancy Ruddle (785.2915)

Director of Medical Studies

David Katz

Professors

Michael Bracken, Kelly Brownell, Arthur DuBois, Theodore Holford, Ralph Horwitz, Keith Joiner, Edward Kaplan, Stanislav Kasl, Ilona Kickbusch, Brian Leaderer, Robert Makuch, Lawrence Marks, Diane McMahon-Pratt, Kathleen Merikangas, Michael Merson, I. George Miller, Alvin Novick, Curtis Patton, Nancy Ruddle, Peter Salovey, Eugene Shapiro, John Stitt, Mary Tinetti, Daniel Zelterman

Associate Professors

Serap Aksoy, Michael Cappello, Elizabeth Claus, Loretta DiPietro, Durland Fish, Nora Groce, Robert Heimer, Sarah Horwitz, Jeannette Ickovics, Harlan Krumholz, Susan Mayne, Mary Olson, A. David Paltiel, Harvey Risch, Mark Schlesinger, Jody Sindelar, William White, Heping Zhang, Hongyu Zhao, Tongzhang Zheng

Assistant Professors

Elizabeth Bradley, Susan Busch, Kent Buse, Joel Dubin, Akiko Iwasaki, Beth Jones, Kaveh Khoshnood, Becca Levy, Haiqun Lin, Linda Niccoli, Alexander Ortega, Melinda Pettigrew, Nina Stachenfeld, Liangbiao Zheng

Fields of Study

Programs of study are offered in the areas of biostatistics, chronic disease epidemiology, environmental health sciences, genetic epidemiology, health policy and administration, and epidemiology of microbial diseases (infectious disease epidemiology, medical entomology, microbiology, parasitology, and virology). 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 and, in the case of biostatistics, mathematics. The GRE General Test is required.

Special Requirements for the Ph.D. Degree

To be admitted to candidacy, a student must: (1) satisfactorily complete the course requirements listed below, achieving grades of Honors in at least two; (2) obtain satisfac-

tory grades in the comprehensive examination; and (3) submit an acceptable dissertation prospectus. The comprehensive examination usually is taken at the end of the second full academic year. With the assistance of his/her faculty adviser, each student requests appropriate faculty members to join a dissertation advisory committee. The dissertation prospectus must be approved within a year of passing the comprehensive examination. Teaching experience is regarded as an integral part of the graduate training program. Ten hours per week of teaching (TF 2) or the equivalent per term are required in years two and three. In the fourth and subsequent years, students are required to be research associates, or the equivalent.

The special course requirements of each division are:

Biostatistics — twelve courses not including seminars and colloquia;

Chronic Disease Epidemiology — twelve courses not including seminars and colloquia;

Environmental Health Sciences — twelve courses not including seminars and colloquia;

Epidemiology of Microbial Diseases — two years of course work developed with a faculty committee;

Health Policy Administration — twelve courses not including seminars and colloquia.

Master's Degrees

M.Phil. Students who have completed all requirements for the Ph.D. except the dissertation may petition the graduate school for the Master of Philosophy degree.

M.S. Upon application, the faculty may recommend students in divisions other than Biostatistics for the M.S. degree if they have satisfactorily completed the first year of a program leading to the Ph.D. degree and they intend to withdraw from the Ph.D. program. The department also offers a two-year, terminal master's degree program leading to an M.S. in Biostatistics (for the requirements see Biostatistics, page 64). A Biostatistics student who is withdrawing from the Ph.D. program may apply and be recommended for the M.S. provided he or she meets the requirements of the M.S. program in Biostatistics.

Program materials are available upon request from the EPH Admissions Office, Epidemiology and Public Health, Yale University, PO Box 208034, New Haven CT 06520-8034; 203.785.2844.

Courses

BIS 505a, Introduction to Statistical Thinking. Elizabeth Claus.

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 linear regression. Statistical analysis using the Statistical Analysis Systems (SAS) software on the IBM PC is introduced. Prerequisite: algebra.

BIS 505b, Introduction to Statistical Thinking. Daniel Zelterman.

Continuation of BIS 505a, covering multiple regression, analysis of variance, nonparametric tests, survival analysis, and an introduction to logistic regression. Concludes with a review of variable classification and choice of statistical analysis. As in the first term the Statistical Analysis Systems (SAS) software package is used for statistical analysis. Prerequisite: BIS 505a.

[BIS 511a, GIS Applications in Epidemiology and Public Health.]**BIS 525a and b, Seminar in Biostatistics. Joel Dubin.**

Faculty and invited speakers present and discuss current research.

BIS 538b, Survey Sampling: Methods and Management. Durland Fish.

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.

An overview of issues related to the design, conduct, and analysis of clinical trials: 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.

BIS 560b, Database Management in Medicine and Epidemiology.

Prakash Nadkarni.

This course covers the theory and practice of database management as applied to clinical trials, observational studies, and other prospective research projects. Emphasis is placed on the use of user-friendly database management packages that require little programming. Difficult problems in database management are described, although students are not expected to build applications of such complexity. Recent advances in the field of data management are studied. Prerequisite: working knowledge of Macintosh or Microsoft Windows.

BIS 561b, Advanced Topics and Case Studies in Multicenter Clinical Trials.

Peter Peduzzi, Pamela Hartigan.

This course addresses advanced issues related to the design, conduct, monitoring, and analysis of multicenter randomized clinical trials. Topics include organizational, regulatory, and human rights issues; an overview of design strategies; advanced topics in sample size estimation and monitoring; data management and quality assurance procedures; cost-effectiveness and quality of life; and case studies of vaccine trials, factorial trials, primary and secondary prevention trials, large simple trials, strategy trials, and cost-effectiveness. The case studies include many of the classical and landmark clinical trials, such as the polio vaccine field trial, Physicians Health Study, and the trials of AZT for the treatment of AIDS. Prerequisites: BIS 505a and BIS 540b. Enrollment limited to second-year students.

BIS 623a, Applied Regression Analysis. Theodore Holford.

Linear regression, testing hypotheses in multivariate regression, regression diagnostics, analysis of variance, and adjusting for covariates. Emphasis on application of methods. Prerequisites: BIS 505a and 505b or equivalent.

BIS 625a, Categorical Data Analysis. Daniel Zelterman.

Presentation of methods for analyzing categorical data in public health, epidemiology, and medicine. Topics include measures of association, comparing distributions among groups, log-linear models, and logistic regression. Emphasis on the application of methods and the interpretation of results obtained by using these techniques. Prerequisites: BIS 505a,b.

[BIS 628b, Longitudinal Data Analysis.]**[BIS 631b, Topics in Genetic Epidemiology.]****BIS 635b, Topics in Statistical Epidemiology. Theodore Holford.**

Discussion of methods of analyzing association among one or more factors with disease. Topics include the analysis of cohort studies, case control studies, and vital rates. Analysis of

matched data also discussed. Emphasis on the application and interpretation of the techniques. Prerequisites: BIS 505a,b, 623a, or 625a.

BIS 637a, Stochastic Processes in Biology and Medicine. Daniel Zelterman.

This course derives deterministic and stochastic models that describe population growth, as well as the development and spread of disease. The models are used to describe events in either discrete or continuous time. Emphasis is placed on the derivation of mathematical models and their application to the study of specific health questions. Prerequisite: STAT 541a.

BIS 640a, Quantitative and Computational Methods in Bio-Informatics.

Heping Zhang.

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 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. Prerequisites: BIS 623a or equivalent.

BIS 643a, Theory of Survival Analysis and Its Applications. Haiqun Lin.

This course presents the statistical theory underlying survival analysis. It is considered a first course in survival analysis because it covers only the standard models and asymptotic arguments; the martingale approach to the statistical analysis of failure time data is introduced. The application of this theory through some exemplary data sets is also presented. Prerequisite: STAT 610.

[BIS 645a, Statistical Methods in Human Genetics.]

BIS 646a, Nonparametric Statistical Methods and Their Applications. Joel Dubin.

Nonparametric statistical procedures including recursive partitioning techniques, splines, bootstrap, and other sample reuse methods are introduced. Some of the supporting theory for these methods is proven rigorously, but some are described heuristically. Advantages and disadvantages of these methods are illustrated by medical and epidemiological studies. Students may be required to compare these methods with parametric methods when analyzing data sets. Familiarity with basic statistical theory and computer languages is assumed. Prerequisites: STAT 541a and STAT 542b.

BIS 691b, Generalized Linear Models. Faculty.

This course considers a class of statistical models that is a natural generalization of the classical linear model. An outline of the generalized linear model is developed, and particular cases are discussed including binary response data, polytomous data, log-linear models, quasi-likelihood models, and models for survival data. Prerequisites: STAT 541a, STAT 542b, BIS 623a.

CDE 508a, Principles of Epidemiology I. Robert Dubrow.

An understanding of the research methods used in infectious and chronic disease epidemiology and in microbiology, showing the similarities and differences in their approaches to diseases and other conditions. Emphasis is on methods and disease etiology, stressing the implications of research for the formulation of policy and for individual decision making. *Also EMD 508a.*

CDE 516b, Principles of Epidemiology II. Tongzhang Zheng.

An overview of the principles of epidemiology. The first part emphasizes fundamental epidemiologic principles including measures of disease frequency and association, bias, confounding, precision, and interaction. The second part emphasizes the design and conduct of various epidemiological studies. The final part of the course emphasizes causal inference and disease prevention and control. Prerequisites: CDE/EMD 508a, BIS 505a.

CDE 517a, Developing a Research Protocol. Stanislav Kasl.

The development of 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 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, second-year M.P.H. or doctoral status.

CDE 518b, Introduction to Pharmacoepidemiology. Mary Olson.

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 the 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. This course is offered in odd years. Prerequisites: CDE/EMD 508a, BIS 505a and BIS 505b.

CDE 521a, The Epidemiology of Some Common Chronic Diseases. Beth Jones.

Introductory survey course covering some of the major chronic diseases, including coronary artery disease, cancer, stroke, chronic obstructive lung disease, alcoholism, HIV, and Alzheimer's disease. Two classes devoted to each disease. The first class is taught by an expert on the disease and covers its basic pathophysiology, etiology, epidemiology, risk factors, and public health importance. In the second class, an important research article about the disease is discussed. Emphasis on developing a working knowledge of chronic diseases and the capacity to read the literature critically.

CDE 523b, Measurement Issues in Chronic Disease Epidemiology. Susan Mayne.

Measurement issues in chronic disease epidemiology addressed from a practical perspective. Covers the use and limitations of currently available techniques for measuring exposure to a number of such etiologic factors as diet, alcohol, tobacco, physical activity, psychological stress, and environmental/occupational exposures. Focus on the measurement of outcome for some of the major chronic diseases. Prerequisite: CDE/EMD 508a.

CDE 532b, Epidemiology of Cancer. Brenda Cartmel.

Application of 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. Focus on risk factors for cancer (including tobacco, alcohol, diet, radiation, and occupation) and on major cancer sites (including colon, breast, and prostate). Heavy emphasis on critical reading of the literature. Prerequisites: CDE/EMD 508a, CDE 516b or permission of instructor.

CDE 533b, Topics in Perinatal Epidemiology. Michael Bracken, Kathleen Belanger.

Pregnancy, delivery, and reproduction provide the course's organizing focus. The current perinatal epidemiologic literature critically reviewed from a methodological perspective. Topics 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 relations in this specialty. Implications of research findings for public health policy, individual decision making, and future studies considered.

CDE 535b, Vascular Epidemiology. Judith Lichtman

Vascular disease is 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 epi-

demic of vascular disease 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 analysis of actual 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 a highly interactive discussion on a specific epidemiologic topic or principle. Students are encouraged to develop their own solutions to current gaps in the epidemiologic literature.

CDE 550a, 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 health care in formulating clinical or public health questions, systematically searching for evidence, and applying it to the question. Types of questions considered include treatment/prevention of disease, 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.

CDE 562a, Nutrition and Chronic Disease. Susan Mayne.

This course provides students with a scientific basis for understanding the role of nutrition and specific nutrients in the etiology, prevention, and management of chronic diseases. Nutrition and cancer are particularly emphasized. Other topics include cardiovascular diseases, osteoporosis, obesity, diabetes mellitus, and aging. Prerequisites: biology, biochemistry, and physiology helpful. Preference given to CDE majors.

CDE 619a, Advanced Epidemiologic Research Methods. Harvey Risch.

An advanced course on quantitative issues and techniques relevant to the design and analysis of observational epidemiologic studies. Starts with formal definitions of the commonly used epidemiologic parameters, assumes working knowledge of ANOVA and linear regression, 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: HP or better in BIS 505a,b; doctoral status or permission of instructor.

CDE 634a, Advanced Seminar in Perinatal Epidemiology. Michael Bracken.

EHS 502a, Physiology for Environmental Health Sciences. Gary Mack, Lawrence Marks.

Description of 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. Faculty.

Factors that affect the toxicity of foreign substances. The absorption, distribution, excretion, and metabolism of foreign compounds. Lectures in cell biology, teratology, chemical carcinogenesis, dose-response relations, and behavioral toxicology.

EHS 505a, Introduction to Industrial Hygiene. Judith Sparer.

Students are introduced to the practice of industrial hygiene: the recognition, evaluation, and control of health hazards in the workplace. A systematic approach to identifying hazards in the workplace is presented, and students are asked to exercise these techniques in at least one industrial worksite. 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.

The potentials and the limitations of environmental epidemiology 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 of interpretation of such studies as well as the consequences for the design and conduct of studies is examined. Prerequisite: CDE/EMD 508a or permission of instructor.

EHS 508a, Assessing Exposure to Environmental Stressors. Brian Leaderer.

Human exposure to environmental stressors as it applies to environmental epidemiology and risk assessment. Indirect and direct methods of assessing exposures, case studies.

EHS 509a, Environmental Toxicology. Faculty.

Survey of the basic methods and fundamental biochemical mechanisms of toxicity. Toxicity in mammalian organ systems, techniques for evaluating toxicity, mechanisms of selective toxicity, and environmental interactions. Biomonitoring of human exposure to specific environmental toxicants. Prerequisite: EHS 503b or permission of instructor.

EHS 510b, Fundamentals of Environmental Health and Risk Assessment.**Loretta DiPietro.**

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 to 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.

Applied environmental risk assessment consists of the effective integration in a specific situation of what is known about pollution sources and their characteristics, about human exposures, about the entry and absorption of pollutants, and about the adverse health effects associated with dosage exposure. In any actual situation there are uncertainties in all of the elements to be integrated. This course emphasizes methodologies in use and the limitations that inevitably constrain the process. A number of applied risk assessments are analyzed.

EHS 514a, Environmental Chemistry. Meredith Stowe.

The basic chemical principles of underlying environmental pollutants in water, soil, air, and specialized media. Various categories of federally regulated compounds and elements examined with respect to group characteristics, analytical techniques of choice, sampling methods, and data interpretation. Selected chemical agents studied with regard to possible transformations/decomposition in the environment. Insight into some current problems faced in applying pollutant measurements to public health, e.g., analytical precision, uncertainty, detection limits, chemical specification, and toxicological properties.

EHS 516b, Principles of Epidemiology II. Tongzhang Zheng.

An overview of the principles of epidemiology. Emphasis on fundamental epidemiologic principles including measures of disease frequency and association, bias, confounding, precision, and interaction; the design and conduct of various epidemiological studies; causal inference and disease prevention and control. Prerequisites: CDE/EMD 508a, BIS 505a.

EHS 532b, Indoor Climate. Brian Leaderer.

The impact of environmental factors in the indoor environment on human health and well-being is examined. Emphasis is placed on assessing the nature of and exposures to indoor air contaminants and different thermal micro-environments and their influence on health and comfort.

EHS 551a and b, Seminar in Environmental Health. Nina Stachenfeld.

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 553a, Epidemiological Methods in Injury Control. Linda Degutis.

Application of epidemiological methods to injury surveillance, etiology of injuries, and the evaluation of the effects of injury-control programs. Topics include methods of scoring injury severity; distribution of injury types and severity in segments of the U.S. population; exemplar epidemiological studies of etiology; strategies to reduce incidence and severity; evaluation of attempts to change environments and behavior by standards, laws, persuasion, and economic incentives; and the use of cost-effectiveness, cost-benefit, and cost-savings analysis.

EHS 573b, Occupational Epidemiology. Mark Cullen.

Various approaches to the epidemiologic evaluation of health hazards in the workplace. Consideration of specific substances. Critical review of the literature. Intermediate to advanced techniques in study design and analysis of occupational epidemiologic studies included. Prerequisites: BIS 505a, CDE/EMD 508a.

EHS 575a and b, Introduction to Occupational and Environmental Medicine.

Mark Cullen [F], Mark Russi [Sp].

An overview of the principles of occupational and environmental medicine. Fall term covers the major diseases of environmental origin. Spring covers the major hazards—chemical, physical, and biologic, and the settings in which they occur. Prerequisite: M.D. degree or permission of instructor.

EHS 579a and b, Advanced Laboratory Techniques in Environmental Health Sciences.

This course is taken for two or three terms. Laboratory technique tools in environmental health. Methods in tissue culture, exposure measurement, toxicology, and molecular biology are offered. This is a hands-on course closely supervised by technically trained personnel. Since the laboratory works with biohazards, laboratory safety and use of biosafety hoods are emphasized. Prerequisites: familiarity with biosafety procedures, prior lab experience, and permission of the instructor.

EHS 611a and b, Advanced Research Laboratories.

This course is taken for two or three terms. Offers experience in directed research and readings in selected research laboratories. The first two terms should be taken in the first year of the doctoral program; the third term is taken at a time determined after faculty consultation with the student. Prerequisite: doctoral status and permission of the instructor.

EHS 655a or b, Readings in Environmental Health. Brian Leaderer.

By arrangement. Study of environmental topics through the current literature, often to develop a research or thesis protocol. Prerequisite: EHS major.

EMD 508a, Principles of Epidemiology I. Robert Dubrow.

An introduction to epidemiologic concepts and methods. Topics include causation, measurement of disease rates, epidemic investigation, cohort studies, clinical trials, case-control studies, ecological studies, bias and confounding, effect modification, random variation and statistical significance, and screening. The course utilizes a wide variety of case studies from both chronic and infectious disease epidemiology. *Also CDE 508a.*

EMD 512b, Immunology for Epidemiologists. Akiko Iwasaki.

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. Prerequisite: two terms of college biology.

EMD 516a, Biology of Viruses of Humans. Louis Alexander.

This course consists of a systematic review of the spectrum of viruses and their modes of replication, dissemination, pathogenesis, and immunogenicity. Special problems representative of the characteristics of individual families of viruses are discussed. Prerequisites: biology and EMD 519a.

EMD 519a, Introduction to Microbial Diseases. Liangbiao Zheng.

This course provides an introduction to the biology and epidemiology of etiologic agents associated with infectious diseases. The course introduces students to key concepts in immunology, bacteriology, virology, parasitology, and vector biology as they relate to human disease and its control. This course provides a framework for later courses that cover these individual topics in greater detail.

EMD 530b, Hospital Epidemiology. Louise-Marie Demby.

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 534b, Molecular Epidemiology of Bacterial Pathogens. Kaveh Khoshnood.

This course is designed to introduce students to the fundamentals of the molecular epidemiology of bacterial pathogens. The scientific basis for molecular epidemiological tools and their application toward addressing contemporary problems in public health is evaluated through a combination of lectures and case studies. Topics include the emergence of new bacterial pathogens, antibiotic resistance, vaccine design, and bioterrorism. Prerequisite: EMD 519a or permission of the instructor.

EMD 536b, Investigation of Disease Outbreak.

This course provides students with the basic skills and perspectives necessary to investigate acute disease outbreaks. The emphasis is on the use of epidemiology to investigate outbreaks of infectious diseases, although the methods are not limited and can be applied to outbreaks of noninfectious diseases as well. Through this course, it is hoped that students will gain a better appreciation of epidemiology as the science of public health, and the use of epidemiology to guide public health interventions and the development of public health policy.

EMD 541b, Infectious Diseases: Epidemiology, Prevention, and Control.

Kaveh Khoshnood.

Students learn epidemiologic methods and concepts in infectious diseases, specific viral and bacterial infections, and problems illustrative of the methods and/or disease. Methods include surveillance, seroepidemiology, case/control and cohort studies, vaccine trials, epidemic investigation, principles of causation, immunization policies and their implementation, and evaluation in developed and developing countries. Specific viral and bacterial infections of the central nervous, respiratory, and intestinal tracts; the herpes viruses; slow and persistent viral infections; retroviruses, including AIDS; the exanthems; nosocomial infections; and the relation between viruses and cancer are discussed. The use of epidemiological concepts in the prevention of disease is emphasized. Prerequisite: microbiology.

EMD 542a, Infectious Diseases in Countries with Limited Resources.

The pattern, process, and impact of infectious diseases on human populations in the Third World are studied through lecture and discussion. The epidemiology and ecology of infectious agents are reviewed in the context of environmental and socioeconomic factors that influence transmission. Epidemiological analysis of the major tropical infectious diseases address problems in surveillance, risk reduction, prevention of outbreaks, and design of research. Emphasis is placed on principles of tropical diseases, vaccination, international child health, and emerging diseases.

EMD 548b, Observing the Earth from Space. Ronald Smith, Durland Fish.

Applications of satellite images to studies of the environment are explored. Topics include the spectrum of electromagnetic radiation, satellite-borne radiometers, data transmission and storage, computer image analysis, and merging satellite imagery with GIS. The uses of remotely sensed data in climatology, oceanography, surficial geology, forestry, agriculture, ecology, and epidemiology are discussed. A research project using satellite images to address

a problem in one of these realms is required. Prerequisites: physics or chemistry, two courses in environmental sciences or equivalent, and permission of the instructors. *Also G&G 562b^{II}, F&ES 506b.*

EMD 557a/657a, Public Health Issues in HIV/AIDS. Kaveh Khoshnood, Kathleen Ethier.

An introductory, broad-based survey course on the epidemiology of HIV/AIDS. Topics include virology, clinical issues, natural history of infection, laboratory testing, transmission, and prevention of HIV/AIDS. Gives a general, comprehensive understanding of HIV/AIDS issues for those 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 required.

EMD 642a, Roles of Microorganisms in the Living World. L. Nicholas Ornston, Diane McMahon-Pratt, Robert Macnab.

tth 11.30–12.45

A topical course exploring the biology of microorganisms. Emphasis on mechanisms underlying microbial adaptations and how they influence biological systems. Prerequisites: biology, chemistry, biochemistry. *Also GENE 642a, MB&B 642a, MBIO 642a, MCDB 642a.*

EMD 664b, Biology of Parasitic Protozoa and Helminths. Serap Aksoy, Curtis Patton.

tth 3

Focus on developmental biology, natural history, form, function, cell and molecular biology of the major eukaryotic parasites of public health importance. Host/parasite integration, co-evolution, diagnosis, pathogenesis, and control strategies emphasized. Prerequisites: one year of biology, two years of chemistry. *Also MBIO 664b.*

EMD 670a and b, 671a, Advanced Research Laboratories. Diane McMahon-Pratt.

Experience in directed research and reading in selected research laboratories. *May be taken for three terms. The first two terms must be taken in the first year of the doctoral program and the third term is taken at a time determined after faculty consultation with the student.* Prerequisite: doctoral status.

EMD 680a,b, Advanced Topics in Molecular Parasitology. Curtis Patton, Diane McMahon-Pratt, Christian Tschudi.

f 12–1.30

A broadly based seminar course on current research topics in cell and molecular parasitology, with topics chosen from the current literature. For doctoral and advanced M.P.H. students only. *Also MBIO 680a,b.*

EMD 682a, Advanced Topics in Vector Biology. Liangbiao Zheng.

A broadly based seminar course on current research topics in the biology of medically important vectors, vector-pathogen interactions, vector ecology, disease management, and vector control strategies. Topics are chosen from the current literature. Prerequisites: doctoral status or permission of instructor.

EMD 695a, Readings in Vector Ecology.

HPA 510a, Health Policy and Health Systems. Mark Schlesinger.

An introduction to the making and understanding of health policy. The various goals of policy making and the alternative means of achieving those goals examined. Health issues placed in the context of broader social goals and values. The current performance of the health care system assessed, with particular emphasis on shifting needs, rising costs, and changing institutional arrangements. An overview of the important actors in the health care and political systems and introduction to methods for understanding their behavior. Students apply these methods to a set of concrete policy issues.

HPA 514b, Government and Health Policy. Karl Kronebusch.

The various processes by which governmental health policy is made in the United States and the substance and background of current policy debates. Primary emphasis on Congress and executive branch agencies, with attention given to both the financing and organization of health services and to public health problems such as AIDS. Different policy actions or problems discussed weekly, selected for both their importance and their usefulness in illuminating important aspects of the policy process.

HPA 521a, Health Services Epidemiology. Alexander Ortega.

Epidemiologic methods and data may be used to understand and improve public health practice, health services research, and health policy. This course emphasizes methodological and conceptual issues through a research-oriented approach to health promotion and disease prevention, the measurement of health status, assessment of health needs and population-based planning, health-related behaviors and beliefs, evaluation of medical practices and health programs, and public health decision making. Prerequisite: first-term core.

HPA 529a, Policy Analysis and Health Politics. Karl Kronebusch.

Provides students with policy analytic skills and teaches students to think critically and to write succinctly about health care policy. Integrates the study of policy analysis and the world of health politics as analysts must do in real life. Considers the nature of public policy and the theories of policy analysis and policy decision making, eight key components of the policy analysis process, and jointly examines the impact of major political organizations and institutions on the process of analyzing and selecting public health care policy. Prerequisite: HPA 510a.

HPA 538a, Regulation and Public Health Policy. Mary Olson.

This course provides students with an understanding of the role of government regulation in public health and health-related markets. Students learn to analyze how economic and political forces can influence both the development and the implementation of public health regulations. The course utilizes theories and empirical evidence from economics, political science, law, and public health to help students answer five questions relating to government intervention in health-related markets: Why regulate? How are regulatory rules made? How are regulations enforced? How do we determine whether regulations are successful? What alternatives exist to regulation? Students also apply insights and concepts from the course to explain policy making in public health bureaucracies.

HPA 542a, Health of Women and Infants. Mary Alice Lee.

Focus on the health of women and infants in the United States. Epidemiology of selected health conditions presented. The utilization and financing of women's and infants' health care discussed. Existing targeted governmental and private programs identified and assessed. Major sources of data identified and compared. Students investigate a program or agency (public or private) that addresses a particular health problem of women or infants. Topics include contraceptive use, abortion, sexually transmitted diseases, substance abuse, prenatal care, low birth weight, perinatal AIDS, domestic violence, midlife health, and maternal mortality (with an international perspective). Discussion of the public health implications of these health problems provides a basis for policy analysis in later study.

HPA 544a, Public Law and Public Health: The Law, the Individual, and the State.

John Culhane.

A basic orientation to the law, the legal system, and legal decision making as they relate to the public's health. Emphasis 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, procreation, human experimentation and clinical research, domestic violence, adoption and foster care, religious practices, and seat belt and helmet laws. Discussion of issues that must be considered in assessing the state's silence, omis-

sion, intervention, or intrusion into health matters of the person, the family, or the group. Prerequisite: first-term core.

HPA 545b, Health Care Disparities. Alexander Ortega.

This course explores what constitutes and explains a disparity in health care. Emphasis is placed on understanding the history of disparities in the U.S., 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 students are required to evaluate and expand on these models. Prerequisites: HPA 510a and CDE 505a.

HPA 546b, 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, and 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 like preventive medicine and behavior modification, smoking, control of infectious diseases, and contraception and teen pregnancy.

HPA 547b, Law and the Management of Health Care Organizations.

W. John Thomas.

A survey course of legal topics important to the management of health care organizations designed to acquaint the future health care manager with the basic legal issues that daily impact the provision of health care services. Examination of the relations among the parties involved in the delivery of health care; the law of business organizations, including that of corporations, partnerships, and professional corporations; the legal constraints that operate upon health care organizations, including state and federal regulatory laws, labor relations, and antitrust doctrines; and doctrines particularly applicable to managed care organizations. Consideration of a variety of emerging legal issues in the health care field.

HPA 560b, Health Care Finance and Delivery. Susan Busch.

This course introduces students to the organization and operation of the American health care system. The course examines systems of health care delivery and finance and recent trends in their organization, including the growth of managed care. The course seeks to provide students with an understanding of the existing structure of the system and to provide them with conceptual frameworks to consider forces for change and the implications of recent trends for policy and management.

HPA 570a, Cost-Effectiveness Analysis and Decision Making. A. David Paltiel.

Introduction to the methods of decision analysis and cost-effectiveness analysis in health-related technology assessment, resource allocation, and clinical decision making. Aims to develop technical competence in the methods used; practical skills in applying these tools to case-based studies of medical decisions and public health choices; and 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. Elizabeth Bradley.

Introduction 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 project. Prerequisite: BIS 505a.

HPA 586b, Microeconomics for Health Care Professionals. William White.

Introduction to microeconomics. Emphasis on topics of particular relevance to the health care sector. Attention paid to issues of equity and distribution, uncertainty and attitudes toward risk, and alternatives to price competition. *Designed for students with minimal previous economics.*

HPA 587b, Health Care Economics. Douglas Leslie.

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, regulations, and the market for physician services are covered. Prerequisite: microeconomics or permission of the instructor.

HPA 588a, Economics of Alcohol, Drugs, and Crime. Jody Sindelar.

This course uses economics as a base discipline in studying the use and abuse of alcohol and illicit drugs and the various social problems produced by each — such as crime, lost productivity, misuse of health care, and impact on families and children. Other topics included are cost-effectiveness of treatment versus the criminal justice system, racial and gender differences, comorbidity with psychiatric problems, inner-city drug problems, problems of youth, and the history of drug use. Such policy alternatives as prevention, treatment, taxation of alcohol, legalization of illicit drugs, and the criminal justice system are analyzed.

HPA 596b, Critical Policy Issues in the AIDS Pandemic. Michael Merson.

Seminar for students with an understanding of the epidemiology of HIV/AIDS (either through work experience or course work). Students in public health, medicine, nursing, law, management, and international studies will appreciate this in-depth interdisciplinary examination of key policy challenges that this pandemic presents, as well as the sharpened skills in policy analysis that such examination necessarily fosters. Class size limited to eighteen students. Prerequisite: first-term core.

HPA 597b, Integrative Policy Analysis Seminar. Mark Schlesinger.

Seminar designed as the capstone educational experience for students concentrating in the health policy at EPH, though it is also open to students from other schools who have had previous training or experience in policy analysis. The first theme involves exploring different strategies of policy analysis and associated models of professionalism. The second theme involves the complicated prospects for policy analysis associated with the boundaries between health care defined in a clinical sense and the broader social determinants of health. These issues are studied in a series of applied areas, including substance abuse, family policy, and the community obligations of managed care plans. Prerequisite: HPA 510a or equivalent.

HPA 600a or b, Readings in Health Services Research and Policy. Faculty.

Seminar to explore current and cutting-edge topics in the broad fields of community and personal health services. Designed to familiarize students with a breadth of research opportunities. Students review existing research projects and critique recent research publications. Prerequisite: doctoral status or permission of instructor.

HPA 603b, The Ethical Conduct of Research. Susan Katz.

Seminar exposing students to both practical and theoretical issues in research ethics. Focus on real-world situations in public health research with the aim of equipping students to function as responsible researchers. Representative areas include informed consent; research with vulnerable populations; privacy and confidentiality; the collection, retention, and reporting of data; federal regulations and institutional policies governing research; research in developing countries; authorship and publication; scientific misconduct; and conflict of interest. Prerequisite: doctoral status or permission of instructor.

HPA 617a, Colloquium in Health Policy and Health Services Research I.

Sarah Horwitz and faculty.

Seminar focusing on the analysis of current issues in health policy and on state-of-the-art methodological issues in health services research. Guest speakers and presentations by EPH and other faculty and graduate students of ongoing research projects on health services. Students participate in critical discussions of the issues that arise in both types of sessions. Prerequisite: doctoral status or permission of instructor.

HPA 617b, Colloquium in Health Policy and Health Services Research II.

Rani Hoff, Sarah Horwitz.

Seminar includes in-depth discussions of major policy concerns in the health and health care of vulnerable populations like the poor, young, old, and disabled. Students present their own research. Prerequisite: doctoral status or permission of instructor.

HPA 621a, Advanced Health Services Epidemiology. Alexander Ortega.

Epidemiologic methods and data may be used to understand and improve public health practice, health services research, and health policy. Emphasis on methodological and conceptual issues through a research-oriented approach to health promotion and disease prevention, the measurement of health status, assessment of health needs and population-based planning, health-related behaviors and beliefs, evaluation of medical practices and health programs, and public health decision making. Prerequisite: doctoral status or permission of instructor.

HPA 650a, Colloquium on Mental Health Services Research I. Sarah Horwitz and faculty.

Seminar focusing on the state-of-the-art in the evaluation and the 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: doctoral status or permission of instructor; SOCY 550a.

HPA 650b, Colloquium on Mental Health Services Research II. Rani Hoff, Sarah Horwitz.

Seminar focusing on social and cultural factors in the development, diagnosis, treatment, and prevention of mental illness. Attention given to the underlying theory of and research in the social epidemiology of mental illness and the relation between stress and psychiatric status. Includes presentations of student research in mental health services. Prerequisite: doctoral status or permission of instructor.

council on european studies

Luce Hall, 34 Hillhouse, 432.3423

Chair

Ivo Banac

Director of Graduate Studies

Paul Bushkovitch (245 Luce Hall, 432.3423)

Professors

Bruce Ackerman (*Law; Political Science*), Vladimir Alexandrov (*Slavic Languages & Literatures*), Ivo Banac (*History*), Paul Bracken (*Management; Political Science*), Peter Brooks (*Humanities; French*), Paul Bushkovitch (*History*), David Cameron (*Political Science*), Katerina Clark (*Slavic Languages & Literatures*), Mirjan Damaška (*Law*), Kai Erikson (*Emeritus, Sociology*), Robert Evenson (*Economics*), John Gaddis (*History*), Harvey Goldblatt (*Slavic Languages & Literatures*), Benjamin Harshav (*Comparative Literature*), Michael Holquist (*Comparative Literature*), Paul Kennedy (*History*), Joseph LaPalombara (*Emeritus, Management; Political Science*), John Merriman (*History*), William Nordhaus (*Economics*), William Odom (*Adjunct, Political Science*), Merton J. Peck (*Economics*), Susan Rose-Ackerman (*Law*), Frank Snowden (*History*), Ivan Szelenyi (*Sociology*), Frank Turner (*History*), Henry Turner (*History*), Paolo Valesio (*Italian Language & Literature*), Tomas Venclova (*Slavic Languages & Literatures*), Miroslav Volf (*Divinity*), Jay Winter (*History*)

Associate Professors

Kevin Repp (*History*), Hilary Fink (*Slavic Languages & Literatures*)

Assistant Professors

Giancarlo Corsetti (*Economics*), Lawrence King (*Sociology*), John MacKay (*Slavic Languages & Literatures*), Timothy Snyder (*History*)

Lecturers

Vladimir Golstein (*Slavic Languages & Literatures*), Slobodan Novak (*Slavic Languages & Literatures*)

Senior Lectors

Rita Lipson (*Slavic Languages & Literatures*), Constantine Muravnik (*Slavic Languages & Literatures*), George Syrimis (*Hellenic Studies*)

Participating Staff

Jonathan Brent (*Yale University Press*), Brian Carter (*PIER*), Tatjana Lorković (*Library*)

On July 1, 1999, the Council on West European Studies merged with the Council on Russian and East European Studies to create a new interdisciplinary body, the Council on European Studies. The Council on European Studies will formulate and implement new curricular and research programs reflective of current developments in Europe, broadly defined to encompass all states and peoples from Ireland to the Urals.

European Studies builds on existing programmatic strengths at the same time it serves 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 or research specialties in the area. Such departments as Economics, History, History of Art, Political Science, Slavic Languages and Literatures, and Sociology regularly offer courses with a European focus.

European Studies includes a master's degree program in Russian and East European Studies (see listing under Russian and East European Studies) and strongly supports the disciplinary and interdisciplinary study of Western Europe as well as Russia and Eastern Europe and the increasing interactions between them. European Studies is also the home of the newly organized program on Hellenic Studies, which offers instruction in Modern Greek language, literature, and culture. The Council on European Studies will continue the efforts of both predecessors to promote and coordinate existing resources, including those in the professional schools, and to support individual and group research.

Currently, more than two hundred and fifty graduate students are working toward degrees with a European emphasis within the major disciplines of the humanities and the social sciences. As in the past, the chair and faculty members of the Council on European Studies and other Europeanist faculty are available to assist students with formulating a tailored interdisciplinary course of study.

The benefits provided to the Yale community by the new Council on European Studies include its affiliation with inter-university 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 offers generous fellowship support to qualified students who undertake research at specified institutions in the United Kingdom, Germany, France, and Russia, for example. Furthermore, the Council supplements the regular Yale curriculum with courses, 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 Fellow during the 2001–2002 academic year was Brian McDonald, Principal Administrator in the European Commission's Directorate General for Trade, who taught a course on trade policy and the WTO. During 2002–2003, the European Union Fellow will be a specialist in questions of health and consumer affairs related to the Euro and the EMU. Also in 2002–2003, European Studies will host the distinguished scholar Slobodan P. Novak, who will teach courses on South Slavic literatures and cultures and on Serbian and Croatian language.

The special objective of European Studies, spearheaded by the Council on European Studies, is to encourage research and discussion on projects of a pan-European nature or those involving comparison of developments among several countries. Thus, faculty are available to supervise work on European economic, political, and cultural integration, including studies of a specific topical character like labor migration between south and north, comparable problems of socialist or center parties in several countries, common tendencies in the national literatures or art of European countries, or common problems in the relations of European countries with other areas of the world.

Inquiries regarding European Studies should be addressed to the Council on European Studies, Yale University, PO Box 208206, New Haven CT 06520-8206.

experimental pathology

342 Brady Memorial Laboratory, 785.6721
M.S., M.Phil., Ph.D.F

Chair

Jon Morrow (*Molecular, Cellular & Developmental Biology*)

Director of Graduate Studies

David Stern (785.4832, df.stern@yale.edu)

Professors

Dario Altieri, Philip Askenase (*Internal Medicine*), Darryl Carter, Young Choi, José Costa, S. Evans Downing (*Emeritus*), Stuart Flynn, Michael Kashgarian (*Molecular, Cellular & Developmental Biology*), Joseph Madri, Vincent Marchesi (*Director, Boyer Center for Molecular Medicine; Cell Biology*), Mark Mooseker (*Molecular, Cellular & Developmental Biology*), Jon Morrow (*Molecular, Cellular & Developmental Biology*), Jordan Pober (*Immunobiology; Dermatology*), John Rose (*Cell Biology*), David Stern, Raymond Yesner (*Emeritus*)

Associate Professors

Xin-Yuan Fu, Earl Glusac (*Dermatology*), Robert Homer, Jung Kim, Diane Krause (*Laboratory Medicine*), Lucia Languino, Paul Lizardi, Jennifer McNiff (*Dermatology*), Vinita Parkash (*Obstetrics & Gynecology*), Archibald Perkins (*Molecular, Cellular & Developmental Biology*), Miguel Reyes-Mugica (*Pediatrics*), David Rimm, Marie Robert, John Sinard (*Ophthalmology*), Giovanni Tallini

Assistant Professors

Mary Chacho, Tamara Handerson (*Dermatology*), Liming Hao, Pei Hui, Dhanpat Jain, Diane Kowalski, Rossitza Lazova (*Dermatology*), Pars Ravichandran, Idris Tolgay Ocal, Rebecca Wells (*Internal Medicine*), Wenxin Zheng

Instructors

Larry Bernstein, Pratibha Shukla

Research Scientists

David Johnson, Christine Howe

Associate Research Scientists

Purba Biswas, Robert Camp, Gouri Chaterjee, Jan Czycyk, Debbie Dillon, Mara Fornaro, Lisa Madge, Keyvan Mahboubi, Mark Mattie, Deepti Pradhan, Nina Rose, Michael Stankewich, Zenta Walther, Thomas Welte, Bogdan Yatsula, Shao-Min Zhang, Zhushan Zhang

Fields of Study

Fields include molecular and cellular basis of cancer; biology, biochemistry, and pathology of the plasma membrane; cells, molecules, and response to stimuli of connective tissue; interaction of viruses with animal cells; pathology of organ systems; somatic cell genetics and birth defects; biology of endothelial cells; assembly of viruses.

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 pages 59–61).

Special Requirements for the Ph.D. Degree

There is no foreign language requirement. Three to four terms of course work including courses in biochemistry, genetics, immunology, cell biology, and pathology are selected according to the student's background and choice. The qualifying examination has both written and oral parts. After a reading period of six weeks the student will answer, in essay form, one of two questions in each of three subject areas, which include a brief research proposal. The oral examination will specifically address the chosen areas of interest in addition to general problems of pathology. 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. They must then submit a written thesis describing the research and present a thesis research seminar.

In accordance with the BBS program, Ph.D. students are expected to participate in two terms (or the equivalent) of teaching.

Master's Degrees

M.Phil. See Graduate School requirements, page 375. Awarded only to students who are continuing for the Ph.D. Students are not admitted for this degree.

M.S. Awarded only to students who are not continuing for the Ph.D., but who have successfully completed one year of the doctoral program. 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, info.med.yale.edu/pathol/training/gtp.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 (Dr. Joseph Madri).

PATH 600, Pathological Basis of Human Disease. Joseph Madri 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. José Costa 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, Norman Siegel.

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. David Stern.

Laboratory rotations for first-year graduate students.

PATH 640a, From Molecular Biology to Molecular Medicine: New Concepts, Trends, and Applications. Xin-Yuan Fu, Paul Lizardi.

The objective of the course is to update students on the most recent progress in the research field of molecular medicine. The course has five themes: (1) Genome projects and applications. (2) Bioinformatics in gene discovery and pathway analysis. (3) Gene therapy: theory and practice. (4) Signaling pathways and molecular targets with small compounds. (5) Applications of biologicals such as cytokines and cell surface proteins in molecular therapy.

PATH 650b, Cellular and Molecular Biology of Cancer. David Stern, Archibald Perkins.

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.

PATH 67ob, Biological Mechanisms of Reaction to Injury. Michael Kashgarian, Jon Morrow, José Costa, and Archibald Perkins.

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 68oa, Seminar Course. Staff.

Readings and discussion in topics relevant to cell biology, pharmacology, and molecular medicine. The class emphasizes analysis of the primary research literature and development of presentation skills.

PATH 69oa, Molecular Mechanisms of Disease. Dario Altieri.

The molecular defects underlying fundamental human diseases. Covers the cellular and molecular mechanisms of infectious and degenerative diseases, vascular and inflammatory processes, AIDS, and hemorrhagic disorders. Objective is to highlight the interface between experimental and molecular medicine and how it relates to the pathogenesis of human diseases.

film studies

53 Wall, Rm 216, 436.4668

M.Phil., Ph.D.

Co-Chairs

Dudley Andrew

Charles Musser

Director of Graduate Studies

Dudley Andrew (Rm 219, 53 Wall, dudley.andrew@yale.edu)

Graduate Committee

Dudley Andrew, Katerina Clark (*on leave*), John MacKay (*on leave*), Charles Musser, Brigitte Peucker (*on leave*), Noa Steimatsky, Katie Trumpener

Professors

Ora Avni, David Bromwich, Hazel Carby, Francesco Casetti (*Visiting* [Sp]), Michael Denning, John Mack Faragher, Shoshana Felman, Benjamin Harshav, Thomas Kavanaugh, Christopher L. Miller, Joseph Roach, Michael Roemer, John Szwed, Paolo Valesio, Laura Wexler

Associate Professor

Susan Weiner

Assistant Professors

Seth Fein, Mia Mask (*Visiting* [Sp]), Kristin Philips

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, sociology, and other areas. Film Studies offers a joint Ph.D. with a number of other departments and programs, currently including American Studies, Comparative Literature, East Asian Languages and Literatures, German, 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 will be 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, early cinema.
2. Aesthetics: theories of the image, adaptation, film/philosophy.
3. European film: British, 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; documentary.

Through course work, examinations, and the dissertation, the candidate will link a film specialty with material and methods coming from the participating discipline.

Directors of graduate studies from both programs will monitor the candidate's plans and progress.

Special Admissions Requirements

Interested students must check the joint Ph.D. in Film Studies box on their applications and indicate the participating department they plan to work within in combination with Film Studies.

Special Requirements for the Ph.D. Degree

Every student selected for the combined program will be subject to the combined 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 courses. Course requirements vary for participating departments but comprise a total of sixteen courses (fourteen for American Studies). A student advances to candidacy by completing a number of formal procedures by the end of the sixth semester:

1. One-hour oral examination covering basic primary and secondary texts in Film Studies and administered by two members of the Film Studies graduate committee.
2. Qualifying examination, following the regulations of the participating department with at least one member of the Film Studies graduate committee participating.
3. The dissertation prospectus presented to a faculty committee consisting of at least one member of the Film Studies graduate committee and one member of the participating department who is not also on that Film Studies committee. Once the student and dissertation adviser deem the dissertation finished, a public defense of the completed work shall be held. At least one examiner of the dissertation must be a member of the graduate Film Studies committee and one a member of the participating department who is not also on the Film Studies 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 required for the degree to serve as a teaching fellow in two of the following courses: Introduction to Film; Film Theory; World Cinema.

Master's Degree

M.Phil. See Graduate School requirements, page 375.

Program materials are available upon request to the Director of Graduate Studies, Yale Film Studies Program, Yale University, P.O. Box 200174, New Haven CT 06520-0174.

Courses

FILM 601a, Films and Their Study. Dudley Andrew.

t 10.30–12.20

“Films and their Study” sets in place some undergirding for graduate students in various disciplines who plan to develop a subspecialty or who want to anchor their particular film interest to something like the “professional discourse” of this field. Providing a coordinated set of topics under the rubrics of (a) spectacle, (b) narrative, (c) realism, and (d) signification, the flow of this survey is interrupted first by the often discordant relation of history to theory and second by the obtuseness of the films examined each week. As the title of this seminar is meant to convey, films themselves take the lead in our discussions. *Also CPLT 917a.*

[FILM 603, Problems in Film History.]

FILM 721b^u, Spatial Dimensions in Cinema. Dudley Andrew.

w 3.30–5.20; screenings htba

Investigation of how cinema orients its spectators, how nations orient their citizens through cinema, and how businessmen and bureaucrats map the territories that images reach and affect. Methods used by scholars to parse the films of the world to account for their variable power. Examination of both films and the distribution patterns of cinema.

FILM 731b^u, Classical Hollywood Cinema. Charles Musser.

w 1.30–3.20

Examination of American cinema in the period from 1925 to 1950 through a focus on the Hollywood studio system, with Warner Brothers as a case study. Consideration of the ways in which Warner Brothers and Hollywood affected American culture, as well as the ways their films were shaped by Wall Street financing, the introduction of recorded sound, the production code, and such larger social and cultural forces as radio and the Great Depression. *Also AMST 811b^u.*

FILM 736b^u, Contemporary Documentary Film and Video. Charles Musser.

m 6.30–10

Examination of documentary and related nonfiction forms in the last three decades. Explores such issues as film truth, performance, ethics, race and gender or multi-culturalism, and the filmmaker as participant-observer. Filmmakers studied include Frederick Wiseman, William Greaves, Chris Choy, Errol Morris, Lourdes Portilla, Trin T, Minh-Ha, Sue Friedrich, and Marlon Riggs. *Also AMST 813b^u.*

[FILM 737, American Documentary Film and Photography.]

[FILM 763, The Films of Fassbinder, Herzog, and Wenders.]

FILM 811a, Cinematic Landscapes in Postwar Europe. Noa Steimatsky.

t 11.30–3 (film screenings included)

This seminar traces a trajectory of postwar European film production that privileges actual locations, the landscape of the everyday, as arenas where realist and modernist discourses converge. Focus on the work of Antonioni, Rossellini, Bresson, Godard, Straub-Huillet, and Akerman, among others. Discussion of the periodizing of film history, new articulations of cinematic space and temporality, the tracing of action and affect, the restoration of identity in the quotidian landscape. *Also HSAR 715a.*

[FILM 822, Eisenstein, Pudovkin, Vertov.]

forestry & environmental studies

205 Prospect, 432.5100
M.S., M.Phil., Ph.D.

Dean

James Gustave Speth

Director of Doctoral Studies

Oswald Schmitz (370 Prospect, 432.5110, oswald.schmitz@yale.edu)

Professors

Mark Ashton, Gaboury Benoit, Graeme Berlyn, William Burch, Michael Dove, Daniel Esty, Thomas Graedel, Timothy Gregoire, Stephen Kellert, Robert Mendelsohn, Chadwick Oliver, Oswald Schmitz, John Wargo

Associate Professors

Lisa Curran, Xuhui Lee, James Saiers, Hilary Sigman, David Skelly

Assistant Professors

Benjamin Cashore, Sheila Cavanagh, Marian Chertow, Erin Mansur, Kathleen McAfee, Peter Raymond

Non-Ladder Faculty

Shimon Anisfeld, Ann Camp, Carol Carpenter, Timothy Clark, Paul Draghi, Gordon Geballe, Bradford Gentry, Reid Lifset, James Lyons, Florencia Montagnini, Offer Ovidia, Robert Repetto, Thomas Siccama

Joint Appointments

James Axley, Ruth Blake, Adalgisa (Gisela) Caccone, Michael Donoghue, Menachem Elimelech, Roger Ely, Robert Evenson, Jonathan Feinstein, Mary Helen Goldsmith, Brian Leaderer, William Nordhaus, Jeffrey Powell, Alison Richard, James Scott, Stephen Stearns, Christopher Timmins, Karl Turekian, Robin Winks

Visiting Faculty, Fellows, Adjunct Faculty, and Faculty with Primary Appointments Elsewhere

Xuemei Bai, Michael Balick, Diana Balmori, Brian Boom, Edgar Brannon, Richard Burroughs, Douglas Daly, John Ehrenfeld, William Ellis, Emil Frankel, Andrew Henderson, David Lentz, James MacBroom, Scott Mori, Arvid Nelson, Daniel Nepstad, John Nolon, Christine Padoch, Charles Peters, Jonathan Reuning-Scherer, Dennis Stevenson, Fred Strebeigh, Sylvia Tesh, Andrew Willard

Fields of Study

Fields include tree physiology and anatomy, forestry and natural resource economics, forest ecology and nutrient cycling, ecosystem ecology, social ecology and sociology of planning, leisure and recreation, forest history, biometry and mensuration, forest management, tropical resources, agroforestry, tropical forestry, population ecology, environmental biophysics and meteorology, silviculture, stand development, forest

pathology and air pollution impact, forest soils, nitrogen fixation, forest, natural resource, environmental and energy economics, environmental law, human dimensions of wildlife, environmental and resource policy, wildlife ecology, entomology, environmental chemistry, and hydrology and water resource management.

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, 824a/b, for 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 or third term. All students must complete the examination at the end of their fourth term of study. 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 graduate 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. See Graduate School requirements, page 375.

M.S. (en route to the Ph.D.). Upon petition, the department will recommend for the M.S. degree any student who has completed one year of study and has maintained a better than passing record in courses, including at least one Honors grade.

Program materials are available upon request to the Director of Doctoral Studies, School of Forestry & Environmental Studies, 205 Prospect Street, New Haven CT 06511-2199.

For courses, see the *Bulletin of the School of Forestry & Environmental Studies*.

french

82–90 Wall Street, 3rd floor, 432.4900

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

Chair

Edwin Duval

Director of Graduate Studies

Ora Avni (82–90 Wall Street, Rm 322, 432.4902, ora.avni@yale.edu)

Professors

Ora Avni, Howard Bloch, Peter Brooks, Edwin Duval, Shoshana Felman, Thomas Kavanagh, Christopher L. Miller

Associate Professor

Susan Weiner

Assistant Professors

Mark Burde, Catherine Labio, Farid Laroussi, Donia Mounsef, Jean-Jacques Poucel, Julia Prest

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 will have to 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 normally takes place during the fifth term or, in some special cases, no later than the end

of 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 pre-dissertation 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, in conjunction with the program in African American Studies, a combined Ph.D. in French and African American Studies. The program is most appropriate for students who intend to concentrate in and write a dissertation on the literature of the francophone Caribbean.

Students in the combined degree program are subject to all the requirements for a Ph.D. in French. In addition, they 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 the program and the department. For further details see African American Studies.

Master's Degrees

M.Phil. See Graduate School requirements, page 375. Alternatively, the Department of French offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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.

w 3.30–5.20

An introduction to the historical grammar of Old French through reading, translation, and discussion of some of its major literary forms, including epic, romance, allegory, *fabliau*, and drama.

FREN 682b, Stylistics and Rhetoric. Ora Avni.

th 1.30–3.20

Practice in oral and written presentation of ideas for all occasions: thesis prospectus, proposals for colloquia or grants, twenty-minute talks, first class meetings, job interviews, etc. Practical work in oral and written French, including phonetics. Daily writing in French.

FREN 713b, Mythology and Renewal in French Theater. Donia Mounsef.

w 3.30–5.20

This course looks at modern stage adaptations of classical theatrical myths as a form of renewal, denial, or distortion of a tradition and examines the structural, thematic, and ideological specificity of the adapted text (including parody and pastiche). Readings from Anouilh, Molière, Racine, Césaire, Cixous, Cocteau, Sartre, and Ionesco; theoretical readings from Ricoeur, Domenach, Barthes, Genette, and Lassalle.

FREN 784b, Literature and Psychoanalysis. Shoshana Felman.

w 1.30–3.20

How has psychoanalysis revolutionized our conception of knowledge and of man? What are the psychoanalytic concepts that inform modern culture? How does psychoanalysis give us tools for understanding and interpreting literary works? The course explores these questions through selected readings in Freud, Lacan, Winnicott, Klein, Kohut, and others. Emphasis on Freud's and Lacan's understanding of the self as well as of society and culture, through an illumination of the relation of desire to repression, of life to death, of fiction to reality. Among the notions discussed are theories of sexuality, narcissism, identification, dreams, repetition, death drive, mourning, trauma, memory, and history. In English. *Also CPLT 784b.*

FREN 788a, Literature, Film, and Justice. Shoshana Felman.

w 1.30–3.20

A study of scenes of judgment in literature, film, and history, focusing on literature's ways of dealing with injustice in various legal, historical, political, and/or psychoanalytic circumstances. Topics include the opposition between legal justice and literary justice, and the relation between evidence, truth, and judgment. The course also looks at some historical trials reflected on by literary writers. Texts by poets, storytellers, and dramatists such as Kleist, Balzac, Flaubert, Zola, Mallarmé, Celan, Camus, Blanchot, Beckett, Brecht, Melville, Forster, Woolf, and Morrison, and critics such as Benjamin, Arendt, Derrida, Lyotard, Foucault, Barthes, Levinas, and Lanzmann. Films such as *Night and Fog*, *The Sorrow and the Pity*, *Shoah*. In English. *Also CPLT 931a.*

FREN 819b, Le Roman de la Rose. Howard Bloch.

t 1.30–3.20

An overall study of the sources, authorship, manuscripts, and illuminations, French and foreign influences, the "Debate," and scholarly tradition, along with a critical reading of Guillaume de Lorris's and Jean de Meun's portions of the *Roman de la Rose*.

FREN 823b, Poésie Lyrique à la Renaissance. Edwin Duval

W 10.30–12.20

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.

FREN 862b, The Enlightenment and Its Legacy. Catherine Labio.

M 1.30–3.20

Seminar devoted to the French Enlightenment in its broader Euro-American context. Particular attention is paid to its epistemological organization, questions pertaining to the nature of civil society, ties with England and North America, the French Revolution and the reactions to it both in France and abroad, and the Counter-Enlightenment, as well as to the applicability of Enlightenment thought to key contemporary social, political, and economic issues. Works by Montesquieu, Condillac, Voltaire, Diderot, Rousseau, the physiocrats, Laclous, Kant, Gouges, Horkheimer, Foucault, and Lyotard, among others. In French and English. Also CPLT 762b.

FREN 864a, Novel and Society in Eighteenth-Century France. Thomas Kavanagh.

M 10.30–12.20

This seminar focuses on the growing importance and diverse forms of the novel in eighteenth-century France. Placing the novel in its historical, cultural, and literary contexts, we aim to understand this form as a genre whose development both reflects and consolidates the emerging forms of consciousness and sociability that distinguish the Enlightenment. Works by Montesquieu, Prévost, Crébillon, Jourdan, Denon, Graffigny, Charrière, Laclous, and Diderot. In French.

FREN 870b, Hazard and Culture. Thomas Kavanagh.

M 10.30–12.20

Using French literary works from the Middle Ages to the present, as well as paintings and films, this seminar examines the changing idea of chance and its dialectic with culture. We focus on representations of the gambler as a figure whose position at the juncture of chaos and order questions society's cosmological, ethical, economic, and psychological assumptions. Our concern is with how the gambler's embrace of chance relates to agency, causality, and order as well as their ethical implications of identity, responsibility, and freedom. Works by Bodel, Pascal, Regnard, Prévost, Casanova, Diderot, Laméry, Saurin, Laplace, Mérimée, Hoffmann, Balzac, Barbey d'Aurévilly, Bourget, Borges, Serres, Rosset as well as films by Melville and Demy. In French.

FREN 895a, "Character"—"Person"—"Identity." Peter Brooks.

T 1.30–3.20

The course attempts to talk about what we mean by "character," in relation to such other terms as "subject," "person," "identity," "self." It draws on some material from linguistics, psychoanalysis, moral philosophy, and law. Readings are mainly narratives, eighteenth to twentieth century, and will probably include: Rousseau, *Confessions*; Nathalie Z. Davis, *The Return of Martin Guerre*; Balzac, *Le Colonel Chabert*; Wilkie Collins, *The Woman in White*; Gustave Flaubert, *L'Education sentimentale*; George Eliot, *Daniel Deronda*; Henry James, *The Beast in the Jungle* and *The Jolly Corner*; and Marguerite Duras, *Le ravissement de Lol V. Stein*. In English. Also CPLT 864a.

FREN 910a, Reading/Writing (after) Mallarmé. Jean-Jacques Poucel.

T 10.30–12.20

This course juxtaposes close readings of Stéphane Mallarmé's poetry and prose with studies in its reception, including perspectives in psychoanalysis, structuralism, and deconstruction. Secondary readings include Blanchot, Mauron, Richard, and Derrida.

FREN 941a, Le Récit. Ora Avni.

th 1.30–3.20

An examination of nineteenth-century French short story with emphasis on the “subject” (narrator, tone, “reader”) and narratological techniques. Some historical perspective. Tentative readings: Constant, Balzac, Flaubert, Gautier, Barbey d’Aureville, Michelet, Maupassant, Mérimée, Hugo, Nerval, Loti, Lunel, Daudet.

FREN 946a, Postcolonial Theory and Its Literature. Christopher L. Miller.

th 10.30–12.20

A survey of theories relevant to colonial and postcolonial literature and culture. The course focuses on theoretical models (Orientalism, hybridity, *métissage*, *créolité*, “minor literature”), but also gives attention to the literary texts from which they are derived (francophone and anglophone). Readings from Said, Bhabha, Spivak, Mbembe, Amselle, Glissant, Deleuze, Guattari. Taught in English. Also AFAM 846a, AFST 746a, CPLT 725a.

FREN 948b, From One Congo to Another: Literature and Culture in Central Africa. Christopher L. Miller.

th 10.30–12.20

An interdisciplinary approach to two nations, with a primary focus on literature but with reference to history, anthropology, film, and other fields. How the two Congos evolved side by side, through a history of genocide, colonialism, dictatorship, and war; the emergence of a rich literary tradition. Readings of Conrad, Tintin, Gide, Bamba, Dongala, Lopes, Sony Labou Tansi, Tchicaya, Mudimbe, Ngal. Also AFST 748b.

FREN 952a, Popular Culture, *culture populaire*, *politique culturelle*. Susan Weiner.

w 10.30–12.20

Investigation of the history, theories, and practices of these three interrelated aspects of French culture in the twentieth century. Readings from authors including Malraux, de Certeau, Bourdieu, as well as fiction, film, and song.

genetics

I-313 Sterling Hall of Medicine, 785.5846

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

Chair

Richard Lifton, M.D., Ph.D.

Director of Graduate Studies

Michael Stern (I-352 SHM, 737.2283, michael.stern@yale.edu)

Professors

Edward Adelberg (*Emeritus*), Nancy Berliner (*Internal Medicine; Hematology*), Douglas Brash (*Therapeutic Radiology*), W. Roy Breg, Jr. (*Emeritus*), Lynn Cooley, Daniel DiMaio, Jerome Eisenstadt (*Emeritus*), Bernard Forget (*Internal Medicine; Hematology*), Peter Glazer (*Therapeutic Radiology*), Arthur Horwich, Kenneth Kidd, Richard Lifton (*Internal Medicine; Nephrology; Molecular Biophysics & Biochemistry*), Maurice Mahoney, Charles Radding, Shirleen Roeder (*Molecular, Cellular & Developmental Biology*), Margretta Seashore, Carolyn Slayman, Kay Tanaka (*Emeritus*), Peter Tattersall (*Laboratory Medicine*), David Ward, Sherman Weissman

Associate Professors

Allen Bale, Susan Baserga (*Therapeutic Radiology*), Paula Kavathas (*Laboratory Medicine*), Barbara Pober, Mazin Qumsiyeh, Stefan Somlo (*Internal Medicine; Nephrology*), Michael Stern, Hong Sun, Joann Sweasy (*Therapeutic Radiology*), Tian Xu, Hui Zhang, Hongyu Zhao (*Epidemiology & Public Health; Biostatistics*)

Assistant Professors

Cheryl Garganta, Valerie Reinke, Kevin White

Fields of Study

Fields include molecular genetics, including studies of chromosome structure, genetic recombination, viral genetics, and the regulation of gene expression; genome mapping; cellular and developmental genetics, including organ and organelle biogenesis and the genetic control of membrane transport; oncogenes and tumor suppressor genes, human genetics, especially the analysis of fundamental defects in heritable diseases; 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 & Cellular Biology, Genetics and Development (MCGD) track within the interdepartmental graduate program in the Biological and Biomedical Sciences (see pages 59–61).

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 with the opportunity to explore a specific area of genetics and molecular biology in depth. To satisfy the breadth requirement, each student is expected to acquire knowledge of genetics at three of the following four levels: molecular, cellular, organismal, and populational. This will normally be accomplished through formal courses, although some students may wish to propose a program of guided reading, together with a term paper or examination, in satisfaction of one or more of the breadth requirements. Students are required to pass at least six graduate level courses. A qualifying examination, consisting of a reading period and written and oral portions, is given during the second year of study. Following successful completion of course work, the qualifying examination, and submission of a dissertation prospectus, the student is admitted to candidacy for the Ph.D. degree. Dissertation research in a specific area of genetics is carried out under the supervision of a faculty adviser with the guidance of a thesis committee. There is no language requirement.

An important aspect of graduate training in genetics 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 level. 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.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see page 373).

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

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. Students are not admitted for this degree.

Prospective applicants are encouraged to visit the BBS Web page (info.med.yale.edu/bbs/), MCGD Track. Ph.D. degree program materials are available upon request to the Administrative Assistant, Graduate Program, Department of Genetics, Yale University, PO Box 208005, New Haven CT 06520-8005.

Courses

GENE 500a, Genetics in Health and Disease. Margretta Seashore.

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.

GENE 520b, Scientific Integrity in Biomedical Research. Susan Baserga.

W 12–1

Numerous issues that bear upon responsible research conduct are discussed, including record keeping, availability of research materials, student/mentor responsibilities, reproducibility of results, confidentiality, conflict of interest, authorship, and fraudulent behavior. Required for all first- and second-year Genetics graduate students and postdoctoral fellows/associates.

GENE 620, Topics in Medical Genetics. Barbara Pober.

W 9–10

A variety of topics in the fields of biochemical genetics, DNA diagnostics, cytogenetics, pre-natal genetics, and general clinical genetics. Of particular interest to graduate students and medical students who wish to broaden their background in the basic principles as well as the clinical applicability of medical genetics. Prerequisite: introductory course in human genetics (e.g., GENE 500a) or permission of instructor. Genetics graduate students cannot use this course to fulfill course requirements. Grade Sat./Unsat.

GENE 625a, Basic Concepts of Genetic Analysis. Richard Lifton, Tian Xu, Michael Koelle, Shirleen Roeder, Michael Stern.

tth 1.05–2.20

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. A brief review of undergraduate genetics is offered in two optional lectures at the beginning of the term. *Also MB&B 625a^U, MCDB 625a^U.*

GENE 642a, Roles of Microorganisms in the Living World. L. Nicholas Ornston, Diane McMahon-Pratt, Robert Macnab.

tth 11.30–12.45

A topical course exploring the biology of microorganisms. Emphasis on mechanisms underlying microbial adaptations and how they influence biological systems. *Also EMD 642a, MB&B 642a, MBIO 642a, MCDB 642a.*

[GENE 645a, Statistical Methods in Human Genetics.]**GENE 675, Graduate Student Seminar. Joann Sweasy and Staff.**

W 4.30–5.30

Covers a variety of topics in molecular, cellular, developmental, and population genetics. Students gain experience in preparing and delivering seminars and in discussing presentations by other students. Required for all first- and second-year students in Genetics.

GENE 705a, Molecular Genetics of Prokaryotes. Nigel Grindley, Charles Radding, Joann Sweasy.

mW 11.30–12.45

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. Required: previous or concurrent introductory courses in genetics and biochemistry. *Also MB&B 705a^U, MCDB 505a^U.*

GENE 734a, Molecular Biology of Animal Viruses. Daniel DiMaio, Peter Tattersall.

Wf 9.30–10.45

Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. *Also MBIO 734a.*

GENE 743b^U, Molecular Genetics of Eukaryotes. Mark Hochstrasser, Anthony Koleske.

tth 11.30–12.45

Selected topics in regulation of gene expression, genome structure and evolution, signal transduction, cellular physiology, development, and carcinogenesis. Prerequisite: biochemistry or permission of the instructor. *Also MB&B 743b^U.*

GENE 749a^U, Medical Impact of Basic Science. Joan Steitz, Mark Hochstrasser, Andrew Miranker, and staff.

tth 1–2.30

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: MB&B 600a^U/601b^U or permission of the instructor. *Also MB&B 749a^U.*

GENE 777b, Mechanisms of Development. Lynn Cooley, Valerie Reinke, Kevin White, Xing-Wang Deng, Frank Slack, W. Zhong.

mf 9.45–11

This is an advanced course on 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 and critical analysis of primary literature. *Also MCDB 677b.*

[GENE 810b, Human Molecular Genetics.]**GENE 840a and b, Medical Genetics. Margretta Seashore, Barbara Pober.**

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 and b, Introduction to Research for First-Year Students. Michael Stern and staff.

A required laboratory rotation course designed to give first-year students the opportunity to do research in several different laboratories and to learn a variety of methods now being used in genetic biochemical studies.

GENE 920a and b, Reading Course for Qualifying Examination. Michael Stern and staff.

Reading period for second-year Genetics students for qualifying examination.

GENE 921a and b, Reading Course in Genetics and Molecular Biology. Michael Stern and staff.

Directed reading with faculty. Term paper required.

geology and geophysics

Kline Geology Laboratory, 432.3124
M.S., M.Phil., Ph.D.

Chair

Danny Rye

Director of Graduate Studies

David Bercovici

Professors

David Bercovici, Robert Berner, Leo Buss, Michael Donoghue, Jacques Gauthier, Robert Gordon, Thomas Graedel, Leo Hickey, Shun-ichiro Karato, Jeffrey Park, Danny Rye, Adolf Seilacher (*Adjunct*), Brian Skinner, Ronald Smith, Karl Turekian, George Veronis, Elisabeth Vrba, John Wettlaufer

Associate Professors

Jay Ague, Mark Brandon

Assistant Professors

Ruth Blake, David Evans, Mark Pagani, Peter Reiners, Steven Sherwood

Lecturer

Catherine Skinner

Fields of Study

Fields include geochemistry and petrology, geophysics, structural geology and tectonics, paleontology and paleoecology, and oceanography, meteorology, 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 sciences. Scores from a pertinent GRE Subject Test are desirable but not required. The TOEFL 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 advisers to meet individual interests and needs, to lay the foundations for dissertation research, and to prepare for the general examinations which take place in January of the second year. 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, maintained a better than passing record in the area of concentration, passed the oral and written general examinations, and presented a dissertation prospectus to the faculty. 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 Graduate School requirements, page 375.

M.S. Awarded only to students who are not 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 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 501b^u, Climate Dynamics.]

G&G 502b^u, Introduction to Geochemistry. Peter Reiners.

mwf 9.30–10.20

Basic principles of geochemistry and their use in geological science. Thermodynamics of aqueous and igneous systems. Element fractionation and isotope geochemistry. Biogeochemical cycles, geochronology, cosmochemistry.

G&G 504a^u, Minerals in the Biosphere: The Geochemistry of Human Health.

Catherine Skinner.

tth 11.20–12.45

Study of the interrelations between earth materials and processes, and personal and public health. The chemical transposition of elements essential for life from the environment.

[G&G 505a^u, Geochemistry of Planetary Evolution.]

[G&G 506b^u, Chemical Cycles and the Global Environment.]

[G&G 510a^u, Active Tectonics.]

G&G 511a, Stratigraphic Principles and Applications. Leo Hickey.

Principles of classification, age, determination, and paleoenvironmental interpretation of stratified rocks with application to actual measured sections.

G&G 512b^u, Structural Geology and Tectonics. Mark Brandon.

tth 11.30–12.45, Lab 2 htba

An introduction to the origin and structure of the lithosphere and continental and oceanic crust. Questions addressed include: what controls the solid versus fluid behavior of rocks during deformation; and what controls the character and motion of tectonic plates? Laboratory exercises and field trips.

G&G 513a^u, Invertebrate Paleontology: A Treasure House of Skeletal Reconstructions. Adolf Seilacher.

mw 11.30–12.45, Lab htba

Exploration of the basic constraints and potentials that controlled adaptive radiation in the evolution of the invertebrate skeleton. Open to juniors and seniors. General knowledge about animal phyla assumed.

[G&G 515a^u, Paleobotany.][G&G 520b^u, Kinetics of Geochemical Processes.]**G&G 521b^u, Geophysical Fluid Dynamics. George Veronis.**

tth 1–2.15

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.

G&G 522a^u, Introduction to Meteorology and Climatology. Steven Sherwood.

tth 9–10.15

The climatic system; survey of atmospheric behavior on timescales from days (i.e., weather) to decades (i.e., climate); formulation of mathematical equations describing weather and climate with selected applications to small- and large-scale phenomena.

[G&G 523b^u, Theory of Climate.]**G&G 525a^u, Geophysical Continuum Mechanics. David Bercovici.**

mwf 9.30–10.20

Physics of continuous media with applications to geophysics and geology. Tensors; analysis of stress; motion and strain; conservation of mass, momentum, and energy; rheology; applications to seismology, tectonics, environmental science, and geophysical fluid dynamics.

G&G 526a^u, Introduction to Geophysics. Shun-ichiro Karato.

mwf 10.30–11.20, 1 htba

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 527b, Dynamics of Earth and Planets. David Bercovici.

mwf 10.30–11.20, 1 htba

Introduction to physics of earth and planets; formation of solar system and planets; planetary orbits and tides; rotation and shape of planets; gravity and isostasy; geomagnetism and core dynamo; heatflow and mantle convection; earthquakes and crustal deformation; plate tectonics.

[G&G 530a^u, Large-Scale Atmospheric Motions I.][G&G 531b^u, Large-Scale Atmospheric Motions II.]

G&G 535a^U, Physical Oceanography. George Veronis.

tth 1–2.15

An introduction to ocean dynamics. Exploration of the physical mechanisms underlying the large-scale ocean circulation, the Gulf Stream, wind-driven waves, tides, coastal upwelling, and phenomena attributable to the earth's rotation.

G&G 536b, Mesoscale Atmospheric Dynamics. Ronald Smith.

The fluid dynamics of the atmosphere on scales of 1 km to 1000 km. Gravity waves, mountain airflow and precipitation, transport of pollutants, convection, thunderstorms, shear instability, and vortices. Requires background in fluid mechanics, meteorology, applied mathematics.

G&G 540a^U, Geomicrobiology: Microbial Processes in the Geologic Environment.**Ruth Blake.**

tth 1–2.15

Microbial processes in geologic environments; control through microbial metabolism of the geochemistry of natural waters, sediments, and soils, with emphasis on microbe-mineral interactions. Microbially mediated cycling and transport of metals.

G&G 550a^U, Paleontology and Evolutionary Theory. Elisabeth Vrba.

tth 11.30–12.45

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.

[G&G 555a^U, Ocean Circulation.]**G&G 556a^U, Introduction to Seismology. Jeffrey Park.**

mwf 11.30–12.20

Earthquakes and seismic waves, P and S waves, surface waves, and free oscillations. Remote sensing of the earth's deep interior and faulting mechanisms.

[G&G 557a, Advanced Seismology.]**G&G 559b, Data Analysis in the Earth Sciences. Jeffrey Park.**

mwf 11.30–12.20

Statistical methods in geoscience. Time series methods. Geophysical inverse theory.

[G&G 560a^U, Theory of Viscous Flow.]**G&G 562b^U, 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. *Also EMD 548b, F&ES 506b.*

G&G 567b^U, Geochemical Approaches to Archaeology. Karl Turekian.

tth 9–10.15

The use of geochemical techniques to address archaeological problems including radioactive dating, source identification, and production of artifacts, all in the context of environmental constraints in human development.

G&G 601b, Topics in Earth Science. Steven Sherwood.

For entering graduate students. Examines a major current topic within the earth sciences.

G&G 611a, Advanced Stratigraphy. Leo Hickey

Application of stratigraphic principles to a series of historically, conceptually, or paleoenvironmentally significant measured stratigraphic sections.

[G&G 615a, **Advanced Petrology.**]

[G&G 618b, **Petrology of Light Stable Isotopes.**]

[G&G 621b, **Geochemistry of Heavy and Radioactive Isotopes in Rock Systems.**]

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 reptiles. Introductory lectures provide a broad outline of reptile phylogeny. Participants should have a working knowledge of vertebrate anatomy as they are expected to read, analyze, and discuss relevant primary literature, lead discussions on selected papers in the field, and write a term paper.

G&G 650b^U, Time-Dependent Deformation of Earth Materials.

Shun-ichiro Karato.

mwf 10.30–11.20

Basic physics and chemistry of earth materials, with emphasis on kinetic and transport properties. Geochemical and geophysical processes in earth's crust and mantle and their influence on the dynamics and evolution of this planet. Topics include plastic flow, diffusion, thermal conductivity, electrical conductivity, and chemical reaction.

[G&G 655a, **Extraordinary Glimpses of Past Life.**]

G&G 657a, Marine and Surficial Geochemistry. Karl Turekian.

Geochemical processes at the earth's surface, including the atmosphere, oceans, ice caps, and the upper layers of the crust, are investigated using radioactive, radiogenic, and light stable isotopes.

G&G 660a, Diagenesis, Weathering, and Geochemical Cycles. Robert Berner.

A theoretical approach to earth surface chemical processes; modeling of geochemical cycles.

G&G 675a, Advanced Structural Geology. Mark Brandon.

A review of advanced methods in structural geology, including analysis of deformation in three dimensions, and microscale processes associated with deformation and fabric formation in rocks. Course includes practical exercises for measuring and interpreting strain and lattice preferred orientation in real geologic settings.

G&G 690a and b, Directed Research in Geology and Geophysics.

By arrangement with faculty.

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.

G&G 703a, Seminar in Systematics. Jacques Gauthier.

G&G 705b, Advanced Seminar in Evolutionary Paleontology. Elisabeth Vrba.

The contents of this seminar are designed at the start of each spring term in consultation with graduate students who wish to take it.

G&G 740a or b, Sediment Seminar. Robert Berner.

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, Jeffrey Park.

The seminar covers advanced topics concerning physical and chemical processes in the mantle and core of the earth and planets. Specific topic and hour will be arranged in consultation with enrolled graduate students.

G&G 746a or b, Seminar in Global Change. Karl Turekian.

G&G 753a, Seminar in Petrology. Jay Ague.

Tutorial courses, offered by arrangement with individual faculty, are offered as follows:

G&G 800a or b, Tutorial in Paleobiology.

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

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

Chair

Carol Jacobs (*Acting*)

Director of Graduate Studies

Ingeborg Glier (305 WLH, 432.0782, ingeborg.glier@yale.edu)

Professors

Ingeborg Glier, Cyrus Hamlin, Carol Jacobs, Winfried Menninghaus (*Visiting*),

Brigitte Peucker, Henry Sussman (*Visiting*)

Associate Professor

Matthias Konzett

Fields of Study

Fields include medieval literature, German literature and culture from the Reformation to the twenty-first century in Germany, Austria, and Switzerland; literary theory; literary sociology; film.

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 two other foreign languages, one at the end of the second term, the other by the fifth term of study. Recommended are Latin and French, although other relevant languages may be substituted for these. The faculty in German considers teaching to be essential to the professional preparation of graduate students. Students in German teach in their third and fourth years, at least. Students are normally expected to teach undergraduate language courses under supervision beginning in the third year of study. 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 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 in November or early December of the seventh term. Students are admitted to candidacy for the Ph.D. upon completion of all predissertation 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 all members of their committee, so that faculty members in addition to the dissertation adviser can make suggestions well before the dissertation is submitted.

Two concentrations are available to students: Germanic Literature and German Studies.

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 both from within and outside the department.

Joint Ph.D. Program

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 on page 164. 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.Phil. See Graduate School requirements, page 375. Alternatively, the Department of Germanic Languages and Literatures offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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 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 either Latin or 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 page 375.

Program materials are available upon request to the Director of Graduate Studies, Department of Germanic Languages and Literatures, Yale University, PO Box 208210, New Haven CT 06520-8210; german@yale.edu.

Courses

GMAN 529a, Literature and Culture in the Age of the Reformation. Ingeborg Glier.

W 3.30–5.20

In German culture, the sixteenth century is an especially violent and seminal period of transition. The seminar explores it under a variety of aspects: the upheavals in religion and in textual transmission, the discovery of a “new” continent and new scientific approaches, the breaking and making of literary traditions. Authors to be discussed include Sebastian Brant, Erasmus von Rotterdam, Martin Luther, Albrecht Dürer, Hans Sachs, as well as the first book on Faust, the *Historia von D. Johann Fausten*.

GMAN 536b^U, Around Kafka. Henry Sussman.

W 1.30–3.20

Franz Kafka was not merely a modernist whose sensibility and formal innovations influenced Brecht, Schulz, Gombrowicz, Beckett, Pynchon, Barth, Blanchot, and Borges, to name a few. His writings comprised a major site for the radical questioning and dislocation of Western systems, institutions, and mores that transpired at the outset of the twentieth century and beyond. Kafka's written body of works is not particularly large (he died of tuberculosis at forty-one). While paying careful attention to the shorter fiction, the novels, the letters, and their strategic interrelations, we begin to trace, in a Borgesian maze of time, the fields of knowledge, ideological presumptions, and aesthetic and cultural experiments that Kafka touched, and to some degree deranged, with his writing. In addition to carefully reading Kafka's works, we explore pivotal inspirations (Kleist, Flaubert, Gogol, and Dostoevsky); assess adaptations by Welles, Svankmajer, and Borges; and survey critical interventions by Adorno, Benjamin, and Blanchot.

GMAN 587b, Heroic Epic: *Rolandslied*, *Nibelungenlied*, *Kudrun*. Ingeborg Glier.

W 3.30–5.20

Topics to be discussed in close analysis of the texts: a definition or description of heroic poetry in general and in the context of medieval German literature in particular: the *Rolandslied* as a borderline case (heroic epic, "Kreuzzugsepos," "Staatsroman"?); heroic and courtly elements in *Nibelungenlied* and *Kudrun*; the uniqueness of the *Nibelungenlied* in its literary/cultural context; the *Nibelungenlied* as a challenge to the *Kudrun* poet(s); the dominant role of women in German heroic poetry of the high Middle Ages.

GMAN 601b, Questioning the Enlightenment. Carol Jacobs.

th 1.30–3.20

This is not a course that systematically introduces the basic tenets of the Enlightenment. The seminar proceeds, rather, by close readings of individual works whose performances leave the concept of *basic tenets* uncertain. We explore a number of texts historically rooted in the period and read others that appear as commentaries, declared and undeclared, on the way in which language, knowledge, reason, and power interact in the writings of the authors we read (Hamann, Herder, Shelley, Novalis, Horkheimer and Adorno, Foucault, Plato). *Also CPLT 763b*.

GMAN 630b^U, German Literature, Thought, and Culture in the Age of Goethe.

Cyrus Hamlin.

tth 1–2.15

Interdisciplinary survey of German culture, literature, philosophy, music, and the arts during the Romantic era (1770–1830). Focus on concepts of the individual and self-consciousness, freedom and self-development, the rise of alienation, pessimism, and despair in the early nineteenth century. Among authors to be studied: Kant, Goethe (*Werther* and *Faust*), Mozart (*Magic Flute*), Schiller, and Hölderlin; music by Beethoven and Schubert; Romantic literary criticism and theory (the Schlegels, Novalis); painting by C. D. Friedrich and architecture by C. F. Schinkel; philosophy of Hegel and Schopenhauer. *Also CPLT 630b^U*.

GMAN 651b^U, Richard Wagner and the Theater of Modernism. Cyrus Hamlin.

mw 1–2.15

Introduction to the life, thought, and work of Richard Wagner, with close study of selected musical dramas including *Tannhäuser*, *The Ring of the Nibelung*, *The Mastersingers of Nuremberg*, and *Parsifal*. Particular focus on his concept of theater, drama and opera (*Gesamtkunstwerk*) and its realization through performance, above all in the context of the Bayreuth Festival. Consideration of Wagner's European influence (especially on Nietzsche and G. B. Shaw) and the production history of his work to the present. *Also CPLT 863b^U*.

GMAN 661a^U, Goethe's *Faust* in Its European Context. Cyrus Hamlin.

mw 1–2.15

Close study of Goethe's *Faust*, Parts I and II. History of composition, reception, and performance of the drama, traditions of the Faust legend, philosophical theories of tragedy in German Idealism, and Romantic theories of myth and history in drama. Also *CPLT 611a^U*.

GMAN 695a^U, Aesthetics of Horror and Disgust. Winfried Menninghaus.

t 3.30–5.20

Outline of some major theoretical models of how art can transform horror into a source of pleasure. Focus on a widely neglected topos of aesthetics: that of *Ekel* (disgust), which in Mendelssohn, Lessing, and Kant demarcates those border phenomena which resist any transformation into aesthetic pleasure. Readings include Dubos, Mendelssohn, Lessing, Kant, Nietzsche, Baudelaire, Lovecraft, Freud, and Sartre. Also *CPLT 743a*.

GMAN 707a, Venus and Adonis: Beauty in Art and the Cult of the Beautiful Body. Winfried Menninghaus.

m 3.30–5.20

Taking the myth of Venus and Adonis as its point of departure, the seminar offers a multifaceted approach to dealing with the power and failures of beauty. Readings include Shakespeare's "Venus and Adonis" and other versions of the myth by Ronsard, Friedrich Schlegel, d'Annunzio, John Cheever; philosophical accounts of beauty (Plato, Baumgarten, Burke, Kant, and Nietzsche); as well as the "theories" of beauty in evolutionary biology, psychoanalysis (Freud), and recent empirical psychology. Also *CPLT 951a*.

GMAN 770a^U, German Literature after World War II: Turning Points.**Ingeborg Glier.**

tth 9–10.15

Introduction to young writers intent on finding their own voices in a ruined country and in a culture of uncertain future; their attempts to come to terms with the past and to shape the present; new forms of prose, drama, and poetry; *Gruppe 47*. Authors include Aichinger, Bachmann, Böll, Celan, Eich, Grass, Handke, Müller, and Wolf.

history

240 Hall of Graduate Studies, 432.1366

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

Chair

Jon Butler

Director of Graduate Studies

Valerie Hansen (236 HGS, 432.1361)

Professors

Jean-Christophe Agnew (*American Studies*), Abbas Amanat, Ivo Banac, Beatrice Bartlett, Paul Bushkovitch, Jon Butler, Marcia Colish (*Visiting*), John Demos, Carlos Eire, Laura Engelstein, John Mack Faragher, Enrique Florescano (*Visiting*), Paul Freedman, John Gaddis, Glenda Gilmore, Robert Gordon (*Law*), Timothy Guinnane (*Economics*), Valerie Hansen, Robert Harms, John Heilbron (*Visiting*), Frederic Holmes (*History of Medicine & Science*), Paula Hyman, Matthew Jacobson, Gilbert Joseph, Donald Kagan, Paul Kennedy, Daniel Kevles, Benedict Kiernan, Bentley Layton (*Religious Studies*), Ivan Marcus, John Matthews (*Classics*), John Merriman, Edward Peters (*Visiting*), Cynthia Russett, Lamin Sanneh (*Divinity School*), Stuart Schwartz, Frank Snowden, Jonathan Spence, Harry Stout, Frank Turner, John Harley Warner (*History of Medicine & Science*), Robin Winks, Jay Winter, Keith Wrightson

Associate Professors

Mary Habeck, Robert Johnston, Kevin Repp, Steven Stoll

Assistant Professors

Michael Auslin, Jennifer Baszile, Alejandra Bronfman, Brian Cowan, Seth Fein, Joanne Freeman, Andrew Gregory (*Classics*), Jonathan Holloway, Susan Lederer, Mary Lui, Michael Mahoney, Carolyn Moehling, Carlos Noreña (*Classics*), Stephen Pitti, Mridu Rai, Ronald Rittgers (*Divinity School*), Naomi Rogers (*History of Medicine & Science*), Celia Schultz (*Classics*), Timothy Snyder, Anders Winroth, Keriann Yokota

Fields of Study

Fields include ancient, medieval, early modern, and modern Europe (including Britain, Russia, and Eastern Europe), United States, Latin America, Asia, Middle East, Africa, Jewish history; and diplomatic, environmental, ethnic, intellectual, labor, military, political, religious, social, and women's history.

Special Admissions Requirements

The department requires a short book review 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.

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 department.

American: Two languages relevant to the student's research interests, or a high level of proficiency in one language; competence in statistics may substitute for a natural language under appropriate circumstances.

Ancient: French, German, Greek, and Latin.

Chinese: Chinese and French; additional languages like Japanese, Russian, or German may be necessary for certain dissertation topics.

East European: The language 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 some fields of study.

Latin American: Spanish, Portuguese, and French.

Medieval: French, German, and Latin.

Modern Western European (including British): French and German; substitutions are permitted as appropriate.

Russian: Russian plus French or German with other languages as required.

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 one course in the first year. Three of the twelve courses must be research seminars in which the student produces an original research paper from primary sources. One of the second-year courses will be a tutorial resulting in a prospectus for the dissertation. When this has been discussed in a dissertation colloquium and approved by the student's committee, and after any further language requirements have been met, the student takes an oral examination, normally in the third year. The examination will cover three chosen fields of concentration: a major field and two minor fields, one of which is comparative or theoretical, or on a continent different from the student's ordinary field of specialization. U.S. historians must offer a minor field that addresses historiography outside the United States. If these do not include one field dealing with pre-modern history, then a year's work in that earlier period must have been included among the twelve required courses. 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.

Teaching is an important part of the professional preparation of graduate students in History. Students will teach, usually in the third and fourth years of study. Students are also encouraged to participate in the teaching programs offered by the Graduate School.

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. Alternatively, the Department of History offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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 one must be an Honors grade and the other five courses must average High Pass. 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.

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 512b, Aristotle's *Athenaion Politeia*. Donald Kagan.

th 1.30–3.20

A study of the historical portion of Aristotle's Athenian Constitution. Research seminar. Ancient Greek required. *Also CLSS 885b.*

HIST 514a^u, The Athenian Imperial Democracy. Donald Kagan.

t 2.30–4.20

A history of Greece in the years between the Persian invasion and the Peloponnesian War, with emphasis on Athens.

HIST 516b^u, Thucydides and the Peloponnesian War. Donald Kagan.

t 1.30–3.20

A study both 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.

HIST 525b, Topics in Roman History and Culture. Carlos Noreña, Celia Schultz.

f 4–6

A weekly program of research papers on various topics, given by faculty members, graduate students, and visitors to Yale, followed by formal and informal discussion. Graduate students may acquire a course credit by presenting a paper to the seminar or by writing a term paper on one of the topics chosen, together with regular participation and contributions to discussion. Suggestions for and offers of papers are welcome. *Also CLSS 850b.*

HIST 528a, The Italy of Theoderic (489–526) and Its Neighbors. Walter Goffart.

t 1.30–3.20

Reading and discussion of the main sources documenting the “barbarian” kingdoms in the former West Roman Empire until the conquests of Justinian (534–555). The focal point is the Ostrogoth Theoderic, who sought harmony with the Vandals, Burgundians, Visigoths, Franks, Alamans, and others. East Rome and especially the Papacy are not overlooked. Special attention is reserved for cultural pinnacles of the age, such as the Latin poets of the Vandal kingdom, the laws of the “barbarian” kingdoms, Cassiodorus, Boethius, and Dionysius Exiguus.

HIST 532b^U, Jews in Muslim Lands: Seventh to Sixteenth Century. Ivan Marcus.

tth 11.30–12.45

Introduction to Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics to be discussed include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish courtiers, poets, and philosophers in Muslim Spain; the Jews in the Ottoman Empire.

HIST 533b^U, The History and Literature of Beauty. Ivan Marcus, Giuseppe Mazzotta.

t 1.30–3.20

Examination of how Jews and Christians wrote about the beautiful and the ugly, the ethical and the vicious, cultural truth and error. Consideration of literary, polemical, and exegetical texts as well as visual sources from both cultures in medieval and early modern European times. Authors include St. Augustine, Maimonides, Dante, and Chaucer.

HIST 535a^U, History of Jewish Culture to the Reformation. Ivan Marcus.

tth 11.30–12.45

Undergraduate lecture course open to graduate students by permission of instructor.

HIST 540a, Reading and Research in the European Middle Ages. Anders Winroth.

th 1.30–3.20

An introduction to research and recent work in medieval European history.

HIST 542b, Law in Medieval Europe. Anders Winroth.

th 1.30–3.20

This seminar explores the creation, in the thirteenth century, 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 the roots in the Roman law of Emperor Justinian and in ecclesiastical legislation. We also study its influence on local medieval law. The emphasis is on learning the technical skills necessary to use medieval law in historical research.

HIST 559b, The Life and Thought of Martin Luther. Ronald Ritters, Miroslav Volf.

w 1.30–3.20

This course examines the intellectual biography of Martin Luther from a theological as well as a historical perspective. Its goal is to understand both the man and his ideas. The course stresses close reading of select theological treatises and critical engagement of recent trends in Luther scholarship. Enrollment is limited to fifteen graduate students. Permission of instructors required. *Also REL 762b, RLST 912b.*

HIST 561b^u, Critical Issues in the Renaissance and Reformation. Marcia Colish.

t 1.30–3.20

This course considers debates of historians on major controversial issues in Renaissance and Reformation history, treating church history, political history, and social history. Topics include continuities and discontinuities between late medieval religion and the Reformation; Florentine civic humanism and its causes; and women, children, and theology as political ideology in the period. Some prior background preferred. *Also RLST 679b^u.*

HIST 566b^u, History of Jewish Culture, 1500 to the Present. Paula Hyman.

tth 10.30–11.20

A brief introduction to the history of Jewish culture from the late Middle Ages until the present. Emphasis is on the changing interaction of Jews with the larger society as well as the transformation of Judaism in its encounter with modernity. *Also RLST 774b^u.*

HIST 602a, Microhistories. Keith Wrightson.

th 10.30–12.20

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 drawn from the literature on early modern England. Particular attention is paid to questions of sources and their use. Thereafter, members of the class undertake research exercises on edited primary sources. Particular use can be made of the records of Earls Colne, Essex (available in their entirety in microfiche and online).

HIST 604b, Revolutionary Britain, 1690–1776. Brian Cowan.

w 9.30–11.30

Readings in British history from the civil wars of the seventeenth century to those of the eighteenth. Emphasis is on the political and intellectual history of religious, dynastic, and constitutional conflicts in England, Scotland, Ireland, and the extended British empire.

HIST 609b, Mutualities and Obligations: Social Relationships in Early Modern England. Keith Wrightson.

th 10.30–12.20

Relationships of mutual obligation were the most fundamental of all bonds in medieval society. In their various forms, they provided both the template of social relations and the coordinates of individual identity. In the course of the sixteenth and seventeenth centuries, many such bonds are deemed to have undergone transformation. The seminar reexamines this theme by discussing recent approaches to a variety of relationships of mutuality and obligation; relationships within the household; between kinsfolk, “friends,” and neighbors; in female networks and trade brotherhoods; in the institutional settings of manor and estate, the parish, voluntary associations, and the marketplace. The aim is to encourage fresh thinking about continuity and change in a range of vital social relationships; their conduct, their idioms, their defining contexts, and their meanings.

HIST 615b, Introduction to English Paleography and Archival Sources for Research in English History. Maija Jansson.

t 1.30–3.20

Various types of ecclesiastical, parliamentary, and governmental records of the fifteenth to seventeenth century are studied, as well as private correspondence, medicinal and culinary receipts, Guildhall accounts, etc.

HIST 616a, The European Enlightenment. Darrin McMahon.

w 4–6

This course examines European thought and culture from roughly the late seventeenth century to the time of the French Revolution. An emphasis is placed on the examination of recent critical and historiographical perspectives.

HIST 617a, Science, Society, and Politics in the Seventeenth and Eighteenth Centuries. Frank Turner.

t 1.30–3.20

This seminar examines a number of major texts in European thought dealing with the emergence of the new science in the seventeenth century and its impact on social and political thought. There is an emphasis on the study of works that students will in all likelihood later find themselves having to teach and on works in European thought that had major impact on colonial American political thinking. The major writers to be considered include Montaigne, Bacon, Hobbes, Newton, Descartes, Locke, Swift, Hume, and Rousseau. (Students should read Herbert Butterfield, *The Origins of Modern Science*, at their earliest opportunity.)

HIST 618b^u, The Scientific Revolution. John Heilbron.

tth 1.30–2.45

A survey of the natural science that developed between the Age of Discovery and the French Revolution. The course covers the background in Aristotelian philosophy; the shift from geocentric to heliocentric astronomy; the replacement of scholastic natural philosophy by the ideas of Galileo, Descartes, and Newton; the roles of the Catholic and Protestant churches, universities, and learned academies; the invention and improvement of scientific instruments; and the science of the Enlightenment. *Also HSHM 679b^u.*

HIST 619b^u, Before and after Darwin. Frank Turner.

t 1.30–3.20

The emergence of evolutionary thinking in early Victorian England. Critical reading of Charles Darwin's *On the Origin of Species* and *The Descent of Man*. Attention to the impact of Darwin on religion, social ethics, and philosophy and the debate over Darwin in twentieth-century America.

HIST 635a, Readings in Modern French History. John Merriman.

t 10–12

Readings and discussion of recent work on the social, political, economic, and cultural history of modern France.

HIST 646b, Socialism in Europe from Babeuf to Gramsci. Frank Snowden.

w 10.30–12.20

Main currents of European socialism in their historical context. Attention is paid to utopian socialist thinkers, Marx and Engels, anarchist and libertarian thought, Russian populism, Fabian socialism, revisionism, anarcho-syndicalism, Lenin, and Gramsci.

HIST 655b, Relations of the Great Powers since 1890. Paul Kennedy.

Reading and discussion. Among the topics covered are the "New Imperialism," the military and naval arms race prior to 1914, the relationship between domestic politics and foreign affairs, the First World War and the alteration of the Great Power order, the "new diplomacy," appeasement, and the rise of the dictator-states. There is a heavy emphasis on historiography, and an encouragement to relate economic and strategic trends to diplomatic. Meets on Wednesday evenings.

HIST 670a, Imperial Russia and the Challenge of Modernity. Laura Engelstein.

m 1.30–3.20

This seminar explores selected themes in the late imperial period relating to the problem of modernity as a social and cultural concept, focusing on issues of ideology, representation, and political culture. Subjects include the invention of tradition, the emergence of personality, myths of national identity, and the ethos of rule. Readings in primary sources, as well as from the recent scholarly literature (most in English, some in Russian).

HIST 675b, Nationalism in the Balkans. Ivo Banac.

w 1.30–3.20

Assessment of various trends in the national ideologies of the Balkan peoples from sixteenth-century proto-national ideas to post-Communist conflicts. Reading and discussion.

HIST 682a^u, Jews in Eastern Europe, 1730–1939. Paula Hyman.

tth 2.30–3.45

An exploration of Eastern European Jewry, its traditional culture, and its political and ideological transformations. Topics include the social matrix of tradition, Hasidism, Haskalah (Enlightenment), changing political status, and the emergence of secular movements such as Zionism and socialism.

HIST 684b, Ukraine and Poland, 1569–1999. Timothy Snyder.

t 1.30–3.20

A reading course on the western question in Ukraine and the eastern question in Poland. Topics include political union (1569), the Cossack rebellion (1648), imperial rule, national movements, communism, and contemporary relations.

HIST 700a, Introduction to the Historiography of the United States.**John Mack Faragher.**

tth 10.30–12.20

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. *Also AMST 700a.*

HIST 703b, Research in Early National American History. Joanne Freeman.

t 1.30–3.20

Students are expected to write an original research paper making extensive use of sources from the period. During the course of the semester they present a formal prospectus to the class. They also critique each other's papers at the end of the semester, each student serving as the primary reader for a paper of his or her choice during a final course meeting. Initial course sessions may include introductory readings to familiarize students with the historiography of the period.

HIST 704a, Readings on Early American History. John Demos.

w 1.30–3.20

Reading and discussion of the scholarly literature. *Also AMST 825a.*

HIST 705b, Research on Early American History. John Demos.

w 1.30–3.20

Projects to be chosen from the "colonial" period (1492–1763). Research seminar. *Also AMST 824b.*

HIST 712b, The American Civil War. Mary Habeck.

m 1.30–3.20

An in-depth look at the causes, course, and consequences of the Civil War. We examine the social, cultural, and political background of the war; the military realities of war; the war and race, gender, and society; and the continuing consequences of the war. Reading and discussion.

HIST 721a, Research Seminar in U.S. and European History. Jon Butler.

t 10.30–12.20

This research focuses on the craft/art of writing an article. Students may write on any subject in U.S. and European social, political, and religious history in the early modern to modern eras. *Also AMST 721a, RLST 524a.*

HIST 735b, Readings in Twentieth-Century American Political and Social History.**Glenda Gilmore.**

W 10.30–12.20

Recent trends in American political history from the 1800s, with an emphasis on the social analysis of mass politics and reform. *Also AFAM 706b, AMST 714b.*

HIST 740a, Readings in African American History since 1865. Glenda Gilmore.

W 10.30–12.20

An introduction to major primary and secondary scholarship in twentieth-century African American history. Critical analyses of social movements and gender, culture, and class politics. Methodological issues of particular importance to minority populations are also explored. *Also AFAM 710a, AMST 742a.*

HIST 751a, Race and Races in American Studies. Matthew Jacobson.

t 1.30–3.20

This reading-intensive seminar examines influential scholarship across the disciplines on “race” and racialized relations in American culture and society. Major topics include the cultural construction of race; race as both an instrument of oppression and an idiom of resistance in American politics; the centrality of race in literary, anthropological, and legal discourse; the racialization of U.S. foreign policy; “race mixing”; vicissitudes of “whiteness” in American political culture; and “race” in the realm of popular cultural representation. A lengthy review essay due at the end of the semester gives students a chance to explore in depth the themes, periods, and methods which most interest them. *Also AFAM 687a, AMST 701a.*

HIST 757a, Culture in U.S. International and Transnational Histories. Seth Fein.

W 1.30–3.20

Reading seminar that examines interdisciplinary approaches to the study of “culture” in relations between, within, and among the United States and other nations (mainly since 1900). Discussions and papers focus on comparing methodologies, using theory, doing research, writing history. Topics include globalization, Americanization, transnationalism, and hybridity; gender, national identity, international relations, and state formation; imperialism, post-colonialism, hegemony, and resistance; mass culture, political economy, foreign policy, and postmodernity. *Also AMST 775a.*

HIST 762a, Chicano Historiography. Stephen Pitti.

th 1.30–3.20

A review of the major texts relevant to the historical study of Mexican Americans in the United States. Themes include gender, labor, immigration, citizenship, community formation, transnationality, and the border. Assigned readings are in English. *Also AMST 759a.*

HIST 768b, Asian American History and Historiography. Mary Lui.

W 3.30–5.20

This reading and discussion seminar examines new trends in Asian American history through a selection of recently published texts and older “classics” from the field. Major topics include the racial formation of Asian Americans in U.S. culture, politics, and law; U.S. imperialism; U.S. capitalist development and Asian labor migration; and transnational and local ethnic community formations. Consideration of both the political and academic roots of the field and its evolving relationship to “mainstream” American history. *Also AMST 768b.*

HIST 790b, Narrative, and Other, Histories. John Demos.

W 3.30–5.20

An exploration, through readings and discussion, of the recent “literary turn” in historical scholarship. Readings include history, fiction, and some theory. In addition, a month-long “practicum” focuses on writings by course participants. *Also AMST 790b.*

HIST 799b, The American Century: 1941–1961. Jean-Christophe Agnew.

W 10.30–12.20

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. *Also AMST 799b.*

HIST 805a, Approaches to the Social History of Colonial Latin America. Stuart Schwartz.

M 1.30–3.20

An introduction to the historiography and methodologies such as ethnohistory, cultural studies, and historical demography, emphasizing the major themes and authors. Readings and discussion prepare students for the writing of a historiographical essay.

HIST 807b, Resistance, Rebellion, and Survival Strategies in Rural Latin America. Gilbert Joseph, Patricia Pessar.

W 3.30–5.20

An interdisciplinary examination of new conceptual and methodological approaches to such phenomena as peasants in revolution, millenarianism, “banditry,” refugee movements, and transnational migration. *Also ANTH 510b.*

HIST 815b, Problems in History and Historiography of the Nineteenth- and Twentieth-Century Caribbean. Alejandra Bronfman.

Th 10.30–12.20

This course examines prominent debates in Caribbean historiography, drawing from the literatures of the anglophone, francophone, and Hispanic Caribbean. It works within a comparative framework in the exploration of issues including race and nationalism, state formation, gender, migration, and globalization.

HIST 820a, Problems in Modern Mexican History. Enrique Florescano.

Th 1.30–3.20

This course is a new interpretation of the formation of Mexican historical conscience. Instead of studying the thought of different individual historians, this course analyzes the historical canon or model that was used in the assessment, study, and transmission of the knowledge of the past during a long period. From pre-Hispanic times to the twentieth century, this course emphasizes the processes of national identity and integration through historical discourse. Most dissertations present numerous illustrations, in order to ascertain the use of iconography in the formation of historical conscience.

HIST 829a^U, The History of the Islamic Near East from Mohammad to the Mongol Invasion. Adel Allouche.

MW 9–10.15

An examination of the shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1258. The origins of Islamic society; conquests, and social and political assimilation under the Umayyads and Abbasids; the changing nature of political legitimacy and sovereignty under the caliphate; provincial decentralization; and new sources of social and religious power. *Also NELC 802a^U.*

HIST 832a, Modern Middle Eastern Historiography and Research. Abbas Amanat.

W 3.30–5.20

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.

HIST 841b, The Culture of Colonialism in African History. Michael Mahoney.

t 1.30–3.20

This course examines the intersection of political economy and culture during the colonial era in African history, from 1885 to 1960. The central question for the course is, How did the colonial state manage to stay in power? Through its use of symbolic power and representation? Through the cultivation of legitimacy or hegemony? Or simply by coercion and domination alone? Topics include education, medicine, religion, the civilizing mission, indirect rule, and the psychology of colonialism. We consider the work of such Africanists as Ranger, Cooper, Glassman, the Comaroffs, and Fanon, as well as such non-Africanists as Foucault, Stoler, Scott, Mitchell, and Said. *Also AFST 841b.*

HIST 862a, Historical Documents in Pre-Modern China. Valerie Hansen.

t 1.30–3.20

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 semester of classical Chinese.

HIST 862b, Research Seminar in Pre-Modern China. Valerie Hansen.

t 1.30–3.20

Writing seminar emphasizing the use of primary sources. Prerequisite: HIST 862a.

HIST 863a, Traditional Chinese Historiography. Annping Chin.

m 3.30–5.20

The course examines the ways Chinese historians worked from the time before Confucius to the eighteenth century. The topics include the writing of chronicles and narrative history, the relationship of commentaries to early classics, the development of an exegetical tradition, and the art and theories of several great Chinese historians. Readings are in both English and classical Chinese.

HIST 865a, China, State, and Society, 1600–1949. Jonathan Spence.

w 3.30–5.20

An exploration of some of the main themes in the history of modern China. Topics include Qing political and social history, foreign imperialism, dynastic decline, intellectual explorations, the rise of the communist party, and the impact of Japan. Reading and discussion. Chinese not required.

HIST 866b, China and the Wider World, 1830–1979. Jonathan Spence.

th 1.30–3.20

This course gives a broad view of Chinese relations with the world at large, from the period of the first opium war to the collapse of the Guomindang on the mainland. Some of the focus is on the wars with Britain, France, and Japan, but attention is also given to the impact of foreign missionaries, the translation of texts, the development of press and other media, the role of foreign ideologies, the growth of international business, the varying patterns of Chinese travel abroad (both in diplomacy and for study), the Korean war, and the idolization of the Cultural Revolution. Reading and discussion. Chinese not required.

HIST 868b, Ch'ing and Early Republican Research Resources. Beatrice Bartlett.

f 1.30–3.20

Introduction to the research bibliography and primary sources for late imperial and early modern Chinese history (1600–1927). Oral reports and bibliographical essay. Advanced Chinese required. Research seminar.

HIST 870a^u, Historians on Modern China. Beatrice Bartlett.

w 1.30–3.20

Some of the problems historians have faced in writing about modern China. Questions of historical truth, types and uses of sources, objectivity and bias, conflicting evidence. Works read include translations of writers of various nationalities (Chinese, Russian, Japanese).

HIST 872b^u, Taiwan History, 1600 to the Present. Beatrice Bartlett.

t 1.30–3.20

Taiwan history from the first immigrations to the present. Topics include Koxinga and the Dutch, Qing pioneers and rebels, Taiwan as a Qing province, the Japanese colonial experience (1895–1945), Nationalist rule, the modern economic miracle, foreign relations, and democratization since the 1960s. Problems of conflicting historical interpretations. Reading and discussion.

HIST 892a, Readings in South Asian History. Mridu Rai.

m 3.30–5.20

This seminar explores recent debates in south Asian history. Focused on the period of British colonial rule and Indian resistance, it explores a variety of historiographical perspectives on select themes. Topics include colonialism and culture; colonial vs. Indian modernity; dominance and resistance; the historiography of elites and “subalterns”; gender, religion, caste, and nation. No prior knowledge of south Asian history is either assumed or required.

HIST 930a, Introduction to the History of Medicine and Public Health.**John Warner, Susan Lederer.**

m 1.30–3.20

An examination of the variety of approaches to the social and cultural history of medicine and public health. Readings are drawn from recent literature in the field, sampling writings on health care, illness experiences, 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, region, and religion 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. *Also HSHM 601a.*

HIST 931b, Introduction to the History of Science. John Heilbron,**Frederic Holmes.**

w 1.30–3.20

A core seminar required for first-year graduate students in the history of science and history of medicine. The seminar, which extends through the full academic year, is a foundational introduction to the history and historiography of the history of medicine and public health, the history of the physical sciences, history of chemistry, and the history of life sciences. *Also HSHM 602b.*

HIST 933b^u, Science and Technology in the Twentieth Century. Daniel Kevles.

t 7–8.30

An examination of the development of the scientific and technological enterprise in Europe and the United States, including its major intellectual achievements, academic and industrial institutions, relationship to war and the state, and standing in general culture. Among topics that might be considered are atomic, nuclear, and particle physics, genetics and molecular biology, microelectronics and computers. *Also HSHM 714b^u.*

HIST 938a^u, The Engineering and Ownership of Life. Daniel Kevles.

w 1.30–3.20

The development of biological knowledge and control in relation to intellectual property rights in living organisms. Topics include agribusiness, medicine, biotechnology, and patent law. *Also HSHM 676a^u.*

HIST 939b^u, Biology and Society in the Twentieth Century. Daniel Kevles.

mw 11.30–12.45

An exploration of issues in the understanding, engineering, and control of life. Focus on the history of genetics, molecular biology, and biotechnology and their interaction with politics, economics, law, and culture, mainly in the United States. *Also HSHM 677b^u.*

HIST 940a^u, Nuclear America. Daniel Kevles.

t 7–8.30

A history of the nuclear enterprise from its pre-World War II origins to recent times, covering its military and civilian uses and its impact on scientific research, health and the environment, regional economies, and American politics and culture. *Also HSHM 643a^u.*

HIST 942a, History of Disease and Public Health in Western Societies.**Naomi Rogers.**

t 9.30–11.20

An exploration of recent approaches to understanding the history of disease and public health in Western societies. Topics in this reading seminar, which focuses on the nineteenth and twentieth centuries, include bodies and cities; contested definitions of disease, contagion, and pollution; illness, healing, and popular culture; medicine and empire; health care, the state, and charity; health education; and industrial disease and health policy. *Also HSHM 725a.*

HIST 950a^u, Women and Judaism. Paula Hyman.

t 9.30–11.20

An examination of the changing status and roles of women within Judaism and Jewish history. Topics include women in Jewish law; the social, domestic, and religious roles of women in the modern period; and the development of Jewish feminism. *Also RLST 795a^u.*

HIST 955b, Sexuality, Love, Marriage, and Adultery: Historical and Literary Approaches. Laura Engelstein, Irina Paperno.

th 1.30–3.20

This team-taught course examines selected texts that deal with sexuality, love, marriage, and adultery using the methods of both historical and literary scholarship. Readings include works of literature, journalism, and religious and scientific commentary. Among major texts: Herzen's *Byloe i dumy*, Dostoevsky's *Vechnyi muzh*, Chernyshevsky's *Chto delat'?*, Tolstoy's *Kreitserova sonata*, Artsybashev's *Sanin*, selections from Rozanov. Reading knowledge of Russian is required. Discussions in English. *Also RUSS 674b.*

HIST 965a, Agrarian Societies: Culture, Society, History, and Development.**Robert Harms, Steven Stoll, Michael Dove, Enrique Mayer.**

m 1.30–5.20

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. *Also ANTH 541a, F&ES 753a, PLSC 779a.*

HIST 970a, When Was Europe? The Whitney Seminar on European Identities.**Jay Winter.**

Sem. th 4–6, Lect. th 7

This seminar examines the proposition that Europe has never been a reality but for centuries has been an idea, expressed in a host of ways, about Enlightenment and Progress. This

rhetoric informed social movements, such as Marxism, liberalism, and various forms of nationalism, as well as artistic and intellectual currents. Much of this discussion also cloaked inhumanity and barbarism, especially (but not only) in its imperial forms. This seminar examines the notion that “Europe” was as much a shifting discursive field as it was a shifting territorial one. The boundaries of both discourse and territory have never been fixed but remain fluid to this day. The seminar is complemented by a lecture series, “When Was Europe?,” organized through the Whitney Humanities Center and the Yale Center for International and Area Studies. The lectures follow the Thursday seminar. *Also WHIT 970a.*

HIST 971b, History and Memory. The Whitney Seminar on European Identities.

Jay Winter.

Sem. th 4–6, Lect. th 7

This seminar explores facets of the historical literature surrounding issues of individual memory, collective memory, and commemoration. The focus is on modern Europe, though the literature surveyed addresses issues beyond the confines of Europe. After a survey of interdisciplinary approaches to the field, focusing on social agency, representation, trauma studies, and cognitive psychological research, two different kinds of evidence are examined. The first relates to historical sites (monuments, ruins, battlefields, landscapes) as well as social spaces (families, trials, museums); the second to representations and languages of remembrance, through the narratives of trauma, fiction, memoir, testimonial literature, photography, and film. The focus is on civil society rather than primarily on the state and the manipulation of commemorative forms. *Also WHIT 971b.*

HIST 980a, Genocide: History and Theory. Ben Kiernan.

th 10.30–12.20

Description and analysis of modern genocide; theories and case studies; an interregional, interdisciplinary perspective. Reading and discussion.

HIST 985a, Studies in Grand Strategy, Part II. John Gaddis, Charles Hill,

Paul Kennedy, Paul Bracken.

m 1.30–3.20

Part II of the two-term linked seminar offered during the calendar year 2002. Research seminar. *Also PLSC 715a.*

HIST 989b, Research and Writing in History. Robin Winks.

w 1.30–3.20

A seminar in the writing of history as a discipline distinct from all others, with an emphasis on matters of methodology and professionalism. Intended for first-year students or students whose undergraduate major was in another discipline.

HIST 992a, The Teaching of History. Robert Johnston.

th 1.30–3.20

This course explores the teaching of history from practical, philosophical, and political perspectives.

HIST 995a/b, Prospectus Tutorial. Faculty.

HIST 998a/b, Directed Readings. Faculty.

Offered by permission of instructor and DGS to meet special requirements not met by regular courses.

HIST 999a/b, Directed Research. Faculty.

Offered by arrangement with instructor and permission of DGS to meet special requirements.

history of art

56 High, 432.2668

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

Chair

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Professors

Brian Allen (*Adjunct*), Judith Colton, Edward Cooke, Jr., Diana Kleiner, Mary Miller, Alexander Nemerov, Jock Reynolds (*Adjunct*), Vincent Scully (*Emeritus*), Robert Thompson, Christopher Wood, Mimi Yiengpruksawan

Associate Professors

Christy Anderson, Maria Georgopoulou

Assistant Professors

Judith Barringer, Timothy Barringer, Anne Dunlop, Björn Ewald, Sandy Isenstadt, Kellie Jones, Christine Mehring, Noa Steimatsky

Lecturers

Mark Aronson, Suzanne Boorsch, Georgia Clarke (*Visiting*), Theresa Fairbanks-Harris, Gillian Forrester, Karen Foster, Kishwar Rizvi (*Visiting*), Rebecca Zorach (*Visiting*)

Fields of Study

Fields include Greek and Roman; Medieval and Byzantine; Renaissance; Baroque; eighteenth-, nineteenth-, and twentieth-century European; Modern Architecture; African; African American; American; British; Pre-Columbian; Chinese; Japanese; and film.

Special Requirements for the Ph.D. Degree

Students in the history of art must pass examinations in German or French, and one other language pertinent to their field of study (which may be French or German). One examination must be passed at the beginning of the first term, the other not later than the beginning of the third term. German is required for students in Western art. Students of Chinese art must qualify in Chinese, Japanese, and either German or French, and they have an extra year in which to do so. During the first two and a half 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. By the end of the first term of the third year, the student is expected to have established a dissertation topic. A prospectus outlining the topic must be approved by a committee at a colloquium. During the spring term of the third year the student is expected to take the qualifying examination. The candidate must demonstrate knowledge of his or her field and related areas, as

well as a good grounding in method and bibliography. Students are admitted to candidacy for the Ph.D. upon completion of all predissertation 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 in the History of Art will teach in their second and third years. They receive a total of one course credit as teaching fellows when they lead a discussion section.

Combined Ph.D. Programs

history of art and african american studies

The History of Art department 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 renaissance studies

The Department of 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 Graduate School requirements, page 375. Alternatively, the Department of the History of Art offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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, Introduction to the Study of Art History. Christine Mehring.

m 3.30–5.20

This class introduces students to the methods of the discipline of art history, such as, for example, connoisseurship, iconography, feminism, and social art history. The class is reserved for incoming graduate students in the History of Art department.

HSAR 504b, Aspects of Connoisseurship and Conservation.

Theresa Fairbanks-Harris, Catherine Sease.

t 2.30–4.20

Combines four-week internships in curatorial departments with seminars to address the history of museums, current trends, and future challenges. Enrollment limited to ten.

HSAR 506a or b, The Teaching of the History of Art.

History of Art graduate students only. By arrangement with faculty.

HSAR 512a or b, Directed Research.

By arrangement with faculty.

HSAR 514a or b, Curatorial Training.

By arrangement with faculty.

HSAR 520a, Histories and Critiques of the Art Museum. Timothy Barringer.

w 1.30–3.20

Using recent critical literature in the field, this seminar investigates the history of the art museum from 1750 to the present. Issues include the formation of canons, the social role of the museum, museums and the formation of material and cultural identities, imperialism and the museum, the promotion of modernism, and the relation between contemporary art and the museum.

HSAR 575a, Hellenistic Art. Judith Barringer.

w 2.30–4.20

This seminar considers major issues and problems in Hellenistic art (sculpture, mosaics, painting, and “minor” arts) and architecture with an emphasis on historical, political, and religious considerations. Topics to be addressed include: Alexander’s image and its impact, the Attalid kingdom of Pergamon, Ptolemaic Alexandria, “Graeco-Roman” art, the appeal and function of exotic and erotic sculpture, Athens as a Classical memory and as a Hellenistic reality, and the impact of Rome as conquering power and voracious art collector. *Also CLSS 802a.*

HSAR 577b, Roman Imperial Art. Björn Ewald.

th 2.30–4.20

A course on Roman Imperial art, comprising the period from Augustus to Constantine (late first century B.C. to fourth century A.D.). The focus is on the so-called historical reliefs which once adorned or still adorn public buildings (like triumphal arches) and monuments (like the

Ara Pacis). They are part of an elaborate visual system of official art which served to praise imperial virtues and to imprint the imperial accomplishments on the “collective memory” of Roman society. *Also CLSS 844b.*

HSAR 579a, Contested Identities: The Making of Architecture in the Modern (Islamic) World. Kishwar Rizvi.

t 2.30–4.20

This course studies the ideas and concepts that inform the making and reception of architecture in Islamic Asia, with a focus on Turkey, Iran, and Pakistan. The encounter with Western powers has now been sublimated to the degree of global theories of design; nonetheless these countries are in search of an indigenous aesthetic expression. In the Islamic world, new fundamentalisms and shifting religious trends have created an environment in which each country must renegotiate its part and reconsider its collective future. Whether through suppressing their Islamic roots, as in the case of Republican Turkey, or through reinventing them, as in the case of Pakistan, these countries create their national image. And it is through their public architecture that they convey their political and religious ideology. This course analyzes cases of colonial and nationalist architecture in Islamic countries by situating them in the context of their social and religious history.

HSAR 596b, Architecture, Form, and Function in the Eastern Medieval World. Maria Georgopoulou.

w 1.30–3.20

Focus on religious and secular architecture in the Byzantine and Islamic worlds. Analysis of the architectural space and its decoration in terms of function. Special emphasis on liturgy, court ceremonial, and civic ritual.

HSAR 633a, Desire in the Renaissance. Anne Dunlop.

th 3.30–5.20

This course examines the role of desire in the art of Renaissance Italy and France, using the collections of the Yale University Art Gallery. Seminars focus on specific works in the collection, and participants research a Renaissance object from the gallery for their final papers. Discussion topics include wedding rituals and associated objects; beauty and desire; the erotics of looking in the Renaissance; and the place of likeness in pre-modern art and theory.

HSAR 648a, Baroque Art and Its Critical Fortune. Judith Colton.

w 1.30–3.20

The seminar begins with an overview of Italian Baroque art, using as its point of departure the recent treatment of it in such major exhibitions as “The Genius of Rome,” held in London and Rome in 2001. This is followed by selected studies in the reception, especially the rejection, of the Baroque from the seventeenth century to our own day. Students interested, for example, in Neoclassicism, in Pugin and the Gothic Revival, in Ruskin and such American “Ruskinians” as James Jackson Jarves and Charles Eliot Norton, or in Italian neorealist cinema, will be encouraged to look at ways in which these movements or individuals reacted to the Seicento in general, or to individual artists of the Seicento (e.g., Caravaggio, Salvator Rosa, Bernini).

HSAR 650b, Rereading Ruskin. Timothy Barringer.

w 1.30–3.20

This seminar reconsiders the works of the Victorian polymath John Ruskin in the light of the multiple publications and events of the centenary year of 2001. Ruskin is examined as a literary figure, art critic, artist, aesthetic theorist, social critic, reformer, and educationist. Each week a major text is subjected to close scrutiny and placed in a range of historical and discursive contexts. This seminar also considers works of art of significance to Ruskin, in the Yale Center for British Art and elsewhere.

HSAR 669a, Fontainebleau and the Performance of Meaning. Rebecca Zorach.

t 3.30–5.20

This seminar addresses interpretive quandaries related to the school of Fontainebleau and its esotericism (and eroticism) through an examination of the role of humanism and book publishing, the uses of allegory and mythology, displays of royal power (through ceremonial entries and court entertainments), artists' accounts (e.g., Cellini's theatricality), presentation drawings (Rosso's Mars and Venus), and other examples. Aided by theoretical readings on performance and performativity, we reconceive questions of the "meaning" of works, beyond iconography, as the product of practice and performance in which they are/were embedded.

HSAR 698b, Monuments and Other Containers of Memory. Sandy Isenstadt.

W 1.30–3.20

Architecture endures in at least two senses. First, it is usually made of hard stuff, which resists erosion over time. More importantly, it can remain meaningful long after those who built it are gone, both containing memories and prompting continued interpretation across generations. This has everything to do with the merits of a particular building, as well as the peculiar predicament of human memory. By looking at buildings and objects designed to preserve or, in some cases, induce memory, this seminar examines the political and cultural life of the built environment.

HSAR 704b, German Art of the Sixties. Christine Mehring.

M 3.30–5.20

This seminar examines the art produced in Germany during the 1960s. Themes to be discussed include the traditions of Expressionism and Romanticism, the strategies of anti-art and activist art, nationalism and the question of "German art," the influx of American culture, as well as the rise of consumerism and the art market. We consider prominent artists such as Gerhard Richter and Joseph Beuys as well as less known ones such as the early Jorg Immendorff, K. P. Brehmer, or Thomas Bayrle; the role of the Fluxus and Zero movements, Capitalist Realism, and various German Pop artists; and the figurative painting of Berlin's Großgorschen 35 and the Muchich Spur group.

HSAR 715a, Cinematic Landscapes in Postwar Europe. Noa Steimatsky.

t 11.30–3 (film screenings included)

This seminar traces a trajectory of postwar European film production that privileges actual locations, the landscape of the everyday, as arenas where realist and modernist discourses converge. Focus on the work of Antonioni, Rossellini, Bresson, Godard, Straub-Huiller, and Akerman, among others. Discussion of the periodizing of film history, new articulations of cinematic space and temporality, the tracing of action and affect, the restoration of identity in the quotidian landscape. *Also FILM 811a.*

HSAR 718a, American Novel 1895–1910. Alexander Nemerov.

Th 1.30–3.20

In this seminar we read works by Kate Chopin, Stephen Crane, Harold Frederic, Henry James, Jack London, and Frank Norris. We also consult secondary scholarship by authors such as Bill Brown, Michael Fried, Amy Kaplan, and Mark Seltzer. Our aim is twofold: first, to develop skills of literary interpretation; and second, to use the literature to open new ways of understanding the era's visual arts. *Also AMST 718a.*

HSAR 719b, The Sense of Place in American Art. Alexander Nemerov.

Th 3.30–5.20

Place is both ubiquitous and invisible in studies of American art. So many works of American art deal centrally with place — Church's *Mt. Ktaadn*, Thayer's *Mt. Monadnock*, Homer's Prout's Neck paintings, Bingham's Missouri pictures, to name just a few. Others concern a sense of place more obliquely: de Kooning's paintings in (and maybe of) the Hamptons, for example, or de Kooning's and Kline's in (and of) New York. Still further, we as art historians routinely speak of paintings being located in certain museums in certain cities, and we travel to see them

there: in some way, the actual painting's physical location is also about a poetics of place. Yet for the most part these locations remain unstudied. In this seminar, we theorize the role of place in poetry and painting, and build historically specific readings of certain American meditations on place, dating from the early nineteenth century through the work of the abstract expressionists. *Also AMST 719b.*

HSAR 737b, Craft and Design in Post-World War II America. Edward Cooke, Jr.

w 3.30–5.20

In the two decades after World War II economic prosperity and cultural optimism led to the golden age of American industrial design and the expansion of craft education programs in the universities. The term designer/craftsman was a respected label. Yet, by the 1970s crafts, design, and art were three separate spheres. This seminar draws on period writings and artifactual examination to explore the interconnections of craft and design in the 1950s, their subsequent fragmentation, and recent attempts to build connections. *Also AMST 737b.*

HSAR 746a, Art and Architecture of Mesoamerica A.D. 800–1000. Mary Miller.

m 1.30–3.20

A time of unusual international activity that saw contact range from lower Central America to the U.S. Southwest, the years 800–1000 were also fractious and troubled ones in Mesoamerica. This seminar examines the wealthy cities and enclaves that mounted successful campaigns of art and architecture in this era, particularly Seibal and Chichen Itza in the south, Tula, Cacaxtla, and Xochicalco to the north. Particular attention is given to new architectural forms of the period, particularly as developed in southern Campeche and the Puuc region.

HSAR 778b^u, From West Africa to the Black Americas. Robert Thompson.

tth 11.30–12.45

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. *Also AFAM 728b^u.*

HSAR 779a^u, New York Mambo: Microcosm of Black Creativity. Robert Thompson.

tth 11.30–12.45

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. *Also AFAM 729a^u.*

HSAR 781a, Problem and Theory in Afro-Atlantic Architecture I: Africa.

Robert Thompson.

th 3.30–5.20

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 – Ituri Forest and Namibian spatial solutions, Berber casbah architecture and its interactions with the Jews on Djerba isle and in Morocco, the concept of the Muslim *assatayab* creolized into the Iberia *azotea* and the spread of this terrace-roof style throughout Latin America. 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. The seminar ends with the shrine architecture of New World adherents of the classical religions of Dahomey. *Also AFAM 739a.*

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

Th 3.30–5.20

A continuation of HSAR 781a. *Also AFAM 739b.*

HSAR 818a, The Illustrated Scroll in Japan and Its Theorization.

Mimi Yiengpruksawan.

W 3.30–5.20

What is the nature of pictorial narrative in classical Japan? How does the illustrated scroll, the *emaki*, formulate and punctuate this discourse? What are the formal and functional modalities of the *emaki*, its religious and societal iconographies? The seminar addresses these and related issues in a comprehensive exploration of the narrative scroll for its multiple ramifications, pictorial and textual, in the visual field and as a social project.

history of medicine and science

L-132 Sterling Hall of Medicine, 785.4338

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

Chair

John Harley Warner

Director of Graduate Studies

To be announced

Faculty

John Heilbron (*Visiting, History*), Frederic Holmes, Daniel Kevles (*History*), Martin Klein (*Emeritus, Physics*), Susan Lederer, David Musto (*Child Study*), Naomi Rogers (*Women's & Gender Studies*), William Summers (*Molecular Biophysics & Biochemistry*), John Harley Warner

Affiliated Faculty

Robert Gordon (*Geophysics & Applied Mechanics*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Cynthia Russett (*History*), Frank Snowden (*History*), Frank Turner (*History*)

Fields of Study

Fields of study can be pursued in all periods and areas of the history of medicine and science. Special fields of interest of the core and affiliated faculty include history of medical ethics, Arabic science and medicine, American medicine, disease, therapeutics, psychiatry, alcohol and drug abuse, women in science and medicine, science and medicine in Asia, history of physics, chemistry, physiology, biochemistry, microbiology, molecular biology, and neurobiology.

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

Students are normally required to pass reading proficiency requirements in French and German. A student intending to concentrate in a field or period that requires another foreign language, ancient or modern, may, with approval, substitute that language for either French or German.

Students will ordinarily take twelve term courses during the first two years. All students will normally take the graduate seminar HSHM 601a/602b (Introduction to the History of Medicine, Public Health, and Science), four additional graduate seminars in history of science or medicine, and one graduate seminar 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.

Students who enter having previously completed graduate work may negotiate some reduction in the total course requirement at Yale, the amount being contingent on the extent and nature of the previous work and its fit with intended future work.

All students are expected to demonstrate, prior to entering on their dissertation work, a general command of two of the three fields of: (1) history of the life sciences; (2) history of medicine; (3) history of the physical sciences. This competence may be acquired through a combination of course work taken at Yale or elsewhere and preparation for the oral examination.

Students will normally spend the summer following their second year preparing for the oral qualifying exam to be taken soon after the beginning of the third year. The student will be examined in four fields:

1. One broadly based field, to be chosen from areas such as the following:

History of the life sciences before 1800

History of the life sciences since 1800

History of medicine before 1800

History of medicine since 1800

History of the physical sciences before 1800

History of the physical sciences since 1800

History of a major science, such as chemistry, geology, astronomy, or physiology, without period

History of science or medicine in a major geographic region, such as the history of medicine in America

2 & 3. Two fields with content and boundaries to be established by agreement with the adviser for each field. If the broadly based field (no. 1, above) is in history of science, at least one of these fields must fall within the history of medicine, and vice versa. One of these two fields may be in an area of history outside of medicine or science.

4. One field in an area of history outside of history of science or medicine.

Students in the History of Medicine and Science teach in their third and fourth years of study.

Master's Degrees

M.Phil. and M.A. (en route to the Ph.D.). See Graduate School requirements, page 375.

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 and submit an acceptable master's paper. Course work must include the graduate seminar HSHM 601a/602b and one additional graduate seminar in history of medicine or science. The remaining courses are to be chosen in consultation with the director of graduate studies.

Program materials are available upon request to the Director of Graduate Studies, History of Medicine and Science, Yale University, PO Box 208015, New Haven CT 06520-8015.

Courses

HSHM 601a, Introduction to the History of Medicine and Public Health.

John Warner, Susan Lederer.

m 1.30–3.20

An examination of the variety of approaches to the social and cultural history of medicine and public health. Readings are drawn from recent literature in the field, sampling writings on health care, illness experiences, 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, region, and religion 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. *Also HIST 930a.*

HSHM 602b, Introduction to the History of Science. John Heilbron, Frederic Holmes.

w 1.30–3.20

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 both with the road map of the development of science in general and of its major branches over this period, and an acquaintance with various approaches that historians have followed in interpreting these events. *Also HIST 931b.*

HSHM 620a^u, Gender, Science, and Sexuality. William Summers.

t 9.30–11.20

Examination of the history of the scientific study of sexuality. Primary and secondary sources, covering the Middle Ages to the present, are used in considering theological, taxonomic, psychoanalytic, ethnological, and molecular approaches to the study of sexual practice. Special attention paid to how these studies both reflect and construct gender ideology.

[HSHM 622b^u, Introduction to the History of Life Sciences.]

[HSHM 625a^u, Women and Medicine in America from the Colonial Era to the Present.]

HSHM 631b^u, The Cultures of Western Medicine: A Historical Introduction.

John Warner.

mW 10.30–11.20

A survey of medical thought, practice, institutions, and practitioners from classical antiquity through the present. Changing concepts of health and disease in Europe and America explored in their social, cultural, economic, scientific, technological, and ethical contexts.

[HSHM 637b^u, Race and Medicine in America, 1800–2000.]

[HSHM 642a^u, Plagues, Old and New.]

HSHM 643a^u, Nuclear America. Daniel Kevles.

t 7–8.30

A history of the nuclear enterprise from its pre-World War II origins to recent times, covering its military and civilian uses and its impact on scientific research and on the environment, regional economies, and American politics and culture. *Also HIST 940a^u.*

[HSHM 645b^u, Medical Ethics in America since 1847.]

HSHM 676a^u, The Engineering and Ownership of Life. Daniel Kevles.

w 1.30–3.20

The development of biological knowledge and controlling relation to intellectual property rights in living organisms. Topics include agribusiness, medicine, biotechnology, and patent law. *Also HIST 938a^u.*

HSHM 677b^u, Biology and Society in the Twentieth Century. Daniel Kevles.

mw 11.30–12.45

An exploration of issues in the understanding, engineering, and control of life. Focus on the history of genetics, molecular biology, and biotechnology and their interaction with politics, economics, law, and culture, mainly in the United States. *Also HIST 939b^u.*

HSHM 678a^u, Alcohol and Other Drugs in American Culture. David Musto.

tth 10.30–11.20

The interrelation of alcohol and other drugs since the establishment of the nation. Considerations of scientific, religious, legal, literary, gender, and minority aspects.

HSHM 679b^u, The Scientific Revolution. John Heilbron.

tth 1.30–2.45

A survey of the natural science that developed between the Age of Discovery and the French Revolution. The course covers the background in Aristotelian philosophy; the shift from geocentric to heliocentric astronomy; the replacement of scholastic natural philosophy by the ideas of Galileo, Descartes, and Newton; the roles of the Catholic and Protestant churches, universities, and learned academies; the invention and improvement of scientific instruments; and the science of the Enlightenment. *Also HIST 618b^u.*

HSHM 680a^u, History of Chinese Science. William Summers.

w 3.30–5.20

A study of the major themes in Chinese scientific thinking from antiquity to the twentieth century. Emphasis on non-Western concepts of nature and the development of science in China, East-West scientific exchanges, and China's role in modern science.

[HSHM 711b, Experimentation in the History of Life Sciences.]**HSHM 714b^u, Science and Technology in the Twentieth Century. Daniel Kevles.**

t 7–8.30

An examination of the development of the scientific and technological enterprise in Europe and the United States, including its major intellectual achievements, academic and industrial institutions, relationship to war and the state, and standing in general culture. Among topics that might be considered are atomic, nuclear, and particle physics, genetics and molecular biology, microelectronics and computers. *Also HIST 933b^u.*

HSHM 718, Performance, Identity, and the Making of American Medicine.**John Warner.**

An exploration of the shaping of American medical culture, especially during the late nineteenth and early twentieth centuries, focusing on the ways that healers' identities were constructed, perceived, and contested. Themes include conceptions of orthodoxy and alterity; the relationship between European and American notions of the moral, social, political, technical, and epistemological grounding of professional identity; struggles over the place and meaning of "science" in the healer's identity; and medicine and modernity. Case studies examine the fashioning of identities for the medical marketplace and more private constructions of self, with attention to gender ethnicity, race, religion, and region. Readings engage the recent historiography of the field and explore self-representations of practitioners in primary texts ranging from diaries to prescriptive literature, as well as popular depictions in novels and visual media.

HSHM 723, Making the Modern Body. Susan Lederer.

An examination of the ways in which the human body has become both a site for medical and surgical practices and a source of tissues and tools for therapeutic purposes in twentieth-century America. Topics include the scientific developments and social and cultural implications of such technologies as organ transplantation, plastic surgery, and in vitro fertilization, with attention to gender, race, religion, and cultural representations of the body—male and female, living and dead, animal and human.

[HSHM 724^u, **Methods and Literature in the History of Science and Medicine.**]

HSHM 725a, History of Disease and Public Health in Western Societies.

Naomi Rogers.

t 9.30–11.20

An exploration of recent approaches to understanding the history of disease and public health in Western societies. Topics in this reading seminar, which focuses on the nineteenth and twentieth centuries, include bodies and cities; contested definitions of disease, contagion, and pollution; illness, healing, and popular culture; medicine and empire; health care, the state, and charity; health education; and industrial disease and health policy. *Also HIST 942a.*

[HSHM 912a, **Reading Seminar in the History of Disease and Public Health in America.**]

[HSHM 913b, **Reading Seminar in the History of Life Sciences.**]

HSHM 914a or b, Research Tutorial I.

By arrangement with faculty.

HSHM 915a or b, Research Tutorial II.

By arrangement with faculty.

[HSHM 919b, **Research Seminar in the History of Medicine and Science.**]

HSHM 920a or b, Independent Reading.

By arrangement with faculty.

HSHM 930a or b, Independent Research.

By arrangement with faculty.

immunobiology

FMB 410, 785.3857

Ph.D. (M.S., M.Phil. en route)

Chair

Richard Flavell

Director of Graduate Studies

Peter Cresswell [F] (TE 404)

David Schatz [Sp] (FMB 410, 737.2255, bbs.immunol@yale.edu)

Professors

Jeffrey Bender (*Internal Medicine*), Alfred Bothwell, Kim Bottomly, Joseph Craft (*Internal Medicine*), Peter Cresswell, Richard Flavell, Sankar Ghosh, Charles Janeway, Jr., Paula Kavathas (*Laboratory Medicine*), Ira Mellman (*Cell Biology*), Jordan Pober, Nancy Ruddle (*Epidemiology & Public Health*), David Schatz, Robert Tigelaar (*Dermatology*)

Associate Professors

Fadi Lakkis (*Nephrology*), Mark Shlomchik (*Laboratory Medicine*)

Assistant Professor

Ruslan Medzhitov

Fields of Study

The graduate program in Immunobiology is designed to prepare students for independent careers in research and teaching in Immunology or related disciplines. Training and research focus on the molecular, cellular, and genetic underpinnings of immune system function and development, and on host-pathogen interactions. Specific areas of interest include: B- and T-cell development, activation and effector functions; the role of cytokines in immunoregulation; intracellular signaling and the control of transcription in lymphocytes; antigen processing and presentation; immunoglobulin and T-cell receptor gene rearrangement; B-cell memory; the immunobiology of vascular endothelial cells; innate immunity; and B- and T-cell tolerance. Mechanisms of autoimmunity and immunodeficiency are a major interest, and a number of important human diseases are under study, including diabetes, systemic lupus erythematosus, multiple sclerosis, AIDS, and a variety of other infectious diseases.

The 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. Students enter the Immunobiology graduate program after completing their first year in the Biological and Biomedical Sciences (BBS) graduate program. Students from any of the tracks of BBS may enter the program. Hence, Immunobiology has close ties with other graduate programs in the biological sciences at Yale.

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, and neurobiology. Research seminars and informal interactions with other graduate students, postdoctoral fellows, and faculty also form an important part of graduate education. Three laboratory rotations ensure that first-year students quickly become familiar with the variety of research opportunities available at Yale. Thesis research begins at the end of the first year, and students are encouraged to develop rigorous and creative approaches to examine significant problems in immunology and biology. At the end of the program, the completed research is presented in the form of a written dissertation and a formal seminar.

Special Admissions Requirements

Applicants should have strong previous research experience and a strong academic background in biology, chemistry, and genetics with course work in physics and mathematics preferred. Submission of the GRE General Test is required. Submission of the Subject Test in Biology or Biochemistry is preferred.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences (see pages 59–61).

Special Requirements for the Ph.D. Degree

Students take two to three courses in the Yale Graduate School during each of their first four terms. Required courses are: IBIO 530a, Biology of the Immune System; IBIO 531b, Advanced Immunology; IBIO 600a, Introduction to Research; IBIO 601b, Fundamentals of Research; and two seminar courses covering special topics in immunology (these courses emphasize the methods and logic of research, how to read and critically evaluate the literature, and how to write a research proposal). 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 an advisory committee made up of faculty from the Section of Immunobiology, as well as the director of graduate studies.

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.

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;

(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.

Students are expected to teach two one-term courses during their graduate careers, usually during the second and third years.

Master's Degree

M.S. may be awarded to a student who is in good standing upon completion of at least two terms of graduate study. Note that a High Pass average is required for obtaining a master's degree.

Our 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

IBIO 530a, Biology of the Immune System. Kim Bottomly and staff.

mwf 9.30–10.20

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens; autoimmunity. *Also MCDB 530a^U.*

IBIO 531b, Advanced Immunology. Ruslan Medzhitov 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.

IBIO 537a, Advanced Immunology Seminar: Lymphocyte Development.

David Schatz, Charles Janeway, Robert Tigelaar.

htba

This seminar course considers the molecular and cellular aspects of the development of B and T lymphocytes. Topics covered include lineage commitment and cell fate determination, transcription, signaling, gene rearrangement, and cellular selection and homeostasis. The course emphasizes reading of the primary literature, and important components of student evaluation include class participation and a term paper written in the form of an NIH grant.

IBIO 600a, Introduction to Research. David Schatz and staff.

th 5

Introduction to the research interests of the faculty. Required for all first-year students. Pass/fail.

international and development economics

27 Hillhouse, 432.3626

M.A.

Director

Robert Evenson

The Department of Economics offers a one-year program of study in International and Development Economics, leading to the Master of Arts degree. With a few exceptions, students are from outside the United States, primarily the developing countries. Many students in the program have experience in central banks, foreign ministries, planning agencies, and other public and private agencies concerned with international economics and development, although some enter the program directly from their undergraduate school.

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 GREs and the Test of English as a Foreign Language (TOEFL) examination are also required.

Preference is given to candidates recommended by their employing agencies or institutions and financed by their employers during the study leave. Yale fellowship funds are not available.

The course program requires the completion of eight term courses, five of which are specifically designed for the program and are required; the remaining three are electives. These required courses are designed to provide an understanding of the basic economic theory necessary for economic policy analysis.

An option of a second year of nondegree elective study is available to qualified students.

Joint program options for study with the School of Management and the School of Forestry & Environmental Studies are also available. Admission to these joint programs is determined by the participating professional school and must be obtained prior to beginning either program. Joint-degree students earn both the Master of Arts degree and the Master of Business Administration or the Master of Environmental Studies degree.

Program materials are available upon request to the Director, International and Development Economics Program, Yale University, PO Box 208269, New Haven CT 06520-8269.

international relations

International Affairs Council
Yale Center for International and Area Studies
210 Luce Hall, 34 Hillhouse, 432.3418
M.A.

Chair

John Gaddis (*History*)

Associate Chair and Director of Graduate Studies

Cheryl Doss (*Economics*) (223 Luce Hall, 432.9395, cheryl.doss@yale.edu)

Professors

Abbas Amanat (*History*), Ivo Banac (*History*), Michele Barry (*Medicine*), Beatrice Bartlett (*History*), Seyla Benhabib (*Political Science*), Frank Bia (*Medicine*), Paul Bracken (*Management*), William Burch, Jr. (*Forestry & Environmental Studies*), Paul Bushkovitch (*History*), David Cameron (*Political Science*), James Crowley (*History*), Deborah Davis (*Sociology*), Michael Dove (*Forestry & Environmental Studies*), Eduardo Engel (*Economics*), J. Joseph Errington (*Anthropology*), Daniel Esty (*Forestry & Environmental Studies; Law*), Robert Evenson (*Economics*), William Foltz (*Political Science*), Paul Freedman (*History*), John Gaddis (*History*), Penelope Goldberg (*Economics*), Roger Gould (*Sociology*), Timothy Guinnane (*Economics*), Koichi Hamada (*Economics*), Valerie Hansen (*History*), Robert Harms (*History*), Paula Hyman (*History*), Gilbert Joseph (*History*), Donald Kagan (*History*), Stephen Kellert (*Forestry & Environmental Studies*), William Kelly (*Anthropology*), Paul Kennedy (*History*), Ilona Kickbusch (*Epidemiology & Public Health*), Benedict Kiernan (*History*), Harold Koh (*Law*), Anthony Kronman (*Law*), Theodore Marmor (*Management*), Enrique Mayer (*Anthropology*), Robert Mendelsohn (*Forestry & Environmental Studies*), John Merriman (*History*), Michael Merson (*Epidemiology & Public Health*), William Nordhaus (*Economics*), Curtis Patton (*Epidemiology & Public Health*), Merton Peck (*Economics*), Gustav Ranis (*Economics*), W. Michael Reisman (*Law*), John Roemer (*Political Science*), Susan Rose-Ackerman (*Political Science, Law*), Frances McCall Rosenbluth (*Political Science*), Bruce Russett (*Political Science*), Lamin Sanneh (*Divinity; History*), T. Paul Schultz (*Economics*), Stuart Schwartz (*History*), James Scott (*Political Science*), Martin Shubik (*Management*), Helen Siu (*Anthropology*), Frank Snowden (*History*), Jonathan Spence (*History*), T. N. Srinivasan (*Economics*), Ivan Szelenyi (*Sociology*), Frank Turner (*History*), Christopher Udry (*Economics*), John Wargo (*Forestry & Environmental Studies*), Ruth Wedgwood (*Law*), Robin Winks (*History*), Jay Winter (*History*)

Associate Professors

Nora Groce (*Epidemiology & Public Health*), Jean Lanjouw (*Economics*), Philip Levy (*Economics*), K. Geert Rouwenhorst (*Management*)

Assistant Professors

Arun Agrawal (*Political Science*), Michael Auslin (*History*), Jennifer Bair (*Sociology*), Lynne Bennett (*Forestry & Environmental Studies*), Kent Buse (*Epidemiology & Public Health*), Jose Cheibub (*Political Science*), Brian Cowan (*History*), Keith Darden (*Political Science*), Seth Fein (*History*), Anna Grzymala-Busse (*Political Science*), Mary Habeck (*History*), Anastassios Kalandrakis (*Political Science*), Lawrence King (*Sociology*), Sharon Kinsella (*Sociology*), Kavesh Koshnood (*Epidemiology & Public Health*), Pierre Landry (*Political Science*), Richard Lindsey (*Management*), Pauline Jones Luong (*Political Science*), Ellen Lust-Okar (*Political Science*), Michael Mahoney (*History*), M. Victoria Murillo (*Political Science*), Mridu Rai (*History*), Linda-Anne Rebhun (*Anthropology*), Nicholas Sambanis (*Political Science*), Kenneth Scheve (*Political Science*), Andrew Schrank (*Sociology*), Timothy Snyder (*History*), Steven Stoll (*History*), Christopher Timmins (*Economics*), James Vreeland (*Political Science*), Leonard Wantchekon (*Political Science*)

Lecturers

George Andreapolis (*Epidemiology & Public Health*), Marian Chertow (*Forestry & Environmental Studies*), Giancarlo Corsetti (*Economics*), Cheryl Doss (*Economics*), Debbie Humphries (*Epidemiology & Public Health*), Jean Krasno (*Political Science*), Eric Mood (*Epidemiology & Public Health*), Nancy L. Ruther (*Political Science*), James Sutterlin (*Political Science*)

Adjunct & Visiting Professors

Albert Fishlow (*Adjunct, Management*), Henry Huttenbach (*History*), William Odom (*Adjunct, Political Science*), Patricia Pessar (*Adjunct, Anthropology/American Studies*)

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. degree in economics, history, or political science. Joint degrees, as well as concentrations within the M.A. program, are offered with the School of Management, the Law School, the School of Forestry & Environmental Studies, and the Department of Epidemiology and Public Health.

Special Admissions Requirements

Applicants must take the GRE General Test and should preferably do this by the October testing date; students whose native language is not English must pass the Test of English as a Foreign Language (TOEFL) in October with a minimum score of 610 on the paper-based test or 253 on the computer-based test. Entering students must have taken introductory courses in microeconomics and macroeconomics prior to matriculation.

Special Requirements for the Master's Degree

The substantive core consists of six graduate-level courses: two history courses (one regional and one great power); two in political science (one in world or comparative politics and one in international relations); and two graduate-level courses in economics (one economic analysis and one international economics). In addition, all first-year students are required to take the workshop in international relations (see course description below for INRL 700a).

Beyond the core courses, each student must identify a coherent set of courses and demonstrate their academic integrity as a proposed concentration for approval by the director of graduate studies. The concentrations require a minimum of eight and a maximum of ten courses in the fields selected. Some of the courses are cross-listed in two or more departments. Students are able to develop concentrations based on a topical, regional, or disciplinary focus.

M.A. candidates are required to achieve an average grade of High Pass in graduate courses plus a minimum of two grades of Honors in term courses, one of which will normally be achieved during the first year. For each grade of Pass, there must be an additional grade of Honors.

political economy of trade, development, or business

Within a broad field of political economy, students generally specialize in one of the professional arenas of trade, international business, or international development by taking eight courses beyond the core. They must take three to five additional courses in economics and politics directly related to their professional specialization and at least one of these courses must be in quantitative methods in the first term to prepare for advanced course work. Students specializing in trade or business must complete their concentration by taking an additional three to five relevant courses in law, management, finance, health resource administration, and/or environmental and natural resources policy. Students focused on development should complete their concentration with three to five relevant additional courses in anthropology, management, epidemiology, health resource administration, and/or environmental and natural resources policy.

international security

A specialization in international security is available in conjunction with International Security Studies (ISS). Concentrations in security studies are usually based on courses in history, political science, law, and management. Concentrations of security studies are often combined with a focus on a world region. Students may draw on resources available through United Nations Studies at Yale. Other courses can be selected in consultation with the director of graduate studies of the IR Program.

world regions

It is also possible to undertake concentrations with emphasis on a single geographic region by electing additional courses relating to a specific area. YCIAS councils, including African Studies, East Asian Studies, European Studies, Latin American and Iberian Studies, and Southeast Asia Studies, provide a wealth of research, teaching, and enrichment activities. M.A. degrees in African Studies, East Asian Studies, and Russian and East European Studies are available through these YCIAS councils.

natural resource management and environmental policy

A concentration in natural resource management and environmental studies requires a student to meet two basic objectives. First, to develop core knowledge in the natural sciences that are relevant to natural resource management and the environment. Second, to understand the social, economic, and political setting through which natural resources are utilized. To achieve the first objective, a student will normally complete, while at Yale, a minimum of four natural science courses concerning the problems of managing air, water, or land, or plant or animal resources. To achieve the second objective, a student will normally complete four courses at Yale that deal with the economic, political, or social aspects of natural resource management and the environment. In addition, a student concentrating in natural resources also may enroll in the summer technical training modules in plant identification, vegetation measurement, and land measurement. The School of Forestry & Environmental Studies teaches these immediately prior to the beginning of the fall term. Students in the IR Program who wish to concentrate in F&ES should design an individualized program with a faculty member in the school in conjunction with the DGS of the IR Program.

law and human rights

For those concentrating in international law, a minimum of four term courses is required in the Law School. In addition, a student must select four additional courses that may be outside the Law School to fulfill his or her professional qualifications in the field. With a human rights legal focus, four to six of these eight courses would concentrate on the topic.

public health

Students wishing to concentrate in public health should take between four and six courses in the Department of Epidemiology and Public Health. These should include basic courses in health services administration and epidemiology as well as specialized courses in international health and environmental health. Students in the International Relations Program who wish to concentrate in public health should design an individualized program with a faculty member in that department in conjunction with the DGS of the IR Program.

academic disciplines

For those who wish to concentrate in a single discipline like history, economics, or political science, an additional six courses in the chosen field beyond the core requirement are required. In economics and political science, at least one of these courses must be in quantitative methods, taken in the first semester to set the stage for more advanced course work. In history, courses must include at least one research seminar, two in modern history, including diplomacy and international relations, and two in modern history of an area or country outside North America and Europe. In political science, courses must include one additional course beyond the core in international relations, in comparative politics or a region or country, and in political economy. In economics, the concentration must include at least one term course in the economics of a world region, in development economics, and in international economics.

other

Other individually developed concentrations are possible provided they are well conceived, intellectually coherent, and relevant to the student's career direction. In all instances, approval must be obtained from the director of graduate studies.

Language Requirements

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. For international students whose native language is not English, the language requirement may be fulfilled by demonstrated competence in English. Students pursuing joint degree programs must fulfill all language requirements before beginning the program because of the compressed schedule for other course work. 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.

Special Requirements for the Joint-Degree Programs

Joint-degree candidates must fulfill all of the requirements of both programs in which they are enrolled. Joint-degree students must fulfill the requirements of both programs before receiving either degree. Joint-degree candidates are required to fulfill the core and concentration requirements of the International Relations Program. An overlap of two courses is allowed between core and concentration, and a maximum of an additional two courses may be 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 International Relations 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.

Program materials are available upon request to International Relations, Yale University, PO Box 208206, New Haven CT 06520-8206.

Courses

INRL 510, Ethnic Violence in Global Perspective. Arjun Appadurai.

th 2.30–4.20

This course looks at several major cases of large-scale ethnocidal conflict since the 1980s, and seeks to examine what links large-scale bodily violence to crises of identity, memory, and sovereignty in the contemporary world.

INRL 552a, Globalization and Violence: Interdisciplinary Perspectives.**Arjun Appadurai.**

W 3.30–5.20

This seminar uses the intensive reading of eight or nine monographs as the basis for intensive discussion of ethnic violence in the era of globalization. The course raises questions about the relationship between the crises of national states in the era of globalization, and addresses related forms such as censuses, constitutions, and citizenship policies in the formation of the conditions of identification. In analyzing how routine identities can become mobilized in ethnocidal forms of identification, the course seeks to define the ways in which large-scale forms and technologies for producing ethnicized forms of attachment, set the conditions for experiences of uncertainty and anger that accompany the bodily excesses of much large-scale contemporary ethnic violence. The course is concerned with the general methodological problem of relating scales to forms in social life, and in the related problem of the historical breaks implied by the idea of “globalization.” The readings and class discussions deliberately focus on problems that cut across the social sciences, such as those of state cultures, crowd dynamics, genocidal stereotyping, and the making of modern minorities. A cultural perspective — one focusing on various dimensions of contextual meaning — serves to probe the limits of various disciplinary languages and images in regard to the politics of violence.

INRL 555b, Theories of International Relations. Bruce Russett.

t 1.30–3.20

We analyze a variety of theories of international relations to evaluate their logical structure, empirical support, and relation to policy concerns and to other theories. Topics include theories under such categories as realism, liberal-institutionalism, and feminism. Open only to IR students.

INRL 560a, Economic Analysis. Cheryl Doss.

mw 9–10.15

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. *Also ECON 544a.*

INRL 561b, International Economic Analysis. Cheryl Doss.

m 1–3.20

A continuation of 560a. Extends the use of economic analysis to international economic issues including international trade, growth and development, and international finance. In addition, emphasis is placed on quantitative tools and analysis of data to address international economic issues and evaluate policies. *Also ECON 708b.*

INRL 578b, Crony Capitalism, Development, and Reform in Asia. David Kang.

t 1.30–3.20

Why did Asia’s economies grow so quickly? Why did the financial crisis of 1997 occur? Why and to what extent have these countries reformed their government-business relationship? This master’s level course provides an overview of the Asian economies and focuses on South Korea, the Philippines, and Taiwan, although we may cover other countries as well. The course concentrates on understanding competing theories for development and reform, emphasizing a neoclassical economic model and an institutional model and their critiques. Although detailed knowledge of each individual country is not required, those students with less comprehensive training should expect to spend some time catching up. Topics covered include the basic analytic models, the historical context, the relative importance of the international system versus domestic politics, bureaucratic politics, government-business relations, corruption, and reform.

INRL 700a, International Affairs: Core Issues and Approaches. Nancy Ruther.

th 1–3,50

Current and traditional issues facing international-affairs professionals explored through case study analysis, simulation, readings, and discussion with faculty from related disciplines and professions as well as current practitioners. Focus on negotiation and strategic management tools for understanding and analyzing the complex interactions of different aspects of international affairs. Course emphasizes refining problem solving, presentation, and organizational skills needed by professionals entering the field. International Affairs Fellow Minh Luong will participate in the course. For first-year IR students.

INRL 730a^U, The United Nations and the Maintenance of International Security.**James Sutterlin.**

m 1.30–3.20

Consideration of the role of the U.N. in preventing diplomacy, using force for peacekeeping, 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 undergraduates only.

INRL 750b, Challenges in International Relations: Policy and Practice. Staff.

The Yale Stimson Seminar is taught by a series of practitioners who address three major international policy themes in three modules from the perspective of government, NGOs, and business. Recent themes have included: information technology and diplomacy, investment and international development, government of the global environment, rethinking national and international security, and avoiding disaster in global public health. Open to all graduate and professional students. Admission is by application only.

INRL 900a or b, Directed Reading.

By arrangement with faculty.

investigative medicine

Department of Medicine

Edward S. Harkness Building (ESH), basement 18–20, 785.6842

Ph.D.

Director of Graduate Studies

Keith Joiner (*Internal Medicine*) (invmed@info.med.yale.edu)

Deputy Director

Sharon Inouye (*Internal Medicine*)

Faculty

A broad range of faculty from clinical and basic science departments participate in this program.

Fields of Study

The purpose of this program is to create a special training pathway for highly select physicians in clinical departments who are interested in careers in biomedical research. This program is designed to develop a broad knowledge base, analytical skill, creative thinking, and the hands-on experience demanded of clinical researchers devoted to disease-oriented and patient-oriented investigation. It will provide the candidate with individualized experience encompassing formal course work and practical experience, under the supervision and mentorship of a senior faculty member.

Trainees enter the program with a broad range of experience and interests. Trainees can undertake thesis work in a variety of disciplines, including: evaluating risk factor and interventions for disease using modern concepts in quantitative methods and clinical study design; investigating the biochemical, physiologic, and genetic basis for disease in the setting of a Clinical Research Center; or exploring the molecular basis for a disease from the laboratory standpoint.

Special Admissions Requirements

The Investigative Medicine program is designed for students with an M.D. degree who have completed two or more years of postgraduate clinical training. Application to the program may be made concurrently with application for subspecialty training in a clinical department at Yale. To be eligible for the Investigative Medicine program, the candidate must first be accepted into a subspecialty program (including General Medicine), at which point the candidate may apply to the Investigative Medicine program. Students will typically be involved in clinical training in their subspecialty for the first twelve to twenty-four months after arrival, and thus will enter the Investigative Medicine program after having completed two to five years of postgraduate clinical training. Prospective students who are already in a subspecialty clinical program at Yale may also apply to the Investigative Medicine program anytime during the first two years of that training (approximate).

The most important criterion for selection into the program is the commitment of the applicant to rigorous training in clinical investigation. Successful candidates will also need evidence of high academic achievement in undergraduate and medical-school courses and completion of residency training. Test scores from the USMLE are required, and (if available) the American Board of Internal Medicine, Pediatrics, Neurology, or other relevant subspecialty disciplines.

Special Requirements for the Ph.D. Degree

The minimum course requirements for the doctorate program are nine (9) courses. These consist of three one-term core courses: Principles of Clinical Research, Translational Research and Molecular Tools Part I, and Practical and Ethical Issues in Clinical Investigation; one yearlong seminar course: either Seminars in Clinical Investigation or Seminars in Molecular Medicine; one intensive practical course: either Translational Research and Molecular Tools Part II or Quantitative Clinical Epidemiology; an introductory biostatistics course; the independent reading course in Investigative Medicine; and a minimum of two electives in the specific research area. Full-time course work will extend over twelve months, usually starting in July. Students must enroll in a minimum of two courses each term. The majority of course requirements may be completed in twelve months, with elective courses often taken in the second year. To complete course requirements, students must achieve the grade of Honors in two courses (one course if a full-year course). When requirements are met (typically at the end of the first year), students submit their thesis proposal and undertake a qualifying exam. In order to be admitted to candidacy, students must pass written and oral examinations and submit a prospectus which has been approved by their qualifying committee. The remaining degree requirements include completion of a dissertation project, the writing of the dissertation, and its oral defense. It is expected that most trainees will complete the program in four years.

Courses

IMED 610, Translational Research and Molecular Tools Part II. Elisabetta Ullu.

mtwhf 8.30–6

This is an intensive, full-time two-week lecture and laboratory course. Currently, the emphasis is on protein and nucleic acid biochemistry, and on gene expression profiling through DNA microarray experiments. The lectures complement and extend the laboratory experience. The laboratory course requires full-time commitment. Consent of instructor required. Two weeks, August.

IMED 620, Translational Research and Molecular Tools Part I. Keith Joiner.

mtwhf 2–4

Genomics: In this section, the student becomes familiar with both the underlying theory and the practical application of genetic sequence analysis. Lectures are supplemented with computer laboratory sessions to reinforce the ideas and to provide practical experience. The ideas presented in this course are critical for molecular experimental design, interpreting results of sequencing projects, inferring gene function from primary genetic sequence data, and managing molecular biology data. **Structure-Based Drug Design:** In this section, students learn the underlying principles in structure-based drug design. Lectures are supplemented with

computer laboratory sessions devoted to practical learning of basic principles in protein structure determination, analysis, and relationship to molecular drug design. Clinically relevant examples of this approach are considered. Consent of instructor required. Two weeks, July–August.

IMED 625, Principles of Clinical Research. Sharon Inouye.

mtwthf 2–4

The purpose of this two-week intensive course is to provide an overview of the objectives, research strategies, and methods of 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; challenges in using statistics in clinical research; causal inference; decision analysis. Sessions include lectures and discussion of readings distributed in advance. Consent of instructor required. Two weeks, July.

IMED 630a, Practical and Ethical Issues in Clinical Investigation. Henry Binder.

w 3.30–5

This term-long course addresses topics which 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, medical writing, 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 write, obtain funding for, conduct, and present a clinical study. Consent of instructor required.

IMED 635a or b, Directed Reading in Investigative Medicine. Keith Joiner.

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. Fourteen sessions are required; dates/times by arrangement. Consent of instructor required.

IMED 640a,b, Seminars in Molecular Medicine. Keith Joiner.

m 3–4.30

This year-long seminar course focuses on the details of the basic investigation of the biochemistry, cell biology, genetics, immunology, and molecular biology of human disease from a sophisticated perspective. At each session, articles on the basic laboratory investigation of a disease or disease process (which is well understood at the molecular level) are selected by the faculty. Faculty provide an overview of the topic, followed by discussion of the articles in a seminar format. Consent of instructor required.

IMED 650a,b, Seminars in Clinical Investigation. Sharon Inouye.

w 1–3

This year-long seminar course explores the interface between clinical strategies and methodologies used to investigate these topics. A variety of topics are covered in an interactive seminar format. Articles are selected by the faculty, and students review and discuss the articles at each session. In addition, students gain experience in critical evaluation of study designs and protocol development (in the fall term), and grant writing and reviewing, medical writing/abstract presentation (in the spring term). Attendance and active participation are required. The course gives new clinical investigators tools to conduct their own research project. Consent of instructor required.

italian language and literature

82–90 Wall Street, 432.0595

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

Chair

Giuseppe Mazzotta

Director of Graduate Studies

Olivia Holmes [F] (Silliman 1837, 432.8299, olivia.holmes@yale.edu)

Giuseppe Mazzotta [Sp] (82–90 Wall, Rm 404, 432.0598,

giuseppe.mazzotta@yale.edu)

Professors

Giuseppe Mazzotta, Paolo Valesio, Guido Guglielmi (*Visiting* [F])

Associate Professor

Olivia Holmes (*on leave* [Sp])

Assistant Professors

Francesca Cadel, Kristin Phillips (*on leave*)

Senior Lecturer 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 individual courses of study, 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 year, the progress of beginning students 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. 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. After 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. For further details, see 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 page 375).

Alternatively, the Department of Italian Language and Literature offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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 552b, Italian Lyric Poetry from Middle Ages to Renaissance. Staff.

m 3.30–5.20

An exploration of Italy's vernacular lyric tradition from its emergence in the thirteenth century through its flowerings in the sixteenth, with special attention to the emergence of the genre of the autobiographical *Canzoniere* and to the ascendance of the modern authorial self. Poets studied may include those of the *Scuola Siciliana* and *Dolce stil novo*, Boccaccio, Petrarca, Poliziano, Lorenzo de' Medici, Sannazaro, Boiardo, Bembo, Vittoria Colonna, Gaspara Stampa, Veronica Franca, and Michelangelo.

ITAL 640a, Topics in Renaissance Epic. Giuseppe Mazzotta.

t 3.30–5.20

A study in some detail of three outstanding epics of the Italian Renaissance: Pulci's *Morgante*, Boiardo's *Orlando Inamorato*, and Ariosto's *Orlando Furioso*. The course stresses such issues as the clashes between Christians and Moslems, the continuity of the epic tradition, the recreation of medieval chivalric material, Renaissance theories of comedy, and perspectivism. The guiding idea is the examination of the specific ways in which the three poets represent history, theology, and politics in their texts. The course also investigates the impact of the intellectual, historical, and political events of fifteenth-century Italy on the construction of the poems.

ITAL 761a^U, The Prose and Thought of a Poet: Giacomo Leopardi. Paolo Valesio.

w 3.30–5.20

Leopardi's crucial importance as one of the founders of modern poetry on the international scene is in large part due to the depth of his philosophical thought and to the brilliant counterpart and context in prose of his output in verse. We study his dramatic dialogues (*Operette morali*), his critical and social essays, and his uniquely rich journal (*Zibaldone*), with reference to other philosophical-poetical experiences, like those represented by English Romantic writings and by Soeren Kierkegaard's *Journals*. Also *CPLT 814a*.

ITAL 770b^U, Poetry, Poetics, and Modernism. Paolo Valesio.

w 3.30–5.20

In the first half of the twentieth century, Italian poetry shows an exceptional variety of voices and a great distinction of achievements. After a review of the creative continuations of Symbolism (some representative work by d'Annunzio and Pascoli, and the *Crepuscolari*), and of the historical avant-garde (Futurism), the course concentrates on the Modernists, especially Dino Campana, Umberto Saba, Giuseppe Ungaretti, Eugenio Montale, Salvatore Quasimodo, and Cesare Pavese. We consider these authors in their international context and study their poetry in a dialectical and critical connection with their statements of poetics; in so doing, we test various approaches to the analysis of poetry.

ITAL 920b, Petrarch and Boccaccio. Giuseppe Mazzotta.

t 3.30–5.20

An examination of some of the major poetic and moral works of these two classics of the Italian Trecento. The readings range from Petrarch's *Canzoniere* and *On His Own Ignorance*, to

Boccaccio's *Decameron* and the *Genealogy of the Gentile Gods*. Their discussion takes place in the context of the classical tradition, and of patristic and vernacular poetic experiments.

ITAL 930a, Literary Criticism and the Science of Literature. Guido Guglielmi.

m 3.30–5.20

The relationship between text and history, an exploration of current discussions on literary criticism, with particular attention to the temporal dimension of the literary text.

Judaic Studies

451 College, 432.0843

Chair

Steven Smith

Professors

Steven Fraade (*Religious Studies*), Benjamin Harshav (*Comparative Literature*), Christine Hayes (*Religious Studies*), Paula Hyman (*History; Religious Studies*), Ivan Marcus (*History; Religious Studies*), Chaim Milikowsky (*Visiting, Religious Studies*), Daniel Schwartz (*Visiting, Religious Studies*), Steven Smith (*Political Science*)

Assistant Professor

Israel Koren (*Visiting, Religious Studies*)

Lecturers

Beth Berkowitz (*Religious Studies*), Rebecca Kobrin (*History*)

Lectors

Ayala Dvoretzky (*Near Eastern Languages & Civilizations*), Neta Stahl (*Near Eastern Languages & Civilizations*)

Judaic Studies is an interdisciplinary and interdepartmental field drawing upon the study of languages, history, literature, religion, and culture of the Jews. Jewish society, texts, ideologies, and institutions are studied in comparative perspective in the context of the history and culture of the nations among whom Jews have lived and created throughout the ages and across the continents.

Graduate-level programs are available through the following departments: *History* (Medieval and Modern Jewish History), *Religious Studies* (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 Chairperson, Judaic Studies Program, Yale University, PO Box 208287, New Haven CT 06520-8287.

council on latin american and iberian studies

Luce Hall, 34 Hillhouse, 432.3422

Chair

Gilbert Joseph (*History*)

Professors

Rolena Adorno (*Spanish & Portuguese*), Mark Ashton (*Forestry & Environmental Studies*), Michele Barry (*Medicine*), Frank Bia (*Medicine*), Arturo Bris (*School of Management*), Richard Burger (*Anthropology*), Hazel Carby (*African American Studies; American Studies*), Carlos Eire (*History*), Eduardo Engel (*Economics*), Owen Fiss (*Law*), Paul Freedman (*History*), Roberto González Echevarría (*Spanish & Portuguese*), K. David Jackson (*Spanish & Portuguese*), Gilbert Joseph (*History*), Ilona Kickbusch (*Epidemiology & Public Health*), Vera Kutzinski (*American Studies; African American Studies; English*), Juan Linz (*Emeritus, Political Science; Sociology*), Florencio Lopez-de-Silanes (*School of Management*), Josefina Ludmer (*Spanish & Portuguese*), Enrique Mayer (*Anthropology*), Robert Mendelsohn (*Forestry & Environmental Studies*), Mary Miller (*History of Art*), Florencia Montagnini (*Forestry & Environmental Studies*), Gustav Ranis (*Economics*), Michael Reisman (*Law*), T. Paul Schultz (*Economics*), Stuart Schwartz (*History*), James Scott (*Political Science*), Robert Thompson (*History of Art*), Noël Valis (*Spanish & Portuguese*), Bryan Wolf (*American Studies; English*)

Associate Professors

Philip Levy (*Economics*), Patricia Pessar (*Adjunct, American Studies*), Linda-Anne Rebhun (*Anthropology*)

Assistant Professors

Jennifer Bair (*Sociology*), Jennifer Baszile (*History*), Richard Bribiescas (*Anthropology*), José Cheibub (*Political Science*), Seth Fein (*History*), Mary Habeck (*History*), Guillermo Irizarry (*Spanish & Portuguese*), Kellie Jones (*History of Art*), Jaime Lara (*Divinity*), Oscar Martín (*Spanish & Portuguese*), Kathleen McAfee (*Forestry & Environmental Studies*), M. Victoria Murillo (*Political Science*), Simone Pinet (*Spanish & Portuguese*), Stephen Pitti (*History*), Lidia Santos (*Spanish & Portuguese*), Alicia Schmidt-Camacho (*Spanish & Portuguese*), Andrew Schrank (*Sociology*), Michael Veal (*Music*)

Lecturers

Antonio Ladeira (*Spanish & Portuguese*), Jordano Quaglia (*Spanish & Portuguese*), Nancy Ruther (*Political Science*)

Although there is no advanced degree in Latin American and Iberian Studies at Yale, graduate and professional students may draw upon resources of many departments in order to make Latin America and/or Iberia their field of concentration while working toward their respective degrees in conventional disciplines. In addition, a graduate program in International Relations offers an M.A. degree centered on political science and

economics with possibilities for a Latin American emphasis, and the Department of History and the Council on Archaeological Studies offer M.A. degree programs that allow a Latin American concentration. In all cases, the University's Council on Latin American and Iberian Studies can assist the graduate student in designing a balanced and coordinated curriculum.

The council supplements the graduate curriculum with term-long, thematically integrated lecture series and special seminars as well as conferences that bring visiting speakers 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 other departments, schools, and independent groups at Yale, and as the 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 445,000 printed volumes, plus newspapers and microfilms, CD-ROMs, films, sound recordings, maps, and musical scores. 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.

The Yale library's Iberian collections comprise several hundred thousand volumes as well as newspapers, microfilms, electronic publications, films, maps, and musical scores. The collections are particularly strong in literature and history. Works collected include all languages and literatures of the peninsula, including Catalan, Gallegan, Basque, and Bable. The Yale libraries also have substantial collections of publications and research materials from Spain and Portugal, relating to most disciplines in the humanities and social sciences.

Program materials are available upon request to the director of graduate studies of the department of intended specialization. Information about supplemental resources in Latin American studies should be addressed to the Council on Latin American and Iberian Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; e-mail, latin.america@yale.edu; Web site, www.yale.edu/las/.

linguistics

370 Temple, Rm 204, 432.2450
M.A., M.Phil., Ph.D.

Chair

Stephen Anderson

Director of Graduate Studies

Louis Goldstein (320 HGS, 432.2453, louis.goldstein@yale.edu)

Professors

Stephen Anderson, Paul Bloom, Carol Fowler (*Adjunct*), Roberta Frank, Louis Goldstein, Laurence Horn, Stanley Insler, Frank Keil, Hugh Stimson

Associate Professor

Dianne Jonas

Assistant Professors

Maria Babyonyshev, Darya Kavitskaya, Maria Piñango, Charles Yang

Lector

Seema Khurana

Director, African Language Program

Ann Biersteker

Director, Center for Language Study

Nina Garrett

Supporting Faculty in Other Departments

Stephen Colvin (*Classics*), 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, Indo-European, Germanic linguistics, and African linguistics.

Special Admissions Requirements

Two terms of two ancient Indo-European languages, preferably Latin and Greek, are required for the Indo-European program.

Special Requirements for the Ph.D. Degree

Language Requirements: By the end of the second year, students must demonstrate knowledge of two research languages, either by passing a translation examination in the language, or by presenting a piece of research which relies in significant part on sources in

the foreign language. A one-term language description course, a field methods course, or a course in the structure of a non-Indo-European language is also required.

Course Requirements: Sixteen term courses at the graduate level. Required courses in syntax, phonology, phonetics, morphology, semantics, and historical linguistics will be taken during the first two years. Remaining course work during the first two years in residence will be selected so as to prepare the student in some substantial subfield of linguistics.

Program Requirements: At the end of the second year, each student will take an examination in some subfield of linguistics and also present samples of work demonstrating knowledge of the core areas of the field: syntax, phonology, and historical linguistics. By the end of the third year, the student should have presented two substantial research papers of publishable quality in different areas of linguistics. By the end of the seventh semester, students should have defended a dissertation prospectus.

Dissertation Requirements: Students are expected to complete their dissertations by the end of the sixth year. A dissertation defense is required after submission.

Teaching Fellow and Research Assistantship Requirements: Teaching experience is regarded 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 in the third or fourth years of study. Two additional terms of assistantship are also required, either in the form of additional participation in the Teaching Fellow Program, through participation in externally supported, supervised research (e.g., NSF Fellowship), or by serving as an assistant on a research project. Research assistantships are provided by the Linguistics faculty (e.g., from research grants) and by various Yale and Yale-affiliated units. Before accepting a research assistantship in fulfillment of the academic requirement, students must receive approval from the director of graduate studies. To be approved, an assistantship must meet the following criteria: (1) It must be under the supervision of a departmental faculty member or faculty at an affiliated unit, such as the Haskins Laboratories or the Yale School of Medicine. (2) It must provide research experiences that complement the student's academic plan of study. (3) It must provide at least 10 hours of experience per week. If a research assistantship is accepted in fulfillment of the department's academic requirement and if the assistantship provides a stipend less than the standard departmental stipend, a University Fellowship will be provided to bring the combined stipends up to the standard departmental stipend.

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

M.A. (en route to the Ph.D.). Students in the doctoral program who successfully complete the examinations and work samples required by the end of the second year of graduate study (see above) may petition for an 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 510b^u, Introduction to Linguistics. Darya Kavitskaya.**

mwf 10.30–11.20

The goals and methods of linguistics. The relation of linguistics to psychology, logic, and other disciplines. Basic concepts in phonology, morphology, syntax, and semantics. Techniques of linguistic analysis and construction of linguistic models. Trends in modern linguistics.

LING 512b^u, Historical Linguistics. Dianne Jonas.

mw 1–2.15, 1 htba

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.

LING 513a^u, Introduction to Indo-European Linguistics. Stanley Insler.

t 1.30–3.20

Location in space and time of the major branches of Indo-European; history of Indo-European studies, especially the development of methodology; sketch of the phonology, morphology, syntax, and lexicon of proto-Indo-European, with main developments of these in the daughter languages.

LING 515^u, Elementary Sanskrit. Stanley Insler.

mwf 10.30–11.20

Careful study of Sanskrit grammar both in its historical development and as the synchronic system attested in classical Sanskrit. Historical phonology and morphology treated in detail; comparison with other Indo-European languages. Close reading in later Sanskrit texts.

[LING 516b^u, Elementary Hittite.]**LING 517a^u, Language and Mind. Stephen Anderson.**

mw 2.30–3.45

Knowledge of language as a component of the mind: mental grammars, the nature and subdivisions of linguistic knowledge. 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. Representation of language in the brain. Use of linguistic knowledge in speaking; processing. Comparison between human spoken natural language and other systems (signed languages; nonhuman communication).

LING 520a^u, General Phonetics. Louis Goldstein.

mw 1–2.15

Investigation of possible ways of describing the speech sounds of human languages. Tools to be developed: acoustics and physiology of speech; computer synthesis of speech; practical exercises in producing and transcribing sounds.

LING 532a^u, Introduction to Phonological Analysis. Darya Kavitskaya.

tth 1–2.15

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.

LING 535b^u, Phonological Theory II. Stephen Anderson.

mw 11.30–12.45

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 532a or permission of instructor.

LING 541b^u, Language and Computation. Charles Yang.

mw 11.30–12.45

The computational study of natural language and the use of linguistic theories in applied problems. Topics include finite state tools, computational morphology and phonology, grammar and parsing, discourse models, machine translation, and language learning in children and machines. Prerequisite: LING 524 or CPSC 201a/b.

[LING 542b^u, Statistical Natural Language Processing.]

LING 553a^u, Syntax I. Dianne Jonas.

mw 11.30–12.45, 1 htba

Introduction to generative syntactic theory and argumentation. Phrase-structure analysis, constituent structure, motivation for syntactic transformations, constraints on rule application, and conditions on representations.

LING 561a^u, Introduction to Psycholinguistics. Maria Babyonyshev.

tth 11.30–12.45

The course covers central topics in three major areas of psycholinguistic research: language acquisition, language impairment, and real-time processing. The emphasis is on the relevance of this research to the study of the human mind and on the importance of theoretical linguistics as a tool of psycholinguistic investigation.

LING 563b^u, Language Acquisition. Charles Yang.

tth 11.30–12.45

Language learnability. Acquisition of the lexicon. Development of syntactic knowledge. Parameter-setting model of language acquisition and maturation. Experimental methods in developmental psycholinguistics.

[LING 565b^u, Development of Phonology.]

LING 580b^u, Morphology. Darya Kavitskaya.

mw 2.30–3.45

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).

[LING 582a^u, Introduction to Old Norse.]

[LING 583b^u, Readings in Old Norse Poetry and Prose: Chronicles of the Vikings.]

[LING 590a^u, Topics in the History of Linguistics.]

LING 602b^u, Comparative Old Germanic. Stanley Insler.

t 1.30–3.20

An examination and comparison of the oldest continental Germanic languages: Gothic, Old Saxon, and Old High German. Discussion of the grammatical differences and sample readings from Wulfila's Bible translation, *Heiland*, and *Hildebrandlied*. Prerequisite: course in Old English or Old Norse or modern German or permission of instructor.

LING 621b^u, The Relation of Speech to Language. Carol Fowler.

tth 2.30–3.45

A study of the relation between the speech signal and the linguistic message it conveys. Special attention to those characteristics of speech that fit it to humans and make it a uniquely efficient vehicle of communication. Also PSYC 605b^u.

LING 624a^u, Formal Foundations of Linguistic Theories. Charles Yang.

tth 9–10.15

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.

[LING 625, Second-Year Sanskrit.]

[LING 627, Sanskrit Legal Texts.]

[LING 630a, Speech Production.]

[LING 631b^u, Neurolinguistics.]**LING 636b^u, Articulatory Phonology. Louis Goldstein.**

tth 4–5.15

Introduction to phonology as a system for combining units of speech (constriction gestures of the vocal organs) into larger structures. Course includes both theory (reading) and practice (analysis of articulatory movement data; modeling using techniques of dynamical systems). Emphasis on universal vs. language-particular aspects of gestural combination and coordination.

LING 640a^u, Topics in Phonology: Sound Change. Stephen Anderson.

t 9.30–11.20

Discussion of the phonetic, phonological, and morphological bases of the traditional category of Sound Change (and its antagonist, Analogy), with the goal of understanding how this basic construct of historical linguistics should be understood within current linguistic theory. Prerequisites: LING 512b, 520a, 532a, 535b, or equivalents.

LING 641a^u, Field Methods. Darya Kavitskaya.

mw 2.30–3.45

The principles of phonetics, phonology, morphology, syntax, and semantics are applied to the collection and interpretation of novel linguistic data. Working directly with a speaker of a relatively unstudied language, the class as a group collects and analyzes the data.

LING 647b^u, Structure of Swahili. Ann Biersteker.

tth 4–5.15

Study of Swahili grammar. Phonology, morphology, and syntax of Swahili examined in detail. Topics also include Swahili dialects, history of Swahili, and comparison with other Bantu languages. *Also AFST 647b^u.*

LING 654b^u, Syntax II. Maria Babyonyshev.

tth 2.30–3.45

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.

[LING 656b^u, Grammatical Relations.]**LING 660b^u, Topics in Syntax: Sentence Processing. Maria Babyonyshev.**

tth 11.30–12.45

Recent models of sentence comprehension. Syntactic parsing strategies and mechanisms of reanalysis; the role of frequency, morphological, and discourse factors in sentence comprehension; individual and cross-linguistic differences in sentence processing. Prerequisites: LING 153/553 or permission of instructor.

LING 661b^u, Topics in Syntax: Celtic Syntax. Dianne Jonas.

t 9.30–11.20

The comparative syntax of the Celtic languages: Irish, Scottish Gaelic, Welsh, and Breton. Clause structure, verb-initial, and verb-second syntax from a synchronic and diachronic perspective within the principles-and-parameters framework. Prerequisite: one course in syntax.

[LING 662a^u, Topics in Syntax: Discourse-Motivated Movement.]**LING 663b^u, Semantics. Laurence Horn.**

tth 1–2.15

Lexical and truth-conditional semantics. Word meaning and semantic roles. Survey of propositional, predicate, and modal logic. Compositional theories of sense and reference. Opacity, intentionality, and belief contexts; entailment and presupposition. The relations between semantics and pragmatics, and between semantics and syntax.

[LING 675b^u, Pragmatics.]**[LING 676b^u, Implicature and Pragmatic Theory.]****[LING 680a^u, Topics in Morphology: Clitics.]****LING 720b^u, Basics of Digital Signal Processing and Speech Acoustics.****Louis Goldstein.**

w 1.30–3.20

A gentle introduction to concepts of digital signal processing for those without strong mathematics, engineering, or programming backgrounds. Application to techniques for acoustic analysis and synthesis of speech. Vocal tract acoustics. Course is taught through regular programming exercises in MATLAB, but no prior programming experience is assumed.

LING 760b, Seminar in Information Structure. Laurence Horn.

m 1.30–3.20

Approaches to the description of information packaging at sentence and discourse levels. The articulation of focus, topic/comment, theme/rheme, and given/new information. (In)-definiteness at the syntax/semantics/discourse interface and its explication in terms of “assumed familiarity,” “accessibility,” and “givenness.” Functional motivation for grammatical structures, rules, and constraints. The compatibility of formal and functional approaches to linguistic structure.

LING 761a, Seminar in Argument Structure. Maria Babyonyshev.

th 3.30–5.20

Current theories of argument structure and the lexicon-syntax interface. Topics include argument structure alternations, linking rules, and systematic lexical gaps. Descriptions and explanations of cross-linguistic variation in the organization of the lexicon. Permission of instructor.

[LING 770a, Learnability and Development.]**LING 771a, Language Creation and Language Change. Charles Yang.**

t 3.30–5.20

The study of creolization and language change from the perspective of language acquisition. Topics include the structure of creoles, acquisition under exceptional circumstances, grammaticalization, parameter setting and language change, formal models, and implications for the origin of language.

LING 777a, Current Research in Phonetics. Louis Goldstein.

th 3.30–5.20

Intensive discussion of selected research topics in phonetics, primarily in the areas of gestural structure and coordination, dynamical modeling, and articulatory-acoustic relations. Experi-

mental, analytical, and simulation methods are evaluated. Students are expected to have ongoing research projects and to present regular reports on their progress.

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.

HINDI 515^U, Elementary Hindi. Seema Khurana.

tth 2.30–3.45, w 4–5.15, 1 htba

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, this course provides cultural insights and is geared toward increasing proficiency in understanding, speaking, reading, and writing Hindi. Emphasis is placed on spontaneous self-expression in the language.

HINDI 530^U, Intermediate and Advanced Hindi. Seema Khurana.

tth 1–2.15, w 2.30–3.45, 1 htba

Through extensive use of cultural documents including feature films, radio broadcasts, as well as graded literary and nonliterary texts, this course continues to build students' proficiency in understanding, speaking, reading, and writing Hindi. Provides a space for meaningful interaction with authentic materials and their related cultures. Furthers the student's appreciation of cultural nuances. Introduces various Hindi literary traditions in the second half of the course. Prepares the student for further academic and nonacademic use of Hindi. Emphasis is placed on spontaneous self-expression in the language. After HINDI 515 or satisfactory placement test.

HINDI 557b^U, Modern Hindi Literature and Popular Culture. Seema Khurana.

tth 4–5.15, w (alt.) 5.30–7.30

An advanced language course designed to further develop the student's overall language skills through exposure to selected modern Hindi literature and popular culture. Focus on the works of Premchand, Manto, and Chughtai; various art forms including theater and film; debates informing the political, social, and cultural dimensions of the parent and related cultures as found in newspaper articles and television news reports. After HINDI 530 or satisfactory placement test.

The following courses are also of particular value to students in Linguistics:

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

See description under Anthropology.

[ANTH 533a^U, Bilingualism in Social Context.]

[ANTH 669a^U, Language, Nationalism, and Ideology.]

management

135 Prospect, 432.3955
M.A., M.Phil., Ph.D.

Director of Graduate Studies

Subrata Sen (55 Hillhouse, Rm 306, 432.6028, subrata.sen@yale.edu)

Professors

Rick Antle, Paul Bracken, Garry Brewer, Zhiwu Chen, Judith Chevalier, Ravi Dhar, Jonathan Feinstein, William Goetzmann, Jonathan Ingersoll, Edward Kaplan, Lode Li, Florencio Lopez-de-Silanes, Paul MacAvoy, Theodore Marmor, Barry Nalebuff, Sharon Oster, Benjamin Polak, Douglas Rae, K. Geert Rouwenhorst, Fiona Scott-Morton, Martin Shubik, Matthew Spiegel, Shyam Sunder, Arthur Swersey, Victor Vroom, Ivo Welch, Dick Wittink

Associate Professors

Sigal Barsade, Christopher McCusker

Participating Faculty from the School of Management

Arturo Bris, Martijn Cremers, Stanley Garstka, Roger Ibbotson, Andrew Jeffrey, Nathaniel Keohane, Jonathan Koppell, Erin Mansur, Dina Mayzlin, Brian Mittendorf, Ganapathi Narayanamoorthy, Nathan Novemsky, Rodney Parker, Peter Schott, Sandra Spataro, K. Sudhir

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 is required by the Graduate School. The GMAT Test may be accepted in some cases. 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 (see page 374), among which are 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 mid-November 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 two courses that are outside of the student's depth area. At least one of these courses must be from an *applied* area of management different from the student's own depth area. Breadth courses are selected by the student with the consent of the area faculty and the DGS.

Course requirement: Each student must complete a total of sixteen courses, achieving a grade of Honors in at least two courses, and a High Pass average in the other fourteen 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 sixteen 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 7o2a and MGMT 7oob, Seminar in Accounting Research III and I.

Rick Antle, Brian Mittendorf, Ganapathi Narayanamoorthy, Shyam Sunder.

This course examines research into accounting institutions. Topics are generally drawn from areas of income measurement, managerial evaluation, industry structure and regulation in the accounting industry, informational efficiency of public markets, and asset valuation models under incomplete markets.

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 queueing theory. Many real problems from various areas in manufacturing and service operations are covered throughout the course.

MGMT 740a, Financial Economics I. Jonathan Ingersoll.

Theory of single-period financial models. Risk aversion, stochastic dominance, the canonical portfolio problem, the fundamental theorem of asset pricing, mean-variance analysis and its uses, mutual fund separation theory, arbitrage pricing theory, asset pricing in complete markets, and selected empirical topics. *Also ECON 670a.*

MGMT 741b, Financial Economics II. 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. *Also ECON 671b.*

MGMT 742a, 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 offers, and mergers and acquisitions. The market microstructure half of the course 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 743b, Empirical Workshop in Accounting and Financial Economics.

William Goetzmann.

This is a doctoral-level course in the empirical analysis of financial data. The course reviews the historical development of empirical accounting and finance, beginning with the early development and tests of the efficient market paradigm and extending through modern evidence on market efficiency, trading profits, and information-based arbitrage. The course requires the reading of three to five research papers per week, regular presentations and discussion, and an empirical study of financial data.

MGMT 751a, Seminar in Marketing II. Dick Wittink.

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.**MGMT 753b, Behavioral Decision Making. Ravi Dhar, Nathan Novemsky.**

This seminar examines research on the psychology of judgment and choice. 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 choice, judgment heuristics and biases, decision framing, prospect theory, mental accounting, context effects, task effects, regret, 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. *Also PSYC 658b.*

MGMT 780a and b, Ph.D. Student Research Workshop.**MGMT 781a and b, Accounting/Finance Workshop. Arturo Bris.****MGMT 782a and b, Doctoral Student Pre-Workshop Seminar. 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
M.S., M.Phil., Ph.D.

Chair

Gregory Margulis

Director of Graduate Studies

Gregg Zuckerman (423 DL, 432.4198, zuckerman-gregg@yale.edu)

Professors

Richard Beals, Donald Brown (*Economics*), Andrew Casson, Ronald Coifman, Walter Feit, Michael Frame, Igor Frenkel, Howard Garland, Roger Howe, Peter Jones, Ravidran Kannan (*Computer Science*), Serge Lang, Ronnie Lee, Benoit Mandelbrot, Gregory Margulis, Vincent Moncrief (*Physics*), Steven Orszag, Ilya Piatetski-Shapiro, David Pollard (*Statistics*), Vladimir Rokhlin (*Computer Science*), Katepalli Sreenivasan, Efim Zelmanov, Gregg Zuckerman

Gibbs Instructors

Serguei Arkhipov, Greg Friedman, Aleksei Kazarnovskii-Krol, Bruno Klingler, Irina Kogan, Anna Mazzucato, Tim Riley, Gabriel Rosenberg, Agata Smoktunowicz, Song Wang, Jeb Willenbring, Catalin Zara

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; homological algebra; homotopy theory; the theory of fiber bundles; finite and infinite groups; Lie algebras, Lie groups and discrete subgroups; representation theory; automorphic forms, L-functions; algebraic number theory and algebraic geometry; mathematical physics, relativity; differential topology and algebraic K-theory; 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 (see page 373).

Master's Degrees

M.Phil. In addition to the Graduate School requirements (see page 375), 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. (en route to the Ph.D.). 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.

Master's Degree Program. Students may also be admitted to a terminal master's degree program that has the same requirements as the M.S. en route to the Ph.D., except that a sophisticated computer language may be substituted for French, German, or Russian in fulfillment of the language requirement. Full-time students must complete the program in two years, part-time students in three years. No financial aid is available.

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. Agata Smoktunowicz.

mwf 1.30–2.20

MATH 501b^U, Modern Algebra II. Uzi Vishne.

mw 1–2.15

MATH 515b^U, Intermediate Complex Analysis. Serge Lang.

tth 11.30–12.45

MATH 520a^U, Measure Theory and Integration. Gabriel Rosenberg.

tth 1–2.15

MATH 525b^U, Introduction to Functional Analysis. Richard Beals.

tth 1–2.15

MATH 530a, Equilibrium Analysis on Finite Data Sets. Donald Brown.

mw 1–2.15

This course investigates the central issues in the theory of competitive markets, i.e., existence, uniqueness, and tatonment stability of market clearing prices. We consider both the Walrasian and Marshallian theory of general economic equilibrium. The analysis differs from the

traditional approach to these topics in that we restrict attention to propositions derivable from finite data sets. These properties include counterfactuals, i.e., global comparative statics of market economics. *Also ECON 530a.*

MATH 544a, Introduction to Algebraic Topology. Andrew Casson.

mwf 10.30–11.20

MATH 545b, Introduction to Algebraic Topology II. Andrew Casson.

htba

MATH 553a^U, Introduction to Representation Theory. Igor Frenkel.

tth 11.30–12.45

Each term between ten and twelve advanced courses in different fields of study are offered by junior and senior faculty. In addition to the graduate courses, there are regular weekly seminars in algebra, analysis, topology, discrete mathematics, Lie groups, applied mathematics, and mathematical physics.

mechanical engineering

Dunham Laboratory, 432.4250

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

Chair

Marshall Long

Professors

Robert Apfel, Ira Bernstein, Boa-Teh Chu (*Emeritus*), Juan Fernández de la Mora, Alessandro Gomez, Robert Gordon, Amable Liñan-Martinez (*Adjunct*), Marshall Long, Lisa Pfefferle, Daniel Rosner, Ronald Smith, Mitchell Smooke, Katepalli Sreenivasan, George Veronis, Peter Wegener (*Emeritus*), Forman Williams (*Adjunct*)

Associate Professors

Udo Schwarz, Wei Tong

Assistant Professors

Jerzy Blawdziewicz, David Wu, Bjong Yeigh (*Adjunct*)

Lecturers

Beth Anne Bennett, Natalie Jeremijenko, Kailasnath Purushothaman, Glenn Weston-Murphy

Fields of Study

Mechanics of Fluids: Acoustics and bioeffects of ultrasound; bulk and surface properties of liquids (including metastable liquids, radiation-induced bubble formation, and surfactant-induced effects); dynamics and stability of drops and bubbles; experimental, theoretical, and computational studies of turbulence; chaos; fractals; aerodynamics; kinetic theory of gases and mixtures; electrospray theory and characterization; combustion and flames; computational methods for fluid dynamics and reacting flows; laser diagnostics of reacting and nonreacting flows; atmospheric turbulence, climate, theoretical and laboratory modeling of large-scale ocean circulation.

Mechanics of Solids/Material Science: Mechanisms of deformation, mass transport, and nucleation within material systems through experimental, analytic, and computational studies. Examples of projects include mechanical testing of small-scale structures; characterization of microscale inhomogeneities in plastic flow; impact loading of materials; diffusion of dopants within semiconductor films; evolution of surface roughness during plastic deformation; ion implantation–induced disorder in crystalline films; incorporation of microstructural information into constitutive laws; biomechanics of the heart; electromigration in metallic interconnects; and transient nucleation in multicomponent systems.

For admissions and degree requirements, and for course listings, see Engineering and Applied Science, pages 123–35.

medieval studies

53 Wall, Rm 324, 432.0672

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

Chair and Director of Graduate Studies

Lee Patterson

Professors

Marilyn McCord Adams, Robert Babcock, R. Howard Bloch, Gerhard Böwering, Walter Cahn, Carlos Eire, Margot Fassler, Roberta Frank, Paul Freedman, Ingeborg Glier, Walter Goffart, Harvey Goldblatt, Beatrice Gruendler, Dimitri Gutas, Valerie Hansen, Traugott Lawler, Bentley Layton, Ivan Marcus, Dale Martin, John Matthews, Giuseppe Mazzotta, María Rosa Menocal, Lee Patterson, Barbara Shailor, Paolo Valesio, Craig Wright

Assistant Professors

Jessica Brantley, Mark Burde, Maria Georgopoulou, Matthew Giancarlo, Olivia Holmes, Dianne Jonas, Jaime Lara, Nicole Rice, Ronald Rittgers, Anders Winroth

Lecturer

Laura King

Fields of Study

Fields in this interdisciplinary program include history, history of art, history of music, religious studies, language and literature, and philosophy.

Special Admissions Requirements

Both the General and the Subject Tests (in the student's strongest field) of the GRE are 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. Proficiency in Latin 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 pre-dissertation 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 Graduate School requirements, page 375. 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 (one of these courses must be one term of MDVL 551a or b, Seminar in Medieval Studies); (2) proficiency in Latin or Arabic 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.

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.

Program materials are available upon request to the Director of Graduate Studies, Department of Medieval Studies, Yale University, PO Box 208313, New Haven CT 06520-8313.

Courses

MDVL 550a or b, Directed Reading.

By arrangement with faculty.

MDVL 552b, Liturgical Drama and Its Setting in the Latin Middle Ages and the Latin New World. Margot Fassler, Jaime Lara.

m 1.30–3.30

microbiology

354 Boyer Center for Molecular Medicine, 737.2404
M.Phil., Ph.D.

Director of Graduate Studies

Joann Sweasy

Professors

Sidney Altman (*Molecular, Cellular & Developmental Biology*), Norma Andrews (*Microbial Pathogenesis*), Kim Bottomly (*Immunobiology*), Yung-chi Cheng (*Pharmacology*), Donald Crothers (*Chemistry*), Daniel DiMaio (*Genetics*), Jorge Galán (*Microbial Pathogenesis*), Nigel Grindley (*Molecular Biophysics & Biochemistry*), Margaret Hostetter (*Pediatrics*), Charles Janeway, Jr. (*Immunobiology*), Keith Joiner (*Internal Medicine*), K. Brooks Low (*Therapeutic Radiology*), Diane McMahon-Pratt (*Epidemiology & Public Health*), Robert Macnab (*Molecular Biophysics & Biochemistry*), I. George Miller (*Pediatrics*), L. Nicholas Ornston (*Molecular, Cellular & Developmental Biology*), Curtis Patton (*Epidemiology & Public Health*), John Rose (*Pathology*), Nancy Ruddle (*Epidemiology & Public Health*), W. Dean Rupp (*Therapeutic Radiology*), Clifford Slayman (*Cellular & Molecular Physiology*), Dieter Söll (*Molecular Biophysics & Biochemistry*), William Summers (*Therapeutic Radiology*), Peter Tattersall (*Laboratory Medicine*)

Associate Professors

Serap Aksoy (*Epidemiology & Public Health*), Susan Baserga (*Therapeutic Radiology*), Michael Cappello (*Pediatrics*), Erol Fikrig (*Internal Medicine*), Durland Fish (*Epidemiology & Public Health*), Margaret Riley (*Ecology & Evolutionary Biology*), Craig Roy (*Microbial Pathogenesis*), Joann Sweasy (*Therapeutic Radiology*), Elisabetta Ullu (*Internal Medicine*)

Assistant Professors

Louis Alexander (*Epidemiology & Public Health*), S. P. Dinesh-Kumar (*Molecular, Cellular & Developmental Biology*), Roger Ely (*Chemical & Environmental Engineering*), Akiko Iwasaki (*Epidemiology & Public Health*), Christine Jacobs (*Molecular, Cellular & Developmental Biology*), Walther Mothes (*Microbial Pathogenesis*), Christian Tschudi (*Internal Medicine*), Liangbiao Zheng (*Epidemiology & Public Health*)

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.

Program materials are available upon request from the Microbiology Graduate Program, Section of Microbial Pathogenesis, BCMM 354F, Yale University, New Haven CT 06536.

Special Requirements for the Ph.D.

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 and 671a), with different faculty members, in their area of interest. Laboratory rotations assure 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 level. 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 Graduate School requirements, page 375. Although the program does not formally offer a master's degree, students who have been admitted to candidacy qualify for an M.Phil.

Courses

MBIO 601a and b, Seminal Papers on the Foundations of Modern Microbiology.

Norma Andrews, Peter Tattersall.

w 5–6.30

A required course for Microbiology first- and second-year students; not for credit. Students present and discuss papers describing fundamental discoveries in areas related to Microbiology. The goal is to familiarize students with the process of scientific discovery, and with the history of major developments in the field. Topics include important discoveries involving major human pathogens, fundamental processes in molecular biology, and the development of technology that had a major impact in current biomedical research. Wednesdays: September 18, 25; October 2, 9, 16, 23, 30; November 6, 13, 20. March 5, 12, 19, 26; April 2, 9, 16, 23.

MBIO 642a, Roles of Microorganisms in the Living World. L. Nicholas Ornston,

Diane McMahon-Pratt, Robert Macnab.

tth 11.30–12.45

A topical course exploring the biology of microorganisms. Emphasis on mechanisms underlying microbial adaptations and how they influence biological systems. Prerequisites: biology, chemistry, biochemistry. *Also EMD 642a, GENE 642a, MB&B 642a, MCDB 642a.*

MBIO 664b, Biology of Parasitic Protozoa and Helminths. Serap Aksoy,

Curtis Patton.

tth 3

Human diseases caused by eukaryotic parasites are the most prevalent in the world. They are also important causes of mortality. Malaria alone is the leading killer of children under the age of five. This course focuses on the epidemiology, developmental biology, and cellular and molecular biology of the major eukaryotic parasites. We discuss the impact of these organisms on health in developing countries and also touch on the role of selected parasites on disease burden in the United States. The format consists of two one-hour lectures a week and a total of three laboratory demonstrations. *Also EMD 664b.*

MBIO 670a,b, Laboratory Rotation. Joann Sweasy.

Rotation in three laboratories. Required for all first-year graduate students.

MBIO 680a,b, Advanced Topics in Molecular Parasitology. Diane McMahon-Pratt,

Curtis Patton, Christian Tschudi.

f 12–1.30

A broadly based seminar course on current research topics in cell and molecular parasitology, with topics chosen from the current literature. *Also EMD 680a,b.*

MBIO 734a, Molecular Biology of Animal Viruses. Daniel DiMaio, Peter Tattersall,

Walther Mothes.

wf 9.30–10.45

Lecture course with emphasis on mechanisms of viral replication, oncogenic transformation, and virus-host cell interactions. *Also GENE 734a.*

council on middle east studies

Luce Hall, 34 Hillhouse, Ste 232, 432.5596

Chair

Abbas Amanat (*History*)

Professors

Abbas Amanat (*History*), Harold Attridge (*Religious Studies*), Ivo Banac (*History*), Gerhard Böwering (*Religious Studies*), Adela Yarbro Collins (*Divinity*), John J. Collins (*Divinity*), Benjamin Foster (*Near Eastern Languages & Civilizations*), Steven Fraade (*Religious Studies*), Beatrice Gruendler (*Near Eastern Languages & Civilizations*), Dimitri Gutas (*Near Eastern Languages & Civilizations*), Frank Hole (*Anthropology*), Stanley Insler (*Linguistics*), Bentley Layton (*Religious Studies*), Ivan Marcus (*History*), Ashgar Rastegar (*Medical School*), W. Michael Reisman (*Law*), Lamin Sanneh (*History*), Harvey Weiss (*Near Eastern Languages & Civilizations*), Robert Wilson (*Religious Studies*)

Associate Professor

Maria Georgopoulou (*History of Art*)

Assistant Professors

John Darnell (*Near Eastern Languages & Civilizations*), Frank Griffel (*Religious Studies*), Pauline Jones Luong (*Political Science*), Kaveh Khoshnood (*Epidemiology & Public Health*), Ellen Lust-Okar (*Political Science*)

Senior Lectors

Ayala Dvoretzky, Bassam Frangieh, Fereshteh Amanat-Kowssar

Lector

Neta Stahl

Librarians

Simon Samoeil (*Sterling Memorial Library*), Ulla Kasten (*Babylonian Collection*), Susan Matheson (*Yale University Art Gallery Ancient Arts*)

Students with an interest in the Middle East should apply to one of the University's degree-granting departments, like Anthropology, History, Linguistics, Near Eastern Languages and Civilizations, Political Science, or Religious Studies. The Council on Middle East Studies is part of the Yale 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.

Inquiries about Middle East Studies should be directed to the Council on Middle East Studies, Yale University, PO Box 208206, New Haven CT 06520-8206.

molecular biophysics and biochemistry

301 Josiah Willard Gibbs Laboratories, 432.5662

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

Chair

Thomas Steitz

Director of Graduate Studies

Nigel Grindley (301 JWG, 432.5662, mbb.grad@yale.edu)

Professors

Donald Crothers (*Chemistry*), Donald Engelman, Joseph Fruton (*Emeritus*), Alan Garen, Sankar Ghosh (*Immunobiology*), Nigel Grindley, Andrew Hamilton (*Chemistry*), Mark Hochstrasser, William Konigsberg, Peter Lengyel (*Emeritus*), Richard Lifton (*Genetics/Internal Medicine/Nephrology*), Robert Macnab, I. George Miller (*Pediatric Infectious Diseases*), Simon Mochrie (*Physics; Applied Physics*), Peter Moore (*Chemistry*), Anna Pyle, Charles Radding (*Genetics*), Lynne Regan, Frederic Richards (*Emeritus*), Gaston Schmir (*Emeritus*), Robert Shulman, Sofia Simmonds (*Emeritus*), Michael Snyder (*Molecular, Cellular & Developmental Biology*), Dieter Söll, Joan Steitz, Thomas Steitz, Scott Strobel, Julian Sturtevant (*Emeritus*), William Summers (*Therapeutic Radiology*), David Ward (*Genetics*), Kenneth Williams (*Adjunct, Research*), Harold Wyckoff (*Emeritus*)

Associate Professors

Mark Gerstein, Michael Koelle, Andrew Miranker, Mark Solomon, Sandra Wolin (*Cell Biology*)

Assistant Professors

João Cabral, Enrique De La Cruz, Lise Heginbotham, Anthony Koleske, Vinzenz Unger

Fields of Study

The principal objective of members of the department is to understand living systems at the molecular level. Areas of current interest include structure and function of biological macromolecules as determined by amino acid or nucleotide sequencing, diffraction, spectroscopic or computational analyses; mechanisms of enzyme action; bioenergetics, motility, and chemotaxis; structure and function of membranes, viruses, ribosomes, ribogymes, nucleosomes, ribonucleoprotein particles, and other macromolecular assemblies; developmental genetics; animal virology; plant molecular genetics; metabolic regulation; protein degradation; DNA transposition replication, recombination, and repair; regulation of RNA and protein synthesis; cell cycle; molecular immunology; chromosome segregation; nuclear organization.

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 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 (see pages 59–61).

Special Requirements for the Ph.D. Degree

All first-year students (except M.D./Ph.D.) take three laboratory rotations (MB&B 650a and 651b, 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. 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 attend the two departmental seminars: MB&B 675, Seminar for First-Year Students, and 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 teach two terms during their graduate careers, usually during the second and third years. The student selects a research adviser, usually from the department faculty, by the end of the second term of residence. At that time two additional faculty members are chosen to form a research committee. Requirements for admission to candidacy, which usually takes place after four terms of residence, are: (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. The qualifying examination, 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 committee includes at least one of the two members of the research committee excluding the thesis adviser, and the remaining one or two members are selected by the Qualifying Examination Committee. Once final drafts of the thesis chapters have been approved by the research committee, the student presents a dissertation seminar to the entire department, only after which 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 page 373).

Master's Degree

M.Phil. See Graduate School requirements, page 375. Awarded only to students admitted to candidacy who are continuing for the Ph.D. 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 (granted to students who are not continuing in the Ph.D. program). Note that a High Pass average is required for obtaining a master's degree.

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.

Program materials are available upon request to the Director of Admissions, Department of Molecular Biophysics and Biochemistry, Yale University, PO Box 208114, New Haven CT 06520-8114.

Courses

MB&B 600a^U, Principles of Biochemistry I. Michael Koelle, Donald Engelman.

tth 11.30–12.45

Rigorous introduction to the major concepts of biochemistry and to the process of discovery in this discipline, with emphasis on macromolecular conformation and physical processes in biochemistry. 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.

MB&B 601b^U, Principles of Biochemistry II. Joan Steitz.

tth 11.30–12.45

The chemistry and metabolism of nucleic acids, the mechanism and regulation of protein and nucleic acid synthesis, and selected topics in macromolecular biochemistry.

MB&B 625a^U, Basic Concepts of Genetic Analysis. Tian Xu, Michael Koelle, Richard Lifton, Shirleen Roeder, Michael Stern.

tth 1.05–2.20

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. *Also GENE 625a, MCDB 625a^U.*

MB&B 642a, Roles of Microorganisms in the Living World. L. Nicholas Ornston, Diane McMahon-Pratt, Robert Macnab.

tth 11.30–12.45

A topical course exploring the biology of microorganisms. Emphasis on mechanisms underlying microbial adaptations and how they influence biological systems. Prerequisites: biology, chemistry, biochemistry. *Also EMD 642a, GENE 642a, MBIO 642a, MCDB 642a.*

MB&B 650a and 651b, Lab Rotation for First-Year Students. Nigel Grindley.

Required for all first-year graduate students.

[MB&B 658a, Research Topics in Biophysics.]**MB&B 675, Seminar for First-Year Students. Michael Koelle, Andrew Miranker, and staff.**

f 4

Required for all first-year graduate students.

MB&B 676b, Responsible Conduct of Research. Lynne Regan and staff.

f 4

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 during the spring term, run in a seminar/discussion format. Required for all first-year graduate students. *Also C BIO 676b.*

MB&B 700b^U, Properties of Macromolecules. Lynne Regan, Vinzenz Unger, Mark Gerstein.

mw 11.30–12.45

Solution properties of macromolecules and current topics in biophysics, including electrostatics, hydrodynamics, enzyme kinetics, molecular dynamics, and multiple equilibria. Prerequisites: physical chemistry; biochemistry.

MB&B 701b3^U, Diffraction Methods. João Cabral, Vinzenz Unger.

tth 9–10.15

Biological applications of X-ray crystallography, small-angle X-ray, and neutron scattering and cryoelectron microscopy.

MB&B 701b4^U, NMR Methods. Andrew Miranker.

tth 9–10.15

Basic principles of NMR with emphasis on biological applications in the primary literature. Application areas include structure determination, drug binding, molecular recognition, protein folding, and in vivo metabolism. Prerequisites: physical chemistry and biochemistry.

[MB&B 704a^U, Structural Biology.]**MB&B 705a^U, Molecular Genetics of Prokaryotes. Nigel Grindley, Charles Radding, Joann Sweasy.**

mw 11.30–12.45

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. Required: previous or concurrent introductory courses in genetics and biochemistry. *Also GENE 705a, MCDB 505a^U.*

MB&B 710b4, Electron Cryo-Microscopy for Protein Structure Determination. Vinzenz Unger, Fred Sigworth.

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. *Also C&MP 710b.*

MB&B 741a^U, Structure and Chemistry of Proteins and Nucleic Acids.**Thomas Steitz.**

tth 11.30–12.45

Selected topics in the structure of proteins and nucleic acids; sequence dependent interactions between proteins and nucleic acids; chemical modifications of DNA; chemical studies of DNA-binding proteins; catalytic RNA. Prerequisite: biochemistry.

MB&B 743b^U, Molecular Genetics of Eukaryotes. Mark Hochstrasser, Anthony Koleske.

tth 11.30–12.45

Selected topics in regulation of gene expression, genome structure and evolution, signal transduction, cellular physiology, development, and carcinogenesis. Prerequisite: biochemistry or permission of the instructor. *Also GENE 743b^U.*

[MB&B 746a1, Advanced Biochemical Control.]**MB&B 749a^U, Medical Impact of Basic Science. Joan Steitz, Mark Hochstrasser, Andrew Miranker, and staff.**

tth 1–2.30

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: MB&B 600a^U/601b^U or permission of the instructor. *Also GENE 749a^U.*

MB&B 750a2, Biological Membranes. Vinzenz Unger, Donald Engelman, Lise Heginbotham.

mw 10–11.15

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.

MB&B 752a^U, Genomics and Bioinformatics. Dieter Söll, Mark Gerstein, Michael Snyder.

mw 1–2.15

Genomics describes the determination of the nucleotide sequence and many further analyses to discover functional and structural information on all the genes of an organism. Topics include the methods and results of functional and structural gene analysis on a genome-wide scale as well as a discussion of the implications of this research. Bioinformatics describes the computational analysis of genomes and macromolecular structures on a large scale. Topics include sequence alignment, biological database design, comparative genomics, geometric analysis of protein structure, and macromolecular simulation. Prerequisite: EEB 122b and MATH 115, or permission of the instructor. *Also MCDB 752a^U.*

[MB&B 760b^U, Principles of Macromolecular Crystallography.]**MB&B 775b, Advanced Seminar in Genetics:****[MB&B 800a, Molecular Mechanisms of Disease.]****MB&B 900a or 901b, Reading Course in Biophysics.**

Directed reading course in biophysics. Term paper required. By arrangement with faculty.

MB&B 902a or 903b, Reading Course in Molecular Genetics.

Directed reading course in molecular genetics. Term paper required. By arrangement with faculty.

MB&B 904a or 905b, Reading Course in Biochemistry.

Directed reading course in biochemistry. Term paper required. By arrangement with faculty.

The following courses are for students in the joint B.S./M.S. program with Yale College:

**MB&B 569b or MB&B 572b, Independent Research for B.S./M.S. Candidates.
Scott Strobel.**

**MB&B 570a or MB&B 571b, Intensive Research Seminar for B.S./M.S. Candidates.
Scott Strobel, Nigel Grindley.**

molecular, cellular, and developmental biology

Kline Biology Tower, 432.3538

M.S., Ph.D.

Chair

Michael Snyder

Director of Graduate Studies

Ronald Breaker (708 KBT, 432.9389, ronald.breaker@yale.edu)

Professors

Sidney Altman, Kim Bottomly (*Immunology*), John Carlson, Stephen Dellaporta, Xing-Wang Deng, Mary Helen Goldsmith, Timothy Goldsmith, Douglas Kankel, Michael Kashgarian (*Pathology*), Haig Keshishian, Perry Miller (*Anesthesiology*), Mark Mooseker, Jon Morrow (*Pathology*), Frederick Naftolin (*Obstetrics & Gynecology*), Timothy Nelson, L. Nicholas Ornston, Thomas Pollard, Shirleen Roeder, Joel Rosenbaum, Frank Ruddle, Alanna Schepartz (*Chemistry*), Steven Segal (*Physiology*), Michael Snyder, Robert Wyman

Associate Professors

Ronald Breaker, Craig Crews, Paul Forscher, Vivian Irish, Junhyong Kim (*Ecology & Evolutionary Biology*), Archibald Perkins (*Pathology*)

Assistant Professors

Savithramma Dinesh-Kumar, Scott Holley, Christine Jacobs, Frank Slack, David Wells, Weimin Zhong

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, cell surface receptors, protein transport, hormone action, mammalian transcription factors, 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 track, students are provided with unique opportunities for interdisciplinary studies.

To enter the Ph.D. program, students apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences (see pages 59–61).

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 required, preferably in Biology, or in Biochemistry, Cell and Molecular Biology.

Special Requirements for the Ph.D. Degree

None of the fields of study has a required curriculum of courses. With the help of a faculty committee, each student plans 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. When this is accepted by a dissertation committee of faculty members, when the committee is satisfied that the student has demonstrated competence in the areas necessary to conduct the proposed work, and when the other requirements indicated above are fulfilled, the student is admitted to candidacy for the Ph.D. (but no later than the end of the second year of study). 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 excluding the first year.

Honors Requirement

Students must meet the Graduate School's Honors requirement by the end of the fourth term of full-time study (see page 373).

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, or (b) by successfully completing an approved combination of courses and research and 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.

Program materials are available upon request to the Director of Graduate Studies, Department of Molecular, Cellular, and Developmental Biology, Yale University, PO Box 208103, New Haven CT 06520-8103.

Courses

MCDB 500a^U, Biochemistry. L. Nicholas Ornston, Robert Macnab.

mwf 9.30–10.20

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.

MCDB 505a^U, Molecular Genetics of Prokaryotes. Nigel Grindley, Charles Radding, Joann Sweasy.

mw 11.30–12.45

Molecular aspects of the storage, replication, evolution, and expression of genetic material in prokaryotes. *Also GENE 705a, MB&B 705a^U.*

MCDB 530a^U, Biology of the Immune System. Kim Bottomly and staff.

mwf 9.30–10.20

The development of the immune system. Cellular and molecular mechanisms of immune recognition. Effector responses against pathogens; autoimmunity. *Also IBIO 530a.*

MCDB 550a^U, Physiological Systems. Steven Segal and staff.

mwf 9.30–10.20

Regulation and control in the human body, emphasizing principles of feedback and the maintenance of homeostasis. Biophysical properties of cells, tissues, and organs are presented in light of the structural basis of physiological control. *Also C&MP 550a, ENAS 550a^U.*

MCDB 555b^U, Molecular Basis of Development. Xing-Wang Deng, Douglas Kankel, and staff.

mw 9–10.15

Current understanding of the molecular mechanism of cell signaling and development in multicellular organisms. Topics include the basics of cell signaling and experimental model organisms, cell proliferation and death, cell specification and determination, cell migration, hormonal regulation, and environmental regulation.

MCDB 560b^U, Cell and Molecular Physiology from Fundamental Mechanisms to Human Disease. Michael Caplan, Emile Boulpaep, Mark Mooseker.

mwf 9.30–10.20

Focus on understanding the processes that transfer molecules across membranes. Topics also include the different classes of molecular machines that mediate membrane transport. Emphasis on interactions among transport proteins in determining the physiologic behaviors of cells and tissues. *Also C&MP 560b.*

MCDB 570b^U, Biotechnology. Michael Snyder, Ronald Breaker, Kenneth Nelson, Joseph Wolenski.

mw 11.30–12.45

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, industrial agents, or for the further study of biological systems.

MCDB 600La, Advanced Biological Laboratory. Mike Snyder, Ronald Breaker, Xing-Wang Deng, Kenneth Nelson, Joseph Wolenski, David Austin, Frank Ruddle.

mw 1–5

A laboratory course to familiarize graduate students with state-of-the-art technologies in molecular biology, genomics. Students carry out research projects and incorporate their own projects into the lab. The class meets for two afternoons each week and consists of 2–3 week modules covering the following topics: microarray analysis, plant genetic engineering, mouse genetic engineering, imaging/microscopy, ribozyme enzymol/engineering, phage display/chemical biology.

MCDB 615b^U, Genetics and Molecular Biology of Plant Development.

Timothy Nelson and staff.

m 2.30–4.20

Genetic and molecular analyses of plant embryogenesis, organogenesis, and other topics in plant development.

MCDB 625a^U, Basic Concepts of Genetic Analysis. Tian Xu, Michael Koelle, Richard Lifton, Shirleen Roeder, Michael Stern.

tth 1.05–2.20

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. *Also GENE 625a, MB&B 625a^U.*

MCDB 642a, Roles of Microorganisms in the Living World. L. Nicholas Ornston, Diane McMahon-Pratt, Robert Macnab.

tth 11.30–12.45

A topical course exploring the biology of microorganisms. Emphasis on mechanisms underlying microbial adaptations and how they influence biological systems. *Also EMD 642a, GENE 642a, MB&B 642a, MBIO 642a.*

[MCDB 645b, Advanced Seminar in Cell Biology.]

MCDB 660a^U, Structure, Function, and Development of Vascular Plants.

Graeme Berlyn.

tth 2.30–3.45

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.

MCDB 670b, Advanced Seminar in Biochemistry and Genetics. Frank Slack, Ronald Breaker, Stephen Dellaporta.

w 1.30–3.45

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.

MCDB 677b, Mechanisms of Development. Lynn Cooley and staff.

mf 9.45–11

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 and critical analysis of primary literature. *Also GENE 777b.*

MCDB 685b^U, Evolutionary Developmental Biology. Günter Wagner, Vivian Irish, Michael Donoghue.

tth 1–2.15

This course is an introduction into an emerging biological discipline, evolutionary developmental biology. The course provides an introduction to the evolutionary biology of developmental processes as well as the developmental underpinnings of major evolutionary transformations. Topics include the evolution of Hox genes and other developmental genes, the origin of multicellular organisms, the evolution of flowers, and the origin of the arthropod and vertebrate Bauplan. The course has a mixed lecture/seminar format and thus engages the student to do independent study and prepare papers. Entering graduate students are expected to complete a unique research project and present in a lecture format to the class. *Also E&EB 685b^U.*

MCDB 692a, Advanced Seminar in Cell Biology: Mechanisms of Signal Transduction. Craig Crews.

m 7–10

Discussion/seminar course with special emphasis on the molecular signal transduction mechanisms of mitogenesis and cell division.

MCDB 720a^U, Neurobiology. Haig Keshishian, Paul Forscher.

mwf 11.30–12.20

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. *Also NBIO 720a, NSCI 720a.*

MCDB 721La^U, Laboratory for Neurobiology. Haig Keshishian, Robert Wyman, Stephen Senft.

t or w 1.30–6

Optional laboratory. Introduction to the neurosciences. Projects include the study of neuronal excitability, sensory transduction, CNS function, synaptic physiology, and neuroanatomy.

MCDB 735b^U, Brain Development and Plasticity. David Wells.

mwf 2.30–3.45

Interpretation of primary literature including recent reviews and basic research papers in the areas of neuron generation and regeneration, neuron phenotype determination, axon guidance systems, and the role of activity in organizing and increasing the efficiency of synaptic connections. *Also NSCI 504b.*

MCDB 752a^U, Genomics and Bioinformatics. Dieter Söll, Mark Gerstein, Michael Snyder.

mw 1–2.15

Genomics describes the determination of the nucleotide sequence and many further analyses to discover functional and structural information on all the genes of an organism. Topics include the methods and results of functional and structural gene analysis on a genome-wide scale as well as a discussion of the implications of this research. Bioinformatics describes the computational analysis of genomes and macromolecular structures on a large scale. Topics include sequence alignment, biological database design, geometric analysis of protein structure, and macromolecular simulation. *Also MB&B 752a^U.*

MCDB 861b^U, Global Problems of Population Growth. Robert Wyman.

tth 2.30–3.45

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.

MCDB 900a and 901b, First-Year Introduction to Research and Rotations.

Ronald Breaker.

th 5

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 end of this course, students complete a detailed prospectus describing their thesis project, and the work completed thus far. An oral and written presentation of this prospectus is evaluated by the adviser and two faculty members; the evaluation will determine whether the student may continue in the program.

MCDB 595, Intensive Research in MCDB for B.S./M.S. Candidates.

A four-credit course (two credits each term) that is similar to MCDB 495 and spans the last two terms (i.e., typically the senior year). During this course, students give an oral presentation describing their work. At the end, a comprehensive thesis is turned in and evaluated by the adviser and two other faculty members. Students must earn a B grade or higher in this course in order to receive the M.S. degree.

music

143 Elm, 432.2985
M.A., M.Phil., Ph.D.

Chair

Patrick McCreless

Director of Graduate Studies

James Hepokoski (143 Elm, 432.2991, james.hepokoski@yale.edu)

Professors

Margot Fassler, Allen Forte, Michael Friedmann (*Adjunct*), James Hepokoski, Patrick McCreless, Robert Morgan, Leon Plantinga, Ellen Rosand, Craig Wright

Associate Professors

Kathryn Alexander, Daniel Harrison (*Visiting [F]*), Richard Lalli (*Adjunct*), Kristina Muxfeldt

Assistant Professors

David Clampitt, Eric Drott, John Halle, Robert Holzer, Michael Veal

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 including extended papers, compositions, 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 sixteen courses, are normally required. Students in the music theory program must pass examinations in two foreign languages: German and normally French, Latin, or Italian. For students in the music history program, German and two other languages are required. Language examinations, partly with dictionary and partly without, are administered at the beginning of each term. A practicum exam (ear training, keyboard, and basic theory and analysis) is given to all entering students. Admission to candidacy for the Ph.D. must occur before the end of the third year of study. It is granted if the student has received a grade of Honors in two full-year courses or in four term courses, has passed the language and qualifying examinations, and has submitted an acceptable dissertation prospectus. The departmental qualifying examination is given near the beginning of the third year and all language requirements must be satisfied by that time. Students attend a weekly prospectus/dissertation seminar

during the third year of study. Before the end of that year, the student must submit a dissertation prospectus for faculty approval.

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 also 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 Graduate School requirements, page 375.

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.

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.

Program materials are available upon request to the Director of Graduate Studies, Department of Music, Yale University, PO Box 208310, New Haven CT 06520-8310.

Courses

MUSI 704b, Theory and Aesthetics: Eighteenth Century. Patrick McCreless.
th 10–12

MUSI 706a, Theory and Aesthetics: Twentieth Century. Robert Morgan.
t 10–12

MUSI 819b, The Motives of (Musical) Eloquence: Approaches to Music and Text in the Seicento. Robert Holzer.
m 1.30–3.20

A re-investigation of traditional notions of music and text in the seventeenth century. Following the lead of the rhetorician Richard Lanham, the alleged role of music as a means of textual expression is measured against a more complex reality, where display contends with decorum. A similar approach, charting the interaction of substance and sophism, is employed for music theory of the time.

MUSI 821a, Monteverdi's Late Operas in Context. Ellen Rosand.
w 1.30–3.20

The seminar considers *Il ritorno d'Ulisse* and *L'incoronazione di Poppea* in two contexts: that of the composer's own madrigals (especially Books 7 and 8) and that of contemporary Venetian operas by Saccati, Cavalli, and Ferrari, focusing on issues of style, sources, performance, and meaning.

MUSI 827b, Middle-Period Beethoven. Leon Plantinga.

W 1.30–3.20

A study of selected compositions from ca. 1803 to 1816 in their historical contexts.

MUSI 845a, Methodological Issues in Music History and Analysis.**James Hepokoski.**

t 1.30–3.20

Foundational concerns in confronting a piece of music and the context in which it is embedded. These include: the nature and status of the artwork as an object of interpretation; the existence of multiple voices and layers of implication within a single work; the role of the observer in producing aesthetic or cultural meanings; contending constructions of history into which the work might be interwoven. Carl Dahlhaus's *Foundations of Music History* serves as one of the texts from which we radiate outward to several issues: phenomenological hermeneutics, cultural materialism, structuralism and poststructuralism, postmodernism, claims of aesthetic autonomy and relative autonomy, objectivity and evidence, political interpretation and advocacy positions, and so on.

MUSI 848b, Music in Renaissance Paris and London. Craig Wright.

th 1.30–3.20

Although Paris and London were the two largest cities in Western Europe during the sixteenth century, they offer rather different views of musical culture. Paris flourished earlier in the century, and it was marked by a robust publishing business that specialized in the “Parisian” chanson, printed dance music, and keyboard music for the church. England continued its medieval ways until the forty-five-year reign of Elizabeth I (1558–1603), when the country, with London as its center, saw an outpouring of polymorphous religious music, instrumental music for solo lute, for viol consort, and for harpsichord, as well as secular vocal music (madrigal, consort song, and lute ayre). This seminar examines all of these musical genres as well as reading two theory treatises of the time, the *Dodecachordon* (1547) of Heinrich Glareanus (educated in Paris) and the *Plaine and Easie Introduction to Practicall Musicke* (1597) of Thomas Morley.

MUSI 902a, Post-Tonal Analysis I. Michael Friedmann.

W 10–12

Introduction to a range of approaches to the analysis of post-tonal twentieth-century music. The theoretical core material is “set theory,” which finds its primary application in analyzing pitch structures and transformational processes but also deals with rhythm and contour. Critical readings of theory and analysis are complemented by the study of works by Schoenberg, Webern, Stravinsky, Bartok, Varèse, and others.

MUSI 902b, Post-Tonal Analysis II. Allen Forte.

t 9–11

Continuation of Music 902a. Further study of contemporary music-theoretic formulations, with analytical applications to a broad range of twentieth-century music.

MUSI 930a, Music of Sub-Saharan Africa. Michael Veal.

m 1.30–3.20

An introduction to the music of Sub-Saharan Africa, through a focus on several regional, national, and/or local cultures. The seminar provides an overview of the musicological and critical issues fundamental to the study of African music and surveys several scholarly approaches to this music both within and outside of Africa. *Also AFAM 789a, AFST 830a.*

MUSI 941a, Theory and Analysis: Extended Tonal Techniques. Daniel Harrison.

th 10–12

Research seminar in late nineteenth- and early twentieth-century music. Differing historical theories of tonal structure are examined and applied analytically, including those of Kurth, Riemann, Louis and Thuille, and Karg-Elert. Also studied are recent approaches, including neo-Riemannian theory and the ideas of Robert Bailey.

MUSI 945b, Liturgical Drama and Its Settings in the Latin Middle Ages and the Latin New World. Margot Fassler, Jaime Lara.

m 1.30–3.20

Dramatic musical productions and their architectural and festive settings, from origins in the Carolingian period to the transplantation of these musical genres, liturgical practices, and architectural settings to the New World. Materials include study of filmed performances and staging of the Southern French *Play of the Wise and Foolish Virgins*. Students may join a study tour to Southern France and Spain in May, led by the Institute of Sacred Music. No prerequisites. Plays are studied in English, with Latin performances for listening.

MUSI 981b, Neo-Riemannian and Other Transformational Theories. David Clampitt.

w 10–12

Neo-Riemannian theory and analysis, in the context of an introduction to Lewinian transformational theory in general. Late nineteenth- and early twentieth-century tonal music is the core repertoire. Extensions and generalizations of neo-Riemannian theory are also applied to post-tonal music. Readings include work of Cohn, Hyer, and Lewin, along with papers from the Buffalo Conferences of 1993, 1997, and 2001.

MUSI 998a, Prospectus Workshop. Ellen Rosand.

t 4–5.30

MUSI 999b, Dissertation Colloquium. Ellen Rosand.

t 4–5.30

near eastern languages and civilizations

314 Hall of Graduate Studies, 432.2944

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

Chair

Dimitri Gutas

Director of Graduate Studies

Beatrice Gruendler (2703 HGS, 432.7522, beatrice.gruendler@yale.edu)

Professors

Benjamin Foster, Beatrice Gruendler, Dimitri Gutas, Bentley Layton, William Simpson, Harvey Weiss

Assistant Professors

John Darnell, Eckart Frahm

Lecturer

Karen Foster

Senior Lectors

Fereshteh Amanat-Kowssar, Ayala Dvoretzky, Bassam Frangieh

Lectors

Siam Bhayro, Neta Stahl

Fields of Study

Fields include Arabic and Islamic studies (also with interdisciplinary minor), Greco-Arabic studies, Archaeology of the Ancient Near East, Assyriology, Egyptology, and Coptic 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 departments 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, e.g., 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; *Archaeology of the Ancient Near East:* at least one ancient language relevant to the student's area of interest; majors in archaeology are also required to take at least one term of archaeological method and theory and at least one term of descriptive and inferential statistics; *Assyriology:* Sumerian and Akkadian; *Egyptology:* Egyptian and at least four terms of Demotic or Coptic; *Coptic and Egyptology:* Coptic, Egyptian, Greek, Arabic, Latin, and one other Christian oriental language. 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 Medicine and Science, Judaic Studies, Italian, Linguistics, Medieval Studies, Political Science and Sociology, Philosophy, 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 within one month after 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 Graduate School requirements, page 375. Alternatively, the department of Near Eastern Languages and Civilizations offers, in conjunction with the Medieval Studies Program, a joint M.Phil. degree. For further details, see Medieval Studies. In addition to the Graduate School requirements (see page 375), the dissertation prospectus must have been accepted.

M.A. Applicants who do not wish to enroll in the Ph.D. program may pursue a Master of Arts degree. Students enrolled in such 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.

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

NELC 503a, The Art of Ancient Palaces. Karen Foster.

NELC 504b^u, Art of the Ancient Near East and Aegean. Karen Foster.

Introduction to the art and architecture of Mesopotamia, Egypt, and the Aegean, with attention to cultural and historical contexts.

NELC 506b, History of Mesopotamia: Third Millennium B.C.E. Benjamin Foster.

[NELC 507a, History of Mesopotamia: Second Millennium B.C.E.]

[NELC 508b, History of Mesopotamia: First Millennium B.C.E.]

NELC 510a^u, Conflicts that Shaped Pharaonic Egypt. John Darnell.

An overview of the history of ancient Egypt, from the predynastic period, c. 4500 B.C.E., to the end of Byzantine rule on the Nile. Focus on periods of internal social and political fragmentation; examination of the struggles and mechanisms that led to the establishment and renewal of central authority on the Nile.

[NELC 511b^u, Ancient Egypt from the Ramesside to the Ptolemaic Periods.]

NELC 512b^u, Egyptian Religion through the Ages. John Darnell.

tth 1–2.15

Topics in Egyptian religion including religious architecture; evidence for protodynastic cults; foreigners in Egyptian religious celebrations; music and vocal expression in Egyptian religion; Re and Osiris; the Amarna interlude and the Ramesside solar religion; and the goddess of the eye of the sun. The approach is diachronic. Readings in English of primary and secondary sources.

[NELC 520, **Beginning Sumerian.**]

[NELC 521b, **Intermediate Sumerian.**]

NELC 528a or b, Advanced Sumerian. Benjamin Foster.

NELC 539a or b, Directed Readings: Sumerian.

NELC 540^U, Elementary Akkadian. Harold Vedeler.

mwf 9.30–10.20

NELC 541b, Advanced Akkadian. Benjamin Foster.

NELC 544a, Mesopotamian Selected Texts: Bilingual. Eckart Frahm.

NELC 544b, Mesopotamian Selected Texts: Scholarly Texts, First Millennium B.C.E. Eckart Frahm.

[NELC 545b, **Neo-Babylonian.**]

NELC 559a or b, Directed Readings: Assyriology.

NELC 560^U, Introduction to Classical Hieroglyphic Egyptian. Colleen Manassa.

An introduction to the language of ancient pharaonic Egypt (Middle Egyptian) and its hieroglyphic writing system, with short historical, literary, and religious texts. Grammatical analyses with exercises in reading, translation, and composition.

NELC 563b^U, From Pictograph to Pixel: Changing Ways of Human Communication.

John Darnell, Michael Fischer, Beatrice Gruendler.

tth 11.30–12.45

An exploration of the five pivotal stages in the development of human communication throughout world history: pictographic and syllabic ways of writing, the consonantal or phonetic alphabet, the invention of paper, movable type, and acoustic/electronic/digital media and the Internet. These technologies are considered for their innovative features, new capabilities, social and ideological implications, and the instrumental roles they played in contemporary periods of change.

NELC 564a, Egyptian Historical Texts: Old and Middle Kingdom. William Simpson.

NELC 564b, Egyptian Historical Texts: New Kingdom and Later.

NELC 565a, Egyptian Literary Texts: Old and Middle Kingdom. William Simpson.

NELC 565b, Egyptian Literary Texts: New Kingdom and Later.

NELC 566a, Late Period Historical Texts: Napatan Historical Inscriptions. John Darnell.

Close reading of Napatan historical texts, including the inscription of Karimala, the Piye Stela, the Dream Stela of Tanutamun, the Stela of Enthronement, the Stela of Excommunication, and the Stela of Harsiotef. Discussion of the historical significance of the texts; analyses of grammatical material touching upon Nubian perceptions of Middle and Late Egyptian grammar and early Demotic grammar; hieratic-inspired orthographies, etc.

[NELC 566b, **Literary Texts in Late Egyptian.**]

NELC 567a, Egyptian Religious Texts.

NELC 568a, Selected Egyptian Literary Texts. William Simpson.

[NELC 569b, **Ptolemaic and Roman Hieroglyphic Texts.**]

NELC 571a or b, Selected Egyptian Wisdom Texts.

NELC 572b, Ramesside Texts. John Darnell.

Readings of Ramesside monumental inscriptions, mostly of historical significance. Focus on inscriptions from the reigns of Sety I, Ramesses II, and Merneptah, including the Wadi Mia Temple inscriptions of Sety I, the stela of Sety I for Ramesses I; the *Inscription dédicatoire* of Ramesses II for Sety I at Abydos, the Kom el-Ahmar Stela, and the Kadash texts of Ramesses II; the Amada Stela, Triumph Stela, and other monuments of Merneptah. Discussions of late Middle Egyptian grammar and orthography, historical significance, etc.

NELC 573b, Introduction to Demotic. John Darnell.

Introduction to the grammar and script followed by readings from a variety of genres: wisdom, religious and historical texts, legal documents, letters, and graffiti.

NELC 576a, Ancient Egyptian Epistigraphy. John Darnell.

Reading (in hieroglyphic and hieratic scripts) of Egyptian letters, from the Old Kingdom through the Third Intermediate Period, including the Letters to the Dead, Kahun Letters, and Late Ramesside Letters.

NELC 577b, Ancient Egyptian Cosmographic Texts. John Darnell.

Close reading of Egyptian cosmographic books, including the King as Solar Priest, the *Book of the Creation of the Solar Disk*, the *Book of Nut*, the *Book of the Day and the Night*, the Enigmatic Netherworld Books of the Solar-Osirian Unity.

NELC 578a, Egyptian Religious Texts: The Ancient Egyptian Netherworld Books.**NELC 579a or b, Directed Readings: Egyptology.**

[NELC 586b^u, Origins of Cities and States in Greater Mesopotamia.]

[NELC 587b^u, Environmental History of the Near East.]

NELC 588a^u, Civilizations and Collapse. Harvey Weiss.

th 3.30–5.20

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. *Also ANTH 773a^u, ARCG 773a^u.*

NELC 590a, Coffin Texts. John Darnell.

Readings of the religious texts found on the inner surfaces of Middle Kingdom coffins. The course focuses on creation accounts, the Shu texts, spells of transformation, the *Book of the Two Ways*, etc. Readings in both normalized hieroglyphic transcription and original cursive hieroglyphic writing.

NELC 591b, Ancient Egyptian Love Poetry. John Darnell.

mw 3–5

Egyptian love poetry, concentrating on the major documents. Most readings in hieratic, with discussions of the grammar of literary Late Egyptian, its relationship to non-literary Late Egyptian and late Middle Egyptian.

[NELC 592b, Death and Afterlife in Ancient Egypt.]

NELC 595a, Ancient Egyptian Art and Archaeology. William Simpson.**NELC 621, Ugaritic. Siam Bhayro.**

f 9–11

NELC 631b, Ethiopic. Siam Bhayro.

tth 3.45–5

NELC 661^U, Elementary Modern Hebrew. Ayala Dvoretzky, Neta Stahl.mwf 11.30–1, *drill* 1 htba

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.

NELC 662^U, Modern Hebrew II. Ayala Dvoretzky, Neta Stahl.mwf 10.30–11.20, *drill* 1 htba

Introduction to modern Hebrew literature, with readings selected from contemporary prose and verse. Review and continuation of grammatical study leading to a deeper comprehension of style and usage. Prerequisite: NELC 661^U or equivalent.

NELC 665a^U, Advanced Modern Hebrew: Ideological and Social Discourse. Neta Stahl.

mw 1–2.15

An examination of major controversies in Israeli society. Readings include newspaper editorials and academic articles as well as documentary and history-based plays. Advanced grammatical structures are introduced and practiced. Conducted in Hebrew. Prerequisite: NELC 662^U or equivalent.

NELC 666b^U, Introduction to Modern Israeli Literature. Ayala Dvoretzky.

mw 1.30–2.45

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: NELC 662^U or equivalent.

NELC 726a^U, Introduction to the History of Christianity in the Ancient World: Jesus to Augustine. Bentley Layton.

mw 10.30–11.20, 1 htba

The rise of Christianity and the development of Western culture into the Middle Ages, including the creation of Christian orthodoxy; religious, political, social, gender, literary, and theological history of Christian religion in many forms. No previous background assumed. *Also RLST 651a^U.*

[NELC 735b^U, Gnostic Religion and Literature.][NELC 740^U, Biblical Coptic: Elementary Course.]**NELC 741b^U, Introduction to Gnostic Texts in Coptic. Bentley Layton.**

tth 11.30–12.45

NELC 745a^U, Egyptian Monastic Literature in Coptic. Bentley Layton.

tth 11.30–12.45

[NELC 746a, Early Ascetism and Monasticism in Egypt (Patristic Seminar).]

[NELC 748a, The White Monastery of Atripe: Study of Canons 1–5 of Shenoute.]

[NELC 749b, The White Monastery of Atripe: Reconstruction of the Disciplinary Code.]

NELC 770^U, Elementary Syriac. Siam Bhayro.

mw 3.30–4.45

The Mesopotamian Christian form of Aramaic widely used in the Roman and Byzantine Near East. Thorough grounding in grammar and vocabulary as a basis for reading biblical, historical, poetic, and theological texts.

[NELC 772a, **Classical Syriac Historiography.**]

[NELC 773b, **Theological and Literary Texts in Syriac.**]

NELC 802a^u, The History of the Islamic Near East from Mohammad to the Mongol Invasion. Adel Allouche.

mw 9–10.15

An examination of the shaping of society and polity from the rise of Islam to the Mongol conquest of Baghdad in 1258. The origins of Islamic society; conquests, and social and political assimilation under the Ummayyads and Abbasids; the changing nature of political legitimacy and sovereignty under the caliphate; provincial decentralization; and new sources of social and religious power. *Also HIST 829a^u.*

[NELC 805b^u, **Greek into Arabic into Latin: Foundations of Western Culture.**]

[NELC 807b^u, **Modern Islamic Thought.**]

[NELC 808b^u, **Islamic Law: Concepts and Controversies.**]

[NELC 809a^u, **Science in the Islamic World.**]

[NELC 810a^u, **Memory, Fiction, and the Creation of Meaning in Classical Arabic Literature.**]

NELC 811a^u, Love, Desire, and the Erotic in Classical Arabic Literature. Beatrice Gruendler.

tth 11.30–12.45

The theme of love in classical Arabic literature, from the pre-Islamic era through the Middle Ages (seventh to fifteenth century, C.E.). Exploration of the guises of love, its standard motifs and varying meanings according to different contexts: erotic and platonic, courtly and spiritual, literal and metaphorical. Genres include the pre-Islamic Bedouin ode (*qasida*), the Islamic love lyric (*ghazal*), Islamic court poetry and *belles lettres* (*adab*), mystical poetry, Andalusian poetry (*muwashshab*, *zajal*), as well as exegetical tales and medieval popular romances.

[NELC 812b, **Abbasid Poetry in Context.**]

NELC 818b^u, Early Arabic Philosophy. Dimitri Gutas.

m 3.30–5.20

The transition from Greek philosophy in late antiquity to Arabic philosophy under the early 'Abbasids (sixth to eleventh century). Readings in English translation from the works of Kindi, Rhazes, Farabi, and Avicenna, with special emphasis on epistemology, theory of the soul, and metaphysics. Prerequisite: a course in ancient or medieval philosophy, or permission of instructor. *Also PHIL 613b^u.*

NELC 821^u, Elementary Modern Standard Arabic. Bassam Frangieh.

mtwhf 1.30–2.20

Develops a basic knowledge of modern standard Arabic. Emphasis on grammatical analysis, vocabulary acquisition, and the development of reading and writing skills.

NELC 822^u, Spoken Modern Standard Arabic. Bassam Frangieh.

tth 2.30–3.45

A supplement to the elementary course in modern standard Arabic, emphasizing oral skills. Corequisite or prerequisite: NELC 821^u or permission of instructor.

NELC 824^u, Intermediate Modern Standard Arabic. Bassam Frangieh.

mw 11.30–12.45

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.

NELC 825^U, Advanced Modern Standard Arabic. Racha El-Omari.

mw 1–2.15

Focus on improving the listening, writing, and speaking skills of students who already have a substantial background in the study of modern standard Arabic.

[NELC 829b, History of the Arabic Language.]

NELC 830a^U or b^U, Arabic Seminar. Dimitri Gutas [F], Beatrice Gruendler [Sp].

t 3.30–5.20

Study and interpretation of classical Arabic texts for advanced students.

NELC 831b, Greco-Arabic Seminar. Dimitri Gutas.

w 1.30–3.20

[NELC 832b, Introduction to Medieval Arabic Literary Criticism.]

[NELC 834b, Arab Historical Writing.]

[NELC 836b, Classical Arabic Biography.]

[NELC 844b, Arabic Palaeography and Textual Criticism.]

NELC 845a, Plato's *Laws* in Arabic. Dimitri Gutas.

m 3.30–5.20

[NELC 846a, Seminar in the Philosophy of Avicenna.]

[NELC 847a, Medieval Islamic Ethics.]

[NELC 848a, Seminar in Islamic Theology.]

NELC 849a or b, Directed Readings: Arabic.**NELC 850a, Introduction to Arabic and Islamic Studies. Beatrice Gruendler.**

w 2.30–4.20

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.

NELC 851^U, Elementary Persian. Fereshteh Amanat-Kowssar.

mwf 9.30–10.20

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.

NELC 852^U, Intermediate Persian. Fereshteh Amanat-Kowssar.

mwf 10.30–11.20

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.

NELC 859a or b, Directed Readings: Persian.

neurobiology

C300 Sterling Hall of Medicine, 785.4323
M.S., M.Phil., Ph.D.

Chair

Pasko Rakic

Director of Graduate Studies

Amy Arnsten (SHM B428, 785.4431, amy.arnsten@yale.edu)

Director of Medical Studies

Michael Schwartz (SHM C314, 785.4324, michael.schwartz@yale.edu)

Professors

Colin Barnstable, Benjamin Bunney, Nigel Daw, Patricia Goldman-Rakic, Charles Greer, Susan Hockfield, Jeffery Kocsis, Robert LaMotte, Csaba Leranth, David McCormick, Pasko Rakic, Joseph Santos-Sacchi, Ilsa Schwartz, Gordon Shepherd, Stephen Strittmatter, Stephen Waxman

Associate Professors

Meenakshi Alreja, Amy Arnsten, Charles Bruce, Nihal de Lanerolle, Tamas Horvath, Thomas Hughes, Bitu Moghaddam, Marina Picciotto, Michael Schwartz

Assistant Professors

Hal Blumenfeld, Wei Chen, Maria Donoghue Velleca, Reiko Maki Fitzsimonds, Mark Laubach, Dhasakumar Navaratnam, Vincent Pieribone, Anna Roe, Ning Tian, Flora Vaccarino, Mark Yeckel

Fields of Study

Fields include the development, neuronal organization, and function of the mammalian central nervous system. The range of methods includes molecular and cellular neurobiology, neuroanatomy, receptor biochemistry, neuropharmacology, neurophysiology, and behavior. An integrative, multidisciplinary approach is encouraged.

Special Requirements for the Ph.D.

Four terms of course work, selected in consultation with faculty advisers, are required. Neurobiology 500b and an advanced course in cell biology are required. It is expected that the student maintain a better than passing record in the area of concentration. The Graduate School requires two term grades of Honors during the first two years of study. The qualifying examination is given at the end of the second year of study. The remaining degree requirements include the submission of a prospectus, after which a student may be admitted to candidacy; research under the supervision of the adviser; and the submission of the dissertation. There is no formal foreign language requirement.

An important aspect of graduate training in neurobiology is the acquisition of teaching skills through participation in courses appropriate for the student's scientific inter-

ests. These opportunities can be drawn from a diverse menu of lecture, laboratory, and seminar courses given at the undergraduate, graduate, and medical school level. 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.

To enter the Ph.D. program, students apply to the Neuroscience track within the Biological and Biomedical Sciences (see pages 59–61).

Master's Degrees

M.Phil. See Graduate School requirements, page 375. Awarded only to students who are continuing for the Ph.D. degree. 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. 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, Structural and Functional Organization of the Human Nervous System.

Pasko Rakic, Michael Schwartz, 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. 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. Each student may participate in a weekly physiology conference with a faculty member, covering such topics as vision, sensory physiology, motor systems, simple nervous systems, or general neurophysiology. 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 instructor. *Also NSCI 510b.*

NBIO 501a, Principles of Neuroscience. Marina Picciotto, Reiko Fitzsimonds.

wf 3.15–4.45

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. *Also NSCI 501a.*

NBIO 502a, Structure and Function of Neocortex. Patricia Goldman-Rakic and faculty.

This seminar/lecture 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. Permission of instructor required.

[NBIO 507b, Cellular and Molecular Mechanisms of Neurologic Disease.]

[NBIO 509b, Synaptic Organization of the Nervous System.]

NBIO 510, 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 autoradiography, 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, extracellular and intracellular recordings, sensory stimulation, dye injections, and selected neuropharmacological procedures. Choice of techniques and hours to be arranged with individual faculty or staff members of the Department of Neurobiology.

[NBIO 520a, Vision: Cellular and Network Dynamics of the Cerebral Cortex.]

[NBIO 524a, The Regulation of Cell Fate during CNS Development.]

[NBIO 530b, Neurobiology of Schizophrenia.]

[NBIO 570a, Cellular and Network Dynamics of Sensory and Motor Functions.]

NBIO 601, Topics in Olfactory Physiology. Gordon Shepherd.
Advanced tutorial course.

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.

NBIO 720a, Neurobiology. Haig Keshishian, Paul Forscher.

mwf 11.30–12.20

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. *Also MCDB 720a^U, NSCI 720a.*

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*) (LSOG 221, 785.4034, charles.greer@yale.edu)

Professors

George Aghajanian (*Psychiatry; Pharmacology*), Colin Barnstable (*Ophthalmology & Visual Science; Neurobiology*), Linda Bartoshuk (*Surgery; Epidemiology; Psychology*), Walter Boron (*Cellular & Molecular Physiology*), Thomas Brown (*Psychology; Cellular & Molecular Physiology*), Benjamin Bunney (*Psychiatry; Pharmacology*), John Carlson (*Molecular, Cellular & Developmental Biology*), Lawrence Cohen (*Cellular & Molecular Physiology*), Nigel Daw (*Ophthalmology & Visual Science; Neurobiology*), Pietro De Camilli (*Cell Biology*), Ronald Duman (*Psychiatry; Pharmacology*), Barbara Ehrlich (*Pharmacology; Cellular & Molecular Physiology*), Patricia Goldman-Rakic (*Neurobiology; Psychology*), Charles Greer (*Neurosurgery, Neurobiology*), Susan Hockfield (*Neurobiology*), Marcia Johnson (*Psychology*), Leonard Kaczmarek (*Pharmacology; Cellular & Molecular Physiology*), Kenneth Kidd (*Genetics; Molecular, Cellular & Developmental Biology; Psychiatry*), Jeffery Kocsis (*Neurology; Neurobiology*), Robert LaMotte (*Anesthesiology; Neurobiology*), Thomas Lentz (*Cell Biology*), Laura Manuelidis (*Neuropathology*), David McCormick (*Neurobiology*), Edward Moczydlowski (*Pharmacology; Cellular & Molecular Physiology*), Mark Mooseker (*Molecular, Cellular & Developmental Biology; Cell Biology*), Frederick Naftolin (*Obstetrics & Gynecology; Molecular, Cellular & Developmental Biology*), Angus Nairn (*Psychiatry*), Pasko Rakic (*Neurobiology*), J. Murdoch Ritchie (*Pharmacology*), Robert Roth (*Psychiatry; Pharmacology*), Gary Rudnick (*Pharmacology*), Joseph Santos-Sacchi (*Surgery; Neurobiology*), Ilsa Schwartz (*Surgery; Neurobiology*), Steven Segal (*Epidemiology; Cellular & Molecular Physiology*), Gordon Shepherd (*Neurobiology*), Frederick Sigworth (*Cellular & Molecular Physiology*), Allan Wagner (*Psychology*), Stephen Waxman (*Neurology; Pharmacology*), Robert Wyman (*Molecular, Cellular & Developmental Biology*), Steven Zucker (*Computer Science*)

Associate Professors

Meenakshi Alreja (*Psychiatry; Neurobiology*), Amy Arnsten (*Neurobiology*), Catherine Berlot (*Cellular & Molecular Physiology*), Charles Bruce (*Neurobiology*), Nihal de Lanerolle (*Neurosurgery; Neurobiology*), Paul Forscher (*Molecular, Cellular & Developmental Biology*), James Howe (*Pharmacology*), Thomas Hughes (*Ophthalmology & Visual Science; Neurobiology*), Bitu Moghaddam (*Psychiatry; Neurobiology*), Mark Packard (*Psychology*), Marina Picciotto (*Psychiatry; Pharmacology; Neurobiology*), George Richerson (*Neurology; Cellular & Molecular Physiology*), Michael Schwartz (*Neurobiology*), Stephen Strittmatter (*Neurology; Neurobiology*), Flora Vaccarino (*Child Study Center; Neurobiology*), Tian Xu (*Genetics*)

Assistant Professors

Hal Blumenfeld (*Neurology; Neurobiology*), Angélique Bordey (*Neurosurgery*), Wei Chen (*Neurobiology*), R. Todd Constable (*Diagnostic Radiology; Neurosurgery*), Maria Donoghue Velleca (*Neurobiology*), Reiko Maki Fitzsimonds (*Cellular & Molecular Physiology*), Karyn Frick (*Psychology*), Lise Heginbotham (*Molecular Biophysics & Biochemistry*), Jeansok Kim (*Psychology*), Anthony Koleske (*Molecular Biophysics & Biochemistry*), Mark Laubach (*Neurobiology*), Christy Marshuetz (*Psychology*), Vincent Pieribone (*Cellular & Molecular Physiology*), Maria Mercedes Piñango (*Linguistics*), Anna Roe (*Neurobiology*), Ning Tian (*Ophthalmology & Visual Science*), David Wells (*Molecular, Cellular & Developmental Biology*), Michael Westerveld (*Neurosurgery*), Mark Yeckel (*Neurobiology*), Weimin Zhong (*Molecular, Cellular & Developmental Biology*)

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 (see pages 59–61).

Special Requirements for the Ph.D. Degree

Each entering student is assigned a faculty advisory committee to provide guidance relevant to the student's stated field of interest. This committee is responsible for establishing the student's course of study and for monitoring his or her progress. This com-

mittee 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 upon a model curriculum beginning with three core courses 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. A series of at least two laboratory rotations during the first two years of the program also ensures that degree candidates obtain a solid background in systems, cellular, and molecular approaches to neuroscience. The Graduate School requires two term grades of Honors during the first two years of study. Admission to candidacy requires passing a qualifying examination normally given at the end of the second year, and submission of a dissertation prospectus prior to the start of the fourth 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.

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

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. 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, Principles of Neuroscience. Marina Picciotto, Reiko Fitzsimonds.

wf 3.15–4.45

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. *Also NBIO 501a.*

[**NSCI 502b, Cell Biology of the Nerve Cell.**]

[**NSCI 503b, Molecular Neurobiology.**]

NSCI 504b, Brain Development and Plasticity. David Wells, Weimin Zhong.

mw 2.30–3.45

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. *Also MCDB 735b^{ll}.*

[**NSCI 505b, Sensory Systems.**]

NSCI 506b, Introduction to Brain and Behavior. Jeansok Kim.

th 3–5

Introduction to basic principles of brain function, including fundamentals of synaptic transmission, organization of the CNS, sensory and motor integration, and higher processes such as the neurobiology of language, learning, and memory. *Also PSYC 506b.*

[NSCI 507b, **Cellular and Molecular Mechanisms of Neurological Disease.**]

[NSCI 508a, **Functional Properties of Cortical Neurons and Circuits.**]

[NSCI 509, **Neuroimmunology: Neural and Immune Cell Adhesion Molecules.**]

NSCI 510b, 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 pertaining to major neurological and psychiatric disorders. *Also NBIO 500b.*

[NSCI 511b, **Neurobiology of Drug Addiction.**]

[NSCI 512a, **Genes and Behavior.**]

[NSCI 514a, **The Regulation of Cell Fate during CNS Development.**]

NSCI 519a/b, Tutorial.

By arrangement with faculty and approval of the director of graduate studies.

[NSCI 521a, **Neuroimaging in Neuropsychiatry.**]

[NSCI 529b, **Introduction to Computational Neuroscience.**]

[NSCI 530b, **Neurobiology of Schizophrenia.**]

[NSCI 539b, **Synaptic Organization of the Nervous System.**]

[NSCI 540a, **Introduction to Statistics in Psychology.**]

[NSCI 570a, **Cellular and Network Dynamics of Sensory and Motor Functions.**]

NSCI 600a, Experimental Methods in Neuroscience. R. Todd Constable.

This course examines the experimental techniques currently available for the neuroscientist. It explores the kinds of information obtainable in studying phenomena ranging from electrophysiological recordings of individual neurons to metabolic processes, from ensembles of neurons to behavioral output. Techniques covered include microscopic methods (light, electron), electrophysiology (extracellular/intracellular single cell recordings, multiple cell recording methods, brain slices), macroscopic methods (ERP, MEG, TMR), metabolic measures (microdialysis, biosensors, MR spectroscopy), imaging approaches (optical tomography, PET, SPECT, functional MRI), and interventional techniques (lesions, cortical stimulation, knockout genetics, surgery, drugs). The knowledge gained from each of these approaches, the limitations of the methods, and future developments are considered.

[NSCI 605b, **Pathways of Discovery in Neuroscience.**]

[NSCI 610b, **Neurophysiology: Theory and Practice.**]

[NSCI 611b, **Neurophysiology.**]

[NSCI 614b, **Neurobiology of Learning and Memory.**]

[NSCI 634b, **Behavioral Neuroendocrinology.**]

[NSCI 645a, **Foundations of Behavioral Neuroscience.**]

[NSCI 646, **Advances in Cognitive Neuroscience: Prefrontal Cortex and Memory.**]

[NSCI 647b, **Cellular Analysis of Learning: In Vitro.**]

[NSCI 648b, **Cellular Analysis of Learning: Vertebrate Model Systems.**]

[NSCI 666b, **From Neurons to Behavior.**]

[NSCI 674b, **Psychopharmacology.**]

NSCI 720a, Neurobiology. Haig Keshishian, Paul Forscher.

mwf 11.30–12.20

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. *Also MCDB 720a^U, NBIO 720a.*

The following course is also of particular value to students in Neuroscience:

MCDB 721La^U, Laboratory for Neurobiology. Haig Keshishian, Robert Wyman.

pharmacology

B-334 Sterling Hall of Medicine, 785.4545
M.S., M.Phil., Ph.D.

Chair

Joseph Schlessinger

Director of Graduate Studies

William Sessa (BCMM 436, 737.2291, william.sessa@yale.edu)

Director of Medical Studies

Karen Anderson

Professors

George Aghajanian, Karen Anderson, G. Peter Beardsley, Harold Behrman, B. Stephen Bunney, Evangelo Canellakis (*Emeritus*), Yung-chi Cheng, J. G. Collins, Jack Cooper (*Emeritus*), Priscilla Dannies, Ronald Duman, Barbara Ehrlich, Robert Handschumacher (*Emeritus*), Leonard Kaczmarek, Edward Moczdlowski, Perry Molinoff (*Adjunct*), William Prusoff (*Emeritus*), J. Murdoch Ritchie, Sara Rockwell, Robert Roth, Gary Rudnick, Alan Sartorelli, William Sessa, Joseph Schlessinger, John Tallman (*Adjunct*), Stephen Waxman

Associate Professors

Edward Chu, Valentin Gribkoff (*Adjunct*), Robert Heimer, James Howe, Robert Kalb, Elias Lolis, Guiseppa Pizzorno, Todd Verdoorn (*Adjunct*)

Assistant Professors

Anton Bennett, Michael DiGiovanna, Marina Picciotto, Ya Ha

Lecturers

Louise-Marie Dembry, Gregory Gardiner, Robert Levine, John Pawelek, Alexander Scriabine

Fields of Study

Major emphases in the department are in the areas of molecular pharmacology, mechanisms of drug action, 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 apply to an interest-based track within the interdepartmental graduate program in the Biological and Biomedical Sciences (see pages 59–61).

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 four to 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 level. 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 Graduate School requirements, page 375.

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.

Program materials are available upon request to the Director of Graduate Studies, Department of Pharmacology, Yale University, PO Box 208066, New Haven CT 06520.

Courses

PHAR 502a and b, Seminar in Pharmacology. To be announced.

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.

PHAR 504a, Pharmacology I: Maintaining and Restoring Homeostasis.

Priscilla Dannies and staff.

MW 10.30–12

Lectures covering drug-receptor interactions, control of messenger systems and channels, and regulation of physiological systems.

PHAR 504b, Pharmacology II: Interfering Selectively. Priscilla Dannies and staff.

MW 10.30–12

Lectures covering antibiotics, immunotherapy, and chemotherapy.

PHAR 506a and b, Methods in Pharmacological Research (Rotations).

Priscilla Dannies.

Students work in laboratories of faculty of their choice. The period spent in each laboratory is one term.

PHAR 508b, Neuropharmacology. J. Murdoch Ritchie.

t 2-4

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.

PHAR 510b, Life Science Business. Gregory Gardiner.

Exploration of where the life sciences intersect with finance and the law from a variety of perspectives including those of industry, academia, and the communications media.

PHAR 518b, Current Topics in Cancer and Viral Therapy.

Yung-chi Cheng, Elias Lolis.

w 5.15-7.15

PHAR 520a, Principles of Research Methodologies: Methods behind the Madness.

W. C. Sessa, Priscilla Dannies.

t 4-6

A course designed for first-year students to illustrate basic principles of contemporary techniques commonly used in many research laboratories. The class is taught by senior students in the Pharmacology department along with faculty. The class meets for two hours weekly in the fall semester. Grades are based on class attendance, participation, and a take-home examination.

PHAR 522a, Neuroimaging. Julie Staley.

w 4.15-6

Neuroimaging methodologies including Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT), Magnetic Resonance Imaging (MRI), functional Magnetic Resonance Imaging (fMRI), and Magnetic Resonance Spectroscopy (MRS) 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 and their application to neurologic and psychiatric disorders.

philosophy

Connecticut Hall, 432.1665

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

Chair

Michael Della Rocca

Director of Graduate Studies

Karsten Harries (107 Connecticut Hall, 432.1682, karsten.harries@yale.edu)

Professors

Marilyn McCord Adams, Robert Adams, Seyla Benhabib, Susanne Bobzien, Jules Coleman, Michael Della Rocca, Keith DeRose, Karsten Harries, Robin Jeshion, Shelly Kagan, Christopher Shields (*Visiting [F]*), Sun-Joo Shin

Associate Professor

Tad Brennan

Assistant Professors

Katalin Balog, Troy Cross, James Kreines, Michael Nelson, Gabriel Richardson, Michael Weber

Lecturer

Eric Cavallero

Fields of Study

Fields include most of the major areas of philosophy. Please write for 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 pre-dissertation 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 Graduate School requirements, page 375.

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.

Program materials are available upon request to the Director of Graduate Studies, Department of Philosophy, Yale University, PO Box 208306, New Haven CT 06520-8306. See Philosophy Web page for information (www.yale.edu/philos).

Courses

PHIL 504a^u, Logical Theory I: Philosophical Logic. Sun-Joo Shin.

mw 1–2.15

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.

PHIL 510b^u, European Political Thought from Weber to Derrida. Seyla Benhabib.

tth 2.30–3.20, 1 htba

Twentieth-century European political thought is dominated by the shadows of Hegel and Nietzsche. Hegel believed in realizing reason in the modern state, whereas Nietzsche argued that modern politics mobilized resentment and anti-rational impulses. We examine Weber, Lukacs, the Frankfurt School, Arendt, Heidegger, Habermas, and Derrida in the light of this dual legacy of Hegel and Nietzsche. Special focus on the Habermas-Derrida exchanges. *Also PLSC 604b^u.*

PHIL 565b^u, Kant. James Kreines.

An introduction to the thought of Immanuel Kant. Focus on the central problems and doctrines of the *Critique of Pure Reason*. Topics include Kant's ethical theory as presented in the *Groundwork to the Metaphysics of Morals*.

PHIL 610b^u, Aristotle on Practical Reasoning. Gabriel Richardson.

m 3.30–5.20

An examination of Aristotle's theory of practical reasoning. Can we deliberate about ends? Can such deliberation affect desire? How do emotions "share in reason in a way"? Is there a robust distinction between theoretical and practical reasoning? How are we to make sense of practical irrationality? In addition to selections from the *Ethics*, *Rhetoric*, and *De Motu Animalium*, we briefly consider Hume's account of practical reasoning in the *Treatise* as a useful comparison.

PHIL 611a^u, Plato's *Phaedrus*. Gabriel Richardson.

m 3.30–5.20

A close reading of Plato's dialogue on rhetoric and love. Topics include: Plato's account of moral psychology; the connection between love and the desire for happiness; the immortality of the soul; the relationship between speech making and philosophy; and Plato's critique of writing.

PHIL 612a^u, Plato's Late Metaphysics. Christopher Shields.

t 3.30–5.20

Late in his philosophical career, in the *Parmenides*, Plato deploys a series of arguments intended to devastate his own Theory of Forms, a theory postulating the existence of distinctive abstract mind- and language-independent entities variously characterized as perfect paradigms and as universals. In this seminar we examine these arguments in order first to under-

stand Plato's Theory of Forms and subsequently to determine whether we should ourselves accept the existence of abstract entities of the sort Plato understands forms to be. No knowledge of Greek or Greek philosophy is required.

PHIL 613b^u, Early Arabic Philosophy. Dimitri Gutas.

m 3.30–5.20

The transition from Greek philosophy in late antiquity to Arabic philosophy under the early 'Abbasids (sixth to eleventh century). Readings in English translation from the works of Kindi, Rhazes, Farabi, and Avicenna, with special emphasis on epistemology, theory of the soul, and metaphysics. Prerequisite: a course in ancient or medieval philosophy, or permission of instructor. *Also NELC 818b^u.*

PHIL 614b^u, Kant: Autonomy, Beauty, and the Finality of Nature. James Kreines.

w 1.30–3.20

An examination of Kant's *Critique of Judgment*. Topics covered include: Kant's aesthetics, philosophy of biology, and account of the importance, nature, and limits of teleological explanation. Emphasis on how consideration of these diverse topics is supposed to help resolve the tensions inherent in Kant's transcendental idealism and his account of autonomy.

PHIL 615a^u, The Philosophy of Spinoza. Michael Della Rocca.

w 1.30–3.20

An in-depth study of Spinoza's major work, the *Ethics*, with some attention to his earlier writings where helpful. Focus on Spinoza's views in metaphysics and the philosophy of mind.

PHIL 616b^u, The Moral Theories of Moore and Ross. Shelly Kagan.

t 1.30–3.20

What can we say systematically about right and wrong? What can we say about what things are good? Most moral philosophers ground their answers in accounts "external" to ethics — theories of human nature, the human condition, or divine will, or general claims about the nature of reason and rationality. But in the early twentieth century a more "autonomous" approach to ethics was common — the appeal to moral intuition was primary — and this approach remains important today. We study two great classics from this period: G. E. Moore's *Principia Ethica* and W. D. Ross's *The Right and the Good*. Particular attention is paid to evaluating the value theories defended by each book. Prerequisite: a previous class in moral philosophy, or permission of the instructor.

PHIL 640b^u, Vagueness and the Sorites Paradox. Susanne Bobzien.

w 3.30–5.20

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.

PHIL 641b^u, The Metaphysics of Modality. Troy Cross.

w 1.30–3.20

The course explores a family of modal notions including dispositions, counterfactuals, laws of nature, possibility, necessity, essence, and supervenience. We compare theories that take some of these notions as primitive with theories that attempt to explain all modal notions in terms of categorical features of the actual world. Throughout, we pay close attention to the implications of this debate for the philosophy of science and the philosophy of mind.

PHIL 642b^u, Philosophy of Language. Keith DeRose, Michael Nelson.

t 1.30–3.20

Some recent developments in the philosophy of language. Topics may include conversational implicatures, warranted assertability, conditionals, modal language, knowledge attributions, and context-sensitivity.

PHIL 643b^U, Numbers and Our Knowledge of Numbers. Robin Jeshion.

th 1.30–3.20

An exploration of a cluster of topics about the ontology of natural numbers and the nature of our knowledge of arithmetic. These topics include: the viability of platonism; the relationship between objectivity (realism) about mathematical truth, platonism, and fictionalism; the idea that there can be no genuine ontology of natural numbers; the possibility of neo-Fregean logicism and its associated epistemology; the development of a notion of intuition and singular thought rich enough to explain belief about and knowledge of number.

PHIL 655a^U, Normative Ethics. Shelly Kagan.

t 1.30–3.20

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).

PHIL 656b^U, Rational Choice Theory. Michael Weber.

th 1.30–3.20

A philosophically sophisticated introduction to the theory of rational choice that underlies orthodox treatments of decision-making behavior in economics, political science, and other social sciences. Some of the paradoxes of rational choice theory are examined, including the Prisoner's Dilemma, the Allais Paradox, and Newcomb's Problem, in an attempt to derive conclusions about the nature of practical reason. Topics also include the use and alleged misuse of rational choice theory in the social sciences.

PHIL 657b^U, Global Justice. Eric Cavallero.

t 7–8.50

An enquiry into principles of justice for political institutions at the global level, with readings drawn from recent work in the area. Topics include the concept of political sovereignty; the moral relevance of political borders; group self-determination rights; universal human rights; intervention; just immigration policy; and global economic distributive justice.

PHIL 700a, Contemporary Critical Theory: Habermas and Beyond. Seyla Benhabib, Rahel Jaeggi.

w 3.30–5.20

Deliberative democracy and struggles for recognition are two competing paradigms in critical social and political theory. This course traces the emergence of these paradigms in Habermas's work, as well as examining conflicts and convergences among them. We also trace the origins of these paradigms in the Kantian versus Hegelian roots of critical theory. Readings from Habermas, Taylor, Honneth, Fraser, Cohen and Arato, Benhabib, Forst, Bohman, Young, and others. *Also PLSC 583a.*

PHIL 701a, Epistemology. Keith DeRose.

m 1:30–3:20

A study of some prominent issues in current epistemology. Topics may include skepticism, internalist vs. externalist accounts of knowledge and of justification, the structure of knowledge and justification (foundationalism vs. coherentism), contextualism in epistemology, and the "relevant alternatives" account of knowledge.

PHIL 702a, Nietzsche and Tragedy. Karsten Harries.

t 10.30–12.20

The seminar focuses on *The Birth of Tragedy* and *Zarathustra*. An examination of the boundary that separates and joins philosophy and tragedy; also of the tasks and limits of philosophy.

PHIL 7o3b, Power and Poverty of Perspective: Cusanus and Alberti.**Karsten Harries.**

t 10.30–12.20

This seminar confronts Alberti and Cusanus. Key is the theme of perspective. To confront Alberti with Cusanus is to gain a deeper understanding both of the legitimacy of the modern age and of the poverty that shadows its power. Readings include Alberti, *On Painting*; Cusanus, *On Learned Ignorance (De Docta Ignorantia)*, *On [Intellectual] Eyeglasses (De Beryllo)*, the *Layman (Idiota)* dialogues, and *On Not-other (De Li Non Aliud)*.

PHIL 7o4a, Complexity: Theory of Meaning and the Literary Text.**Benjamin Harshav.**

m 1.30–3.20

The course presents a comprehensive and systematic theory of works of literature as the highest sign-complexes in human culture. Departing from the basic concepts of meaning and reference in linguistics and philosophy of language, a theory of semantic integration is developed. Departing from the basic assumptions of narratology and the philosophy of fictional worlds, a theory of works of literature as complex and open-ended constructs is offered. The theoretical framework includes all their aspects: from metaphor to ideology, and from verse and style to the interaction between internal and external fields of reference. *Also CPLT 541a.*

PHIL 75o, Tutorial.

By arrangement with faculty.

physics

35 Sloane Physics Laboratory, 432.3607

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

Chair

Ramamurti Shankar

Director of Graduate Studies

Steven Girvin (35 SPL, 432.3607, graduatephysics@yale.edu)

Professors

Yoram Alhassid, Thomas Appelquist, Charles Bailyn (*Astronomy*), Charles Baltay, D. Allan Bromley, Richard Casten, Richard Chang (*Applied Physics*), Michel Devoret (*Applied Physics*), Paul Fleury (*Applied Physics*), Moshe Gai (*Adjunct*), Steven Girvin, Robert Grober (*Applied Physics*), Martin Gutzwiller (*Adjunct*), John Harris, Victor Henrich (*Applied Physics*), Jay Hirshfield (*Adjunct*), Pierre Hohenberg (*Adjunct*), Francesco Iachello, Mark Kasevich, Martin Klein, Samuel MacDowell, William Marciano (*Adjunct*), Simon Mochrie, Vincent Moncrief, Peter Parker, Daniel Prober (*Applied Physics*), Nicholas Read, Subir Sachdev, Jack Sandweiss, Michael Schmidt, Ramamurti Shankar, Charles Sommerfield, Katepalli Sreenivasan (*Mechanical Engineering*), A. Douglas Stone (*Applied Physics*), John Tully (*Chemistry*), C. Megan Urry, Michael Zeller

Associate Professors

Sean Barrett, Cornelius Beausang, Paolo Coppi (*Astronomy*), David DeMille, Samson Shatashvili

Assistant Professors

Colin Gay, Gerd Kunde, Reiner Kruecken, Homer Neal, Robert Schoelkopf (*Applied Physics*), Jeffrey Snyder, Tilo Wettig

Senior Research Scientists

Robert Adair, Satish Dhawan, Vernon Hughes, Richard Majka, Andrew Szymkowiak, N. Victor Zamfir

Lecturers

Stephen Irons, Henry Kasha

Fields of Study

Fields include experimental atomic physics; theoretical and experimental nuclear, particle, condensed-matter physics; astrophysics; and mathematical physics.

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 (Dynamics, 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 required courses in classical and quantum field theory, provides an introduction to modern physics and research. Prior equivalent course work may reduce the course requirement 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 having had sufficiently advanced prior course work or by taking a course offered by the department. All students will also attend a seminar during their first term in order to be introduced to the various research efforts and opportunities at Yale.

Students who have completed their course requirements with satisfactory grades, 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. Approximately eighteen months after passing the qualifying examination, but no later than the end of the fourth year, students take an oral examination in their chosen field of specialization (the Field Oral Examination).

There is no foreign language requirement. Teaching experience is regarded as an integral part of the graduate training program. All students are expected to serve as teaching fellows during a portion of their first two years of study. 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. See Graduate School requirements, page 375.

M.S. (en route to the Ph.D.). Students who complete the first-year graduate courses with a satisfactory record (i.e., at least 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, Dynamics. Yoram Alhassid.**

tth 10.30–12

Newtonian dynamics and kinematics, Lagrangian dynamics, small oscillations, Hamiltonian dynamics and transformation theory, completely integrable systems, regular and chaotic motion of Hamiltonian systems, mechanics of continuous systems: strings and fluids.

PHYS 502b, Electromagnetic Theory I. Jack Sandweiss.

mw 9–10.30

Classical electromagnetic theory including boundary-value problems and applications of Maxwell equations. Macroscopic description of electric and magnetic materials. Wave propagation.

PHYS 504Lb, Modern Physics Measurements. Simon Mochrie and staff.

A laboratory course with experiments in condensed matter, nuclear, and elementary particle physics. Data analysis provides an introduction to computer programming and to the elements of statistics and probability.

PHYS 506a^U, Mathematical Methods of Physics. Tilo Wettig.

mw 9–10.30

Survey of mathematical techniques useful in physics. Includes vector and tensor analysis, group theory, complex analysis (residue calculus, method of steepest descent), differential and integral equations (regular singular points, Green's functions), and advanced topics (Grassmann variables, path integrals, supersymmetry).

PHYS 508a, Quantum Mechanics I. Francesco Iachello.

mw 10.30–12

The principles of quantum mechanics with application to simple systems. Canonical formalism, solutions of Schrödinger's equation, angular momentum and spin.

PHYS 512b, Statistical Physics I. Yoram Alhassid.

tth 9–10.30

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.

PHYS 515a, Topics in Modern Physics Research. John Harris.

m 2–3

A seminar course intended to provide an introduction to current research in physics and an overview of physics research opportunities at Yale.

[PHYS 522a, Introduction to Atomic Physics.]**PHYS 524a, Introduction to Nuclear Physics. Richard Casten.**

Introduction to a wide variety of topics in nuclear structure, nuclear reactions, and nuclear physics at extremes of angular momentum, isospin, energy, and energy density.

PHYS 526a, Introduction to Elementary Particle Physics. Colin Gay.

mw 10.30–12

An overview of particle physics including a historical introduction to the standard model, experimental techniques, symmetries, conservation laws, the quark-parton model, and a semi-formal treatment of the standard model.

PHYS 538a, Introduction to Relativistic Astrophysics and General Relativity.**Vincent Moncrief.**

mw 9–10.30

Basic concepts of differential geometry (manifolds, metrics, connections, geodesics, curvature); Einstein's equations and their application to cosmology, gravitational waves, black holes, etc.

PHYS 548a^u and 549b^u, Solid State Physics I and II. A. Douglas Stone [F],**Simon Mochrie [Sp].**

tth 1–2.15

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. *Also ENAS 850a^u, 851b^u.*

PHYS 570b^u, High-Energy Astrophysics. Charles Bailyn.

3 htba

A survey of current topics in high-energy astrophysics, including accreting black holes, black holes and neutron stars, relativistic jets, gamma-ray bursts, and ultra-high-energy cosmic rays. The basic physical processes underlying the observed high-energy emission are also covered. *Also ASTR 570b^u.*

[PHYS 600b, Cosmology.]**PHYS 602a, Classical Field Theory. Jack Sandweiss.**

tth 9–10.30

Covariant formulation of electrodynamics, radiation phenomena, and introduction to general relativity.

PHYS 608b, Quantum Mechanics II. Thomas Appelquist.

mw 10.30–12

Approximation methods, scattering theory, and the role of symmetries. Relativistic wave equations. Second quantized treatment of identical particles. Elementary introduction to quantized fields.

PHYS 609a, Relativistic Field Theory I. Charles Sommerfield.

tth 10.30–12

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.

PHYS 610b, Many-Body Theory of Solids. A. Douglas Stone.

tth 10.30–12

Solids as many-particle systems. Second quantization. Green's functions, quantum statistical mechanics, linear response theory. Hartree-Fock theory, perturbation theory, Feynman diagrams at finite temperature. Theory of the electron gas, electron-phonon coupling, BCS theory of superconductivity. *Also ENAS 852b.*

[PHYS 624a, Group Theory.]**[PHYS 628b, Statistical Physics II.]****PHYS 630b, Relativistic Field Theory II. Charles Sommerfield.**

tth 9–10.30

An introduction to nonabelian gauge field theories, spontaneous symmetry breakdown and unified theories of weak and electromagnetic interactions. Renormalization group methods, quantum chromodynamics, and nonperturbative approaches to quantum field theory.

[PHYS 631a^u, Computational Physics I.]

PHYS 650a and 651b, Theory of Solids I and II. Simon Mochrie [F], Staff [Sp].

mw 9–10.30 [F], mth 1–2.30 [Sp]

Theoretical techniques for the study of the structural and electronic properties of solids, with applications. Topics include band structure, phonons, defects, transport, magnetism, and superconductivity. *Also ENAS 856a and 857b.*

special topics courses

[PHYS 662a, Special Topics in Particle Physics.]

[PHYS 663b, Special Topics in Cosmology and Particle Physics.]

PHYS 664b, Special Topics in Nuclear Physics. Richard Casten.

Emphasis is on nuclear structure. The approach stresses physical ideas, leading to an understanding of a number of advanced nuclear models and to practical case studies with them.

[PHYS 667b, Special Topics in Condensed Matter Physics.]

[PHYS 668b, Special Topics in Geometry and Modern Field Theory.]

PHYS 671a, Special Topics in Nuclear and Particle Physics. John Harris.

Course specializes in relativistic heavy Ion physics with emphasis on understanding the basic physics of the field, techniques utilized, and recent developments.

PHYS 671b, Special Topics in Experimental Nuclear and Particle Physics. Colin Gay.

Propagation of particles and photons in matter, modern detection techniques, types of detectors, large detector systems, accelerators, and seminal experiments are studied. The subject spans the range of energies from low-energy nuclear physics through high-energy physics.

[PHYS 672a or b, Special Topics in Experimental Physics.]

[PHYS 673a or b, Special Topics in Atomic Physics.]

[PHYS 674b, Quantum Information, Quantum Cryptography, and Quantum Computation.]

political science

124 Prospect, 432.5241
M.A., M.Phil., Ph.D.

Chair

Ian Shapiro

Director of Graduate Studies

Frances Rosenbluth

Professors

Bruce Ackerman, Seyla Benhabib, Paul Bracken (*Management*), David Cameron, William Foltz, Alan Gerber, Donald Green, Ilona Kickbusch (*Epidemiology*), Theodore Marmor (*Management*), David Mayhew, Barry Nalebuff (*Management*), William Odom (*Adjunct*), Douglas Rae, John Roemer, Susan Rose-Ackerman, Frances Rosenbluth, Bruce Russett, James Scott, Ian Shapiro, Stephen Skowronek, Steven Smith, Ivan Szelenyi (*Sociology*)

Associate Professors

Arun Agrawal, John McCormick, M. Victoria Murillo, John Wargo (*Forestry & Environmental Studies*)

Assistant Professors

Jose Cheibub, Keith Darden, Anna Grzymala-Busse, Jacob Hacker, Gregory Huber, Anastassios Kalandrakis, Pauline Jones Luong, Pierre-François Landry, John Lapinski, Ellen Lust-Okar, Jennifer Pitts, Rose Razaghian, Nicholas Sambanis, Kenneth Scheve, James Vreeland

Fields of Study

Fields include contemporary theory, political philosophy, international relations, comparative politics, American politics, political economy, and empirical analysis and research methodology.

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 fourteen term courses during their first two years in the program, and 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 seven courses in the first year. Courses are offered in seven fields: Contemporary Theory; Political Philosophy; International Relations; Comparative Politics; American Politics; Political Economy; and Empirical Analysis and Research Methodology. Each student must demonstrate competence in three of the seven fields by

the beginning of the third year. Competence is demonstrated by passing the comprehensive examination in the field. The department also allows students to petition for the creation of a special field of study and examination in exceptional cases.

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. Performance in the first-term course (540a) is graded on a Satisfactory/Unsatisfactory basis. The second-term course (541b) carries conventional letter grades that are assigned retroactively to 540a at the end of the second term.

Students are required to take a one-term course in statistical methods, successful completion of which satisfies the statistics requirement. All students are also required to demonstrate at least an elementary reading competence in one foreign language. Such competence is usually demonstrated by taking, or having completed, two years of undergraduate course work. A student may fulfill the language requirement by taking a graduate-level course in statistics offered in the department, or in another department at Yale, in addition to the required course in statistical methods.

In the fall term of the student's third year, each student must take the Dissertation Prospectus seminar. Upon submission of a dissertation prospectus that is approved by the seminar instructor and the student's dissertation adviser, the student is given a grade of either satisfactory or unsatisfactory for the seminar. The prospectus is judged by both readers for the following standard: the dissertation prospectus should present a summary of the nature and scope of the dissertation research. The prospectus should make clear the significance of the topic and should go into enough detail about research methods and plans to give the reader a clear idea of the research and persuade him or her of its feasibility. The prospectus must not exceed six double-spaced typewritten pages. If a satisfactory grade is not obtained, the student will be required to write a prospectus that is approved by three members of the faculty by May 1 of the student's third year. If three members of the faculty approve a student's prospectus prior to the start of the fall term of the third year, the requirement to participate in the prospectus seminar may be waived by the director of graduate studies.

Students are admitted to candidacy by the end of the third year, but only after all courses, including those involving statistics, language, and Research and Writing, and approval of the dissertation prospectus have been completed.

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 is an essential and central component of graduate teaching. 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.

A joint Ph.D. degree is available with African American Studies. Students must apply to and be accepted by both departments independently. Consult that department 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 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 seven term courses) with an average of High Pass or better. The course must include one each in at least three of the department's substantive fields and a basic 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.

tt 9–10.15

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, while 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 are considered on a variety of political science problems, such as turnout, crime, elections, party systems, etc.

PLSC 503b, Advanced Quantitative Methods. Kenneth Scheve.

m 1.30–3.20, 1 htba

This course provides an extensive treatment of the linear regression model. It covers a wide array of regression techniques including those which 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 students have command of the material covered in PLSC 500 including basic knowledge of probability theory.

PLSC 512a^U, Experimental Methods in Political Science. Alan Gerber, Donald Green.

m 1.30–3.20

An introduction to how experimental methods can be used to study politics. The strengths and weaknesses of experimental and nonexperimental studies are explored. 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. Background in introductory statistics is helpful but not required.

PLSC 516b, Research Seminar for Experimental Methods. Alan Gerber.

m 9–11

Research workshop for advanced graduate students working on projects involving experimental methods. Most sessions consist of presentation and discussion of research projects. Several times during the term there are lectures on methodological issues in experimental research. Students interested in this course should see the instructor prior to first meeting.

PLSC 517a, Fundamentals of Modeling. John Roemer, Anastassios Kalandrakis.

th 10.30–12.30

Topics include preferences, utility functions, Pareto efficiency, economic equilibrium, voting for public goods, Nash equilibrium, Downs-Nash political equilibrium, Wittman-Nash political equilibrium, social welfare functions, the Arrow Impossibility Theorem, the prisoners' dilemma, elements of probability, von Neumann-Morgenstern utility, Harsanyi's veil of ignorance, games in extensive form, and subgame perfect Nash equilibrium. The necessary mathematics is introduced as needed, but students are advised to review elementary calculus before the class begins.

PLSC 521a, Strategies in Research Design. Pauline Jones Luong, Anna Grzymala-Busse.

t 3.30–5.20

This course provides students with the analytical and methodological tools to pursue problem-driven research. Questions addressed include: How does one identify important problems or empirical puzzles independently from the theories and methods used to explore them? How does one test the validity of his/her claims against competing hypotheses derived from existing theories? How does one generate hypotheses where no theories exist? Do certain kinds of questions lend themselves to specific methodological approaches? How can we avoid the trap of method-driven research? What are the trade-offs between large and small studies?

PLSC 540a, 541b, Research and Writing. David Mayhew, Kenneth Scheve.

t 9–11

Six weeks in beginning of fall term; six weeks in beginning of spring term. This is a required course for all second-year students. The fall meetings are devoted to discussion of research design as well as individual student projects. These meetings supplement 540a, the individual meetings with faculty advisers. 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.

PLSC 545a, Prospectus Seminar. Stephen Skowronek.

htba

This seminar is for third-year students without an approved prospectus. Students present drafts of their prospectuses for discussion by fellow students and faculty.

contemporary theory**PLSC 550a, Proseminar in Contemporary Political Theory. Ian Shapiro.**

m 1.30–3.20

This seminar is intended to help students prepare for the contemporary political theory Field Exam and to do advanced (i.e., dissertation-level) work in political theory. The emphasis is on those sections of the department's Field Exam reading list and deals with theories of democracy, justice, equality, freedom, and power.

PLSC 565a^{II}, Democracy and Distribution. Ian Shapiro.

t 3.30–5.20

An examination of the effects of democracy on the distribution of income and wealth. Particular attention to factors that limit redistribution to the bottom quintile of the population, and those that might increase it.

PLSC 570a, Discourse Analysis of Politics. David Apter.

t 4–6

This seminar examines the “discursive” turn in political analysis. While discourse theory can be applied to the role of authority and state power, the emphasis here is on confrontational situations, protest, and violence. Particularly useful in analyzing some of the factors which lead people to try to change their political circumstances by interpreting and reinterpreting their experiences, part one examines the diverse theoretical strands and components making up contemporary political discourse theory as compared to other approaches, and an intellectual pedigree (much of it drawn from related fields) is mapped. Part two develops hypotheses derived from discourse theory as an analytical approach to show the kinds of questions with which it can be expected to deal. In part three a model framework for analysis is offered while students are expected to develop their own. In part four these frameworks are applied to relevant comparative and case materials. *Also AFST 638a, SOCY 538a.*

PLSC 575a, Political Competition. John Roemer.

w 9–12

Political competition in democracies is party competition. We develop, from the formal viewpoint, theories of party competition in democracies. The familiar “median voter theorem” of A. Downs is the simplest example of such a theory, but it is inadequate in several ways. We develop a theory in which parties: (1) compete over *several* issues, not just one issue, as in Downs; (2) are *uncertain* about how citizens will respond to platforms; and (3) represent interest groups in the population. Applications, particularly to the theory of income distribution and taxation, are studied. *Also ECON 788a.*

PLSC 583a, Contemporary Critical Theory: Habermas and Beyond. Seyla Benhabib, Rahel Jaeggi.

w 3.30–5.20

Deliberative democracy and struggles for recognition are two competing paradigms in critical social and political theory. This course traces the emergence of these paradigms in Habermas’s work, as well as examining conflicts and convergences among them. *Also PHIL 700a.*

PLSC 597b^u, Lincoln: Principle, Statesmanship, Persuasion. Steven Smith, David Bromwich.

m 1.30–3.20

An inquiry into the problem of statesmanship as epitomized by the career of Abraham Lincoln. *Also ENGL 848b^u.*

political philosophy**PLSC 602b^u, Political Theory from Plato to Machiavelli. Robert Wokler.**

mw 9–10.15, 1 htba

An intensive study of the foundations of political philosophy. An analysis of the origins of political philosophy in Socratic and Platonic thought, followed by Machiavelli’s comprehensive critique of the Socratic tradition.

PLSC 603b^u, Political Theory since Machiavelli. John McCormick.

mw 10.30–11.20

The development of political thought in the West from Machiavelli to Mill, with selected readings from the twentieth century. Themes addressed include politics and morality; the rights and responsibilities of citizenship; liberty; community and equality; violent and non-violent political transformation.

PLSC 604b^u, European Political Thought from Weber to Derrida. Seyla Benhabib.

tth 2.30–3.20, 1 htba

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; 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. *Also PHIL 510b^{II}.*

PLSC 607a, Reading Karl Marx. Ivan Szelenyi.

t 1–3

A close textual analysis of some of Karl Marx’s work. *Also SOCY 545a.*

PLSC 612a^{II}, International Justice. Jennifer Pitts.

t 3.30–5.20

What are states’ obligations to people who are not their citizens, especially the very vulnerable? How are standards of justice that are developed in domestic politics applied abroad? How do we argue about the morality of war, about rules of conduct in situations of extreme violence and insecurity? This course analyzes modern theories of war, empire, and international justice from Aquinas and Grotius to Hannah Arendt.

PLSC 642a^{II}, The Republic Tradition I: Ancient and Renaissance Republicanism.

John McCormick.

w 1.30–3.20

The first in a two-course sequence, this class focuses on four giants of classical and Renaissance republican political thought: Aristotle, Cicero, Guicciardini, and Machiavelli. Themes include: the person and the polity, moral and political virtue, patriotism, class conflict, mixed institutions, participation and military conquest.

PLSC 643b^{II}, The Republic Tradition II: Modern Civic Republicanism.

Jennifer Pitts.

t 3.30–5.20

This is the second in a two-course sequence on the republican tradition of political thought. This term covers the adoption of republican themes and arguments in revolutionary and post-revolutionary England, France, and the United States, examining thinkers and texts such as Milton and James Harrington; Rousseau and Tocqueville; and Thomas Jefferson, James Madison, and the *Federalist*.

international relations

PLSC 652b^{II}, The Politics of Non-Democratic Regimes. Keith Darden.

t 1.30–3.20

Even though the majority of countries of the world are non-democratic, scholarly understanding of non-democratic regimes is limited. The purpose of this course is to move beyond simple notions of non-democratic regimes as a form of personalistic rule, to examine the formal and informal patterns of contestation and control within these regimes, and to develop systematic explanations for the foreign and domestic policies of non-democracies.

PLSC 656a^{II}, U.S. National Security. William Odom.

m 3.30–5.20

This course examines the institutions and processes for making U.S. national security strategy and policy. We reflect critically on inherent tensions in the way Americans view the nature of war, the use of force, the aims of diplomacy, and America’s role in the world; and we address several contemporary challenges facing the U.S. national security policy making.

PLSC 665a^{II}, Ideas, Culture, and Rationality in International Politics. Keith Darden, Oona Hathaway.

t 1:30–3:20

This course examines the diverse literature in international politics known generally as “Constructivism.” The first part of the course examines the origins of constructivist thinking outside of the field of international relations. We then look at efforts to define and explain the role

of identity, morality, different forms of rationality, and other “intractable” variables in international affairs. *Also LAW 20301.*

PLSC 666b^U, Research Seminar on Democracy, Interdependence, and Peace.

Bruce Russett.

W 1.30–3.20

Examination of whether the international system is changing fundamentally, with zones of peace among many countries, through forces of democratization, economic linkages, and international organizations. Consideration of how classical and contemporary theories of international relations may illuminate these questions and what the empirical evidence may be.

PLSS 689a^U, Secession and Political Boundaries. **Nicholas Sambanis.**

W 3.30–5.20

This course analyzes the political economy of decentralization, secession, and political boundaries (both internal to states and international). We explain why some countries have stable systems of political decentralization and others do not. We develop a framework that explains why (and which) regions will demand more self-determination and where these demands might lead to violent conflict.

comparative politics

PLSC 708a^U, Urban Politics in China. **Pierre Landry.**

W 3.30–5.20

The course introduces students to the key political science literature (and sociological literature) on the transformation of Chinese urban politics in the reform era (1978–2002).

PLSC 712b, Political Economy. **Frances Rosenbluth.**

Th 10–12

The course introduces graduate students to the basic theoretical and methodological approaches to political economy (most notably rational choice and game theory), as well as analyzing important empirical questions and providing a forum for students to undertake their own research. Some of the empirical topics include transitions to democracy and the market, political competition and economic outcomes, globalization, deregulation, environment, regional integration, federalism, and corruption.

PLSC 714b, Corruption, Economic Development, and Democracy.

Susan Rose-Ackerman.

T 2.10–4

A seminar on the link between political and bureaucratic institutions on the one hand, and economic development on the other. Consideration is given to the role of international aid and lending organizations such as the World Bank. A particular focus is the impact of corruption on development. This course has a limited enrollment and students should be in contact with Professor Rose-Ackerman prior to the beginning of class. *Also LAW 21042.*

PLSC 715a, Studies in Grand Strategy, Part II. **John Gaddis, Charles Hill,**

Paul Kennedy, Paul Bracken.

M 1.30–3.20

This two-term course began in January 2002 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, whether of a historical or contemporary character. Written reports on these projects are presented and critically discussed early in the fall term. The seminar then turns its attention to strategic dilemmas currently facing governments, corporations,

and nongovernmental organizations. Students must take both terms, fulfill the summer research/internship requirement, and attend additional lectures on grand strategy to be scheduled throughout the spring and fall terms. For the first term, students from the graduate school receive a grade of FY (full year), which converts to a final grade for both terms upon completion of the course. Other students receive grades in accordance with the grading systems of their respective schools. In both terms the seminar meets during reading week and holds a total of fourteen weekly sessions. Admission is by competitive application only; forms are available at International Security Studies. *Also HIST 985a.*

PLSC 722b^U, Authoritarian Regimes. Pierre Landry.

W 3:30–5:20

The course introduces students to the key literature on authoritarian regimes and their political evolution.

PLSC 724a, Comparative Policy Development: Theories, Methods, Realities.

Jacob Hacker.

M 3:30–5:20

An introduction to comparative public policy, both as a field of social science inquiry and as a set of concrete observations about the character of government interventions and the differences that they make in people's lives. Theoretical emphasis on the ways in which political processes shape — and, in turn, are shaped by — policy outcomes. Substantive emphasis on the domestic policies of advanced industrial democracies. Topics include the evolution of the welfare state, public-private and business-government relations, sources of cross-national policy convergence and divergence, models of policy making, and historical-institutional approaches.

PLSC 734a,b, Comparative Research Workshop. Ivan Szelenyi, Lawrence King.

M 5–7

This workshop is a weekly interdisciplinary seminar at which work-in-progress by distinguished visiting scholars, Yale graduate students, and faculty from various social science disciplines is discussed. Papers are distributed a week ahead of time and also posted at the Web site of the Center for Comparative Research. Students who take the course for a letter grade have to present a paper the term they are enrolled for credit. *Also SOCY 560a,b.*

PLSC 738b^U, Resource Wealth, Political Regimes, and Economic Growth.

Pauline Jones Luong.

T 3:30–5:20

Is there in fact a “resource curse”? The proposition that the abundance of resources is more often a curse than a blessing is all too familiar — and particularly prominent in the developing world. There are countless studies documenting the correlation between resource wealth and a series of negative economic and political outcomes, including poor economic performance, unbalanced growth, weakly institutionalized states, and authoritarian regimes. The causal mechanisms, however, are rarely specified and often assumed rather than empirically verified. It is quite possible, then, that the link between resource wealth and these negative economic and political outcomes throughout the developing world is one of correlation and not causation. Moreover, few of these studies offer any hope that countries in the developing world can actually escape this so-called “resource curse.” The purpose of this course is to explore the relationship between resource wealth and a series of negative political and economic outcomes and to provide students with the analytical tools to determine whether this correlation is in fact causation.

PLSC 744a^U, Dynamics of Russian Politics. William Odom.

T 1:30–3:20

Issues of political stability, constitutionalism, and institutions for political participation and governing are examined in light of contemporary events as well as the legacy of the Soviet

period. Concepts from political development literature are used to devise alternative interpretations of the most critical determinants of Russian political change and stability, today and in the future. Huntington's *Political Order in Changing Societies*, Dahl's *Polyarchy*, Barrington Moore's *The Social Origins of Dictatorship and Democracy*, as well as selected journal articles on transitions to democracy, provide the analytic tools for analysis.

PLSC 746b, Models of Legislatures and Parliaments. Anastassios Kalandrakis.

t 3.30–5.20

This course provides a unified introduction to recent developments in the theory of legislative bargaining, and is intended for students of legislative politics in the American and Comparative fields. Although familiarity with the basic concepts of noncooperative game theory is helpful, there are no technical requirements other than an understanding of probability and the ability for basic algebraic manipulation. The course starts with static agenda setting followed by dynamic models of legislative bargaining. Subsequent applications built around the latter include legislative power, the size of winning coalitions, legislative committees, seniority, government formation in parliaments, investiture institutions, etc. Emphasis is placed on the corresponding empirical literature (including novel approaches to empirical testing such as game-theoretic experiments and calibration methods).

PLSC 755a^u, European Politics. David Cameron.

t 1.30–3.20

A comprehensive survey of politics in Europe. Attention is concentrated upon the development of the European Union as a supranational organization — including recent developments associated with economic, monetary, and political union, and the developments that have occurred throughout Eastern Europe since 1989.

PLSC 759b^u, European Union. David Cameron.

w 1.30–3.20

An examination of the history, institutions, and policy-making processes of the European Union. Topics include theories of European integration, the creation of the single market and the euro, the eastward enlargement of the European Union, and the so-called democratic deficit.

PLSC 764b, International Political Economy. Kenneth Scheve.

t 1.30–3.20

This course examines how domestic and international politics influence the economic relations between states. It addresses the major theoretical debates in the field and introduces the chief methodological approaches used in contemporary analyses. We focus on five types of cross-border flows and the policies that regulate them: the flow of goods (trade policy), the flow of capital (financial and exchange rate policy), the flow and location of production (foreign investment policy), the flow of people (immigration), and the flow of pollutants (environmental policy).

PLSC 768a, Globalization and Violence: Interdisciplinary Perspectives.

Arjun Appadurai.

w 3.30–5.20

This seminar uses the close reading of eight or nine monographs as the basis for intensive discussion of ethnic violence in the era of globalization. The course is concerned with the general methodological problem of relating scales to forms in social life, and with the related problem of the historical breaks implied by the idea of “globalization.” The readings and class discussions deliberately focus on problems that cut across the social sciences, such as those of state cultures, crowd dynamics, genocidal stereotyping, and the making of modern minorities. A cultural perspective — one focusing on various dimensions of contextual meaning — serves to probe the limits of various disciplinary languages and images in regard to the politics of violence. *Also ANTH 552a.*

PLSC 770b^U, Party Politics. Anna Grzymala-Busse.

t 1.30–3.20

This is an advanced undergraduate/graduate seminar to examine party politics, their development, and its ramifications for democratic governance. Main topics of the course include: the rise of political parties, electoral laws and their effects, parties as organizations, parties and patronage/corruption, fragmented political systems, consociational arrangements, and the roles of parties in ethnic conflict. Broader theoretical themes addressed in the course include the specificity of political party organizations, “difficult choices” (responsiveness to the electorate versus responsibility as the government), and the threats to democracy from the parties themselves, both in the interwar period and at the end of the twentieth century. Principal readings include: Kitschelt, *The Transformation of European Social Democracy*; Sartori, *Parties and Party Systems*; Horowitz, *Ethnic Groups in Conflict*. As a graduate seminar, the format includes a research/theoretical paper, suitable for publication, or a conference presentation. There may be student presentations.

PLSC 773b, Political Institutions and Market Failures. Rose Razaghian.

w 3.30–5.20

The goal of this course is to provide a survey of the literature on institutions through systematically studying the role that institutions play in shaping outcomes, in particular the effect that *political* institutions have on *economic* outcomes. Because there is no unified theory of institutions, the course is structured around the major contributions in economics and business organization and then turns to work in political science and political economy.

PLSC 776b^U, States and Regimes in Comparative Perspective.**Anna Grzymala-Busse.**

t 3.30–5.20

This seminar is designed to analyze the state as a responsive, if not necessarily a unitary, political actor. Main topics include: theories of the state; analytical issues in “measuring the state”; the rise of bureaucracy, patronage, corruption, and rent-seeking; state engineering of economic and administrative policies; the state under a variety of political systems; the colonization of the state by political parties, interest groups, and economic classes; state collapse and regeneration. Principal readings include Bates, *States and Markets*; Scott, *Seeing Like a State*; and Bunce, *Subversive Institutions*.

PLSC 779a, Agrarian Societies: Culture, Society, History, and Development.**Robert Harms, Steven Stoll, Michael Dove, Enrique Mayer.**

m 1.30–5.20

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. *Also ANTH 541a, F&ES 753a, HIST 965a.*

PLSC 783b^U, The IMF at the Crossroads. James Vreeland.

m 1.30–3.20

The International Monetary Fund is at a crossroads. Originally intended to provide exchange rate stability, the IMF has gradually become involved in the economic policies of most countries in the world. Since the East Asian financial crisis, however, the IMF has come under closer scrutiny than ever before. For the first time, calls for its reform and even its dissolution come from across the political spectrum. We study the purposes of the Fund, the effects of its economic programs, and the various reform arguments.

PLSC 784a^u, Africa and the Disciplines. William Foltz.

t 1.30–3.20

This seminar is designed to introduce students to the study of Africa from the perspective of the several disciplines, specifically history, anthropology, politics and economics, law, literature, linguistics, and art history. It will examine how Africa has been studied from the perspectives of the different disciplines, and also show how the study of Africa has in turn contributed to the disciplines themselves. *Also AFST 764a^u.*

PLSC 787b^u, Japanese Politics. Frances Rosenbluth.

mw 9–10.15

This course places Japanese politics in historical, theoretical, and comparative perspectives. After comparing conceptual frameworks, we examine the organization and functioning of political parties, factions, and local electoral machines and take a close look at the government's decision-making process in the area of economic regulation and social policies and recent changes in Japanese politics and their implications for Japan's global role.

american politics**PLSC 806a, Topics in Congressional Research. David Mayhew.**

t 1.30–3.20

Two topics are considered: majority versus supermajority rule in the Senate and theories of accounting for committees.

PLSC 828b, American Political Development. Stephen Skowronek.

w 3.30–5.20

An examination of patterns of political change and institutional development in the United States. The course considers patterns of reform, the political construction of interests and movements, problems of political culture, party-building, and state-building. *Also AMST 828b.*

PLSC 837a, Political Organization. Gregory Huber.

t 10–11.50

This course is an introduction to the study of political organizations, with a particular focus on formal political organizations including parties, legislatures, and bureaucracies. It offers an overview of organization theory for political scientists.

PLSC 842b, The Constitution: Philosophy, History, and Law. Bruce Ackerman.

t 2.10–4

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 will try to gain a critical perspective on the effort by the present Supreme Court to create a new constitutional regime for the twenty-first century. *Also LAW 21046.*

PLSC 853a^u, U.S. National Elections. David Mayhew.

w 1:30–3:20

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.

PSCL 854b^u, Seminar on Urban Change. Douglas Rae.

m 3.30–5.20

This seminar uses New Haven and its region as a case study for change in older American cities over the course of the twentieth century. Major studies of New Haven and of other cities are discussed during the first nine weeks of term. Student research is the major focus in the concluding weeks of term. Specific topics include economic decentralization, racial and ethnic conflict, civic engagement and its decline, changing patterns of political competition, and the challenges of government leadership.

PLSC 871a, Health Law and Policy. Theodore Marmor, Jerry Mashaw.

This course provides a general introduction to health law, policy, politics, and economics. Topics include access to health care, patients' rights, the meaning and effects of "managed care," the relationship of health care to public health, and selected issues in bioethics. Treatment of these issues in foreign health care systems is analyzed to provide perspective on domestic issues. Examination with a limited paper option. *Also MGT 661a, LAW 20304.*

PLSC 876b^u, The American Welfare State in Comparative Perspective.**Jacob Hacker.**

th 3.30–5.20

An exploration of the causes and consequences of America's comparatively distinctive social welfare framework. Consideration of competing analytic and normative perspectives in the context of selected policy issues and political episodes, including health care, retirement pensions, economic inequality, the New Deal, the Great Society, and current debates over Medicare and Social Security.

PLSC 903b, Scope of the Policy Sciences. Garry Brewer.

htba

Emphasizing a systematic and comprehensive approach to the study of policy, this course concentrates on a general sequence of decisions comprised of six distinct, interrelated, phases of the "life" of a policy or problem. The course has served as a foundation upon which other substantive policy courses and work have been built. Furthermore, it works to integrate theory with practice in a variety of substantive fields. *Also F&ES 770b, MGT 676b.*

PLSC 990a,b, Directed Reading. Faculty.

psychology

2 Hillhouse, 432.4518

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

Chair

Peter Salovey

Director of Graduate Studies

Kelly Brownell (432.4518, kelly.brownell@yale.edu)

Professors

J. Truett Allison (*Veterans Administration Medical Center*), Stephen Anderson (*Linguistics*), Linda Bartoshuk (*Surgery; Otolaryngology*), Sidney Blatt (*Psychiatry*), Paul Bloom, Thomas Brown, Kelly Brownell, Celia Fisher (*Visiting*), Carol Fowler (*Haskins Laboratories*), Patricia Goldman-Rakic (*Neurobiology*), Louis Goldstein (*Linguistics*), Donald Green (*Political Science; ISPS*), Marcia Johnson, Alan Kazdin, Frank Keil, Marianne LaFrance (*Women's & Gender Studies*), James Leckman (*Pediatrics*), Nicholas Mackintosh (*Visiting*), Lawrence Marks (*Epidemiology & Public Health*), Donald Quinlan (*Psychiatry*), Tomi-Ann Roberts (*Visiting*), Peter Salovey, Jerome Singer, Sara Sparrow (*Child Study Center*), Robert Sternberg, Fred Volkmar (*Child Study Center*), Victor Vroom (*School of Management*), Allan Wagner, Karen Wynn, Edward Zigler

Associate Professors

Amy Arnsten (*Neurobiology*), Elena Grigorenko (*Child Study Center*), Jeannette Ickovics (*Epidemiology & Public Health*), Robert Kerns (*Veterans Administration Medical Center*), Jeansok Kim, Linda Mayes (*Child Study Center*), Mary Schwab-Stone (*Child Study Center*), Kathleen Sikkema (*Psychiatry*)

Assistant Professors

David Armor, Geoffrey Cohen, William Corbin, Karyn Frick, Joseph Mahoney, Christy Marshuetz, Douglas Mennin, Mitchell Prinstein, Laurie Santos, Mark Schaefer (*Child Study Center*), Brian Scholl, Teresa Treat, Robin Weersing (*Child Study Center*)

Lecturers

James Charney, Nancy Close, William Cunningham, Nelson Donegan, Carla Horwitz, Kent Kiehl, Janet Kremenitzer, Valerie Kuhlmeier, Kristi Lockhart, Jianjian Qin, Marlene Schwartz, Golan Shahar, Joseph Stevens, Charles Yang

Fields of Study

Fields include behavioral neuroscience; clinical psychology; cognitive psychology; developmental psychology; social/personality psychology; and abilities and expertise.

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 predissertation research project, to be initiated not later than the second term and completed not later than March 15 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, is necessary for continuation beyond the second year. (4) Submission of a dissertation prospectus, a dissertation area review of the literature, 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. (5) 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. The dissertation area review of the literature must be approved prior to receipt by the readers of a preliminary draft of the dissertation. 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. 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 upon request to the Registrar, Department of Psychology, Yale University, PO Box 208205, New Haven CT 06520-8205.

Courses

[PSYC 501a, Perception.]

[PSYC 502a, Learning Theory.]

PSYC 503a, Memory. Marcia Johnson.

t 10–12

A consideration of major theoretical ideas and empirical findings about human memory.

[PSYC 505a, Creativity.]

PSYC 506b, Introduction to Brain and Behavior. Jeansok Kim.

th 3–5

Introduction to basic principles of brain function, including fundamentals of synaptic transmission, organization of the CNS, sensory and motor integration, and higher processes such as the neurobiology of language, learning, and memory. *Also NSCI 506b.*

[PSYC 507, Health Psychology: Clinical and Social Foundations.]

PSYC 509b, Social Development. Joseph Mahoney.

th 1.30–4

A critical review of the foundations and current theories of social development, including views on the development of attachments, empathy, aggression, morality, and friendships.

PSYC 510a, Self and Identity. David Armor.

tth 1–2.30

In-depth analysis of central issues in psychological analyses of self and identity, drawing from classic and contemporary sources. Topics include content and structure of self-knowledge, accuracy and bias in self-evaluation, and self-regulation.

PSYC 511b, Cognitive Development. Paul Bloom.

htba

This course explores how fundamental questions in perception, language, and cognition are informed by a developmental perspective. It surveys developmental theories and experimental research on several topics, including color, object, and depth perception; speech and multimodal perception; perceptual motor coordination and imitation; cognition about number, space, and physical objects; grammatical and semantic competencies; theory of mind; conceptual change; and cognitive skills.

[PSYC 512b, The Cognitive Sciences.]

[PSYC 513b, Personality Development and Psychopathology.]

PSYC 515b, Structural Equation Modeling. William Cunningham.

th 9.30–11.20

Covers introductory and advanced issues in structural equation modeling. Examines strengths and weaknesses of general latent-variable approaches. Surveys major programs for such analyses (e.g., LISREL, EQS, Amos, Mx, Calis).

PSYC 518a, Data Analysis: Quantitative Variables. Teresa Treat.

mwf 10.30–11.20

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.

[PSYC 520b^U, Multivariate Data Analysis with Latent Variables.]

PSYC 521b^u, Multivariate Data Analysis with Observable Variables. Jianjian Qin.

tth 9–10.15

A survey of multivariate techniques for discovering relations among observable variables; multivariate analysis of variance, profile analysis, discriminant analysis, multiple and canonical regression. Limited enrollment.

[PSYC 525a, The Minds of Infants.]**[PSYC 527, Psychotherapy: Historical and Scientific Foundations.]****[PSYC 530b, Advanced Quantitative Methods.]****[PSYC 533, The Nature of Cognition.]****PSYC 534a, Theories of Development.****[PSYC 535, Foundations of Behavioral Neuroscience.]****PSYC 539a, Psychopathology and Its Treatment. Kelly Brownell.**

m 1.30–3.20

The major forms of psychopathology approached from a cognitive-behavioral perspective. Diagnosis, assessment, conceptualization, and treatment are emphasized, drawing from both theory and current research.

[PSYC 540b, Changing Behavior in Applied Settings.]**PSYC 541b, Research Methods in Psychology. Alan Kazdin.**

th 1.30–4.20

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.

[PSYC 542, Research Methods in Psychology: Investigating Social Thought and Behavior.]**[PSYC 554b, Human Intelligence and Its Development.]****[PSYC 556, Developmental Psychopathology.]****[PSYC 570b, Nonverbal Communication.]****PSYC 572b, Neurobiology of Learning and Memory. Thomas Brown.**

mw 11.30–12.45

The goal is to comprehend the field and memory across several levels of analysis – including synapses, neurons, circuits, systems, behavior, and cognition. The emphasis is on mammalian memory systems that are sufficiently well understood to begin unifying facts and principles across these levels using suitable combinations of theoretical approaches to computational neuroscience.

PSYC 605b^u, The Relation of Speech to Language. Carol Fowler.

tth 2.30–3.45

A study of the relation between the speech signal and the linguistic message it conveys. Special attention to those characteristics of speech that fit it to humans and make it a uniquely efficient vehicle of communication. *Also LING 621b^u.*

[PSYC 607a^u, Human Thinking and Reasoning.]

PSYC 608a^u, Spatial Cognition. Andrew Hollingworth.

w 1.30–3.20

A multidisciplinary examination of the cognitive and neural mechanisms supporting spatial abilities in humans and other animals. Topics include the perception of and memory for spatial information, spatial representation for the purpose of navigation, and the development of spatial competencies in humans.

PSYC 608b, Behavior Genetics. Elena Grigorenko.

m 3.30–5.20

Behavioral genetics is an area of scientific investigation devoted to the study of the genetic and environmental bases of individual differences in behavior. As a discipline, behavior genetics combines knowledge and methodologies from psychology, genetics, and statistics. The course provides a brief overview of the principles and techniques used in developmental genetics, molecular genetics, pharmacogenetics, and quantitative genetics as applied to the analysis of behavior. In addition, the course surveys current conceptions of the genetic etiologies of individual differences in cognitive abilities/disabilities, personality/temperament, and selected psychopathologies.

[PSYC 614b^u, Neurobiology of Learning and Memory.][PSYC 615a^u, Psychology and Psychotherapy: History, Systems, and Practice.][PSYC 616a^u, Psychopathology and Cognitive Processing.]**PSYC 617b^u, Evolutionary Psychology. Laurie Santos.**

This course provides an in-depth look at the newly emerging field of evolutionary psychology. We begin by examining the central tenets of evolutionary psychology and then discuss several main topic areas including human mate choice, sexual conflict, the nature of violence, and the evolution of morality.

[PSYC 618b, Visual Cognition and Attention.]

[PSYC 620, Topics in Cognitive Development.]

PSYC 621a^u, Bioethics: Issues in Mental and Physical Health Care, and Biomedical and Behavioral Science Research. Celia Fisher.

t 2.30–4.20

This course examines ethical issues in medical and mental health practice and research. Through readings and case examples, the course explores the influence of moral, sociopolitical, cultural, and religious values on ethical decision making within a relational framework emphasizing respect and partnership between patients and professionals.

PSYC 622a^u, Social Intervention. Joseph Mahoney.

th 1.30–3.20

Theory and research on social intervention from a developmental perspective. Discussion of interventions for school failure, aggression, substance use, disadvantaged children, high-risk infants, and antisocial youth.

PSYC 623b^u, Topics in Bioethics. Celia Fisher.

t 2.30–4.20

This course examines ethical issues in medical and mental health practice and research. Through readings and case examples, the course explores the influence of moral, sociopolitical, cultural, and religious values on ethical decision making within a relational framework emphasizing respect and partnership between patients and professionals.

[PSYC 626b, Modularity and Cognition.]

PSYC 627a^u, Topics in Infant Cognition. Karen Wynn.

W 2.30–4.20

The course investigates selected advanced topics in infant cognition, such as infants' concept of object, concept of number, understanding of intentional agency and goals, and representation of space.

[PSYC 628a^u, Working Memory, Attention, and Executive Processing.]**PSYC 631a, Topics in Associative Learning. Nicholas Mackintosh.**

M 1.30–3.20

The course evaluates different theoretical approaches to the phenomena of conditioning and associative learning, generalization and discrimination – ranging from theories of selective association to those emphasizing performance rules, to non-associative theories. We also discuss how adequately such theories apply to other learning phenomena such as spatial memory and navigation and primate social behavior.

[PSYC 632b, Comparative Psychology.]**PSYC 633a^u, IQ and Intelligence. Nicholas Mackintosh.**

T 1.30–3.20

In addition to the standard questions asked about IQ tests – heredity vs. environment, group differences – the course concentrates on trying to understand the cognitive operations and neuropsychological mechanisms underlying performance on IQ tests; i.e., what they do and do not measure. We also discuss the social and political uses and misuses to which the tests have been put.

PSYC 640b, Transdisciplinarity: A New Research Approach to Address Complex Scientific Problems. Suchitra Krishnan-Sarin.

W 9.30–11.20

The traditional method of addressing scientific and health problems has been to study the question within a single discipline in depth. However, the complexity of most disorders requires a more integrated approach. A new approach, transdisciplinarity, has arisen in an effort to address these complex issues from the standpoint of many disciplines at the same time. The course faculty uses a case-based approach, with examples from their own work, to illustrate and define how transdisciplinary approaches might be used to come up with a more meaningful understanding of complex problems.

[PSYC 642b, Social Psychology and Social Change.]**PSYC 643a, Diagnosis and Assessment. Marlene Schwartz.**

T 9.30–11.20

This course focuses on the theoretical underpinnings of psychological assessment as well as covering the administration of major cognitive, projective, and personality instruments and the basics of report writing.

[PSYC 646b, Advances in Cognitive Neuroscience: Prefrontal Cortex and Memory.]**[PSYC 648, Cellular Analysis of Learning: Vertebrate Model Systems.]****PSYC 651b^u, Object Cognition. Brian Scholl.**

T 2.30–4.20

The exploration of how the mind processes the world in terms of discrete persisting objects. Topics include object-based attention, the infant's "object concept," objects in higher-level cognition, and perception vs. cognition. Instructor's permission required for undergraduates.

PSYC 652a^u, Topics in Cognitive Neuroscience. Christy Marshuetz.

m 1.30–3.20

Students learn about and discuss recent developments in cognitive neuroscience. The course consists of (1) an introduction to neuroimaging techniques, (2) topics in experimental design for neuroimaging, using primary research articles as examples, (3) recent developments in cognitive neuroscience, with a focus on memory and higher-order cognitive processing.

PSYC 654b^u, Sensory Processes. Lawrence Marks, Joseph Stevens.

t 3.30–5.20

A course on the senses, emphasizing functional properties of human vision, hearing, taste, smell, and skin senses.

[PSYC 656, Teaching Undergraduate Psychology.]**[PSYC 657a, Social and Behavioral Influences on Health.]****PSYC 658b, Behavioral Decision Making. Ravi Dhar, Nathan Novemsky.**

This seminar examines research on the psychology of judgment and choice. 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 choice, judgment heuristics and biases, decision framing, prospect theory, mental accounting, context effects, task effects, regret, 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. *Also MGMT 753b.*

PSYC 659b^u, Addictive Behaviors. William Corbin.

w 1.30–3.20

This seminar course introduces students to important issues in the field of addictive behaviors. Three areas of focus include: defining, assessing, and diagnosing addictive behaviors and reviewing epidemiological research on alcohol and drug abuse and negative consequences of normative alcohol and drug use; examining factors that contribute to alcohol and drug related problems, including genetic, physiological, neurochemical, cognitive, and social factors; and evaluating current prevention and treatment approaches for addictive behaviors.

[PSYC 660b^u, Child Development and Social Policy.]**PSYC 661a, Clinical Diagnostic Evaluation of Children. Sara Sparrow, Mark Schaefer.**

Covers major testing instruments used in the evaluation of children's cognitive, emotional, and academic development as well as adaptive functioning. Limited enrollment.

PSYC 662a, Abilities, Competencies, and Expertise I. Robert Sternberg.

t 4.30–6

This seminar is a forum for students to discuss contemporary issues related to intelligence and thinking. In some classes, we discuss the work of researchers outside Yale. Occasionally there are presentations from researchers outside our community. Most of the classes consist of informal presentations by seminar members aimed at helping them clarify their ideas for theory and research

PSYC 663b, Abilities, Competencies, and Expertise II. Robert Sternberg.

t 4.30–6

For description, see PSYC 662a.

[PSYC 669b, Neurochemical and Hormonal Modulation of Learning and Memory.]**[PSYC 672, Concepts, Categories, and Word Meanings.]**

PSYC 673a^u, Clinical Cognitive Neuroscience. Kent Kiehl.

f 2.30–4.20

The tools and techniques of cognitive neuroscience (i.e., EEG/ERP, PET, fMRI, MRS) as applied to the study of clinical populations. Each session focuses on how cognitive neuroscience has elucidated the underlying neurobiological correlates of major clinical disorders, including depression, anxiety disorders, borderline personality disorder, psychopathy, schizophrenia, and eating disorders. Special emphasis is placed on how brain imaging can be used to assess neural changes associated with cognitive and/or pharmacological treatment.

[PSYC 676a^u, Neuroscience Simulation Lab.]**[PSYC 677b^u, Introduction to Computational Neuroscience.]****[PSYC 678a, Psychology's Contribution to Gender and Vice Versa.]****[PSYC 680a^u, Consciousness, Volition, and Responsibility.]****[PSYC 682a, Child and Adolescent Peer Relations.]****PSYC 684, Case Conference Seminar.**

Interdisciplinary seminar in which students and faculty discuss case conceptualization and treatment planning for clinic patients.

[PSYC 688b, Psychotherapeutic Process: Clinical and Research Perspectives.]**PSYC 689a, Assessment and Clinical Practice. Douglas Mennin.**

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.

PSYC 690b, Advanced Diagnostic Skills.

This course provides first-year clinical students with extensive supervision on how to conduct diagnostic evaluations using the Structured Clinical Interview for DSM-IV.

PSYC 702, Current Work in Cognition. Faculty.

t 12–1.30

A weekly seminar in which students, staff, and guests report on their research in cognition and information processing.

PSYC 704, Current Work in Behavioral Neuroscience. Allan Wagner.

f 4–5.30

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.

PSYC 705, Current Work in Abilities and Expertise. Robert Sternberg.

m 1.30–2.30

This seminar discusses current work in abilities and expertise viewed from a multidisciplinary approach. It consists of both presentations and discussions of recent readings.

PSYC 708, Current Work in Developmental Psychology. Faculty.

w 12–1.30

A luncheon meeting of the faculty and graduate students in developmental psychology for reports of current research and discussion on topics of general interest.

PSYC 710, Current Work in Social Psychology and Personality. David Armor.

m 12–1.30

Faculty and students in personality/social psychology meet during lunchtime to hear about and discuss the work of a local or visiting speaker.

PSYC 711, Current Work in Child Development and Social Policy. Edward Zigler.

f 11.30–12.30

Guest lectures and discussion on recent topics in child development and social policy, and its influence on public policy in the United States.

[PSYC 717a, Ethical Issues in Psychology, Current Work and Current Research in Clinical Psychology.]**[PSYC 718, Ethnic and Cultural Diversity: Current Work in Clinical Psychology.]****PSYC 719a, History and Systems of Psychology: Current Work in Clinical Psychology. Jerome Singer.**

th 12–1.30

This course examines the current status of research and scientific knowledge bearing on issues of history and systems as they relate to clinical practice. Weekly speakers present research that is examined methodologically. Recent significant journal articles or technical books are also reviewed.

PSYC 720b, Current Work in Clinical Psychology. Faculty.

th 12–1.30

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.

PSYC 721, Research Topics in Infant Cognition. Karen Wynn.

htba

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 instructor required.

PSYC 722, Research Topics in Eating and Weight Disorders. Kelly Brownell.

t 12.30–1.30

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.

PSYC 723b, Research Topics in Child and Adolescent Therapy. Alan Kazdin.

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 724, Research Topics in Child Development and Social Policy. Edward Zigler.

m 5–6

The course focuses on major policy issues pertaining to children and families (particular issues are determined by course participants). The goal of the course is to fully investigate the policy issues under study, discovering what is occurring at several different levels (federal policy, state policy, international policy, best practices, and research) on the issues. The knowledge gained is used to develop a written product by the end of the semester or academic year (e.g., journal article, book chapter, monograph). In addition to the substantive knowledge gained on the issues examined, participants also learn how to do research in the policy arena, a skill which can then be used to study other issues.

[PSYC 727, Professional and Conceptual Issues in Psychology.]**PSYC 728, Research Topics in Prevention Research. Joseph Mahoney.**

f 9.30–11

The course discusses current theory and research on social intervention research and social policy. Format involves student presentation and discussion of original research, student- and

faculty-led discussions of current topics in prevention research and social policy, and student development and career training in social intervention research and policy.

PSYC 729, Research Topics in Language and Cognition. Paul Bloom.

th 10–11.45

Seminar focusing on ongoing research projects in language, cognition, and development. Permission of instructor required.

PSYC 731, Research Topics in Cognition and Development. Frank Keil.

w 2.30–4.20

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.

PSYC 749, Research Topics in Memory. Marcia Johnson.

th 1–2.30

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.

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 neuroanatomy, and contemporary behavioral neuroscience.

[PSYC 751, Research Topics in Memory, Aging, and Neurobiology.]

PSYC 766, Research Topics in Perception and Cognition. Brian Scholl.

f 2–4

A 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.

PSYC 767, Research Topics in Emotion, Health, and Social Behavior. Peter Salovey.

w 3.30–5.20

A forum for graduate students conducting research in the Health, Emotion, and Behavior Laboratory.

PSYC 768, Research Topics in Psychopathology and Cognitive Processing.

Teresa Treat.

th 10–12

Weekly discussion and analysis of theoretical and measurement models relevant to examination of the role of cognitive processing in psychopathology. Permission of instructor required.

PSYC 769, Research Topics in Intelligence and Thinking. Robert Sternberg.

A forum for students to discuss contemporary issues related to intelligence and thinking. Discussion of works of researchers within and outside the Yale community. Primarily consists of informal presentations by seminar members seeking to help them clarify their ideas for theory and research.

PSYC 772, Research Topics in Self and Social Judgment. David Armor.

t 4–5.30

Weekly lab focusing on current research projects in self-evaluation, social judgment, and decision making.

PSYC 773, Research Topics in Working Memory. Christy Marshuetz.

Students have a chance to discover what it is like to be involved in academic research. The course consists of weekly discussion and analysis of theoretical developments in cognitive neuroscience, especially the cognitive neuroscience of memory. Students in the course have a chance to help design experiments and discuss data, and read research papers. Students may also become involved in ongoing research. Permission of instructor required.

PSYC 777, Research Topics in Gender and Psychology. Marianne LaFrance.

This “gender lab” meets weekly to consider research being done in the department that bears on some gender-related issue.

PSYC 779, Research Topics and Current Work in Child and Adolescent Peer Relations. Mitchell Prinstein.

Lab meeting for ongoing studies of child and adolescent peer relationships and adjustments.

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 806a, Practicum in Childhood Intervention. Edward Zigler.

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. Sara Sparrow.

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. Sara Sparrow.

An optional extension of PSYC 661. 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 812b, 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 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 821, Practicum in Clinical Child and Adolescent Treatment.]

PSYC 883b, Practicum in Clinical Assessment. Donald Quinlan.

Supervised psychological assessment using measures of intellectual functioning, projective testing, and neuropsychological testing with patients.

PSYC 920, Individual Study: Dissertation Area Paper.

By arrangement with faculty.

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

Chair

Dale Martin

Director of Graduate Studies

Harry Stout (432.0828, harry.stout@yale.edu)

Professors

Marilyn McCord Adams, Robert Adams (*Philosophy*), Harold Attridge (*Divinity School*), Gerhard Böwering, Jon Butler, Marcia Colish, Adela Collins (*Divinity School*), John J. Collins (*Divinity School*), Carlos Eire, Jamal Elias, Margaret Farley (*Divinity School*), Steven Fraade, Christine Hayes, Paula Hyman, Serene Jones (*Divinity School*), David Kelsey (*Divinity School*), Bentley Layton, Ivan Marcus, Dale Martin, Chaim Milikowsky, Thomas Ogletree (*Divinity School*), Gene Outka, Daniel Schwartz, Harry Stout, Miroslav Volf (*Divinity School*), Stanley Weinstein, Robert Wilson

Assistant Professors

Shannon Craigo-Snell, Stephen Davis, Frank Griffel, Israel Koren, Jonathan Silk, Ludger Viefhues

Lecturers

Beth Berkowitz, Hugh Flick, Jr.

Fields of Study

Students must enroll in one of the following fields of study: American Religious History, Hebrew Bible/Old Testament, History of Ancient Christianity, Islamic Studies, Judaic Studies, New Testament, Philosophy of Religion, Religious Ethics, and Theology.

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, students teach as teaching fellows during their third and fourth years. The faculty considers such teaching to be an important and integral component of the professional training of its graduate students.

A combined Ph.D. degree is available with African American Studies. Consult departments for details.

Master's Degrees

M.Phil. and *M.A.* (both en route to the *Ph.D.*). See Graduate School requirements, page 375. Alternatively, the Department of Religious Studies offers, in conjunction with the Medieval Studies program, a joint *M.Phil.* degree. For further details, see Medieval Studies.

Prospective students must apply in one of the nine fields of study, and when requesting information they should specify their particular field of interest. Program materials are available upon request to the Director of Graduate Studies, Department of Religious Studies, Yale University, PO Box 208287, New Haven CT 06520-8287.

Courses

RLST 505b^u, Apocalyptic Religion in Cross-Cultural Perspective. Robert Wilson.

th 1.30–3.20

An examination of millennial and “end-time” beliefs in a variety of cultures around the world. Attention given to Jewish and Christian texts as well as Native American traditions, African and Pacific Islander movements, and modern manifestations such as Jonestown, the Branch Davidians, and Heaven’s Gate.

RLST 510a, Theories in the Study of Religion: Genealogy of the Body.

Ludger Vieffhues.

th 4–6

The topic of this graduate-level seminar in theory and methods in the study of religion changes annually. This year we explore the emergence of the “body” as theoretical focus in scholarship on religion. What are the reasons for this new focus? Which topics are addressed through the “body” and what kind of “body” is discursively created within the study of religion? Through these questions we connect themes raised by theoretical reflections on the body in philosophy, anthropology, science, and psychology with concerns of some “foundational texts” in the study of religion (e.g., Weber, Otto, Eliade) and current writings on the body in religious studies (Obeyesekere, Walker-Bynum).

RLST 524a, Research Seminar in U.S. and European History. Jon Butler.

t 10.30–12.20

This research seminar focuses on the craft/art of writing an article. Students may write on any subject in U.S. and European social, political, and religious history in the early modern to modern era. *Also AMST 721a, HIST 721a.*

RLST 534b, The Life and Thought of Jonathan Edwards. Harry Stout.

w 1.30–3.20

RLST 560a^u, Understanding Buddhist Scriptures. Jonathan Silk.

m 1.30–3.20

An introduction to the study of Buddhist scriptures. Issues include what defines a scripture, canonicity, the classification of scriptures, the role of commentary, translation and its problems, and intertextuality. Reading and discussion of Buddhist scriptures in translation, as well as theoretical works on scripture.

RLST 601b, The Required New Testament/Ancient Christianity Seminar: Non-Canonical Literature in the Nag Hammadi Hoard. Bentley Layton.

m 2–3.50

The topic and instructor of this seminar change yearly. This year we survey all of the works transmitted in the so-called Nag Hammadi hoard, initially treating them as non-canonical literature rather than heresy and without presupposing a social context. Problems of classification, genre theory, literary form, and intellectual affiliation arise. Required of all Ph.D. students in New Testament and Ancient Christianity; open to other students only by permission of the instructor.

RLST 615b, Johannine Literature. Harold Attridge.

th 1.30–3.20

This seminar focuses on the interpretation of the Fourth Gospel and the Johannine Epistles, with attention both to the ancient context in which those documents were composed and to contemporary trends in the analysis of ancient narratives. The objective of this course is to enhance advanced exegetical and interpretive skills by a close reading of the Fourth Gospel and a critical engagement with contemporary interpreters. *Also REL 688b.*

RLST 651a^u, Introduction to the History of Christianity in the Ancient World: Jesus to Augustine. Bentley Layton.

mw 10.30–11.20, 1 htba

The rise of Christianity and the development of Western culture into the Middle Ages, including the creation of Christian orthodoxy; religious, political, social, gender, literary, and theological history of Christian religion in many forms. No previous background assumed. *Also NELC 726a^u.*

RLST 653b^u, Introduction to Gnostic Texts in Coptic. Bentley Layton.**RLST 658a^u, Egyptian Monastic Literature in Coptic. Bentley Layton.****RLST 665a, Patristic Greek. Stephen Davis.**

mw 9–10.15

This course is designed to help students develop their skills in reading the Greek literature produced in late antiquity by early Christian writers. The primary readings for the class are a selection of texts representing a variety of literary and theological genres, including an early Christian epistle, a hagiographical narrative, a theological treatise, and a sermon. Each week, student preparation involves grammatical analysis and translation of the assigned reading. Class time is devoted to further analysis of grammatical, stylistic, and theological issues in the texts. By the end of the course, students should be prepared to do independent research in original Greek-language sources from the early church.

RLST 669b^u, Christianity in the Ancient Middle East: Egypt and North Africa.**Stephen Davis.**

tth 1–2.15

A study of the history of Christianity in the ancient Middle East, beginning with its origins in the first two centuries and ending with the rise of Islam in the seventh century. Lectures, readings, and discussions focus on the theological, social, and political development of the Christian religion in Egypt and North Africa.

RLST 673b^u, Early Christian Pilgrimage. Stephen Davis.

th 3.30–5.20

An examination of the theory and practice of pilgrimage in the early church through the study of ancient documents and artifacts, including pilgrims' diaries, miracle accounts connected with saints and martyrs, and the art and architecture of Christian holy places.

RLST 679b^u, Critical Issues in the Renaissance and Reformation. Marcia Colish.

t 1.30–3.20

This course considers debates of historians on major controversial issues in Renaissance and Reformation history, treating church history, political history, and social history. Topics include continuities and discontinuities between late medieval religion and the Reformation; Florentine civic humanism and its causes; women, children, and theology as political ideology in the period. Some prior background preferred. *Also HIST 561b^u.*

RLST 702a, Seminar on the *Qur'an*. Gerhard Böwering.

th 3–5

Intensive study of the *Qur'an*. Readings in the literature of Qur'anic commentary. Special emphasis on the pre-Islamic background of the *Qur'an*. Prerequisite: reading knowledge of Arabic; permission of the instructor.

RLST 704b, Seminar in Sufi Thought. Jamal Elias.

m 2–4

A reading and analysis of Sufi works from the tenth to fourteenth century C.E., with special emphasis on texts that outline notions of the structure of the cosmos and the method and nature of our perception thereof. Prerequisite: reading knowledge of Arabic.

RLST 709b, The *Pseudo-Maqasid* of al-Ghazali. Frank Griffel.

th 2.30–4.20

Introduction into the life and works of al-Ghazali, focusing on the period immediately preceding and following the *Incoherence of the Philosophers* (*Tabaḥuṭ al-falāsifa*). We mainly read and discuss the *Aims of the Philosophers* (*Maqasid al-falāsifa*), and the so-called *pseudo-Maqasid*, a manuscript that most probably represents a hitherto unknown text by al-Ghazali. Readings in Arabic.

RLST 752a^u, Mishnah Seminar: Tractate Berakhot (Blessing). Steven Fraade.

th 9.30–11.20

Mishnah Berakhot, dealing with the recitation of public and private prayers and blessings. What do these legal traditions reflect of rabbinic attitudes toward worship as understood in historical context? Prerequisite: reading knowledge of Hebrew.

RLST 756a, The Required Second Temple Judaism Seminar: Wisdom and Retribution. John Collins.

w 1.30–3.20

This course considers the ideas of retribution in Jewish wisdom literature, beginning in Proverbs, proceeding through Qoheleth, Ben Sira, and the wisdom literature in the Dead Sea Scrolls, and concluding with the Wisdom of Solomon and 4 Ezra. The central portion of the

course focuses on a close reading of the fragmentary Qumran text, 4QInstruction. Ability to read unpointed Hebrew is essential. Ability to read Greek is highly desirable. Required for Ph.D. students in Hebrew Bible and ancient Judaism, and M.A.R. students in Judaism. *Also REL 657a.*

RLST 758b^u, Hellenistic Jewish Historiography Daniel Schwartz.

t 9.30–11.20

An introduction to the historical writings of Jews in the Hellenistic-Roman period. The books of Maccabees, works by Philo, Josephus, and others are studied both as historiography and as expressions of the values of Jews seeking their way in a multicultural world.

RLST 760a^u, Midrash Seminar: Leviticus Rabbah. Chaim Milikowsky.

t 3.30–5.20

An examination and analysis of the world of rabbinic midrash. A text-oriented course that considers how the Rabbis read the Bible, the modes of rabbinic exegesis, the nature of the oral and written transmission of midrashic traditions and texts, and the conceptual and ideological world-view of the Rabbis. Prerequisite: reading knowledge of Hebrew.

RLST 761a, Ancient Judaisms and Their Scriptures. Steven Fraade.

t 9.30–11.20

RLST 773a^u, History of Jewish Culture to the Reformation. Ivan Marcus.

tth 11.30–12.45

RLST 774b^u, History of Jewish Culture, 1500 to the Present. Paula Hyman.

tth 10.30–11.20

A brief introduction to the history of Jewish culture from the late Middle Ages until the present. Emphasis on the changing interaction of Jews with the larger society as well as the transformation of Judaism in its encounter with modernity. *Also HIST 566b^u.*

RLST 777b^u, History of the Jews in Muslim Lands. Ivan Marcus.

tth 11.30–12.45

Introduction to Jewish culture and society in Muslim lands from the Prophet Muhammad to Suleiman the Magnificent. Topics include Islam and Judaism; Jerusalem as a holy site; rabbinic leadership and literature in Baghdad; Jewish couriers, poets, and philosophers in Muslim Spain; the Jews in the Ottoman Empire.

RLST 780b^u, Dialogue and Mysticism in the Philosophy of Martin Buber.

Israel Koren.

w 1.30–3.20

An examination of the mystical aspects of Martin Buber's early and late philosophical writings with special attention to the connection between mysticism and dialogue. Approaches Buber's work from historical, phenomenological, and philosophical standpoints.

RLST 788a^u, European Jews in the Age of Emancipation. Paula Hyman.

RLST 791a^u, Jews in Eastern Europe, 1750–1939. Paula Hyman.

tth 2.30–3.45

RLST 795a^u, Women and Judaism. Paula Hyman.

t 9.30–11.20

An examination of the changing status and roles of women within Judaism and Jewish history. Topics include women in Jewish law; the social, domestic, and religious roles of women in the modern period; and the development of Jewish feminism. *Also HIST 950a^u.*

RLST 801a, Hebrew Bible/Old Testament Bible Seminar: Problems in the History of Israelite Religion. Robert Wilson.

m 1.30–3.20

RLST 810b, The Book of Daniel and Related Literature. John Collins.

t 1.30–3.20

Exegesis of the Book of Daniel and of some related Aramaic texts from Qumran. *Also REL 697b.*

RLST 812a, Tradition and Ideology in the Book of Jeremiah. Carolyn Sharp.

w 1.30–3.20

This course probes a variety of complex interpretive issues in the composition, redaction, and theopolitics of the Book of Jeremiah. We attend to synchronic questions of literary artistry and diachronic issues evident in the *Weiterschreibung* of earlier Jeremianic material within the book. We explore the call of Jeremiah and the role of the prophet generally, particularly as that has been constructed over against paradigmatic biblical intercessors and false prophets. We consider the text's virulent sociopolitical polemics and possibilities for the contextualization of those ideologies in the history of sixth-century Judah and in the world constructed by the text. We inquire after the rhetorical and theological functions of judgment oracles, paraenesis, and oracles against foreign nations, prophetic laments, and oracles of promise in Jeremiah. And we reflect on the self-conscious dynamic interplay between orality and "writtleness" in the text's representation of the transmission of and resistance to Jeremiah's prophesying. *Also REL 690a.*

RLST 852a, Agape and Special Relations. Gene Outka.

m 1.30–3.20

The aim overall is to explore possible links between the love commandments and different sorts of special relations. We consider depictions of *agape* and the claims of particular bonds between persons, and examine four different special relations: among religionists (especially ties among those in the church); among members of the political community (including the relations between the Christian community and the civil community); among family members (between spouses, and parents and children); and among friends (and the place generally of preferential relations). Readings come from both contemporary and historical sources, including Aelred of Rievaulx, *On Spiritual Friendship*; Joseph L. Allen, *Love and Conflict*; Aristotle, *The Nicomachean Ethics* (trans. David Ross); Soren Kierkegaard, *Works of Love*; David Little, *Ukraine: The Legacy of Intolerance*; Gilbert Meilaender, *Friendship*; Stephen G. Post, *Spheres of Love: Toward a New Ethic of the Family*. *Also REL 778a.*

RLST 860b, Advanced Medical Ethics. Margaret Farley.

th 1.30–3.20

Also REL 886b.

RLST 862b, Religion and Morality. Gene Outka.

w 1.30–3.20

RLST 912b, The Life and Thought of Martin Luther. Miroslav Volf, Ronald Rittgers.

w 1.30–3.20

This course examines the intellectual biography of Martin Luther from both a theological and a historical perspective. It focuses primarily on Luther's theology of grace. The course stresses close reading of select theological treatises and critical engagement of recent Luther scholarship. *Also HIST 559b, REL 762b.*

RLST 920a^u, Reason, Faith, and Feeling: Early Modern Christian Thought.

Shannon Craigo-Snell.

tth 10.30–11.20, 1 htba

A survey of major developments in religious thought in the West from Descartes to Schleiermacher, focusing on the struggles to defend, discredit, or distance religious belief in relation to reason. Explores connections between theology, philosophy, and social history. No prior background is required.

RLST 921b^u, History, Hope, and the Self: Modern Christian Thought.

Shannon Craigo-Snell.

tth 10.30–11.20, 1 htba

An overview of important developments in Western religious thought during the nineteenth and twentieth centuries. Topics include changing understandings of the significance and movements of history, challenges posed to religious traditions by growing historical knowledge, shifting conceptions of the human person, and contrasting estimations of the role of religious persons in secular and political life. Addresses connections between philosophy, theology, and social history. Authors include Hegel, Marx, Barth, and Gutierrez. No prior background is required.

RLST 935b, The Turn to the Non-Subject in Twentieth-Century Christian

Theology. Shannon Craigo-Snell.

th 1.30–3.20

An examination of shifting views of the priority, responsibility, construction, and coherence of the self in contemporary theology, including feminist, political, liberation, and postmodern texts.

renaissance studies

53 Wall, Rm 324, 432.0672

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

Chair and Director of Graduate Studies

Ellen Rosand (*Acting* [F]), David Quint [Sp]

Executive Committee

Edwin Duval, Carlos Eire, Roberto González Echevarría, Lawrence Manley, John Matthews, Giuseppe Mazzotta, Annabel Patterson, John Rogers, Ellen Rosand, Paolo Valesio, Christopher Wood

Faculty Associated with the Program

Rolena Adorno, Christy Anderson, Leslie Brisman, Walter Cahn, Judith Colton, Anne Dunlop, Paul Freedman, Karsten Harries, John Hollander, Olivia Holmes, Blair Hoxby, K. David Jackson, Maija Jansson, Lee Patterson

Lecturer

Robert Babcock

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, Introduction to Renaissance Studies.

An introduction to major texts, issues, bibliography, and methods in the interdisciplinary study of the Renaissance. Emphasis in the first semester on Italy and in the second on northern Europe. Next offered 2003–2004.]

RNST 510b, Studies in Lyric Poetry of the Renaissance. David Quint.

th 10.30–12.20

A study of several lyric poets writing in Italian, French, and English during the Renaissance, probably including Petrarch, Labé, Ronsard, Du Bellay, Wyatt, Sidney, Shakespeare, and Donne. The stress falls upon textual analysis, although some general perspectives on Renaissance literature are also introduced. *Also CPLT 694b, ENGL 578b.*

russian and east european studies

Luce Hall, 34 Hillhouse, 432-3423

M.A.

Chair

Ivo Banac (*History*)

Director of Graduate Studies

Paul Bushkovitch (*History*)

Professors

Vladimir Alexandrov (*Slavic Languages & Literatures*), Ivo Banac (*History*), Paul Bushkovitch (*History*), Katerina Clark (*Slavic Languages & Literatures*), Mirjan Damaška (*Law*), Robert Evenson (*Economics*), John Gaddis (*History*), Harvey Goldblatt (*Slavic Languages & Literatures*), Benjamin Harshav (*Comparative Literature*), Michael Holquist (*Comparative Literature*), Tatjana Lorković (*Library*), William Odom (*Adjunct, Political Science*), Jaroslav Pelikan (*Emeritus, History*), Susan Rose-Ackerman (*Law*), Ivan Szelenyi (*Sociology*), Tomas Venclova (*Slavic Languages & Literatures*), Miroslav Volf (*Divinity*)

Associate Professor

Hilary Fink (*Slavic Languages & Literatures*)

Assistant Professors

Keith Darden (*Political Science*), Anna Grzymala-Busse (*Political Science*), Lawrence King (*Sociology*), Pauline Jones Luong (*Political Science*), John MacKay (*Slavic Languages & Literatures*), Timothy Snyder (*History*)

Lecturers

Vladimir Golstein (*Slavic Languages & Literatures*), Slobodan Novak (*Slavic Languages & Literatures*)

Senior Lectors

Irina Dolgova (*Slavic Languages & Literatures*), Rita Lipson (*Slavic Languages & Literatures*), Constantine Muravnik (*Slavic Languages & Literatures*), Julia Titus (*Slavic Languages & Literatures*), Karen Von Kunes (*Slavic Languages & Literatures*)

Lector

Nike Agman (*Slavic Languages & Literatures*)

On July 1, 1999, the Council on Russian and East European Studies merged with the Council on West European Studies to create a new interdisciplinary body, the Council on European Studies (CES). The RSEE M.A. program will continue to operate as before while the Council on European Studies moves to formulate and implement new curricular and research programs reflective of current developments in Europe, broadly defined to encompass all states and peoples from Ireland to the Urals.

Fields of Study

See departments of Slavic Languages and Literatures, History, Political Science, Economics, Sociology; the Law School; the School of Forestry & Environmental Studies; the School of Management.

Special Admissions Requirements

Study of Russian through third-year college level or equivalent or another East European language.

Special Requirements for the M.A. Degree

All students must complete sixteen term courses (or their equivalent) in the various fields related to Russian and East European studies. Students are expected to take courses in at least three of the major disciplines relevant to the program (history, literature, social sciences, and law). One of the sixteen term courses may be taken for audit. Students may substitute a yearlong course in Russian or an East European language for two terms of graduate course work. Under this option the language course may not be taken for audit. Students with previous preparation in Russian language and civilization may in certain cases receive credit for this work. Students are required to pass the language examinations in Russian and a second language by the end of the third term at Yale. Students must receive the grade of 1+ or higher in Russian on the ACTFL/ETS Rating Scale as administered by the Slavic Languages and Literatures department at Yale, including reading, oral, and grammar portions. Students specializing in an East European language (such as Polish, Czech, Ukrainian, Hungarian, and others by special arrangement) may take Yale department-administered examinations in the language of the area of concentration. In case of a concentration on a language other than Russian, a student must demonstrate a reading knowledge of Russian by examination as administered by the Slavic Languages and Literatures department.

Joint degrees are available with the School of Management. Interested students must apply separately to the School of Management, as well as to Russian and East European Studies for a joint degree. The Council is currently proposing joint degrees with the Law School, and with the Department of Epidemiology and Public Health. Interested applicants should contact the DGS.

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 RSEE 950.

Program materials are available upon request to the Director of Graduate Studies, Russian and East European Studies, Yale University, Box 208206, New Haven CT 06520-8206.

Courses

RSEE 940a or b, Independent Study.

By arrangement with faculty.

RSEE 950a or b, Master's Thesis.

By arrangement with faculty.

slavic languages and literatures

2710 Hall of Graduate Studies, 432.1300, slavic.department@yale.edu
M.A., M.Phil., Ph.D.

Chair

Harvey Goldblatt

Director of Graduate Studies

Katerina Clark (451 College, Rm 203, 432.0712, katerina.clark@yale.edu)

Professors

Vladimir Alexandrov, Katerina Clark, Laura Engelstein (*History*), Harvey Goldblatt, Benjamin Harshav (*Comparative Literature*), Michael Holquist (*Comparative Literature*), Irina Paperno (*Visiting*), Riccardo Picchio (*Emeritus*), Tomas Venclova

Associate Professor

Hilary Fink

Assistant Professor

John MacKay (*on leave*)

Lecturer

Vladimir Golstein

Senior Lectors

Irina Dolgova, Rita Lipson

Lector

Nike Agman

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 courses in linguistics) 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 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 literature; (2) another Slavic literature; (3) Slavic linguistics; (4) a topic in intellectual history. (A special curriculum may be arranged for students wishing to specialize in either medieval Slavic literature and philology or Polish literature; a minimum of sixteen term courses will be required for each.) 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, based on specific fields of concentration and on topics designed by the student in consultation with the faculty, 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, and the prospectus defense must take place no later than December 1 of the same term. 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

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 on page 164. 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 Graduate School requirements, page 375. Alternatively, the Department of Slavic Languages and Literatures offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. For further details, see Medieval Studies.

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 601b, Old Russian Literature: Kievan Period. Harvey Goldblatt.

W 10.30–12.20

An overview of literary activity in Kievan Rus' (eleventh to fourteenth century). Specific texts — such as Ilarion's *Sermon on Law and Grace*, the *Legend of Boris and Gleb*, the *Igor' Tale*, and the *Zadonschina* — are selected to illustrate the development of the principal theoretical trends, literary types, and writing techniques.

RUSS 626a, Eighteenth-Century Russian Literature: Toward the Codification of a Modern Russian Literary System. Riccardo Picchio.

T 10.30–12.20

The writings of authors such as Prokopovich, Trediakovsky, Lomonosov, Sumarokov, Derzhavin, and Karamzin are examined with a view toward exploring the formation and development of a new literary system in eighteenth-century Russia.

RUSS 674b, Sexuality, Love, Marriage, and Adultery: Historical and Literary Approaches. Laura Engelstein, Irina Paperno.

Th 1.30–3.20

This team-taught course examines selected texts that deal with sexuality, love, marriage, and adultery using the methods of both historical and literary scholarship. Readings include works of literature, journalism, and religious and scientific commentary. Among major texts: Herzen's *Byloe i dumy*, Dostoevsky's *Vechnyi muzh*, Chernyshevsky's *Chto delat'?*, Tolstoy's *Kreitserova sonata*, Artsybashev's *Sanin*, selections from Rozanov. Reading knowledge of Russian is required. Discussions in English. Also HIST 955b.

RUSS 676a, Cvetaeva. Tomas Venclova.

T 3.30–5.20

Discussion of Cvetaeva's life and art in context of her times. Close readings of her poems.

RUSS 691b, Reading Bulgakov. Vladimir Golstein.

W 1.30–3.20

The analysis of Bulgakov's major texts. Special emphasis is on the way Bulgakov's writings reflect his negotiations with the literary tradition that he inherited, and with the cultural and political circumstances in which he found himself.

RUSS 693b, Turn-of-the-Century Russian Prose. Vladimir Alexandrov.

Th 2.30–4.20

A seminar on selected works by Gorky, Kuprin, Andreev, Remizov, Bunin, Bely, and Sologub, with primary attention to the last three.

RUSS 833, Advanced Russian Conversation and Composition: Topics in Contemporary Russian Press and Media. Rita Lipson.

MW 12.30–1.20

A course designed to equip students with advanced language skills necessary to comprehend complexities of contemporary Russian press and media. Accompanied by a grammar review. Fall and spring.

RUSS 834b, Aspects of Russian Grammar and Teaching Methodologies. Irina Dolgova.

TTh 12.30–1.20

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.

RUSS 851a, Proseminar in Russian Literature. Vladimir Alexandrov.

th 2.30–4.20

Introduction to the graduate study of Russian literature. Topics include literary theory, methodology, introduction to the profession.

SLAV 754a^U, Old Church Slavic. Nike Agman.

tth 9–10.15

Rudiments of Old Church Slavic, the oldest Slavic literary language. Introduction to Glagolitic and Cyrillic as early writing systems. Study of grammar, both as attested in the Old Church Slavic literary canon and in its relationship to the modern Slavic languages, especially Russian. Close readings of selected Old Church Slavic texts from the tenth and early eleventh centuries.

SLAV 900, Directed Reading.

By arrangement with faculty.

sociology

140 Prospect, 432.3323
M.A., M.Phil., Ph.D.

Chair

Jeffrey Alexander

Director of Graduate Studies

Ivan Szelenyi

Professors

Jeffrey Alexander, Scott Boorman, Deborah Davis, Bernhard Giesen (*Visiting*), Paul Gilroy, Riaz Hassan (*Visiting*), Karl Ulrich Mayer, Ivan Szelenyi, Kenneth Thompson (*Visiting*), Stanton Wheeler

Associate Professor

Joseph Soares

Assistant Professors

Jennifer Bair, Hannah Brueckner, Lawrence King, Sharon Kinsella, Alondra Nelson (*African American Studies*), Christopher Rhomberg, Andrew Schrank, Philip Smith

Lecturers

David Apter, Kay Junge, Dieter Plehwe, Vron Ware

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 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 complete fourteen term courses and demonstrate competence in sociological theory, statistics, and research methods, competence in which may be demonstrated by passing two term courses in each area. After completion of courses, students prepare written and oral comprehensive examinations in two selected fields 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 joint Ph.D. program must meet all of the requirements of the Ph.D. in Sociology with the exception that, excluding the courses required to demonstrate competence in sociological theory, statistics, research methods, and comprehensive examination in two substantive fields, joint-degree students may substitute African American Studies courses for six of the fourteen term courses required to qualify for the Ph.D. in Sociology. For further details see African American Studies.

Master's Degrees

M.Phil. See Graduate School requirements, page 375.

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 501a, **Foundations of Sociological Theory.**]

[SOCY 502b, **Contemporary Sociological Theory.**]

SOCY 504b, Research Design and Research Practice. Hannah Brueckner.

w 4–6

Survey of (re-)current debates, problems, and innovations in qualitative and quantitative empirical research, including both data collection and data analysis issues. Focus on assessing and improving validity and generalizability within the theoretical and practical limits of social science research. Aims at developing a set of skills necessary for everyone interested in designing and/or providing constructive peer review for empirical research. Familiarity with statistics may be helpful but is not required.

SOCY 506a, Survey Methods. Hannah Brueckner.

w 4–6

Focus on theory and practice as well as strengths and weaknesses of quantitative, observational methods of data collection. Depending on participants' interests, we explore problems and issues of survey research such as conceptualization, measurement, sample design, questionnaire construction, interviewing, data analysis, causal inference, and research ethics. Familiarity with the basics of research methodology and statistical inference is required. Students are welcome to contribute survey design or analysis problems from their own work or discipline/field of interest.

[SOCY 510b^u, **Setting the Scholarly Agenda.**]

SOCY 522a^u, The Sociology of Development. Andrew Schrank.

w 1.30–3.20

The seminar asks how and why states, firms, and popular organizations in the developing world use their natural and human resource endowments to generate different social, political, and economic outcomes.

[SOCY 524b, Sociology of Culture.]**SOCY 525b, Cultural Sociology. Philip Smith.**

W 10–12

The course looks in depth at the tie between culture and society. It reviews the major approaches to this topic within cultural theory over the past one hundred years. We explore diverse understanding of the content and social impact of culture such as functionalism, structuralism, and postmodernism. Emphasis is given to ways we can theorize the autonomy of culture as a determining force in the organization of social life.

[SOCY 526a, Recent Trends in Social Stratification Processes.]**[SOCY 528a^U, Reading Race and Gender.]****[SOCY 529b, Legislation.]****[SOCY 534a, Writing Sociology.]****SOCY 538a, Discourse Analysis of Politics. David Apter.**

t 4–6

This seminar examines the “discursive” turn in political analysis. While discourse theory can be applied to the role of authority and state power, the emphasis here is on confrontational situations, protest, and violence. Particularly useful in analyzing some of the factors which lead people to try to change their political circumstances by interpreting and reinterpreting their experiences, part one examines the diverse theoretical strands and components making up contemporary political discourse theory as compared to other approaches, and an intellectual pedigree (much of it drawn from related fields) is mapped. Part two develops hypotheses derived from discourse theory as an analytical approach to show the kinds of questions with which it can be expected to deal. In part three a model framework for analysis is offered while students are expected to develop their own. In part four these frameworks are applied to relevant comparative and case materials. *Also AFST 638a, PLSC 570a.*

[SOCY 541b, New Theories of Civil Society.]**SOCY 543b, Sociology of Education. Joseph Soares.**

t 4–6

Modern educational systems are situated at the intersection of social stratification, culture, and politics. This seminar evaluates the major theories and significant empirical literature, both historical and statistical, on the origins, structure, and effects of different educational systems. We focus on the United States, with systematic comparisons to France, Germany, and the UK. Our analytical agenda includes questions on class, race, gender, finance, governance, meritocracy, prestige/status, and private/public goods. Authors include Bourdieu, Halsey, Jencks, Meyers, Riesman, Soares, and Trow.

SOCY 545a, Reading Karl Marx. Ivan Szelenyi.

t 1–3

A close textual analysis of some of Karl Marx’s work. *Also PLSC 607a.*

[SOCY 550a, The Future of Work.]**SOCY 552b^U, Corruption and Development. Lawrence King, Andrew Schrank.**

W 1.30–3.20

An exploration of the development of capitalism and the rationalization of legal and political authority in comparative and historical perspective. Topics include the origins of capitalist development, Weber’s notion of “political capitalism,” the “developmental state,” the “predatory” state, contemporary debates over the origins and nature of “crony capitalism,” and institution building in the developing and transitional worlds.

[SOCY 557a, Current Debates in Political Sociology.]**SOCY 560a,b, Comparative Research Workshop. Ivan Szelenyi, Lawrence King.**

m 5–7

This weekly interdisciplinary seminar is devoted to discussions of work-in-progress (forthcoming articles, M.A. thesis drafts, dissertation proposals, dissertation chapter drafts) by distinguished visiting scholars, Yale graduate students, and faculty from various social science disciplines. Papers are distributed a week ahead of time and are also posted at the Web site of the Center for Comparative Research. Students who take the course for a letter grade have to present a paper the semester they are enrolled for credit. *Also PLSC 734a,b.*

SOCY 561b^u, Topics in Contemporary Chinese Society. Deborah Davis.

t 1.30–3.20

In the past two decades, the leaders of the Chinese Communist Party have completely jettisoned the socialist blueprint and “warmly embraced” global markets and private entrepreneurship. At the same time they continue to reject all challenges to their monopoly of political power and outlaw unofficial unions, popular religious associations, and Web sites that carry stories unfriendly to the Party. In this seminar students first review the competing elements of post-Mao reforms and then evaluate the consequences of these tensions on rural and urban society. Knowledge of modern Chinese is desirable but not necessary. Prerequisite: at least one course focused on China after 1911.

SOCY 567b, The Performative Turn in Cultural Sociology. Jeffrey Alexander, Bernhard Giesen.

This seminar develops and explores the possibility that we are in the midst of a “performative turn” in the social sciences, particular in that branch of the social sciences concerned with meaning and culture. We begin with some orienting papers by the instructors that draw attention to this development and offer overlapping interpretations, theories, and research programs based upon it. After this introduction, we return to the origins of ideas of ritual performance in classical and modern sociology, tracing a line from Durkheim to Burke, Goffman, Shils, Geertz, and Victor Turner. After looking at some contemporary manifestations and extensions of these thinkers, e.g., in the work of Wagner-Pacific and Edles, we look at developments in the new field of performance studies, beginning with Schechner and going on from there. The course concludes by looking forward to how this developing perspective might be applied to historical, comparative, and contemporary social studies. Students who have been working in these areas are encouraged to participate and present their work.

[SOCY 577a, Topics in Multivariate Data Analysis.]**[SOCY 580a^u, Introduction to Statistics in Sociology.]****[SOCY 581b, Multivariate Methods for the Social Sciences.]****SOCY 585b, Life Course Research: Theoretical Foundations and Empirical Approaches. Karl Ulrich Mayer.**

th 2–4

This course has been designed to provide a comprehensive introduction to the current state of life course research. How do societies structure human lives? What are universal features of age differentiation and what are historically emergent patterns of life courses? How do advanced societies differ in the ways they organize life transitions, life phases, and life trajectories? How do sociologists empirically analyze the complexities of human lives? The course introduces major concepts like aging, generations, and cohorts; examines the interrelated trajectories in the various life domains of family, education, and work; and gives an overview of the methodological tools for the analysis of life courses.

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.

SOCY 607b, Seminar on Field Methods. Deborah Davis.

th 10–12

An introduction to the challenges and problems of doing fieldwork through a series of supervised field experiences as well as close reading of old and new classics. The course begins by discussing questions of ethics, privacy, and consent and then focuses on analytic and practical problems of observations, note taking, interviewing, transcription and coding, focus groups, photographic data, and life histories.

[SOCY 611b^u, Historical Approaches in Sociology.]

[SOCY 615b^u, Black Communities in the Twentieth Century.]

SOCY 625a, Analysis of Social Structure. Scott Boorman.

m 10–12

Develops and integrates a variety of the most promising contemporary approaches to the study of social structure and social organization.

[SOCY 627a, Sociology of the Welfare State.]

[SOCY 627b, Gender and Society.]

SOCY 628a, Workshop in Cultural Sociology and Civil Society. Jeffrey Alexander.

f 12–2

This workshop is designed to be a permanent, ongoing 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, with special reference to the problem of civil society, democracy, and inclusion. Meaning is approached both as structure and performance, drawing not only upon the burgeoning area of cultural sociology but on the humanities, philosophy, and other social sciences. Our references are codes, narratives, and metaphors, otherwise known as “values and ideologies,” and the elements of their performance. Institutionalization refers to the social processes that provide the context for culture creation and that stratify its effects. Our references here are the normal stuff of sociology—class, race, gender, sexuality, religion, status hierarchies and marginality, centers and peripheries, globality.

SOCY 628b, Workshop in Cultural Sociology and Civil Society. Jeffrey Alexander.

f 12–2

Continuation of SOCY 628a; see 628a for course description.

[SOCY 637b, The Transition to Democracy and Capitalism in Eastern Europe.]

[SOCY 643b, Comparative Political Economy.]

[SOCY 644a, Contemporary Racial and Ethnic Formation.]

SOCY 647b, Social Processes. Scott Boorman.

m 10–12

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 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 nonprofit and other non-market social structures,” *Economics Letters*, 1982, 10, 1–7) and its applications to nonprofits and complex statutes; weak ties model of job information transmission and other information transfer in elite social networks; “garbage can” models of the internal problem-solving dynamics of complex organizations.

SOCY 65ob, Modernity and Its Others: Self, Subject, and Cultural Differences.

Paul Gilroy.

t 9.30–11.20

This social theory course explores aspects of the political, philosophical, and sociological debates that have emerged around the concept of modernity. It looks particularly at articulations of modernity and “race” following four interlinked lines of inquiry: how has the subject of modernity been imagined and articulated; what attributes and experiences have qualified that subject as properly human and rational; where has identity been recognized as coming from, culturally and materially; and where has cosmopolitan loyalty emerged as a demand to see and act beyond the boundaries of immediate particularity? *Also AFAM 712b.*

[SOCY 651a, Roots and Routes: Identity and Travel in African American Political Culture.]

council on southeast asia studies

Luce Hall, 34 Hillhouse, 432.3431, seas@yale.edu

Chair

Michael Dove (*Forestry & Environmental Studies*)

Language Studies Coordinator

J. Joseph Errington (*Anthropology*)

Professors

William Burch (*Forestry & Environmental Studies*), Michael Dove (*Forestry & Environmental Studies*), J. Joseph Errington (*Anthropology*), Robert Evenson (*Economics*), William Kelly (*Anthropology*), Benedict Kiernan (*History*), James Scott (*Political Science*), Robin Winks (*History*), Mimi Yiengpruksawan (*History of Art*)

Associate Professor

Lisa Curran (*Forestry & Environmental Studies*)

Lecturers and Lectors

Carol Carpenter (*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 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 the other Southeast Asian languages by special arrangement.

For information and program materials, contact the Council on Southeast Asia Studies, Yale University, PO Box 208206, New Haven CT 06520-8206; or see our Web site, <http://www.yale.edu/seas/>.

Courses

INDN 520¹⁴, Elementary Indonesian. Indriyo Sukmono.

5 htba

A beginning course in colloquial Indonesian. Conversation practice, discussions of grammar, and, in the second term, introduction to reading and discussion of texts.

INDN 527^U, Intermediate Indonesian. Indriyo Sukmono.

mwf 2.30–3.20

Continues practice in colloquial Indonesian conversation and reading and discussion of texts.

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.

mtwthf 9.30–10.20

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.

VIET 530^U, Intermediate Vietnamese. Quang Phu Van.

mtwthf 10.30–11.20

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.

VIET 560, Readings in Vietnamese. Quang Phu Van.

For students with advanced Vietnamese language skills who wish to engage in concentrated reading and research.

spanish and portuguese

82–90 Wall Street, 432.1150, 432.5439
M.A., M.Phil., Ph.D.

Chair

Roberto González Echevarría

Director of Graduate Studies

Rolena Adorno (432.1154, rolena.adorno@yale.edu)

Director of the Language Program

María Martino Crocetti

Professors

Rolena Adorno, Roberto González Echevarría, K. David Jackson, Josefina Ludmer,
María Rosa Menocal, Noël Valis

Associate Professors

Cristina Moreiras Menor, Lidia Santos

Assistant Professors

Guillermo Irizarry (*on leave*), Oscar Martín, Simone Pinet, Fernando Rosenberg

Senior Lecturer

María Martino Crocetti

Fields of Study

Fields include Spanish Peninsular literature, Latin American literature, Portuguese and Brazilian literatures.

The doctoral program offers: (1) a Spanish major concentrating in a single field of study (medieval, Renaissance/Golden Age, modern Spanish Peninsular, colonial Spanish American, contemporary Spanish American); (2) a combined major 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 program 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. Course work includes two required courses, SPAN 500, History of the Spanish Language, and SPAN 790, Methodologies of Modern Foreign Language Teaching; two courses taken outside the department; and two courses in the literature of the language-literature minor. 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 (oral and written components) and submit and receive approval of the dissertation prospectus. Upon completion of all predissertation requirements, including the 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 mentoring by the faculty as well as 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 African American Studies program, 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 Graduate School requirements, page 375. Alternatively, the Department of Spanish and Portuguese offers, in conjunction with the Medieval Studies program, a joint M.Phil. degree. 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 963a^u, Machado de Assis: Critique of the Empire. K. David Jackson.

mw 1–2.20

Major prose works by J. M. Machado de Assis (1839–1908), Brazil's celebrated novelist, are examined in the light of his subaltern voice and skeptical critique of Empire.

PORT 966b, Melodrama in Latin American Literature. Lidia Santos.

th 4–5.50

The course examines contemporary Latin American fiction that uses melodrama as an artifice. Value theory and cyber culture are employed for understanding the new achievements of these narratives. Works by Vargas Llosa (Peru), Garmendia (Venezuela), César Aira (Argentina), Rosario Ferré (Puerto Rico), Clarice Lispector, Filipe Miguel, Augusto Boal (the three from Brazil). *Also SPAN 906b.*

PORT 970b^U, Fernando Pessoa, Inc.: The End of the Individual Self.**K. David Jackson.**

mw 1–2.15

Introduction to Fernando Pessoa (1888–1935), one of the twenty-six essential authors in Harold Bloom's *The Western Canon* and one of the most mysterious and prolific figures in early twentieth-century European modernism. Study of his plural literary universe, with bilingual readings of prose, poetry, essay, and criticism.

PORT 991a and b, Tutorial.

By arrangement with faculty.

SPAN 501a, Medieval and Early Modern Spanish Texts. Oscar Martín.

w 4–6

An introduction to the historical grammar of Medieval and Early Modern Spanish (Peninsular and Colonial) through reading and discussion of relevant texts, including literary texts, private sources, and legal documents. This class has a practical focus. In Spanish.

SPAN 520b^U, The World of Alfonso, el Sabio. María Rosa Menocal.

m 2.30–4.20

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 go on to become the national language. Readings 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.

SPAN 747a, Generation of '27: Poetry. Noël Valis.

m 2.30–4.20

This course examines the theory and art of vanguard writing. Selected poetry of Guillén, Salinas, Lorca, Cernuda, Alberti, and others, along with Ortega y Gasset's influential *Deshumanización del arte*, are read. In Spanish.

SPAN 790b, Methodologies of Modern Foreign Language Teaching.**María Martino Crocetti.**

m 4.30–6.20

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. An additional one-hour practicum meets weekly. In Spanish.

SPAN 806a, Writings from New Spain: The First Fifty Years. Rolena Adorno.

t 1.30–3.20

Beginning with the writings produced by the conquest of Mexico, this seminar examines how “New Spain” came into being (1519–1569) in the writings of its conquistadores and *encomenderos* (Hernán Cortés and Bernal Díaz del Castillo), its missionaries and polemicists (Fray Toribio de Benavente, “Motolinía,” and Fray Bartolomé de las Casas), and its historians and university professors (Francisco López de Gómara and Francisco Cervantes de Salazar).

The contested concepts of empire, violent conquest, and evangelization that these narratives of “new” Spain embodied orient our readings, and we conclude by briefly considering the paradigmatic value of their legacy today.

SPAN 906b, Melodrama in Latin American Literature. Lidia Santos.

th 4–5.50

The course examines contemporary Latin American fiction that uses melodrama as an artifice. Value theory and cyber culture are employed for understanding the new achievements of these narratives. Works by Vargas Llosa (Peru), Garmendia (Venezuela), César Aira (Argentina), Rosario Ferré (Puerto Rico), Clarice Lispector, Filipe Miguez, Augusto Boal (the three from Brazil). Also *PORT 966b*.

SPAN 907a, Gauchos, indios y negros. Josefina Ludmer.

th 10.30–12.20

Analysis of the gaucho genre in “Río de la Plata,” indigenist literature in Peru-Ecuador, and antislavery writings in the Caribbean. The focuses are alliances and uses of the voice of “the other.” The goal is also theoretical: how to define a comparative literature in Latin America through regions, genres, cultures and “identity symbols.” In Spanish.

SPAN 911b, Borges, Rulfo, García Márquez. Josefina Ludmer.

w 2.30–4.20

This course has three lines. The first one is the examination of the idea of “classic and canonical writer” through the theoretical bibliography. The second line is the analysis of the texts of these Latin American writers in the historical and literary context of the twentieth century. Central texts: Borges’s *Fictions* and some essays, Rulfo’s *Pedro Páramo* and *El llano en llamas*, García Márquez’s *One Hundred Years of Solitude* and *The Autumn of the Patriarch*. Problems: the concept of fiction and literature, the problem of literary change, and some cultural, national, and Latin American identities constructed through their works. The third line is the history of their lectures and translations, and their construction as classics both in Latin American and in the world. Taught in Spanish.

SPAN 942a^U, Fiestas cubanas. Roberto González Echevarría.

tth 2.30–3.45

A study of the feasts marking the Cuban calendar from the nineteenth century to the present, how they respond to cultural and political transformations, and how they are inscribed in literature, particularly the narrative. The feast as the representation of time and social and political change. The work of anthropologists and theorists of literature such as Claude Lévi-Strauss, Marcel Mauss, Arnold van Gennep, and Michail Bachtine, along with that of Latin American and Cuban anthropologists and writers like Fernando Ortiz, Lidia Cabrera, José Arrom, Manuel Moreno Fraginals, Miguel Barnet, and Octavio Paz. Fiction by Cirilo Villaverde, Alejo Carpentier, José Lezama Lima, Severo Sarduy, Reinaldo Arenas, Daína Chaviano, and others. In Spanish. Also *CPLT 941A*.

SPAN 991a and b, Tutorial.

By arrangement with faculty.

statistics

24 Hillhouse, 432.0666

M.A., Ph.D.

Chair

Andrew Barron

Director of Graduate Studies

Marten Wegkamp (Rm 207, 24 Hillhouse, marten.wegkamp@yale.edu)

Professors

Donald Andrews (*Economics*), Andrew Barron, Joseph Chang, John Hartigan, Theodore Holford (*Epidemiology & Public Health; Biostatistics*), Peter Phillips (*Economics*), David Pollard

Associate Professors

Nicolas Hengartner, Junhyong Kim (*Ecology & Evolutionary Biology*), Marten Wegkamp, Heping Zhang (*Epidemiology & Public Health; Biostatistics*)

J. W. Gibbs Instructor

Dragan Radulovic

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 of the undergraduate major should accompany an application. 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.

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.

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 eight term courses, chosen in consultation with the director of graduate studies. Full-time students must take a minimum of three courses per term. Part-time students are also accepted into the master's degree program. See pages 375–76.

Program materials are available upon request to the Director of Graduate Studies, Department of Statistics, Yale University, PO Box 208290, New Haven CT 06520-8290; e-mail, susan.jackson-mack@yale.edu.

Courses

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 Tuesday lecture, which introduces general concepts and methods of statistics, is attended by all students in STAT 501–506 together. The course separates for Thursday lectures (sections), 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, Introduction to Statistics: Life Sciences. Ashley Carter, Joseph Chang.

tth 1–2.15

Statistical and probabilistic analysis of biological problems presented with a unified foundation in basic statistical theory. The problems are drawn from genetics, ecology, epidemiology, and bioinformatics. *Also E&EB 510a^U.*

STAT 502a^U, Introduction to Statistics: Political Science. Rose Razaghian, Joseph Chang.

tth 1–2.15

Statistical analysis of politics and quantitative assessments of public policies. Problems presented with reference to a wide array of examples: public opinion, campaign finance, racially motivated crime, and health policy.

STAT 503a^U, Introduction to Statistics: Social Sciences. Donald Green, Joseph Chang.

tth 1–2.15

Introduction to probability and statistics with emphasis on experimental design and data analysis. Survey of many of the great experiments in social science. Topics include obedience to authority, conformity to social pressure, and susceptibility to perceptual distortions.

STAT 504a^U, Introduction to Statistics in Psychology. Thomas Brown, Joseph Chang.

tth 1–2.15

Statistical and probabilistic analysis of psychological problems presented with a unified foundation in basic statistical theory. The problems are drawn from studies of sensory processing and perceptions, development, learning, and psychopathology.

STAT 506a^U, Introduction to Statistics: Data Analysis. Mihaela Aslan, Joseph Chang.

tth 1–2.15

An introduction to probability and statistics, with emphasis on data analysis.

STAT 530b^U, Introductory Data Analysis. David Pollard.

mw 2.30–3.45

Survey of statistical methods: plots, transformations, regression, analysis of variance, clustering, principal components, contingency tables, and time series analysis. Uses SPLUS and Web data sources. After or concurrent with STAT 501a.

STAT 541a^U, Probability Theory. Marten Wegkamp.

mwf 9.30–10.20

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.

STAT 542b^U, Theory of Statistics. Andrew Barron.

mwf 9.30–10.20

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. After STAT 541a^U and concurrently with or after MATH 222a or b or 225a or b or the equivalent.

STAT 551b^U, Stochastic Processes. Dragan Radulovic.

mw 1–2.15

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 541 or the equivalent.

STAT 600b^U, Advanced Probability. David Pollard.

tth 2.30–3.45

Measure theoretic probability, conditioning, laws of large numbers, convergence in distribution, characteristic functions, central limit theorems, martingales. Some knowledge of real analysis is assumed.

STAT 602b, Central Limit Theorem. Dragan Radulovic.

htba

Central limit theorem (CLT) plays a key role in numerous statistical applications and has imbedded itself in many theoretical models. The proposed topics course covers (besides the historical accounts and the obvious “standard” CLT) the following topics: the “infinite variance case” (P -stable limits, infinite divisible laws, and Poisson $[\mu]$ limits), “dependence case” (alpha and beta mixing, CLT for time series and Markov chains), “multidimensional extension” (empirical processes, Banach space valued random variables) and the bootstrap for the above. Each of the above topics is motivated by real-life problems. Although no specific prerequisite courses are required, the knowledge of measure-theoretical probability (STAT 600) is strongly encouraged. Times to be arranged at organizational meeting.

STAT 610a, Statistical Inference. Andrew Barron.

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.

STAT 612a^u, Linear Models. David Pollard.

tth 9–10.15

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.

STAT 618a, Asymptotic Theory. Marten Wegkamp.

htba

A careful introduction to asymptotic methods in mathematical statistics. Topics include: consistency and asymptotic distributions, edgeworth expansions, M -estimators, contiguity, local asymptotic normality, efficiency, likelihood ratio theory, Le Cam's theory for convergence of experiments, bootstrap. After STAT 600b and STAT 610b. Times to be arranged at organizational meeting.

STAT 625a, Case Studies. Jonathan Reuning-Scherer.

Thorough study of some large data sets on such topics as second-hand smoking, crashes in small cars, reticulate evolution, bloc voting, and Connecticut educational standards.

STAT 626b, Practical Work. Staff.

Individual one-term projects, with students working on studies outside the department, under the guidance of a statistician.

STAT 645b, Statistical Methods in Genetics and Bioinformatics. Joseph Chang.

htba

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 541, STAT 542. Prior knowledge of biology is not required. Times to be arranged at organizational meeting.

STAT 653b, Bayes Theory. John Hartigan.

htba

Axioms and interpretations of probability. Construction of probability distributions. Optimality of Bayes procedures. Martingales. Asymptotics. Markov sampling. Robustness against violations in the assumed distributions. Choice among models. Times to be arranged at organizational meeting.

STAT 660b, Multivariate Statistical Analysis in the Environmental Sciences.

Jonathan Reuning-Scherer.

htba

An introduction to the analysis of multivariate data. Topics to include multivariate analysis of variance (MANOVA), principal components analysis, cluster analysis (hierarchical clustering, k -means), canonical correlation, multidimensional scaling, and factor analysis. Some analysis of multivariate spatial data may be included. Emphasis is placed on practical application of multivariate techniques to a variety of natural and social examples in the environmental sciences. Students are required to select a dataset early in the term for use throughout the term. There are regular assignments and a final project. Times to be arranged at organizational meeting. *Also F&ES 844b.*

STAT 661b^U, Data Analysis. John Hartigan.

mw 2.30–3.45

By analyzing data sets using the S-plus 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 STAT 542 and MATH 222 or 225 or the equivalents.

STAT 664b^U, Information Theory. Edmund Yeh.

tth 9–10.15

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.

STAT 665b^U, Introduction to Function Estimation. Marten Wegkamp.

mw 11.30–12.45

A practical introduction to curve estimation techniques, such as nearest neighbors, regression splines, series estimators, local regression smoothers, and neural networks, with discussion of boundary effects, model and bandwidth selection, goodness of fit, and confidence intervals/bands. Further topics include bootstrap, dimension reduction, boosting, pattern recognition, and density estimation.

STAT 674a^U, Analysis of Spatial and Time Series Data. Dragan Radulovic.

tth 1–2.15

Study of statistical models that are useful for describing data collected over space or time. Models include frequency domain and time domain analysis of time series; state space models and Kalman filters; point processes; Gibbs processes and random fields.

STAT 676a, Some Topics in Portfolio Selection. Andrew Barron.

htba

A study of distributional properties of compounded wealth in repeated gambling and in stock market investment. Wealth concentration inequalities. Strategies of highest concentrated wealth. Normal theory for log-wealth. Relationship to maximum likelihood theory in statistics and to the asymptotic equipartition property in physics and information theory. Greedy strategies. Universal portfolios and their relationship to Bayes methodology. The ratio of idealized wealth (best with hindsight) to actual wealth and the properties of this ratio, both for stochastic stock price sequences and its minimax behavior for arbitrary price sequences. Fast algorithms for universal portfolios. Times to be arranged at organizational meeting.

STAT 695a, Internship in Statistical Research. Marten Wegkamp.

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 semester of the Ph.D. program.

STAT 700, Departmental Seminar.

Important activity for all members of the department. See weekly seminar announcements.

the whitney seminars

Coordinator

Jay Winter (*History*) (300E HGS, 432.1395)

Beginning in 2002–2003 the Whitney Humanities Center is sponsoring a yearlong graduate course entitled “The Whitney Seminar.” Designed to speak across disciplinary lines and to broad public and intellectual issues, the format of the seminar includes both the weekly seminar as well as a series of coordinated public lectures. The lecture series is open to the Yale and local community.

A number of lectures on history, memory, and European identities complement the seminar. These lectures, open to the Yale community, follow the seminar.

Seminars

WHIT 970a, When Was Europe? The Whitney Seminar on European Identities.

Jay Winter, James Whitman.

Sem. th 4–6, Lect. th 7

The seminar examines the proposition that Europe has never been a reality but for centuries has been an idea, expressed in a host of ways, about Enlightenment and Progress. This rhetoric informed social movements, such as Marxism, liberalism, and various forms of nationalism, as well as artistic and intellectual currents. Much of this discussion also cloaked inhumanity and barbarism, especially (but not only) in its imperial forms. This seminar examines the notion that “Europe” was as much a shifting discursive field as it was a shifting territorial one. The boundaries of both discourse and territory have never been fixed. They remain fluid to this day. The seminar is complemented by a lecture series, “When Was Europe?,” organized through the Whitney Humanities Center and the Yale Center for International and Area Studies. The lectures follow the Thursday seminar. *Also HIST 970a.*

WHIT 971b, History and Memory. The Whitney Seminar on European Identities.

Jay Winter, Aleida Assmann, Jan Assmann.

Sem. th 4–6, Lect. th 7

This seminar explores facets of the historical literature surrounding issues of individual memory, collective memory, and commemoration. The focus is on modern Europe, though the literature surveyed addresses issues beyond the confines of Europe. After a survey of interdisciplinary approaches to the field, focusing on social agency, representation, trauma studies, and cognitive psychological research, two different kinds of evidence are examined. The first relates to historical sites (monuments, ruins, battlefields, landscapes) as well as social spaces (families, trials, museums); the second to representations and languages of remembrance, through the narratives of trauma, fiction, memoir, testimonial literature, photography, and film. The focus is on civil society rather than primarily on the state and the manipulation of commemorative forms. *Also HIST 971b.*

women's and gender studies

315 WLH, 100 Wall, 432.0845

Chair

Margaret Homans (*English; Women's & Gender Studies*)

Professors

Linda Bartoshuk (*Psychology*), Kelly Brownell (*Psychology*), Jill Campbell (*English*), Hazel Carby (*African American Studies; American Studies*), Kang-i Sun Chang (*East Asian Languages & Literatures*), Deborah Davis (*Sociology; East Asian Studies*), Kathryn Dudley (*American Studies*), Glenda Gilmore (*History*), Paul Gilroy (*Sociology; African American Studies*), Ingeborg Glier (*German*), Sara Suleri Goodyear (*English*), Dolores Hayden (*Architecture; American Studies*), Margaret Homans (*English; Women's & Gender Studies*), Paula Hyman (*History; Religious Studies*), Matthew Jacobson (*History; American Studies*), Vera Kutzinski (*American Studies; African American Studies; English*), Marianne LaFrance (*Psychology; Women's & Gender Studies*), Charles Musser (*Film Studies; American Studies*), Frances Rosenbluth (*Political Science*), Cynthia Russett (*History*), Harold Scheffler (*Anthropology*), Naomi Schor (*French*), Vicki Schultz (*Law School*), Helen Siu (*Anthropology*), William Summers (*Molecular Biophysics & Biochemistry*), Laura Wexler (*American Studies; Women's & Gender Studies*), Robert Wyman (*Molecular, Cellular & Developmental Biology*)

Associate Professors

Nora Groce (*Epidemiology & Public Health*), Janet Henrich (*School of Medicine*), Serene Jones (*Divinity School*), Linda-Anne Rebhun (*Anthropology*)

Assistant Professors

Jennifer Bair (*Sociology*), Jessica Brantley (*English*), Hannah Brueckner (*Sociology*), Alicia Schmidt Camacho (*American Studies*), Kamari Clarke (*Anthropology*), Elizabeth Dillon (*English*), Laura Frost (*English*), Mary Lui (*History*), Michael Mahoney (*History*), Naomi Rogers (*Women's & Gender Studies; History of Medicine*), Lidia Santos (*Spanish & Portuguese*), Michael Trask (*English*)

Lecturers

Sarah Bilston, Pamela Bro, Geetanjali Singh Chanda, Vron Ware (*Sociology*)

Women's and Gender Studies, an interdisciplinary field, establishes gender and sexuality as fundamental categories of social and cultural analysis. It offers new critical perspectives from which to study the diversity of human experience. 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. Gender — the social meaning of the distinction between the sexes — and sexuality — sexual practices, identities, discourses, and institutions — are studied as they intersect with class, race, ethnicity, and nationality.

Faculty members affiliated with Women's and Gender Studies are available to graduate students as advisers, and they offer graduate courses of relevance to Women's and Gender Studies in their own departments and schools (most frequently African American Studies, American Studies, Anthropology, Divinity, English, History, Law, Psychology, and Sociology). Graduate students may draw on these resources to develop a focus on Women's and Gender Studies while working toward degrees in their chosen disciplines.

Program materials are available on request from the Chair, Women's and Gender Studies Program, Yale University, PO Box 208319, New Haven CT 06520-8319.

Courses

WGST 900b, Research Colloquium in Women's and Gender Studies. Laura Wexler. An interdisciplinary research seminar investigating contemporary theory and methods in women's and gender studies. Requirements include a research paper, works-in-progress presentations, peer reviews, and reviews of the critical literature in a variety of humanities and social science fields. *Also AMST 869b.*

Related Courses

AFAM 712b, Modernity and Its Others: Self, Subject, and Cultural Differences.

Paul Gilroy.

Also SOCY 650b.

AMST 922a, Gender, Territory, and Space. Dolores Hayden.

CPLT 784b, Literature and Psychoanalysis. Shoshana Felman.

Also FREN 784b.

CPLT 951a, Venus and Adonis: Beauty in Art and the Cult of the Beautiful Body.

Winfried Menninghaus.

Also GMAN 707a.

ENGL 814b, Nineteenth-Century Women Writers: Myths, Memoirs, Marketplace.

Linda Peterson.

ENGL 923a, Race, Nation, and American Modernisms. Vera Kutzinski.

Also AFAM 568a, AMST 766a.

HSAR 633a, Desire in the Renaissance. Anne Dunlop.

LAW 20303, Feminist Theory Seminar. V. Schultz.

LAW 20307, Family Law. S. Shapiro.

LAW 21341, Genetics, Ethics, and Law: Research Seminar. R. A. Burt.

LAW 21378, Work and Gender. V. Schultz.

PSYC 777, Research Topics in Gender and Psychology. Marianne LaFrance.

REL 975b, Women in Religious Education. Yolanda Smith.

Research Institutes

the cowles foundation

30 Hillhouse, 432.3702

Director

John Geanakoplos

The Cowles Foundation for Research in Economics at Yale University seeks to foster the development of theoretical, mathematical, and statistical methods of analysis for use in economics and related social sciences. All members of the professional research staff have faculty appointments in the Department of Economics or another social science department at Yale. The foundation sponsors a working paper series and a seminar series. It also maintains a library of materials related to its special areas of research activity.

the economic growth center

27 Hillhouse, 432.3610

Director

Christopher Udry

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 and on the microeconomics of labor and population and includes among its publications book-length studies, reprints by staff 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.

the center for religion and american life

250 Church, 432.4040, iasry@yale.edu, www.yale.edu/iasry/

Administrative Director

Kenneth P. Minkema

The Center for Religion and American Life is a nonsectarian, nondenominational initiative that encourages inquiry into the role that religion has played in the history of our nation. The center provides nonresidential fellowships for scholars working on any aspect of American religion from before European settlement to the present. Annually, the center supports non-Yale scholars from a variety of disciplines with dissertation, research, postdoctoral, and advanced fellowships. The center also awards two Yale dissertation fellowships to students who are in the writing stage of their dissertation, as well as five Yale summer fellowships to help students make significant progress in researching their doctoral topic.

Besides encouraging the creation of a new and significant body of literature on American religion, the center sponsors opportunities for constructive dialogue. We hold two conferences each year. First is the Northeast Regional Faculty Conference in Religion and American Life, which meets the weekend after Thanksgiving and features scholars of American religion who meet to discuss teaching issues and recent books in the field. Second is the Spring Fellows Conference, held each May, which features presentations by our fellows along with lively exchanges of ideas. In addition, the center sponsors a luncheon seminar series that brings in scholars from across the country to present their latest work.

Contingent upon funding, the Center for Religion and American Life will be awarding nonresidential fellowships to dissertation, postdoctoral, and established scholars of all ranks. Candidates from varied disciplines are encouraged to apply, so long as their research interests include religion in American society, past and present, as a key component or variable.

institution for social and policy studies

77 Prospect, 432.3234

Director

Donald P. Green

Executive Committee

John Roemer, Peter Salovey, Stephanie Spangler

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 numerous interdisciplinary faculty seminars, research publications, postdoctoral programs, and the undergraduate major in Ethics, Politics, and Economics. Through these activities, ISPS seeks to shape public policies of local, national, and international significance.

Among the major programs at ISPS are: the *Agrarian Studies Program*, James Scott, director; the *Scholars in Health Policy Program*, Theodore Marmor, director; the *Program in Ethics, Politics, and Economics*, Seyla Benhabib, director; and the *Yale University Interdisciplinary Bioethics Project*, Robert Levine and Margaret Farley, directors.

For more information, refer to the ISPS Bulletin.

international security studies

31 Hillhouse, 432.6242

Director

Paul Kennedy

Acting Director, Fall 2002

John Lewis Gaddis

International Security Studies (ISS) seeks to support interdisciplinary research and teaching in international history and security, with particular reference to diplomatic and military history. Its goal is to fill the critical national need for trained leaders; for discovering flexible and fruitful ways to recognize, define, and analyze security issues; and for independent critiques of policy-thinking and policy-making on these issues. United Nations Studies at Yale (UNSY) exists under the umbrella of ISS and is directed by Bruce Russett. UNSY is a policy-relevant think-tank on key issues concerning the future of the United Nations. Neither ISS nor UNSY are degree-granting programs: rather, they facilitate the work and welcome the participation of students from all academic departments and the professional schools.

ISS offers research grants for Yale graduate and undergraduate students, and postdoctoral fellowships in an international competition. Like UNSY, it also sponsors conferences, lectures, seminars, and workshops. Current projects at UNSY include a collaborative study with the World Bank on *The Political Economy of Civil Wars*, the *United Nations Oral History Project*, which has collected over ninety interviews with United Nations personnel, and *The Public Papers of Secretary-General Boutros Boutros-Ghali*, which is producing a two-volume edition of Dr. Boutros-Ghali's public papers.

The focus of ISS for the next five years will be on its Grand Strategy Project. This project seeks to revive the study and practice of grand strategy by devising methods to teach grand strategy at the graduate and undergraduate levels and by fostering a network of individuals and institutions trained to think about and implement grand strategies in

imaginative and effective ways. The project, launched in January 2000, combines historical depth and analytical range with the belief that the preparation of future leaders is the best long-term investment ISS can make in the future.

Inquiries should be directed to International Security Studies, Yale University, P.O. Box 208353, New Haven CT 06520-8353. Further information on ISS can be found at <http://www.yale.edu/iss/>.

yale center for international and area studies

Luce Hall, 34 Hillhouse, 432.3410

Director

Gustav Ranis

The Yale Center for International and Area Studies (YCIAS) is Yale University's principal agency for encouraging and coordinating teaching and research on international affairs, societies, and cultures around the world. YCIAS seeks to make understanding the world outside the borders of the United States, and America's role in the world, an integral part of the liberal education and professional training at Yale University.

YCIAS includes nineteen research and educational affiliates, specializing in interdisciplinary and problem-oriented, comparative studies of different world regions. They include: African Studies Council; Canadian Studies Committee; East Asian Studies Council; European Studies Council; International Affairs Council; Latin American and Iberian Studies Council; Middle East Studies Council; South Asian Studies Council; Southeast Asia Studies Council; Academic Council on the United Nations System; European Union Studies Program; Fox International Fellowships Program; Genocide Studies Program; Gilder Lehrman Center for the Study of Slavery, Resistance, and Abolition; Genocide Studies Program; Georg Walter Leitner Program in International Political Economy; Global Migration Program; Hellenic Studies Program; and Program in Agrarian Studies.

It also administers six undergraduate majors (African Studies; East Asian Studies; Ethnicity, Race and Migration; International Studies; Latin American Studies; and Russian and East European Studies), four graduate degree programs (African Studies; East Asian Studies; International Relations; and Russian and East European Studies), and several joint-degree programs with the schools of Law, Management, Forestry & Environmental Studies, and the Department of Epidemiology and Public Health.

The center also provides opportunities for scholarly research and intellectual innovation; encourages faculty/student interchange; sponsors more than 500 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 (exclusive of Europe) comprising 1.4 million volumes in the languages of various areas. Through Programs in International Educational Resources (PIER), it brings international education and training to educators, students K-12, the media, businesses, and the community at large.

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 before the one in which students propose to register. Application materials for all programs in the Graduate School may be viewed on the Graduate School's Web site or obtained by writing to Graduate School Admissions, Yale University, PO Box 208323, New Haven CT 06520-8323 (graduate.admissions@yale.edu).

It is important to note that application for admission to the Graduate School may be made to only one department or program. The individual program descriptions listed in this book, in the application brochure, and on the Graduate School Web site explain the prerequisites for each department and program. Applicants must state their intended department specialization when requesting application materials. Completed applications, including three letters of recommendation, transcripts, standardized test scores, and the non-refundable application fee, are due by January 2, 2003. Applications received by December 1, 2002, are eligible for a reduced application fee.

Students who seek a professional degree should write to one of the University's professional schools, which are listed on pages 413–14. 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 apply in other fields and are also eligible to apply for admission as Special Students, for nondegree study (please see Nondegree Study on pages 366–67 for more information). Students interested in postdoctoral appointments should see the information on page 370.

All applicants are required to submit official results of the Graduate Record Examinations (GRE) General Test, which is administered in the United States and abroad by the Educational Testing Service. This examination should be taken no later than the November testing date. Some departments and programs also require scores from a GRE Subject Test; consult the individual program of study listings for those requirements.

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). This examination should be taken no later than the November testing date. The TOEFL requirement is waived only for applicants who have successfully attended for at least two years a university where English is the language of instruction.

Students who do not demonstrate sufficient proficiency in English may be retested and/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.

All students who accept offers of admission to Ph.D. programs and whose native language is not English must present acceptable scores on the Test of Spoken English (TSE)

or SPEAK test before being appointed as teaching fellows with instructional responsibilities. The TOEFL and TSE are administered in the United States and abroad by the Educational Testing Service. The SPEAK test is administered by Yale's English Language Institute.

International students who accept offers of admission will be required to give appropriate evidence of necessary financial support for one or two academic years, depending upon their program of study, before the University will be able to issue visa documents.

Applicants will usually be notified of action concerning admission during the month of March. All entering students must have obtained the bachelor's degree or its foreign equivalent. Offers of admission are contingent on students' providing official evidence of having completed the bachelor's degree or foreign equivalent prior to registration. 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 previously been denied admission three times will not be allowed to apply again.

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 about part-time study, please turn to page 371.

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 are issued transcripts indicating the appropriate credit for work completed.

Application procedures for the DSR are the same as for students seeking admission to regular degree programs.

DSR students engaged solely in course work are identified as special students. Special students admitted for part-time study are charged tuition on a per-course basis, whether for credit or audit. See page 391 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, but students in this category must always pay at least \$1,560 of their tuition per term. Students enrolling for the summer only are charged \$780. Applicants for admission as Visiting Affiliated Research Graduate Students should complete the Applicant's Financial Statement and should submit any other documentation that would clearly establish their need for tuition assistance. Support beyond tuition in the form of fellowship stipends or 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. 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. Such students hold standard graduate student assistantship in research appointments in the faculty member's department. The appointment is funded by the faculty member. The tuition charge for students enrolled as Visiting Assistants in Research is \$1,560 per term. Students enrolling for the summer only are charged \$780.

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 a tuition fee.

Students enrolled in the DSR who are subsequently admitted to degree programs may receive academic and tuition credit for work done 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 but students may be encouraged to take one or more courses in a related department. 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

The Graduate School offers students interested in African American Studies, Classics, Film Studies, and Renaissance Studies an opportunity to 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 that students can pursue. 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.

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. 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 page 378).

Exchange Scholar Program

Graduate students in Yale Ph.D. programs may petition to enroll full-time for a term or for an academic year as exchange scholars at a number of other institutions, including the University of California at Berkeley, Brown, Chicago, Columbia, Cornell, Harvard, Princeton, and Stanford Universities, and at MIT and the University of Pennsylvania. The Exchange Scholars Program enables students to take advantage of special educational opportunities not available at their home institutions. For applications, contact Assistant Dean Diana Cordova (diana.cordova@yale.edu), Room 135, Hall of Graduate Studies (HGS). Applications must be received at least three 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

Center for International and Area Studies

Fox International Fellowship Program (Moscow University; University of Cambridge; Free University, Berlin; Fudan University, Shanghai; University of Tokyo)

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)

Engineering

Ecole Normale Supérieure de Cachan (ENSC), France

Epidemiology and Public Health

Many internship opportunities in numerous countries across the world

Graduate School

Royal Holloway College, University of London, England; The Connecticut Department of Education and the State of Baden-Württemberg Exchange, Germany

French

Ecole Normale Supérieure, Paris; University of Geneva, Switzerland

History

Royal Holloway College, University of London, England

Linguistics

Tokyo Metropolitan University, Japan

Molecular, Cellular, and Developmental Biology

Peking University, Beijing, China

Political Science

Nuffield College, University of Oxford, England

programs in development

Council on East Asian Studies

Kyoto University, Japan

German

Free University, Berlin, Germany

History

Leiden University, Netherlands; Paris-Sorbonne, Paris VI

Agrarian Studies

Amsterdam School for Social Science Research, Netherlands

Summer Study

Many graduate students remain in New Haven during the summer for independent study and research (see Summer Registration, page 383). Although the Graduate School does not offer courses in the summer, a program of undergraduate courses is available, as well as an intensive program of instruction in languages, and graduate students may wish to take advantage of those programs while in New Haven. For further details on summer offerings at Yale, please contact Yale Summer and Special Programs, PO Box 208282, New Haven CT 06520-8282.

Postdoctoral Study

Holders of the doctorate and similarly qualified individuals who wish to undertake special research at Yale may be appointed as postdoctoral fellows, research affiliates, or visiting fellows by the dean of the Graduate School upon recommendation by the chair of the appropriate department. Please consult the appropriate department for further information.

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 on pages 19–360 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 pre-dissertation requirements (courses, examinations, selection of a dissertation topic). The remaining time, typically two and one-half 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, please see Transfer Credit and Advanced Standing on page 372).

Students must register each term until the dissertation is submitted or until six years (twelve terms) of study have been completed. Students who have not completed the dissertation by the end of the sixth year of study may request a period of extended registration, by submitting a one-page petition for extended registration, the standard dissertation progress report that is required annually of all students admitted to candidacy, and a continuous registration form (see page 371). Before a period of extended registration is approved, the student's adviser and director of graduate studies must certify that the stu-

dent is making good progress on the dissertation, will be working full-time on it during the year, and has a reasonable prospect of completing it by the end of the registration period. The Graduate School will normally approve petitions supported by these certifications for a seventh year of registration provided that the student is not employed more than twenty hours per week and will be at Yale or in another location conducive to writing the dissertation.

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 pay four years of full tuition to receive the Ph.D. (see page 372). 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. Part-time study has a five-year limit for students in terminal master's degree programs. Only candidates for terminal master's degrees may enroll less than half-time.

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. The Continuous Registration Fee (CRF) is charged during the period of noncumulative registration. 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.

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, students are charged the Continuous Registration Fee (CRF), \$245 per term in 2002–2003, until the dissertation is submitted or the terminal date is passed. Students who are permitted to register after the sixth year are also charged the 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 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 in 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 on pages 19–360. 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 examina-

tions. 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. 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.

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 on pages 19–360. 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.

Although it is difficult to prescribe a standard length for the prospectus, it should be long enough to include essential information for all proposed topics but concise enough to focus clearly on the subject. About seven pages, including bibliography, should be sufficient in most cases.

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. 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 beginning on page 20. Teaching is required in some departments and is an expectation in all. A student who has not been admitted to candidacy at the expected time will not be permitted to register for the following term.

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.

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 Degree Committee.

For information about submission of the dissertation, please see pages 378–79. Students should also consult the booklet entitled *Preparation and Submission of the Doctoral Dissertation*, available at the Student Information Office, Room 140, Hall of Graduate Studies (HGS).

Requirements for the Degree of Master of Philosophy

The Master of Philosophy is awarded en route to the Ph.D. The minimum general requirements for this degree are that a student shall have completed all requirements for the Ph.D. except 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 on pages 19–360.

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, pages 19–360.

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 the director of graduate studies in both departments and the appropriate associate dean agree on the student's program of study prior to enrollment in courses. 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. 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.

terminal m.a./m.s. degrees

The M.A./M.S. degrees are offered as terminal degrees in twenty-two departments and programs: African Studies, American Studies, Applied Mathematics, Archaeology, Biostatistics (Epidemiology and Public Health), Computer Science, East Asian Studies, Engineering and Applied Science, English, 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, Russian and East European Studies, Slavic Languages and Literatures, and Statistics.

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 on pages 19–360.

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 continuous registration.

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). 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 above, pages 19–360.

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, please 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 International Relations and International and Development Economics. These programs are described in the departmental statements on pages 217–24.

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. Any exception to this pattern of study must be approved by the appropriate 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.

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 Medical School 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 Medical School or the Graduate School before admission to the M.D./Ph.D. program.

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 on pages 414–418). 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).

Dissertation Submission

Dissertations must be submitted to the Graduate School by October 1 for degrees to be considered at the fall meetings of the degree committees and by March 17 for consider-

ation at May meetings of the degree committees. These deadlines have been established to allow sufficient time for readers to make careful evaluations and for departments to review those evaluations and make their recommendations to the Graduate School. No extensions of the deadlines will be granted. Dissertations submitted after the deadlines will be considered during the following term.

Students are advised to obtain the booklet entitled *Preparation and Submission of the Doctoral Dissertation* prior to preparing their dissertations. This booklet, available from the Graduate School Student Information Office (140 HGS), describes the formatting requirements for the dissertation and the processes for submission and approval. Candidates should obtain a Dissertation Submission Packet from the Graduate School Student Information Office prior to submitting their dissertations. This packet contains directions for submission and all required forms.

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 \$45 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.

Students must register continuously until either they have been awarded the Ph.D. or six years have elapsed since matriculation, whichever occurs first. During the first six years, students must be registered through the term of dissertation submission. Registration beyond the sixth year is not required. Registered students who submit dissertations will remain registered until the end of the term and will retain all privileges of registration (for example, 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.

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.

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 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 pages 383–85) 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 page 406).

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 on pages 373–74 (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 barred from further registration and withdrawn.

Course Enrollment

Any student who wishes to enroll in courses during a term must submit to the registrar a course enrollment form, signed by the director of graduate studies of the student's department. The deadlines for filing course enrollment forms each term are listed in the Schedule of Academic Dates and Deadlines on pages 415–18. Students who submit course enrollment forms after the appropriate deadline will be assessed a \$25 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. 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.

A student who wishes to audit a course must receive permission from the instructor before enrolling as an auditor, as not all faculty permit auditors in their classes. The minimum general requirement for auditing is attendance in two-thirds of the class sessions; instructors may set additional requirements for auditing their classes.

course changes

Once the course enrollment form has been submitted to the registrar, all changes must be 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, 140 HGS, as well as from the student's department.

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 on pages 415–18. 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. A fee of \$25 per course will be charged for changes made after midterm (fall term: October 25; spring term: March 7).

Grades

The grades assigned in the Graduate School are:

- H = Honors
- HP = High Pass
- P = Pass
- F = Fail

Marks of Credit/No Credit are assigned for History of Art students enrolled in History of Art courses.

Marks of Satisfactory/Unsatisfactory may be assigned only when the department sponsoring the course has designated such marks. In such cases, all students enrolled in the course must receive these marks; individual students may not receive grades for 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 on pages 415–18 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 a request for the Temporary Incomplete (TI) with the intended completion date, signed by the instructor and the director of graduate studies. The instructor will indicate the mark of TI on the grade sheet, which is to be submitted to the Office of the Registrar by the appropriate grade submission deadline. Only one TI for courses taken 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 in person during the normal registration period at the beginning of that term (see the Schedule of Academic Dates and Deadlines on pages 415–18).

A fee of \$25 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, of 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 (142 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 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.

Students who register in absentia before completing the four-year full-tuition requirement will normally be charged full tuition. Registration in absentia does not reduce the four-year full-tuition or three-year residence requirements, nor will a student who has not met the full tuition requirement be permitted to pay the special fee for more than one year. For additional information, see Eligibility for Fellowships on page 400.

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 on page 372 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 are charged a Continuous Registration Fee (CRF), which in 2002–2003 is \$245 per term. Students who are granted extensions beyond the sixth year are also charged this fee. Forms for continuing registration are provided to eligible students before the start of each term and must be submitted by the end of the registration period for that term.

summer registration

Most Ph.D. students and many M.A./M.S. students continue full- or half-time independent study or research during the summer. Students who were registered during the preceding spring term and are engaged in degree-related activities at least half-time may register for the summer research term, approximately June 1 through August 31.

leaves of absence

Students who wish or need to interrupt their study temporarily may request a leave of absence. There are two types of leave, personal and medical, both of which are described below. The general policies that apply to both 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, to a maximum total of two years of leave, may be granted for students in Ph.D. programs. Leaves of absence for students in M.A./M.S. programs are not renewable. 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, *by the appropriate deadline for the term in which the course was taken*, 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. Students on leave are not eligible for financial aid, including loans, or for the use of any University facilities normally available to registered students, with the exception of the Yale Health Plan, in which they may enroll 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. Additional information may be found in the *YHP Student Handbook*.
5. 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.
6. 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.

Personal Leave of Absence

A student who is current with his or her degree requirements and who wishes to interrupt study temporarily for reasons such as pregnancy, maternity or paternity care, or because of financial exigencies, may request a personal leave of absence. The general policies governing leaves of absence are described above. Students are eligible for per-

sonal 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 for reasons of pregnancy, maternity or paternity care, or for military service. 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 write to the appropriate associate dean 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 personal leave of absence, or who apply for a leave but are not granted one, and who do not register for any term, will be considered to have withdrawn from the Graduate School.

Medical Leave of Absence

A student who must interrupt study temporarily because of illness 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. The general policies governing all leaves of absence are described above, including information about health care coverage. 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 granted a medical leave during any term will have their tuition adjusted according to the same schedule used for withdrawals (please see Schedule of Academic Dates and Deadlines on pages 415–18). Before re-registering, a student on medical leave must secure written permission to return from a physician at the University Health Services. Advanced Ph.D. students may return at any time, 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. Health coverage options during a leave of absence are described on page 405.

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 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. Withdrawal forms are available at the Graduate School Student Information Office.

Students who fail to meet departmental or Graduate School requirements by the designated deadlines will be barred from further registration and 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, are considered to have 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, pages 415–18. 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 on page 405.

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. Neither readmission nor financial aid is guaranteed to students who withdraw. The deadline for making application for readmission is January 2 of the year 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.

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. 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 Report of the Committee on Freedom of Expression at Yale, pages 388–90.)
8. 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.
9. 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.
10. Misrepresentation or lying during a formal inquiry by University officials.
11. Misrepresentation in applying for admission or financial aid.
12. Theft, misuse of funds, or willful damage of University property.
13. Trespassing on University property to which access is prohibited.
14. The possession or use of explosives, incendiary devices, or weapons on or about the campus is absolutely prohibited.
15. Interference with the proper operation of safety or security devices, including fire alarms, electronic gates, and sprinkler systems.
16. 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

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 are available at registration along with *Programs and Policies* and may also be obtained at other times from the office of each of the associate deans of the Graduate School. 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 following procedures have been adopted.

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.

Copies of the grievance procedures of the Graduate School are available at registration along with *Programs and Policies* and may also be obtained at other times from the office of each of the associate deans of the Graduate School, or from the Information Office. The deans may be consulted for further information and advice.

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, 2002 – 2003

*Tuition:**

Full-time study, per term	\$12,240
Full-time study in IDE, per term	12,740
Half-time study, per term	6,120
Master's programs, less than half time per term	
One-quarter time study, per term	3,060
Division of Special Registration (DSR, nondegree study)	
Course work, per course, per term (including audited courses)	3,060
Visiting Affiliated Research Graduate Students, per term	12,240
Visiting Assistants in Research, per term	1,560
Visiting Assistants in Research appointed for the summer only	780

Fees:†

Continuous Registration Fee (CRF), per term (see page 383)	\$245
Special in absentia registration, per term (see page 383)	245
YHP Hospitalization/Specialty Coverage, twelve months‡	852
YHP Prescription Plus Coverage, twelve months	300

For fees relating to registration and course enrollment see page 380.

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.

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.

* 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.

‡ Hospitalization fees are for single students. Rates are higher for students needing dependent coverage.

Yale Charge Account

Students who sign and return a Yale Charge Card Account Authorization form will be able to charge designated optional items and services to their student accounts. Students who want to charge toll calls made through the University's telephone system to their accounts must sign and return this Charge Card Account Authorization. The University may withdraw this privilege from students who do not pay their monthly bills on a timely basis. For more information, contact the Office of Student Financial Services at 246 Church Street, PO Box 208232, New Haven CT 06520-8232; telephone, 203.432.2700; fax, 203.432.7557; e-mail, sfs@yale.edu.

Yale Payment Plan

The Yale Payment Plan is a payment service that allows students and their families to pay tuition, room, and board in eleven or twelve equal monthly installments throughout the year based on individual family budget requirements. It is administered for the University by Academic Management Services (AMS). To enroll by telephone, call 800.635.0120. The fee to cover administration of the plan is \$50. The deadline for enrollment is June 21. Application forms will be mailed to all students. For additional information, please contact AMS at the number above or visit their Web site at <http://www.tuitionpay.com/>.

Bills and Payments

Term bills reflect charges for tuition and health coverage, as well as for room and board, library fines, miscellaneous purchases, and unpaid balances from prior terms.

For Ph.D. students, stipends are paid directly to students by checks issued periodically during the academic year, while tuition fellowships and the Health Award for hospitalization coverage are normally paid as credits against the related charges on students' term bills.

Term bills for the fall term are mailed to students by August 5 and are due and payable by September 1. Bills for the spring term are mailed by November 5 and are due and payable by December 1.

A late fee of \$110 will be imposed by the Office of Student Financial Services for every term in which outstanding charges, less Yale-administered loans and scholarships, exceed \$250 and are not paid by September 1 for the fall term, and by December 1 for the spring term.

Until all outstanding charges, less Yale-administered loans and scholarships, are paid in full, students are not furnished, directly or indirectly, with transcripts, certificates of attendance, or diplomas.

Charge for Returned Checks

A processing charge of \$20 will be assessed for checks returned for any reason by the bank on which they were drawn. In addition, the following penalties may apply if a check is returned:

1. If the check was in payment of a term bill, a \$110 late fee will be charged for the period the bill was unpaid.

2. If the check was in payment of a term bill to permit registration, the student's registration may be revoked.
3. If the check was given in payment of an unpaid balance in order to receive a diploma, the University may refer the account to an attorney for collection.

transcripts

Transcripts may be ordered in writing at the Office of the Registrar for the Faculty of Arts and Sciences (246 Church Street, third floor), or faxed, with a signature, to 203.432.2334. For each transcript order, the charge for the first transcript is \$5, with a charge of \$1 for each additional transcript. 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; there is an additional charge of \$10 for such requests. For overnight delivery, additional mailing charges may be imposed.

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. Yale University Fellowships are awarded at the time of admission. Doctoral students are normally provided a level of support comparable to the fellowship awarded at admission, from the first through the fourth year of study. Eligible students in the humanities and social sciences receive University Dissertation Fellowships in their fifth or sixth year of study.

In addition to grants and fellowships for tuition and living costs, eligible Ph.D. students receive a Health Award, which covers the full cost of single-student Yale Health Plan Hospitalization/Specialty Coverage. For those eligible Ph.D. students who elect two-person or family coverage at the Yale Health Plan, the Graduate School covers half the cost of the coverage plan (which includes both Basic Coverage and Hospitalization/Specialty Coverage for the student and his or her dependents). Information about Yale Health Plan Basic Coverage, provided at no cost to students enrolled at least half-time in M.A., M.S., or Ph.D. programs, may be found on page 404.

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.

Application for University Fellowship Support

Applicants for admission to the DSR and to terminal M.A. departments and programs are required to complete the financial statement contained in the application brochure. Applicants for admission to Ph.D. departments and 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. Tuition

assistance is not available beyond the fourth year of study. Students are strongly encouraged to seek financial support from external sources (see page 399, External Fellowships and Combined Award Policy).

University Fellowships

The Graduate School awards University Fellowships in most departments. Fellowships are awarded at admission to entering students on the basis of recommendations made by individual departments to the appropriate associate dean. Fellowship awards are based on merit.

The Graduate School provides Ph.D. students with a level of support during the second, third, and fourth years of study comparable to that awarded at admission. 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. If during the teaching years a student's teaching fellowship is less than the standard departmental stipend, the Graduate School provides a supplemental fellowship to bring the annual stipend/fellowship to the level of the department's standard stipend.

To assist students in the completion of their studies, the Graduate School also offers Summer Study Fellowships to eligible students in their first and second years in the humanities and social sciences, and University Dissertation Fellowships to eligible students in years four, five, or six in the humanities and social sciences. 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. It is important to note that no University Fellowships are awarded during the summer.

In most departments in the humanities and social sciences, the fellowship stipends of students in the third and fourth years of study will be derived from teaching fellowships. When a student teaches in the third or fourth year, the teaching fellowship will comprise the student's fellowship stipend, according to the terms of the offer of admission. For students who teach in their first or second year when such teaching is not a departmental requirement, the Graduate School will use the standard departmental stipend as a ceiling for combined fellowship stipend and teaching award and will reduce the stipend accordingly.

In some departments where there are insufficient opportunities for undergraduate teaching, graduate students who were admitted with stipends may continue to receive fellowship stipends in their third and fourth years of study up to the level of their standard departmental stipend. Stipend support will normally be withheld if a student in the third or fourth years refuses a teaching position or elects not to teach. Exceptions to this policy require the permission of the appropriate associate dean and the director of the Teaching Fellow Program.

Teaching Fellowships

purpose

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. 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 (Richard Sleight for the natural sciences and Anthropology, Linguistics, Psychology, and Statistics; Pamela Schirmeister for the humanities and other social sciences). 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 and administering 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” at the end of this section.

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 only 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 Test of Spoken English (TSE), or (3) having received a degree from an institution where the principal language of instruction is English. (Degrees awarded en route to the Ph.D. at Yale will not satisfy this requirement.) In some instances, a student’s director of graduate studies (DGS) may require that students with degrees from English-speaking institutions also pass the SPEAK test to satisfy the language requirement.

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 will be permitted to teach 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 PTAIs, 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.

teaching and admission offers

Letters of admission inform students of their programs' requirement for teaching. In many programs there are specific years when students teach and when a portion of their financial aid is derived in part from teaching. For example, most humanities and social science students will participate in teaching in their third and fourth years. In the natural sciences, the timing of teaching is earlier or is flexible across several years. 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 cancelled or if the student, course instructor, and DGS all agree upon a reassignment.

Upon admission, many students receive financial aid packages that include teaching fellowships. The admission letter sets the minimum annual total stipend (including the teaching fellowship), which will be awarded even if appropriate teaching is not available or if the teaching fellowship is less than the standard departmental stipend. Such funding adjustments are made with the participation of a student's associate dean and DGS.

Teaching appointments outside those specified in the letter of admission are contingent on a graduate student's satisfactory academic progress and on sufficient course enrollment. Because the Graduate School considers teaching experience an integral part of graduate education, every effort will be made to assign students to another course at an equivalent level if enrollments are lower than anticipated. Ph.D. students who teach in their first or second year, or when such teaching is not a departmental requirement, will receive the full teaching fellowship, plus a supplemental fellowship, bringing their combined stipend up to the level awarded in the admission letter. M.A. students will receive the full teaching fellowship; any other financial aid will be awarded according to the policies of their program.

limits on teaching

Except in certain science departments, first-year 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. First-year students in the sciences and second-year students in all divisions will normally not be allowed to teach more than eight teaching fellow units in a single year, and not more than four units in a single term. (See "Teaching Fellow Levels" section for definition of a teaching unit.)

After the second year, but before they have completed their qualifying examinations, students are permitted to teach up to a maximum of four TF units or one PTAI in introductory courses per term with a maximum of eight TF units or two PTAs per year.

Students with outside fellowships are eligible to serve as TFs according to the policies of their departments and the conditions of their outside awards.

appointment letters

The Graduate School expects that each term, departments 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.

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 duties of a TF 1 are primarily (a) grading or (b) a modest 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 a course. A TF 1 does not engage in regular classroom teaching. Approximate weekly effort, 5 hours. The 2002–2003 teaching fellowship is \$1,745 per term.

Teaching Fellow 2: A TF 2 typically leads and grades one discussion or laboratory section of up to twenty students in courses in the natural sciences and some social sciences or combines responsibilities (a) and (b) as described under TF 1. Approximate weekly effort, 10 hours. The 2002–2003 teaching fellowship is \$3,490 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 2002–2003 teaching fellowship is \$5,235 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 Intensive TFs. Approximate weekly effort, 17.5 hours. The 2002–2003 teaching fellowship is \$6,108 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 2002–2003 teaching fellowship is \$6,980 per term.

part-time acting instructors

Graduate students appointed as part-time acting instructors (PTAIs) are responsible for the conduct of sections of introductory courses or advanced courses, normally seminars

in their special fields. PTAIs are subject to departmental guidance, which, in the case of multisection introductory courses, may entail the use of a common syllabus and examinations. PTAIs who teach advanced courses 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 2002–2003 teaching fellowship is \$7,080 per term.

Traineeships and Assistantships in Research

Traineeships (National Research Service Awards) from the National Institutes of Health and the National Institute of Mental 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

Graduate 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 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.

supplementary fellowship aid

The Graduate School is currently able to offer a small amount of supplementary fellowship assistance to students who experience significant financial hardship at some point during their first four years of study. Students who wish to request supplemental fellowship awards should send to their associate dean a letter explaining the reasons for their request. Students requesting supplemental assistance may be asked to submit additional information about their financial status at any time thereafter until their request is considered. Requests for supplemental fellowship assistance are usually made during the spring term, and students are typically notified of decisions during the summer.

Students should note that the budget for supplementary aid is extremely modest and only requests from students in serious financial difficulty are likely to be met. Awards of supplementary aid are made for one year only.

external fellowships and combined award policy

All current students and applicants for admission are strongly encouraged to compete for outside fellowships. These fellowships, 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 must report to their associate dean any scholarship/fellowship received from an outside agency or organization.

Students are allowed to hold outside awards in conjunction with University stipends up to combined levels that are significantly higher than the normal stipend. During the nine-month academic year, the sum of the Graduate School's initial stipend award and all outside awards may total the standard department/program nine-month 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 stipend award will be reduced accordingly.

In humanities and social science departments, up to $\frac{3}{12}$ of the external award may be reserved for the summer (when this is permitted by the awarding agency), prior to calculating the nine-month combined award. When outside awards include restricted funds (e.g., for tuition and/or research support), the restricted funds will not be used in calculating the combined stipend.

University Fellowship stipends awarded as a result of this formula are subject to all applicable policies, including replacement of stipends by teaching fellowships, and are awarded for the nine-month academic year. In no case will the application of this policy reduce the amount of an external award, nor will it reduce the amount of a teaching fellowship.

dissertation fellowships

In addition to the substantial regular fellowships awarded to students, the Graduate School offers special University Dissertation Fellowships to eligible advanced graduate students in the humanities and social sciences during their fourth, fifth, or sixth year of

study. 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 an academic-year fellowship and is offered exclusively during the fall and spring terms. 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. In 2002–2003, University Dissertation Fellowships will carry a stipend of \$15,000. A student may be awarded a dissertation fellowship for one year only. Application materials and additional information can be found in the Graduate School Web site: www.yale.edu/graduateschool/financial/UDF_Form.pdf or from the appropriate associate dean.

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. 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.

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.

During 2002–2003, 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 Graduate School also offers special “bridge loans” in the fall term to students whose financial aid is concentrated in the spring term. For full details, consult the director or associate director of finance.

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 the 2002–2003 *Financial Information for Entering Graduate Students*. These documents are available from the financial aid office. Information and FAFSA applications are also available at the Web site of the United States Department of Education (www.fafsa.ed.gov/).

International students are eligible to borrow from Graduate School loan funds, but normally only in the third and fourth years of study. These loans are limited in number and may not exceed \$5,000 per academic year. Because Graduate School loan funds are limited, this policy may change from year to year. Interest-bearing loans are available to international students from private lenders, but require a U.S. citizen as cosigner.

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 128 HGS.

University Services and Facilities

living accommodations

Graduate Housing — On Campus

www.yale.edu/graduatehousing/

The Graduate Housing Office has dormitory and apartment units for a small number of graduate and professional students. Approximate rates for 2002–2003 are: dormitory (single) housing, \$4,144–4,926 per academic year; apartments (single and family housing), \$610–860 per month. Students who have accepted an offer of admission may download the graduate housing application form from the Web site above, and send it in to apply for housing. The assignment process generally starts in mid- to late April after current returning residents are offered renewals.

The Graduate Housing Office consists of two separate offices: the Graduate Dormitory Office and the Graduate Apartment Office, both located within Helen Hadley Hall, a graduate dormitory, at 420 Temple Street. Office hours are from 9 a.m. to 4 p.m., Monday through Friday. For facility descriptions, floor plans, and rates, visit the Graduate Housing Web site. For further information on graduate dormitories, contact Beverly Whitney at 203.432.2167, fax 203.432.4578, or beverly.whitney@yale.edu. For graduate apartment information, contact Betsy Rosenthal at 203.432.8270, fax 203.432.0177, or betsy.rosenthal@yale.edu.

Off-Campus Listing Service

www.yale.edu/offcampuslisting

The University's Off-Campus Listing Service is an online database of rental apartments, houses, room shares, and sublets listed by private landlords. It is a service for current and incoming members of the Yale community, with an office at 155 Whitney Avenue, third floor, open from 8.30 a.m. to 3.30 p.m., Monday through Friday. Its listings may also be accessed from any computer at Yale through the Intranet at www.yale.edu/offcampuslisting. Use the user I.D. "housevis99" and the password "rix99" to access the site.

University Properties

www.yale.edu/up

University Properties owns and operates Yale University's nonacademic, off-campus properties in New Haven. We are 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. Our proper-

ties are managed by contracted management companies chosen for their professionalism and ability to work effectively with the Yale community.

health services

www.yale.edu/uhs/

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, internal medicine, gynecology, mental hygiene, pediatrics, pharmacy, laboratory, radiology, a twenty-three-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, and online.

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 Hygiene. 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 fee. Associates must enroll 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 enroll 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 Care 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

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 September 1 through August 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 August 31.

For a detailed explanation of this plan, see the *YHP Student Handbook*.

Waiving the YHP Hospitalization/Specialty Coverage: Students are permitted to waive YHP Hospitalization/Specialty Coverage by completing a waiver form that demonstrates proof of alternate coverage. Waiver forms are available from the YHP Member Services Department. 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.

Student Two-Person and Family Plans

A student may enroll his or her lawfully married spouse or same-sex 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 coverage for YHP Basic Coverage and for coverage under 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 (<http://www.yale.edu/uhs/>) 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 or students paying less than half tuition may enroll in YHP Student Affiliate Coverage, which includes coverage for YHP Basic and for the benefits offered under 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 (<http://www.yale.edu/uhs/>) 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 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. 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 fee 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. Students who withdraw are not eligible to enroll in YHP Student Affiliate Coverage.

Leaves of Absence: Students who are granted leaves 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. Coverage is not automatic and enrollment forms are available at the YHP Member Services Department or can be downloaded from the YUHS Web site (<http://www.yale.edu/uhs/>).

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 coverage for YHP Basic and for the benefits offered under 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 (<http://www.yale.edu/uhs/>). Students must complete an enrollment application for the plan prior to the start of the term.

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: 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 goes 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, 2002. Please note that the State of Connecticut does not require this vaccine for students who intend to reside off campus.

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 Whitney Avenue, is the University central computing and communications services organization, providing academic

computing, data networking, telephone services, voice and video networking, computer sales, training, printing and reprographic services, and general user support (www.yale.edu/its).

Student Computing of Academic Media & Technology (AMT), a unit of ITS, furnishes general purpose computing clusters at many locations on campus, 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/sc/). Windows NT and Apple Macintosh computers and laser printers are available for open use by the Yale community at Connecticut Hall, Cross Campus Library, Dunham Laboratories, Kline Biology Tower, and the Social Sciences Statistical Laboratory.

The online purchasing site (www.yale.edu/eportal/) sells computers, networking cards, modems, and printers, as well as software and supplies. Apple, IBM, 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/sc/purchase) for more information on purchasing computer supplies. Up-to-date information on pricing and on ordering can be found at the eportal Web site (www.yale.edu/eportal/). Information about computer hardware repairs can be obtained at the repair Web site (www.yale.edu/repair/) or by calling the ITS Help Desk at 203.432.9000.

Network Access to Yale Services and Beyond

The University provides a large, central system for e-mail, Web page hosting, and other services for Yale College, the Graduate School, and selected professional schools. Yale's network offers a wide variety of local services through a campus-wide fiber-optic network, which is linked to both the worldwide Internet and the higher-performance Internet 2, specifically serving research universities. Services include Orbis, the University library's online catalogue; YaleInfo, a campus-wide Web-based information system that includes campus events, and Nexis, a database of newspapers and journal articles, as well as access to online training courses, Web courses, and various other services (www.yale.edu/computing).

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 residences, offices, and laboratories are equipped with Ethernet data outlets. Remote Access Services (www.yale.edu/ras), with offices at 221 Whitney Avenue, is the off-campus and roaming support center for the University.

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 residences, in the McDougal Center Common Room, in the Sterling Memorial Library (SML) reading room and, for doctoral students, in the SML carrels. Registered users can access network resources through wired or wireless connections.

Telecommunications

www.yale.edu/telecom/

The ITS Telecommunications Office at 221 Whitney Avenue provides voicemail, paging, facsimile, and answering services, in addition to a full range of telephone services. Toll calls require a toll authorization number (TAN), which can be arranged through the telecommunications office as well as through departmental offices. Long-distance service for telephones on campus is through the University's private network, YALENET. YALENET calling cards are available to address off-campus needs.

office of international students and scholars

www.oiss.yale.edu/

The Office of International Students and Scholars (OISS) coordinates services and support to 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 can 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. OISS issues the visa documents needed to request entry into the United States under Yale's immigration sponsorship and processes requests for extensions of authorized periods of stay in the United States, 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 monthly international coffee hours, English conversation programs, and orientation receptions for newly arrived graduate students and postdocs, 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 maintains an extensive Web site 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 graduate students, postdocs, and visiting scholars can get connected with OISS by subscribing to one or both of the OISS e-mail lists. OISS-L is the electronic newsletter with important information for Yale's international community. YaleInternational E-Group is an interactive list through which almost 800 international students and scholars keep each other informed about events in the area. Check the Web site for more information. To subscribe to either, send a message to oiss@yale.edu.

Spouses and partners of international students and scholars will want to know about ISPY – International Spouses and Partners at Yale. Information about ISPY and other OISS programs can be found on the OISS Web site.

The Office of International Students and Scholars, located at 246 Church Street, Suite 201, is open Monday through Friday from 8.30 a.m. to 5 p.m.

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 1. 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 College Street entrance to WLH. Office hours are Monday through Friday, 8.30 a.m. to 5 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.

Life at Yale

the international center of new haven

<http://www.oiss.yale.edu/icnh/>

Established in 1949, the International Center of New Haven is a nonprofit community-based organization. The Center's programs are based on the idea that both the international community in Greater New Haven and the local community can benefit from each other. The Center is located at 442 Temple Street, and the office is open from 9 a.m. to 4.30 p.m., Monday through Thursday, and from 9 a.m. to noon on Friday. The work of the International Center is carried out by a small professional staff and by many volunteers in the community. The Center organizes lectures, trips, picnics, and special events, as well as English as a Second Language (ESL) classes, in addition to a number of programs including the International Host Friendship Program, 'Round The World Women, and the International Classroom Project. The International House, a large Tudor mansion located at 406 Prospect Street in New Haven, is the venue of most of the International Center's activities and the home of sixteen students and scholars. Rooms are available for the academic year and summer. For more information on any of these programs, or on International House, telephone 203.432.6460, fax 203.432.6462, e-mail international.centernh@yale.edu, or visit the center's Web site.

religious life at yale

The religious resources of Yale University serve all students, faculty, and staff. These resources are the University Chaplaincy (located on the lower level of Bingham Hall on Old Campus); the Church of Christ in Yale University, an open and affirming member congregation of the United Church of Christ; and Yale Religious Ministry, the on-campus association of clergy and nonordained representatives of various religious faiths. The ministry includes the Chapel of St. Thomas More, the parish church for all Roman Catholic students at the University; the Joseph Slifka Center for Jewish Life at Yale, a religious and cultural center for students of the Jewish faith; several Protestant denominational ministries and nondenominational groups; and religious groups such as the Baha'i Association, the New Haven Zen Center, and the Muslim Student Association. Additional information is available at <http://www.yale.edu/chaplain/>.

cultural opportunities

Yale has long been known for its training and work in the creative and performing arts and this leadership adds much to the cultural life of the University, the city of New Haven, and the entire region. A calendar of events in the University is issued each week during the academic year in the *Yale Bulletin & Calendar*. The hours when special as well as permanent collections of the University may be seen are also recorded in this publication. The *Bulletin & Calendar* is available online at <http://www.yale.edu/opa/current/ybcurrent.html/>.

The Yale Peabody Museum of Natural History contains collections in anthropology, mineralogy, oceanography, paleontology, and some aspects of geology.

The Yale University Art Gallery contains representative collections of ancient, medieval, and Renaissance art, Near and Far Eastern art, archaeological material from the University's excavations, Pre-Columbian and African art, works of European and American masters from virtually every period, and a rich collection of modern art.

The Yale Center for British Art houses an extraordinary collection of British paintings, sculpture, drawings, and books given to the University by the late Paul Mellon, Yale Class of 1929.

There are more than eighty endowed lecture series held at Yale each year on subjects ranging from anatomy to theology, and including virtually all disciplines.

More than four hundred musical events take place at the University during the academic year. These include concerts presented by students and faculty of the School of Music, the Department of Music, the Yale Concert and Jazz bands, the Yale Glee Club, the Yale Symphony Orchestra, and other undergraduate singing and instrumental groups. In addition to graduate recitals and ensemble performances, the School of Music features the Philharmonia Orchestra of Yale, the Chamber Music Society at Yale, the Duke Ellington Series, Great Organ Music at Yale, New Music New Haven, Yale Opera performances and public master classes, and the Faculty Artist Series. Among New Haven's numerous performing organizations are Orchestra New England, the New Haven Chorale, and the New Haven Symphony Orchestra.

For theatergoers, Yale and New Haven offer a wide range of dramatic productions at the University Theater, Yale Repertory Theatre, Yale Cabaret, Long Wharf Theatre, Palace Theater, and Shubert Performing Arts Center.

athletic facilities

The Payne Whitney Gymnasium is one of the most elaborate and extensive indoor athletic facilities in the world. This amazing complex includes the 3,100-seat John J. Lee Amphitheater, the site for many indoor varsity sports contests; the Robert J. H. Kipthut Exhibition Pool, an architectural aquatics marvel; the Brady Squash Center, a world-class facility with fifteen international-style courts; the Adrian C. Israel Fitness Center, a state-of-the-art exercise and weight-training complex; the Brooks-Dwyer Varsity Strength and Conditioning Center, the envy of the Ivy League; the Colonel William K. Lanman, Jr. Center, a 30,000-square-foot space for recreational/intramural play and varsity team practice; the Greenberg Brothers Track, an eighth-mile indoor jogging track; and other rooms devoted to fencing, gymnastics, rowing, wrestling, martial arts, general exercise, and dance. Numerous physical education classes in dance, martial arts, aerobic exercise, and sport skills are offered throughout the year. Graduate and undergraduate students may use the gym at no charge during the academic year and for a nominal fee during the summer term. Academic and summer memberships at reasonable fees are available for faculty, employees, postdoctoral and visiting fellows, and student spouses.

The David S. Ingalls Rink, the Sailing Center in Branford, the Outdoor Education Center (OEC), the tennis courts, and the golf course are open to faculty, students, and employees of the University at established fees.

Approximately thirty-five club sports and outdoor activities come under the jurisdiction of the Office of Outdoor Education and Club Sports. Many of the activities, both purely recreational and instructional, are open to graduate and undergraduate students. Faculty, staff, and alumni, as well as groups, may use the Outdoor Education Center (OEC). The center consists of two thousand acres in East Lyme, Connecticut, and includes cabins, campsites, pavilion, dining hall, swimming, boating, canoeing, and picnic groves beside a mile-long lake. Hiking trails surround a wildlife marsh. The OEC season extends from the third weekend in June through Labor Day and September weekends. For more information, telephone 203.432.2492 or visit the Web page at <http://yale.edu/athletics/> (click on Sport and Rec, then on Outdoor Education).

Throughout the year, Yale University graduate and professional students have the opportunity to participate in numerous intramural sports activities. These seasonal, team-oriented activities include volleyball, soccer, and softball in the fall; basketball and volleyball in the winter; softball, soccer, and volleyball in the spring; and softball in the summer. With few exceptions, all academic-year graduate-professional student sports activities are scheduled on weekends, and most sports activities are open to competitive, recreational, and coeducational teams. More information is available from the Intramurals Office in Payne Whitney Gymnasium, 203.432.2487, or at <http://www.yale.edu/athletics/>.

The Work of Yale University

The work of Yale University is carried on in the following schools:

Yale College: 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; telephone, 203.432.9300; e-mail, undergraduate.admissions@yale.edu; Web site, www.yale.edu/admit/

Graduate School of Arts and Sciences: 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 write to the Yale Graduate School of Arts and Sciences, PO Box 208323, New Haven CT 06520-8323; telephone, 203.432.2770; e-mail, graduate.admissions@yale.edu; Web site, www.yale.edu/graduateschool/

School of Medicine: Courses for college graduates and students who have completed requisite training in approved institutions. Doctor of Medicine (M.D.). Postgraduate study in the basic sciences and clinical subjects. Combined program with the Graduate School of Arts and Sciences leading to Doctor of Medicine and Doctor of Philosophy (M.D./Ph.D.). 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 University School of Medicine, 367 Cedar Street, New Haven CT 06510; telephone, 203.785.2643; fax, 203.785.3234; e-mail, medical.admissions@yale.edu; Web site, www.info.med.yale.edu/medadmit/

For additional information about the Department of Epidemiology and Public Health, an accredited School of Public Health, please write to the Director of Admissions, Department of Epidemiology and Public Health, Yale School of Medicine, PO Box 208034, New Haven CT 06520-8034; e-mail, eph.admissions@yale.edu; Web site, www.info.med.yale.edu/eph/

Divinity School: 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 University Divinity School, 409 Prospect Street, New Haven CT 06511; telephone, 203.432.5360; fax, 203.432.7475; e-mail, ydsadmsn@yale.edu; Web site, www.yale.edu/divinity/

Law School: Courses for college graduates. Juris Doctor (J.D.). For additional information, please write to the Admissions Office, Yale Law School, PO Box 208329, New Haven CT 06520-8329; telephone, 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; telephone, 203.432.1696; e-mail, gradpro.law@yale.edu; Web site, www.law.yale.edu/

School of Art: 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; telephone, 203.432.2600; e-mail, artschool.info@yale.edu; Web site, www.yale.edu/art/

School of Music: 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; telephone, 203.432.4155; fax, 203.432.7448; e-mail, gradmusic.admissions@yale.edu; Web site, www.yale.edu/schmus/

School of Forestry & Environmental Studies: Courses for college graduates. Master of Forestry (M.F.), Master of Forest Science (M.F.S.), Master of Environmental Science (M.E.Sc.), Master of Environmental Management (M.E.M.), Doctor of Forestry and Environmental Studies (D.F.E.S.).

For additional information, please write to the Office of Academic Services, Yale School of Forestry & Environmental Studies, 205 Prospect Street, New Haven CT 06511; telephone, 800.825.0330 or 203.432.5100; e-mail, fesinfo@yale.edu; Web site, www.yale.edu/environment/

School of Architecture: 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; telephone, 203.432.2296; e-mail, gradarch.admissions@yale.edu; Web site, www.architecture.yale.edu/

School of Nursing: Courses for college graduates. Master of Science in Nursing (M.S.N.), Post Master's Certificate, Doctor of Nursing Science (D.N.Sc.).

For additional information, please write to the Yale School of Nursing, PO Box 9740, New Haven CT 06536-0740; telephone, 203.785.2389; Web site, www.nursing.yale.edu/

School of Drama: Courses for college graduates and certificate students. Master of Fine Arts (M.F.A.), Certificate in Drama, One-year Technical Internship (Certificate), Doctor of Fine Arts (D.F.A.).

For additional information, please write to the Registrar's Office, Yale School of Drama, PO Box 208325, New Haven CT 06520-8325; telephone, 203.432.1507; Web site, www.yale.edu/drama/

School of Management: Courses for college graduates. Professional degree: Master of Business Administration (M.B.A.).

For additional information, please write to the Admissions Office, Yale School of Management, PO Box 208200, 135 Prospect Street, New Haven CT 06520-8200; telephone, 203.432.5932; fax, 203.432.7004; e-mail, mba.admissions@yale.edu; Web site, www.mba.yale.edu/

Schedule of Academic Dates and Deadlines

fall term 2002

Monday, August 26	New student orientation week begins.
Tuesday, August 27	Orientation for new international students begins.
Wednesday, August 28	Matriculation ceremony.
Thursday, August 29	SPEAK test for new international students in Ph.D. programs.
Friday, August 30	Registration and orientation in departments for all new students begins.
Tuesday, September 3	Registration for returning students begins.
Wednesday, September 4	Fall-term classes begin, 8.30 a.m.
Friday, September 6	Final day to pick up registration materials from academic departments.
Wednesday, September 18	<p>Fall-term course enrollment forms are due. Final day for registration. <i>A fee of \$25 is assessed for forms submitted after this date.</i></p> <p>Final day to apply for a fall-term <i>personal leave of absence</i>.</p> <p>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 <i>personal leave of absence</i> effective on or before this date.</p>
Friday, September 27	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 <i>medical leave of absence</i> effective on or before this date (<i>The CRF is not prorated.</i>)
Tuesday, October 1	<p>Final date for the faculty to submit grades to replace Temporary Incompletes (TIs) awarded during the 2001 – 2002 academic year.</p> <p>Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in December.</p> <p>Final day to file petitions for degrees to be awarded in December.</p>

Friday, October 25

Midterm.

Final day to add a fall-term course.

Final day to withdraw from a fall-term course without a fee and without the course appearing on the transcript. *A fee of \$25 per course is assessed and a “W” is recorded on the transcript for courses dropped after this date. Please note: Courses may be dropped with the \$25 per-course fee through Friday, December 6.*

Final day to change enrollment in a fall-term course from Credit to Audit *or* from Audit to Credit without a fee. *A fee of \$25 per course is assessed for enrollment changes submitted after this date. Please note: Courses may be changed from Credit to Audit or from Audit to Credit through Friday, November 8.*

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. *The CRF is not prorated.*

Friday, November 1

Readers’ reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in December.

Friday, November 8

Departmental recommendations are due for candidates for December degrees.

Final day to change enrollment in a fall-term course from Credit to Audit *or* from Audit to Credit.

Thursday, November 21

SPEAK test for international students in Ph.D. programs.

Friday, November 22

Fall recess begins, 5.20 p.m.

Monday, December 2

Classes resume, 8.30 a.m.

Friday, December 6

Classes end, 5.20 p.m.

Final day to withdraw from a fall-term course.

Saturday, December 21

Fall term ends; winter recess begins.

spring term 2003

- Monday, January 13** Registration and spring ID validation begin.
Spring-term classes begin, 8.30 a.m.
- Wednesday, January 15** Final grades for fall-term courses due.
- Friday, January 17** Friday classes do not meet. Monday classes meet instead.
- Monday, January 20** Martin Luther King Day. Administrative offices closed. Classes do not meet.
- Thursday, January 23** Registration and spring ID validation end. Spring-term course enrollment forms are due. *A fee of \$25 is assessed for forms submitted after this date.*
Final day to apply for a spring-term *personal leave of absence*.
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.
- Friday, February 7** 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. *The CRF is not prorated.*
- Friday, March 7** Midterm.
Spring recess begins, 5.20 p.m.
Final day to add a spring-term course.
Final day to withdraw from a spring-term course without a fee and without the course appearing on the transcript. *A fee of \$25 per course is assessed and a "W" is recorded on the transcript for courses dropped after this date. Please note: Courses may be dropped with the \$25 per-course fee through Friday, April 25.*
Final day to change enrollment in a spring-term course from Credit to Audit or from Audit to Credit without a fee. *A fee of \$25 per course is assessed for enrollment changes submitted after this date. Please note: Courses may be changed from Credit to Audit or from Audit to Credit through Monday, March 31.*

- 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. *The CRF is not prorated.*
- Monday, March 17** Due date for dissertations to be considered by the Degree Committees for award of the Ph.D. in May.
- Final day to file petitions for degrees to be awarded in May.
- Monday, March 24** Classes resume, 8.30 a.m.
- Monday, March 31** Final day to change enrollment in a spring-term course from Credit to Audit *or* from Audit to Credit.
- Thursday, April 17** Readers' reports are due for dissertations to be considered by the Degree Committees for award of the Ph.D. in May.
- Friday, April 18** Good Friday; *classes meet.*
- Thursday, April 24** Departmental recommendations are due for candidates for May degrees.
- SPEAK test for international students in Ph.D. programs.
- Monday, April 28** Final day to withdraw from a spring-term course. Monday classes do not meet. Friday classes meet instead. Classes end, 5.20 p.m.
- Tuesday, May 13** Spring term ends.
- Friday, May 16** Final grades for spring-term courses are due for candidates for M.A. and M.S. degrees to be awarded at Commencement (master's programs).
- Sunday, May 25** Graduate School Convocation.
- Monday, May 26** University Commencement.
- Monday, June 2** Final grades for spring-term courses and full-year courses are due.

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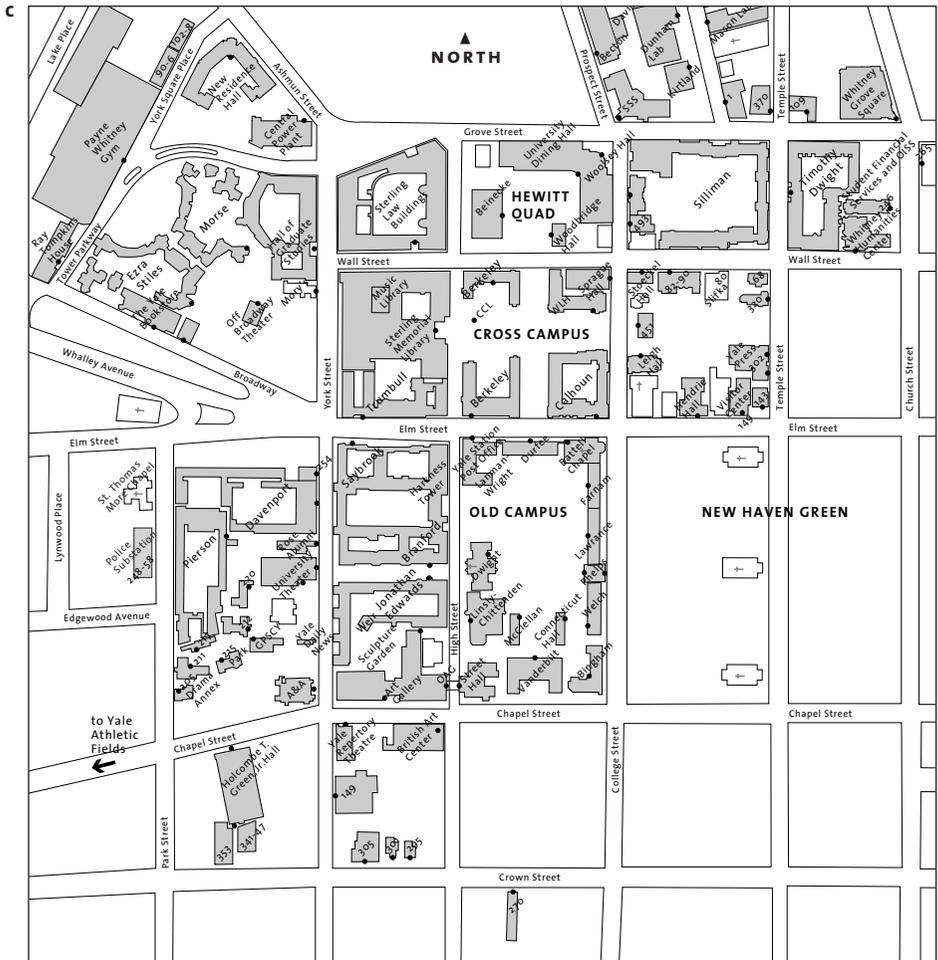
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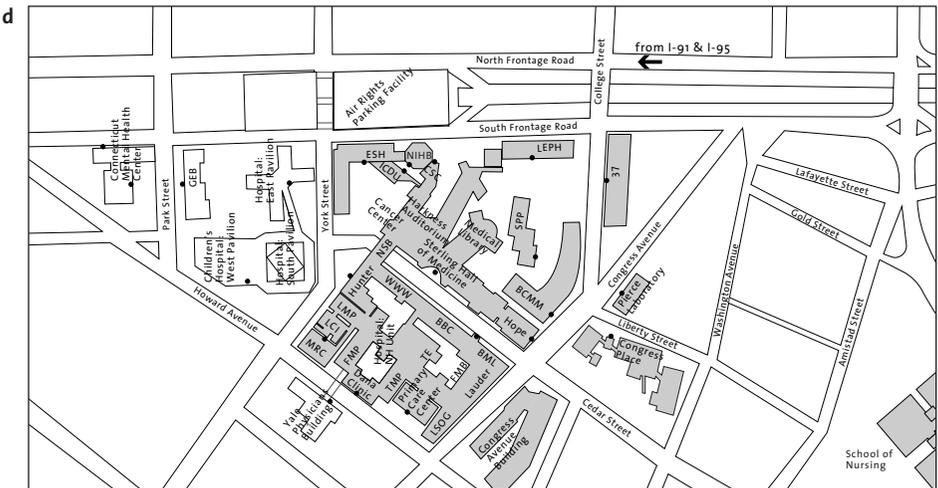
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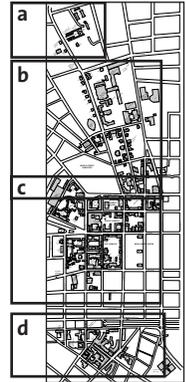
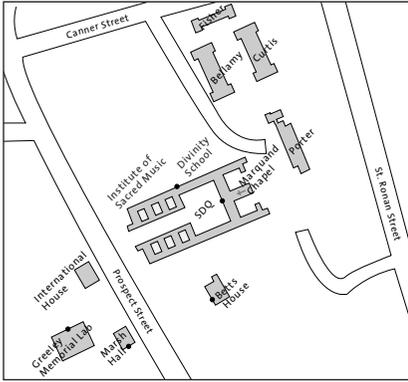


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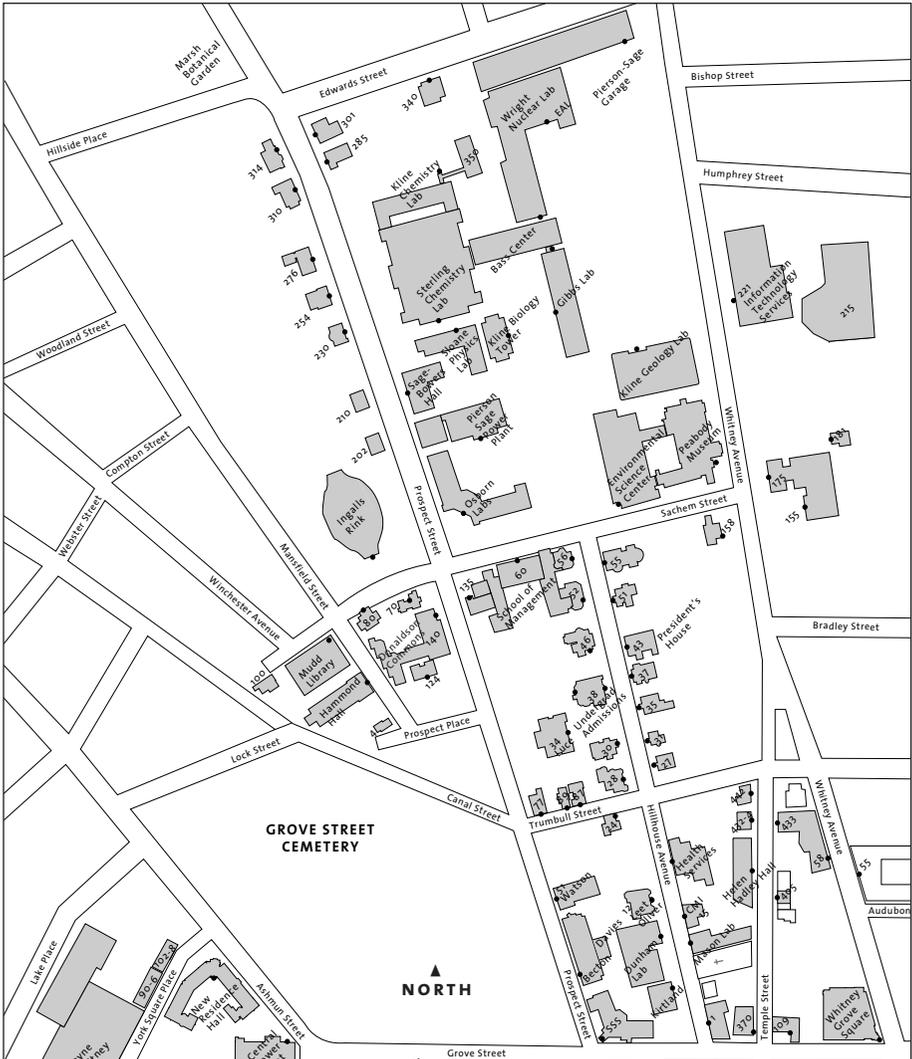
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The University is committed to basing judgments concerning the admission, education, and employment of individuals upon their qualifications and abilities and affirmatively seeks to attract to its faculty, staff, and student body qualified persons 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.

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Inquiries concerning these policies may be referred to Frances A. Holloway, Director of the Office for Equal Opportunity Programs, 104 W. 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. 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 111 from any University telephone

health emergency: 432.0123

graduate housing office: 432.2167

420 Temple Street (Information about all housing for graduate students)

graduate-professional student center: 432.2638

204 York Street (GYPSY bar; social activities)

graduate-professional student senate: 432.2632

204 York Street (Forum for discussion and representation of graduate and professional student concerns.)

graduate student assembly: 432.8893; www.yale.edu/assembly

graduate student dossier service: 432.8850

320 York Street (Maintains dossier files.)

international center: 432.6460

442 Temple Street (An educational and social center serving all international students, faculty, and staff.)

office of international students and scholars: 432.2305

246 Church Street (Assists all international students and scholars with immigration matters.)

office of student financial services: 432.2700

246 Church Street (Processes bills for tuition and other fees, disburses loans administered by the Graduate School.)

payroll department: 432.5408

155 Whitney Avenue (Disburses fellowship, traineeship, and assistantship stipends.)

student employment office: 432.0167

246 Church Street (Assists students in obtaining part-time employment both inside and outside the University.)

student loan office: 432.2727

246 Church Street (Processes federal loans authorized by the Graduate School Financial Aid Office. Handles questions about repayment of student loans.)

university health service: 432.0246 [urgent visit: 432.0123]

17 Hillhouse Avenue (Concerned with all health problems of member students and dependents.

24-hour coverage for emergency problems is available throughout the calendar year.)

university police: 432.4400

Phelps Gateway, Old Campus (Any student arrested by the New Haven Police Department for other than minor traffic violation should immediately contact the Chief of the University Police Dept. at 432.4407.)

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