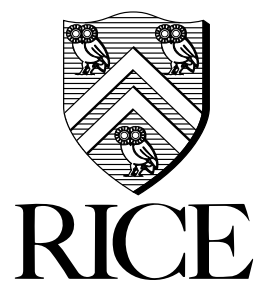


Rice University
General Announcements
2002–2003



NOTE: This catalog represents the most accurate information available at the time of publication. The university reserves the right to correct or otherwise change any such information without notice at its sole discretion. With respect to course offerings, the departments have attempted to anticipate which courses will be offered, and by whom and when such courses will be taught. However, course offerings may be affected by changes in faculty, student demand, and funding. Although efforts have been made to indicate these uncertainties, course offerings are subject to change without notice.

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Please address all correspondence to the appropriate office or department followed by the university mailing address given above.

Admission, Catalogs, Applications	Office of Admission 109 Lovett Hall; 713-348-4036
Business Matters	Office of the Cashier 110 Allen Center; 713-348-4946
Career Services, Part-time Employment off Campus	Career Services Center Rice Memorial Center; 713-348-4055
Credits, Transcripts	Office of the Registrar 116 Allen Center; 713-348-4999
Financial Aid, Scholarships, Part-time Employment on Campus	Student Financial Services 116 Allen Center; 713-348-4958
Graduate Study	Chair of the Appropriate Department (see pages 82–85)
Undergraduate and Graduate Students, Undergraduate Curricula	Office of the Vice President for Student Affairs 101 Lovett Hall; 713-348-4996

Rice University is committed to equal opportunity in education and employment. It is the policy of Rice University to attract qualified individuals of diverse backgrounds to its faculty, staff, and student body. Accordingly, Rice University does not discriminate against any individual on the basis of race, color, religion, sex, sexual orientation, national or ethnic origin, age, disability, or veteran status in its admissions, its educational programs, or employment of faculty or staff. In employment, the university seeks to recruit, hire, and advance women, members of minority groups, individuals with disabilities, Vietnam-era veterans, and special disabled veterans.

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Message from the President

The *General Announcements* of Rice University is an indispensable resource in the academic life of Rice University. It presents the people, the programs, and the practices that make this university a singular center of higher education. The *General Announcements* serves as a reminder of the high standards to which Rice has always aspired. These standards are as vital and robust as they were when the first students matriculated in 1912.

We welcome your interest in Rice and your attention to the *General Announcements*. I encourage you to familiarize yourself with the information presented here: the distinctive academic backgrounds of our faculty; the rules and responsibilities of student life, both undergraduate and graduate; the diverse scope of our degree programs; and the richness of our curriculum.

Malcolm Gillis
President
William Marsh Rice University

Academic Calendar 2002–2003

Fall 2002

- Sunday–Friday,
August 18–23 Orientation week for new students
- Monday, August 26 FIRST DAY OF CLASSES
- Monday–Friday,
August 26–August 30 Registration continues for undergraduate and graduate students
- Monday, September 2 Labor Day (holiday)
- Friday, September 6 **Deadline:** adding courses without a fee
- Friday, September 20 **Deadline:** late registration or adding courses
Deadline: dropping courses without a fee
- Friday, September 27 **Deadline:** changing Spring 2002 “Pass/Fail” to a grade
Deadline: instructors submitting final grades to clear “Incompletes” from Spring 2002 semester
- Friday, October 11 **Deadline:** mid-semester grades for first-year undergraduate students due
Deadline: college course plans due to Vice President for Student Affairs
- Monday–Tuesday,
October 14–15 Midterm recess
- Wednesday, October 16 All classes normally held on Monday meet; all Wednesday classes canceled (to equalize holidays by days of the week during the semester)
- Friday, November 1 **Deadline:** last day to drop courses—graduate students and returning undergraduate students
Deadline: changing course status to “Pass/Fail” option
Deadline: filing of
- thesis master’s candidacy petitions
 - certification of nonthesis master’s
 - form for automatic master’s in the Office of Graduate Studies for mid-year conferral of degree
- Deadline:** filing Ph.D. candidacy petitions in Office of Graduate Studies for mid-year conferral of degree
- Monday, November 4 **Deadline:** filing application for mid-year degree conferral

- Monday–Friday
November 11–15 Preregistration begins for currently enrolled undergraduate, graduate, and fifth year students for the Spring 2003 semester
Deadline: applying for Spring 2003 conferral of degree
- Monday–Wednesday,
November 18–20 Self-scheduling of final exams in undergraduate courses
Noon Deadline: Wednesday, November 20
- Thursday–Friday,
November 28–29 Thanksgiving recess
- Friday, December 6 LAST DAY OF CLASSES
Deadline: last day to drop courses (first semester undergraduate students only)
Noon Deadline: submitting theses in the Office of Graduate Studies for mid-year conferral of degree
- Saturday–Tuesday,
December 7–10 Self-scheduled final examinations ONLY
- Wednesday–Wednesday
December 11–18 Self-scheduled final examinations continues
- Wednesday, December 18 **5:00 P.M. Deadline:** return of take home final examinations
- Thursday, January 2 **5:00 P.M. Deadline:** all final grades due in the Office of the Registrar

Spring 2003

- Monday, January 13 FIRST DAY OF CLASSES
- Monday, January 20 Martin Luther King, Jr. Day (holiday)
- Monday–Friday,
January 13–17 Registration continues for undergraduate and graduate students
- Friday, January 17 **Deadline:** resolving grades of “Other” from Fall 2002 semester
- Friday, January 24 **Deadline:** adding courses without a fee
- Friday, January 31 **Deadline:** filings of
- thesis master’s candidacy petitions
 - certification of nonthesis master’s
 - form for automatic master’s in the Office of Graduate Studies for May 2003 conferral of degree
- Deadline:** filing Ph.D. candidacy petitions in the Office of Graduate Studies for May 2002 conferral of degree

Friday, February 7	Deadline: late registration or adding courses Deadline: dropping courses without a fee
Friday, February 14	Deadline: changing Fall 2002 “Pass/Fail” to a grade Deadline: instructors submitting final grades to clear “Incompletes” from Fall 2002 semester
Friday, February 28	Deadline: mid-semester grades for first-year undergraduate students due Deadline: college course plans due to Vice President for Student Affairs
Monday–Friday, March 10–14	Midterm recess
Friday, March 21	Deadline: sophomores filing majors with the Office of the Registrar
Monday, March 31	Deadline: last day to drop courses—graduate students and returning undergraduate students Deadline: changing course status to “Pass/Fail” option
Monday–Friday, March 31–April 4	Preregistration begins for currently enrolled undergraduate, graduate, and fifth-year students for the Fall 2003 semester
Monday–Wednesday, April 14–16	Self-scheduling of Final Examinations in undergraduate courses
Friday, April 25	LAST DAY OF CLASSES Deadline: last day to drop courses (for January 2003 undergraduate student admits only) Noon Deadline: submitting theses in the Office of Graduate Studies for May 2003 conferral of degree
Saturday–Thursday, April 26–May 1 at Noon	Final examinations for all degree candidates
Wednesday–Wednesday April 30–May 7	Final examinations for nongraduating students
Saturday, May 3	9:00 A.M. Deadline: grades for all degree candidates due in the Office of the Registrar
Saturday, May 10	NINETIETH COMMENCEMENT
Wednesday, May 14	9:00 A.M. Deadline: all remaining grades for nongraduating students due in the Office of the Registrar
Friday, June 6	Deadline: resolving grades of “Other” from Spring 2003 semester

Summer 2003:

Early Session (May 12–30)

Wednesday, April 16	Deadline for early application discount (by 2:30 P.M.)
Friday, May 2	Deadline for application to Early Session courses (by 2:30 P.M.)
Tuesday, May 6	Notification sent to applicants who submitted applications by May 2
Monday, May 12	FIRST DAY OF CLASSES Deadline for final tuition payment and registration (9:00 A.M.–2:00 P.M.)
Thursday, May 15	Deadline for adding courses (by 3:00 P.M.) Deadline for late registration (by 3:00 P.M.)
Monday, May 19	Deadline for visiting and Class III students to submit official transcripts (must be received by this date)
Wednesday, May 21	Deadline for submitting refund requests (Must be received by this date. Please refer to section on Withdrawal Penalty and Tuition Refund.)
Friday, May 23	Deadline for dropping courses without academic penalty (no refunds) (by 3:00 P.M.) Deadline for designating pass/fail option (by 3:00 P.M.)
Monday, May 26	University holiday
Friday, May 30	LAST DAY OF CLASSES
Friday, June 6	Deadline for completion of all Early Session course work, including final examinations. Exam schedule determined by instructor.
Friday, June 13	Deadline for submitting grades to the School of Continuing Studies Summer School Office (by 3:00 P.M.)

General Session (June 2–July 25)

Wednesday, April 16	Deadline for early application discount (by 2:30 P.M.)
Friday, May 16	Deadline for application to General Session courses (by 2:30 P.M.)
Thursday, May 22	Notification sent to applicants who submitted applications by May 16
Monday, May 26	University holiday
Friday, May 30	Deadline for final tuition payment and registration (9:00 A.M.–2:00 P.M.)
Monday, June 2	FIRST DAY OF CLASSES
Friday, June 13	Deadline for adding courses or late registration (by 3:00 P.M.)
Monday, June 16	Deadline for visiting and Class III students to submit official transcripts (must be received by this date)

Monday, June 23 **Deadline** for submitting refund requests (Please refer to section on Withdrawal Penalty and Tuition Refund)

Friday, July 4 No classes

Wednesday, July 9 **Deadline** for dropping courses without academic penalty (no refunds) (by 3:00 P.M.)
Deadline for designating pass/fail option (by 3:00 P.M.)

Friday, July 25 LAST DAY OF CLASSES

Tuesday, July 29 **Deadline** for completion of all General Session course work, including final examinations

Friday, August 1 **Deadline** for submitting grades to School of Continuing Studies Summer School Office (by 3:00 P.M.)

Friday, August 8 Final grades mailed from the Office of the Registrar

The University and Campus

Rice is a private, independent university dedicated to the “advancement of letters, science, and art.” Occupying a distinctive, tree-shaded, nearly 300-acre campus only a few miles from downtown Houston, Rice attracts a diverse group of highly talented students with a range of academic studies that includes humanities, social sciences, natural sciences, engineering, architecture, music, and business management (graduate study only). The school offers students the advantage of forging close relationships with members of the faculty and the option of tailoring graduate and undergraduate studies to their specific interests. Students each year are drawn to this coed, nonsectarian university by the creative approaches it historically has taken to higher education.

One of the unique features of Rice is its residential colleges. Before matriculating, each of the university’s 2,700 undergraduates becomes a member of one of nine residential colleges, which have their own dining halls, public rooms, and dorms on campus; most of the first-year students and close to 80 percent of all undergraduates reside at their associated colleges. Because each student is randomly assigned to one of the colleges and maintains membership in the same college throughout the undergraduate years, the colleges are enriched by the diversity of their students’ backgrounds, academic interests and experiences, talents, and goals. A faculty master, who is assigned to each college and lives in an adjacent house, helps cultivate a variety of cultural and intellectual interests among the students, as well as supporting an effective system of self-government. Other faculty or members of the community serve as associates to individual colleges. The experience of college residence is indispensable to conveying the rich flavor of academic life at Rice, allowing students to combine their usual studies with an array of social events, intramural sports, student plays, lecture series, innovative college-designed courses, and an active role in student government.

Graduate students come to Rice for the chance to work closely with eminent professors and researchers who are seeking to extend the horizons of current knowledge. Although most of the approximately 1,600 graduate students live off campus, taking advantage of the city’s readily available and affordable housing, space is also available in the university-owned Graduate Apartments. Graduate students have a voice within the university community through the Graduate Student Association, which organizes and funds regular social events.

Rice offers students the pleasures and challenges of academic life within the peaceful enclosure of a campus widely acclaimed for its beauty. Campus buildings, including an extensive computer center and the 2 million-volume Fondren Library, form graceful groupings under spreading live oaks. Recent additions include the architecturally stunning Anne and Charles Duncan Hall, a state-of-the-art building for computational engineering; James A. Baker III Hall, which houses the Institute for Public Policy and the School of Social Sciences; and E. Dell Butcher Hall, home to the Center for Nanoscale Science and Technology. Additionally, Rice boasts the largest open-air stadium in the city.

Rice students also enjoy all the commercial and cultural advantages of a major metropolitan center. The school maintains extensive technological links to the area’s many colleges and universities, the acclaimed Texas Medical Center, and other resources. And both students and faculty enjoy Houston’s panoply of cultural offerings, from opera to blues clubs and from a renowned collection of post-impressionist art to alternative art spaces. Rice and Houston together provide an ideal learning and living environment.

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Student Responsibility

The university expects all Rice students to exercise personal responsibility over their actions. Their behavior should reflect a respect for the law and for their contractual obligations, a consideration for the rights of others, and shared standards of considerate and ethical behavior.

Rice encourages self-discipline, recognizing that effective student government, including judicial processes, and the integrity of the honor system depend on the willingness of all students to meet community standards of conduct.

The university, however, reserves the right to insist on the withdrawal of any student whose conduct it judges to be clearly detrimental to the best interests of either the student or the university. The appropriate authorities take such action only after careful consideration.

No individual or group may use the name of the university or one of its colleges without prior approval of the university or the college.

The Honor System

The honor system, one of the oldest and proudest traditions at Rice, is administered by the Honor Council, whose student members are elected each year by the student body. Adopted by a student vote in 1916, the honor system has remained essentially the same since that time but for changes in the procedures and membership of the Honor Council.

Students take all written examinations and complete any specifically designated assignments under the honor system. By committing themselves to the honor system, all students accept responsibility for assuring the integrity of the examinations and assignments conducted under it. The Honor Council is responsible for investigating reported violations and for conducting a hearing when the facts warrant. The assistant dean of student judicial programs, who reviews the results of the investigations and hearing, considers the council's recommendations when issuing penalties.

The Honor Council conducts an ongoing program to acquaint new students and faculty with the honor system.

Faculty Grading Guidelines

The Committee on Examinations and Standing has drawn up the following guidelines on grading. Additional information is available on pages 34–36.

- The evaluation of the student's performance in a course and a decision on the appropriate grade is the responsibility of the designated instructor or instructors in the course.
- No student should be given an extension of time or opportunities to improve a grade that are not available to all members of the class, except for verified illness or justified absence from campus. Students who have three scheduled final examinations in two consecutive calendar days may, however, take one of the examinations at another time. Except for scheduled exams, no course assignments may be due between the last day of classes and the last day of the final examination period.
- Students in independent study courses are not to be allowed an extension beyond the time when grades are due. Faculty are to submit grades at the end of the semester for such students based on work completed during the semester. The instructor directing the independent study assumes responsibility with the student for ensuring that the work undertaken is appropriate to the span of a

- semester and for determining the degree credit to be received.
- The basis for grading and the expectations on all written assignments or tests should be clearly explained to the class in advance, preferably in writing at the beginning of the semester. The instructor should explain clearly which assignments or homework are covered by the honor system and which are not. To prevent allegations of plagiarism on written assignments, students should be warned that all direct and indirect quotations from other sources should be properly acknowledged. The instructor should explain the extent to which the student's paper is expected to be independent of the references and clearly distinguishable from them.
- Instructors should be willing to give any student an explanation of his or her grade as consistent with the grading for the rest of the class. For this reason, the committee urges the faculty to preserve all examinations and written material not returned to students, as well as grade records, for at least the following semester so that students may, if they wish, review with their instructor the basis for the grade received.
- Instructors may not change a semester grade after the grade sheet has been submitted to the registrar, except when there is a clerical error in calculating the grade. This is a long-standing university rule of which the faculty are reminded by the registrar at the end of each semester. It is designed in part to protect the faculty from student pressure for grade changes. All other grade changes, including retroactive change to *withdrawal* or *incomplete*, must be approved by the Committee on Examinations and Standing on the basis of a written petition from the student and on information from the instructor.
- There is no university requirement that a final examination be given in a course. It is university policy that final examinations that cover more than the material since the last examination, that are the only exam in the course, or that are comprehensive of the entire course may be given only during the final examination period. Such examinations may not, for example, be labeled "tests" and administered during the last week of classes. Final examinations are normally of 3-hour duration. Faculty who, under exceptional circumstances, wish to give longer examinations may do so only if the exam is scheduled as take-home. Under no circumstances may final exams exceed five hours. The "due date" for all take-home final exams is the end of the examination period.
- First-year students receive mid-semester grades around the eighth week of the fall and spring semesters so that they can, if advisable, enroll in tutoring or drop a class for which they may not be prepared. Faculty who teach first-year students in any of their classes will be asked to submit grades of standing for these students during the seventh week of the semester and should schedule the grading of tests, quizzes, or homework assignments accordingly. These grades are not recorded on the student's transcript nor calculated in the grade point average, but they are important indicators for students and their faculty advisers.
- Departments using teaching associates, adjunct professors, or visiting faculty of any kind should make sure these teachers are familiar with Rice grading procedures. A regular faculty member who is well-versed in the grading guidelines should be assigned to assist such instructors.

The chair of the Committee on Examinations and Standing or the vice president for student affairs will be glad to advise any faculty member faced with exceptional circumstances that may justify special consideration. Students may petition the committee concerning the application of these guidelines. Suspected or possible violations of the honor system should be submitted to the Honor Council.

Fondren Library

Fondren Library provides a wealth of resources for study and research. Its permanent collection numbers 2.1 million volumes, more than 2.7 million microforms, 28,000 current periodical and serial titles, and 51,000 titles on audiotape, videotape, and compact disc. The library is well-equipped to meet the needs of students and faculty.

Students exploring the library's extensive holdings can take advantage of its networking systems. With Macintosh, PC, and UNIX workstations scattered throughout the first floor of the library, students looking for information have their choice of print or electronic media. Wireless networking is available on the first floor.

If they want to postpone a trek to the library, students may use the campuswide information system, RiceInfo, to access the library's online catalog. RiceInfo also links students to a wide variety of indexes and a growing collection of full-text reference sources, as well as primary literature.

The library staff is committed to the use of evolving information technologies, whether in helping to develop collections of applications, resources, and tools tailored to a particular subject or need or in facilitating user access to networked information sources. The library's electronic resources also include multimedia packages and large data sets, and students will find many specialized research tools available, such as computer programs for text analysis and geographic information systems software.

Fondren Library provides a home for a number of separate collections. It is a federal depository for U.S. government publications, patents, and trademarks. The Woodson Research Center holds the library's rare books, manuscripts, and university archives. The library also houses the Alice Pratt Brown Fine Arts Library. The Business Information Center is in the Jesse H. Jones Graduate School of Management.

The library has an open-shelf policy that encourages creative browsing. Students may use a host of special facilities, including individual study carrels, group-study rooms, audiovisual equipment, electronic workstations, and microform reading carrels. Photocopiers are available in the library.

Fondren Library operates on the philosophy that a library is more than a collection of books. It is, instead, an essential campus resource with a knowledgeable staff and up-to-date technologies—an inviting place that introduces students and faculty to a range of rich possibilities as they pursue their independent inquiries.

Computing and Networking Resources

Overview

The four departments of the Information Technology (IT) division provide centralized services and resources to the entire Rice campus, including:

- computing support staff
- educational labs
- multimedia classrooms
- campus network
- Internet connectivity
- campus telephone service

The resources of particular interest to students include:

- computer accounts for course work, e-mail, and Internet access
- computing help from residential college consultants and a centralized help center
- campus Unix, Macintosh, and PC labs

- network connection ports in each residential college room
- wireless network access in the library and other campus commons areas
- dialup accounts for off-campus network access
- free, one-to-three-hour training classes on computing topics

Educational Computing: OwlNet

"OwlNet" is the name of the computing resources and network designated for educational use by students and faculty. The OwlNet system is comprised of three computing platforms: Unix workstations, and Macintosh and PC-compatible microcomputers. Using OwlNet, students can fulfill coursework requirements, store their academic data, print, browse the web, create their own web pages, and use electronic mail to communicate with professors, classmates, friends, and family. All undergraduates and graduate students are eligible for an OwlNet account. (When students arrive on campus, they can apply online at: <http://apply.rice.edu>.)

Campus Labs

OwlNet computing labs are located across the campus, including one in each residential college. Most OwlNet labs are available 24 hours a day with a Rice ID card and proper authorization. Some labs are limited to hours of operations for the building. Note that some computer labs are used as classrooms during certain posted hours. Lists of available hardware and software are available on the web (<http://www.rice.edu/Computer/labs.html>). Some of the larger labs are:

Fondren Library (1st and 2nd floor)
 Mudd Lab (1st floor)
 Anderson 218
 Ryon Lab 102

Student-Owned Computers

Each residential college dorm room has one active network port for every occupant, providing a direct connection to the campus network and the Internet. Students can seek help from the College Computing Associates (see Help below) to install and configure the necessary network software required to connect their computer to the campus network.

Students living off campus can connect to the Rice network via the Rice dialup service. Instructions on dialup access are available from the Consulting Center in 103 Mudd Lab or online (<http://www.rice.edu/Computer/Documents/>). From an on-campus workstation, students can apply for a dialup account via the web (<http://apply.rice.edu>).

Students who have their own home Internet access service, such as an Internet Service Provider, ADSL, or cable modem service can apply to use Rice's VPN or Virtual Private Network. VPN allows the secure transporting of data between Rice University and a remote user connected to the Internet outside of Rice. For more information, look online (<http://www.rice.edu/Computer/Dialup/vpn>).

Help

For undergraduates, each college has two resident student College Computing Associates (CCAs) to help with questions about using personal computers and Rice

computing facilities. (To learn who your CCAs are, go to: <http://www.rice.edu/Computer/student.html>). In addition, computer consultants are available at the Consulting Center, located in 103 Mudd Lab. Students may call the Consulting Center during normal business hours at 713-348-4983, or submit questions any time via e-mail to problem@rice.edu or via the web (<http://problem.rice.edu>). Consultants are also available at the reference desk in Fondren Library during posted hours.

For graduate students, computing assistance is provided by divisional computing teams, who also provide assistance to the faculty and staff within each academic division. For divisional team members' contact information, look online (<http://www.rice.edu/Computer/facultystaff.html>).

Publications about computing services and how to use supported systems and software are available in 103 Mudd Lab or on the web (<http://www.rice.edu/Computer/Documents>). Students can learn more about computing by taking a variety of Short Courses covering many of the programs and operating systems used at Rice (http://www.rice.edu/Computer/Short_Courses). Short Courses are one-to-three-hours long and are free to students.

Policies

Students using Rice computing facilities and services are required to observe Rice and OwlNet policies and procedures, as well as state and federal laws governing computer use. View these policies online (<http://www.owl.net.rice.edu/policy/index.shtml>).

For Further Information

Students can find more information about computing resources on the Information Technology computing web pages (<http://www.rice.edu/Computer>). Students who need help or wish to ask a question can contact the Consulting Center (103 Mudd Lab, 713-348-4983, problem@rice.edu). Consulting staff can help students get started and guide them to additional resources.

Student Health and Counseling Services

Student Health Fee

By paying an annual student health service fee, all students gain access to both the Student Health Service and the Rice Counseling Center. Detailed information on the care and services each provide is available from both clinics.

Student Health Service

This outpatient primary-care clinic in the north wing of Hanszen College is staffed by two physicians and two nurses. Clinic hours are from 8:30 A.M. to 5:00 P.M., Monday through Friday, during fall and spring semesters. For after-hours and weekend medical care, students may choose among a number of local hospitals. Students must pay for all medical care outside the clinic's purview, including blood tests, x-rays, and outside physician consultations. Should such medical care be necessary, students are urged to review their insurance coverage and pick the best available option.

In serious emergencies, students should call the Student Health Service (713-348-4966 during work hours) or the Rice University Police Department (713-348-6000).

The clinic is open full time from the first day of Orientation Week until the day before commencement. It is closed during the Christmas break and the Thanksgiving and Easter weekends, but it remains open in the mornings during midterm breaks. The clinic is also open for reduced hours during the summer months.

The Student Health Service provides the following:

- Primary care for illness and injury with referrals to specialists when needed
- Maintenance of health records for all students
- Immunizations
- Contraceptive counseling and routine Pap smears
- Allergy shots (students must provide serum after a specialist allergy workup)
- Physical examinations (e.g., for employment, transfer to another school, or scholarship expeditions)

Confidentiality. The Student Health Service physician-patient relationship is a confidential one, and medical records will not be released except as required by law, or when the patient poses a significant risk to herself or himself or another person.

Health Insurance. All Rice students must have health insurance, and MUST enter details of their health insurance online at <http://dacnet.rice.edu/services/health> by August 15 to avoid automatic billing. Students may purchase insurance through the university, as described in a brochure sent to incoming and returning students each summer; dependent coverage is also available. For additional brochures and applications, students should contact the Cashier's Office, Student Health Services, or the Rice Counseling Center. Rice's group coverage for the 2002-2003 school year is effective from 12:01 A.M., August 15, 2002, until 12:01 A.M., August 15, 2003.

Rice Counseling Center

Rice Counseling Center, in 301A Lovett Hall, addresses students' psychological needs with various programs and services. The center is open year-round except for scheduled holidays and occasional all-day staff retreats. Office hours for counseling and consultations are 8:30 A.M. to noon and 1:00 P.M. to 5:00 P.M., Monday through Friday. Students can make appointments by calling 713-348-4867 or by visiting the center.

Typically, most students who use the counseling services bring with them very common concerns: roommate problems, breakup of a relationship, academic and/or interpersonal anxiety, family problems, difficulties adjusting to Rice, or confusion about personal goals, values, and identity. Counselors are equipped to handle a variety of issues, including substance abuse, eating disorders, sexual assault/abuse/date violence, depression, and the coming-out process. Rice Counseling Center offers both individual and group counseling as well as educational workshops and programs.

When students need prolonged or specialized counseling or treatment, counselors refer them to an outside provider. The students, or their health insurance, must pick up those costs. All students who have paid the Health Service Fee are eligible for initial assessment sessions, consultations, crisis intervention, and educational programming. Individual or group counseling may also be available, if appropriate.

The Rice Counseling Center provides the following services:

- Initial assessment
- Short-term individual and couples counseling
- Group therapy and support groups
- Medication consultations with the center's consulting psychiatrist
- Other consultations (e.g., how to make a referral or how to respond to a friend in distress)
- Educational programming (e.g., various presentations on mental health issues)

- Crisis intervention on a walk-in emergency basis during regular office hours; students may call 713-348-4867 for assistance with emergencies after hours or on weekends

College Assistance Peer Program (CAPP). In this peer educator program, students who have been carefully selected and trained in listening skills and mental-health education serve as supportive listeners and referral sources for other students. They also assist the center with its educational programming.

Students with Disabilities. Because students who have physical limitations may find it difficult to reach the Rice Counseling Center's third-floor location in Lovett Hall, staff will arrange to see those students in a more accessible location on campus. Students should call the center to make these arrangements.

Confidentiality. Counseling services are confidential: information about a student is not released without that student's written permission. By state law, confidentiality does not extend to circumstances where (1) there is risk of imminent harm to the student or others; (2) the counselor has reason to believe that a child or an elderly or handicapped person is, or is in danger of, being abused or neglected; (3) a court order is issued to release information; (4) the student is involved in a criminal lawsuit; or (5) the counselor suspects that the student has been the victim of sexual exploitation by a former health provider during the course of treatment with that provider.

Student Resource Centers

Rice Memorial Center/Ley Student Center

The Rice Memorial Center/Ley Student Center provides a base for a range of student-centered activities. It is also an informal place where students, faculty, and staff can congregate. Individuals meet over casual meals at Sammy's Cafeteria and drinks at the Coffeehouse and Willy's Pub, which also offers pizzas, sandwiches, and Smoothees as lunch and dinner options. Others browse through the Rice Campus Store. Located within the group of buildings, students find an array of offices, programs, and resource centers, including the Career Services Center, the Community Involvement Center, the Office of Academic Advising, the Rice Program Council, and the assorted student, international student, and graduate student associations. The campus radio station KTRU has offices there, in addition to the *Thresher* (the campus newspaper) and the *Campanile* (the yearbook). The Rice Memorial Chapel anchors one end of the two-center complex, which also houses the Association of Rice Alumni. On any given evening, the larger rooms may be busy with meetings or catered dinners, and members of the Rice community regularly tap the facilities for special events, from parties and concerts to weddings.

Career Services Center

The Career Services Center is open to everyone in the university community. Undergraduates unable to decide on a major, career, or graduate program, or those who lack direction in the path they have chosen, may benefit from career counseling; testing is also available for those interested in a more analytical approach. Peer counselors assist both undergraduate and graduate students with résumé or vita writing, interviewing, and job search strategies.

The center sponsors workshops, career panels, and various career fairs each year.

Students will find details on individual events publicized throughout the campus and in *Career News*, a center newsletter. The Career Library also has a substantial collection of resources, including literature on a broad range of occupations, material on locating and securing employment, and information on summer jobs, individual companies, and graduate schools.

Representatives from business, industry, and other institutions visit the center each year, seeking both summer workers and full-time employees. Any interested student may schedule interviews with these representatives. Students looking for full-time, part-time, or summer jobs should also check out the listings in the Career Library.

Undergraduate liberal arts majors seeking to parlay their B.A. degrees into a business career may want to consider the Rice Joint Venture Program, which is sponsored by the Career Services Center. Students accepted into the program undertake internships with Houston-area businesses during one semester.

Office of Multicultural Affairs

Located in the cloisters of the Rice Memorial Center, the Office of Multicultural Affairs responds to the academic and social needs of ethnic minority students at Rice. Primarily providing counseling and support, the office maintains its own library of information on graduate schools, jobs, fellowships, internships, and other opportunities available to minority students once they leave Rice. The office encourages cross-cultural programming on campus and attempts to promote a general awareness of issues related to cultural diversity. The Office of Multicultural Affairs is central to the university's continuing efforts to recruit and retain more minority students.

Health Education Office

Also lodged in the cloisters of the Rice Memorial Center, the Health Education Office runs programs on such issues as sexual health awareness, substance abuse prevention, nutrition and diet, and acquaintance rape. The office provides students with private consultations and a resource room containing health-related literature, including brochures, journals, and posters. Student volunteers with the Health Education Office participate in groups such as Students Organized Against Rape (SOAR) and serve as health representatives for their colleges.

Disability Support Services

Located in the Ley Student Center, Disability Support Services coordinates campus services for individuals with documented disabilities. For academic accommodations, adaptive equipment, or disability-related housing needs, the Disability Support Services Office is the campus resource for students with disabilities. Information is maintained on scholarships, internships, and other programs specific to students with disabilities. Counseling and advocacy are available as well as consultation on the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973.

Sports

Intercollegiate Athletics

Rice is a member of the Western Athletic Conference and a Division I-A member of the National Collegiate Athletic Association. The university fields teams for men in football, basketball, baseball, tennis, golf, cross-country, and indoor and outdoor track. Women team sports include basketball, volleyball, soccer, swimming, tennis, cross-

country, and indoor and outdoor track. Home football games are played in the beautiful 70,000-seat Rice Stadium. The rest of the university's extensive athletic facilities include Autry Court and Fox Gymnasium for basketball and volleyball, Reckling Park for baseball, the Jake Hess Tennis Stadium, the Rice Track/Soccer Stadium (Wendel D. Ley Track), and the John L. Cox Fitness Center. Encouraging its student-athletes to pursue high goals, Rice prides itself on its dual goal of excellence in both academics and athletics; the rigors of one may not serve as an excuse for less than high-quality performance in the other.

Intramural Sports

The Recreation Center in Student Affairs offers a supervised program of intramural sports for all students, faculty, and staff. Anyone may participate in individual, dual, or team sports; swim meets; and track and field events. Interested students, faculty, and staff may also form teams to compete in the wide variety of tournaments available. While all students may take part in the university intramural tournaments, undergraduates may also represent their respective colleges in the college team sports tournaments that follow intramural play. In the past few years, Rice has seen more than 6,000 entries in 53 tournaments. Students are reminded, though, that they participate at their own risk.

Sports Clubs

In addition to the intramural program, the Department of Student Activities administers a sports club program. A sports club is a special-interest group organized by students who want to play, and promote interest in, a particular sport. Club organization depends on student interest. In recent years, clubs have included badminton, cricket, cycling, dance, fencing, field hockey, frisbee, lacrosse, martial arts, rowing, rugby, sailing, shooting, soccer, softball, and volleyball. Students join these groups to increase both individual and team skills through a dual program of instruction and competition. They support the clubs with individual contributions, membership dues, solicitation of university funds, and various fund-raising activities. Again, students participate in the different sports at their own risk.

Student Automobiles

All students must register their vehicles with the Traffic Division of the Rice University Police Department. Students must park in assigned areas and observe university regulations. Illegally parked or unregistered vehicles are subject to towing and/or fines by the university. Copies of *University Traffic and Parking Regulations*, a publication giving a detailed account of student privileges and responsibilities, are available from the Traffic Division or online at <http://rupd.rice.edu/parking>. Students must inform all guests of parking regulations; vehicles belonging to visitors who repeatedly violate these rules also may be towed or booted.

Introduction

The undergraduate experience at Rice is one of intense personal interactions. The close sense of community created by individual placement in residential colleges is extended to warm intellectual and personal relationships with members of the Rice faculty. “Behind the hedges,” the beautifully designed, spacious campus is small enough to encourage a sense of belonging even as students engage with the lively cultural currents of one of the country’s largest cities.

The academic philosophy at Rice is to offer students beginning their college studies both a grounding in the broad fields of general knowledge and the chance to concentrate on very specific academic and research interests. By completing the required distribution courses, all students gain an understanding of the literature, arts, and philosophy essential to any civilization, a broad historical introduction to thought about human society, and a basic familiarity with the scientific principles underlying physics, chemistry, and mathematics. Building on this firm foundation, students then concentrate on studies in their major areas of interest.

Rice University is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (SACS), the recognized regional accrediting body in the eleven U.S. Southern states.

Rice grants the two undergraduate degrees, the Bachelor of Arts (B.A.) and the Bachelor of Science (B.S.), in a range of majors. The majority of undergraduates earn the B.A. degree, though students may elect to pursue the B.S. degree, offered at Rice in some science fields and in various fields of engineering accredited by the Accreditation Board for Engineering and Technology (ABET). Undergraduates may major in any of the numerous fields provided by the various schools of architecture, humanities, music, social sciences, science, and engineering. To accommodate the full range of individual student interests, specific interdepartmental majors are also available, as are selectively approved area majors. In certain departments, students also have the option of overlapping the upper-level course work of their undergraduate degree with those basic requirements necessary to earn a higher degree in the field, considerably reducing the time required to complete their graduate studies. The Shepherd School of Music offers a joint degree in music (B.Mus./M.Mus) that may be completed with a fifth year of study.

Through Rice’s Education Certification Program, students interested in teaching in secondary schools may complete a program of teacher training, leading to certification in the state of Texas, together with the B.A. degree. Students interested in satisfying the requirements for admission to medical, dental, or law school should consult with the Office of Academic Advising for completing these programs in conjunction with the various majors.

Graduation Requirements

Degree Requirements for All Bachelor’s Degrees

Students are responsible for making certain that their plan of study meets all degree and major requirements. To graduate from Rice University, all students must:

- Be registered at Rice full time for at least four full fall and/or spring semesters
- Complete the requirements of at least one major degree program
- Complete at least 120 semester hours (some degree programs require more than 120 hours)
- Complete at least 60 semester hours at Rice University

- Complete at least 48 hours of all *degree* work in upper-level courses (at the 300 level or higher)
- Complete more than half of the upper-level courses in *degree* work at Rice
- Complete more than half of the upper-level courses in their *major* work at Rice (certain departments may specify a higher proportion)
- Complete all Rice courses satisfying *degree* requirements with a cumulative grade point average of at least 1.67 or higher
- Complete all Rice courses that satisfy (designated by the department) *major* requirements with a cumulative grade point average of at least 2.00 or higher
- Satisfy the English composition requirement (see below)
- Satisfy the Lifetime Physical Activity Program (LPAP) requirement (see below)
- Complete courses to satisfy the Distribution Requirements (see below)
- Otherwise be a student in good academic and disciplinary standing

To satisfy the English composition requirement, students must pass an English composition examination given during Orientation Week. Those receiving grades of “not satisfactory” on the exam must complete ENGL 103 *Basic Composition*, a one semester course carrying degree credit.

To satisfy the LPAP requirement, students must complete 2 courses in LPAP. Although 2 courses are required, they do not carry degree credit and do not count toward the total semester hours at graduation. Students with disabilities may make special arrangements to satisfy this requirement.

Distribution Requirements

Each student is required to complete at least 12 semester hours of designated distribution courses in each of Groups I, II, and III. The 12 hours in each group must include courses in at least two departments in that group. (Divisional or interdisciplinary designations, e.g. HUMA, NSCI, etc., count as departments for this purpose.) Interdivisional courses approved for distribution credit may count toward the 12 semester hours in any relevant group; however, students may not count any one such course toward the 12 required hours in more than one group, and may count no more than one such course toward the 12 required hours in any one group.

Students must complete the distribution requirements in each group by taking courses that are designated as a distribution course at the time of course registration, as published in that semester’s *Schedule of Courses Offered*.

The distribution system presupposes that every Rice student should receive a broad education along with training in an academic specialty. This goal is achieved by courses that are broad based, accessible to nonmajors, and representative of the knowledge, intellectual skills, and habits of thought that are most characteristic of a discipline or of inquiry across disciplines.

Group I. These courses have one or more of the following goals. They develop students’ critical and aesthetic understanding of texts and the arts; they lead students to the analytical examination of ideas and values; they introduce students to the variety of approaches and methods with which different disciplines approach intellectual problems; and they engage students with works of culture that have intellectual importance by virtue of the ideas they express, their historical influence, their mode of expression, or their critical engagement with established cultural assumptions and traditions.

Group II. Three types of courses fulfill this requirement. The first are introductory courses which address the problems, methodologies, and substance of different disciplines in the social sciences. The second are departmental courses which draw upon at least two or more disciplines in the social sciences or which cover topics of central importance to a social science discipline. The third are interdisciplinary courses taught by faculty from two or more disciplines.

Group III. These courses provide explicit exposure to the scientific method or to theorem development, develop analytical thinking skills and emphasize quantitative analysis, and expose students to subject matter in the various disciplines of science and engineering.

Special Note for Music Majors. A total of 24 semester hours of designated distribution courses are required of music majors. A minimum of 6 hours (2 courses) must come from each of Groups I, II, and III, with the remaining 6 hours chosen from designated distribution courses of the student's choice.

Bachelor of Arts

The specific requirements of individual majors leading to the Bachelor of Arts degree vary widely. No department may specify more than 80 semester hours (required courses, prerequisites, and related laboratories included) for the Bachelor of Arts. To qualify for the Bachelor of Arts:

- All students must complete at least 120 hours of course work.
- Students in the humanities and social sciences must complete between 18 and 80 hours in course work within the major (including required courses, prerequisites, and related laboratories)
- Students in the sciences and engineering must complete between 24 and 80 hours in course work within the major (including required courses, prerequisites, and related laboratories)
- Students in all fields except architecture must complete at least 60 hours in course work outside the major
- Students in architecture must complete at least 38 hours in course work outside the major

Bachelor of Science in the School of Natural Sciences

The Bachelor of Science degree is offered in astrophysics, chemistry, chemical physics, geology, and physics. The specific degree requirements vary from field to field and differ from those of the Bachelor of Arts in that there are greater technical requirements. No department may specify more than 80 semester hours (required courses, prerequisites, and related laboratories included) for the Bachelor of Science. To earn a B.S. degree in one of these fields, students must complete at least 60 hours in course work outside the major.

Bachelor of Science Degrees in Engineering: Bachelor of Science in Chemical Engineering (B.S.Ch.E.), Civil Engineering (B.S.C.E.), Computer Science (B.S.C.S.), Electrical and Computer Engineering (B.S.E.E.), Materials Science (B.S.M.S.), Mechanical Engineering (B.S.M.E.), and Bioengineering (B.S.B.)

The Bachelor of Science degree in a given engineering field is distinct from the B.A. degree in that it must meet greater technical requirements. In establishing a departmental major for the degree of Bachelor of Science in civil engineering, electrical and computer engineering, materials science, and mechanical engineering, the department may specify no more than 92 semester hours (required courses, prerequisites, and related laboratories included). In establishing the departmental major for the B.S. in chemical engineering, the department may specify no more than 100 semester hours (required courses, prerequisites, and related laboratories included). The bioengineering department specifies 94 semester hours for the B.S. degree (required courses, prerequisites, and related laboratories included). To earn a B.S. degree, students must meet the following minimum semester hour requirements in course work:

- All majors except chemical engineering and computer science—a total of at least 134 hours
- Chemical engineering majors—up to 137 hours, depending on ABET requirements
- Computer science majors—a total of at least 128 hours

Other Bachelor's Degrees

The professional Bachelor of Architecture (B.Arch.) degree requires a fifth year of study and a one-year preceptorship. The Bachelor of Music (B.Mus.) degree requires advanced courses in aural skills in addition to the core music curriculum.

Undergraduate Majors

Students must declare a major prior to preregistration for the junior year, if not sooner, according to the deadline in the Academic Calendar (see Declaring Departmental Majors on Page 30). Within some departmental majors, students have the choice of a particular area of concentration. Students also may opt for more than one major; such majors do not necessarily need to be in related fields. More detailed information on the departmental majors briefly described below may be found in the Undergraduate Degree chart (see pages 25–27) in the section “Departments and Interdisciplinary Programs” and by contacting the department chairs or faculty advisers.

Departmental Majors

School of Architecture. Students interested in architecture may choose between the four-year B.A. program or the six-year Bachelor of Architecture (B.Arch.) degree. Students completing the four-year B.A. who have been admitted to the B.Arch. program during their senior year spend a fifth year in a working preceptorship with an architectural firm, returning to Rice to complete a final year of architectural study for the degree.

George R. Brown School of Engineering. Rice offers, through eight departments, majors in bioengineering, chemical engineering, civil engineering, computational and applied mathematics, computer science, electrical and computer engineering, mechanical engineering, materials science and engineering, and statistics. Students may elect a double major by combining environmental science with another science or engineering field. These programs lead to either the B.A. or the B.S. degree and may qualify students for further graduate study.

School of Humanities. Students may declare majors in art and art history, classics, English, French studies, German and Slavic studies (includes Russian), Hispanic studies, kinesiology, history, linguistics, philosophy, and religious studies. Interdisciplinary majors are available in ancient Mediterranean civilizations, Asian studies, medieval studies, and the study of women and gender, while an interdepartmental major in policy studies combines courses from the School of Humanities and the School of Social Sciences.

Shepherd School of Music. Music students may opt for either a B.A. or a Bachelor of Music (B.Mus.) degree in performance, composition, music history, and music theory. Students who pass a special qualifying examination may elect an honors program that leads to the simultaneous awarding of the B.Mus. and Master of Music (M.Mus.) degrees after five years of study.

Wiess School of Natural Sciences. All natural sciences departments, including biochemistry and cell biology, chemistry, ecology and evolutionary biology, earth science, mathematics, and physics and astronomy offer programs leading to the B.A. degree. B.S. degrees are offered in some departments. Majors include astronomy, biochemistry, biology, biophysics, chemical physics, chemistry, geology, geophysics, mathematics, and physics. Students may also elect double majors combining one of the programs in natural sciences with another science, a humanities discipline, or an engineering field.

School of Social Sciences. Rice offers majors in anthropology, economics, mathematical economic analysis, political science, psychology, and sociology. Both the interdepartmental policy studies major and the cognitive studies major include sciences, engineering, and humanities courses, while the managerial studies major incorporates course work in the Schools of Engineering and Management.

Interdepartmental Majors

Interdepartmental majors combine courses taught by faculty from more than one department; they are listed separately in the Undergraduate Degree Chart (pages 25–27).

Other Academic Undergraduate Options

Rice/Baylor College of Medicine Medical Scholars Program

The Medical Scholars Program is for talented and motivated students who are scientifically competent, socially conscious, and capable of applying insight from the liberal arts and other disciplines to the study of modern medical science. Up to 15 graduating high school seniors are admitted to Rice and Baylor College of Medicine concurrently: The traditional four years at Rice are followed by four years at Baylor. Applications for the program are sent to those who indicate their interest on their Rice applications. However, students must have applied under the Early Decision or Interim Decision plans (see pages 45–46). Interviews are scheduled in late March, and decisions are made in April. Early Decision applicants must have Rice as their first-choice school, regardless of the Baylor decision to be made later in the spring. Applicants not admitted to the Medical Scholars Program are still eligible for admission to Rice and may still apply to Baylor upon graduation from Rice.

W. M. Keck Center for Computational Biology Research Training Program

Undergraduates may take advantage of research training opportunities in computational biology offered by this joint project of Rice, Baylor College of Medicine, and the University of Houston. Students in biophysics, cell biology, evolutionary biology, computer science, statistics, mathematics, physics, chemistry, computational and applied mathematics, and engineering may apply for a summer program that provides hands-on research under faculty mentorship in lab settings, seminars and workshops, and access to the advanced computational and analytical resources offered by the center.

Leadership Rice

Leadership Rice develops the leadership capacities of undergraduates from all disciplines. The program links theory to practice and analysis to action with experiential opportunities and classes. It encourages students to look beyond how to get a good

education and good grades and to begin to consider how they can use their great education to make a positive contribution to the world.

The program is especially recommended for second semester sophomores, who are invited to begin with UNIV 309 and then to participate in all aspects of the program, but it is open to all students—including freshmen.

The core component of Leadership Rice is the Summer Mentorship Experience. Students accepted into the program work under the tutelage of experienced mentors for eight weeks during the summer and are given a \$3,000 stipend. Mentorships are in the private, nonprofit, and public sectors in U.S. and abroad. Students also are invited to take on leadership roles in the administration of the program. Recent mentorships as well as more information on Leadership Rice are posted on the web at www.rice.edu/leadership.

Currently, Leadership Rice offers 3 courses for academic credit. UNIV 309 Creating and Managing Change: Principles of Leadership, introduces students to leadership ideas in the context of diverse disciplines. This course includes a team project along with discussion on what makes effective teams, as well as work on writing clearly and persuasively. This course is required in order to apply to Leadership Rice. UNIV 310, Creating and Managing Change, is recommended following the mentorship.

Leadership Rice sponsors the Rice-on-Board program, which places students on nonprofit community boards as participant observers for a year. It also oversees the Envision Program and the Janus Award. Envision funds, offered three times each year, provide seed money to students for first-time projects of benefit to the community, either on campus or beyond. The Janus Award offers one undergraduate the opportunity to research an environmental or science-related issue from multiple perspectives.

Leadership Rice believes that every Rice student is capable of creating positive change. The program aims to help students develop the confidence and commitment as well as the skills to achieve this end.

Students are urged to look at <http://ruf.rice.edu/~leading/>, a university website to help students learn more about the program.

Premedical, Prelaw, and Prebusiness Programs

In addition to the preprofessional and professional programs offered by Rice in architecture, business management, engineering, and music, students may pursue programs that satisfy the admission requirements for graduate schools in business, dentistry, diplomacy and foreign affairs, health science, law, and medicine. Interested students may contact various advisers with offices in the Ley Student Center, including health professions advisers for premedical or pre dental studies and other professional programs in the health sciences, a prelaw adviser for prelegal studies, and a prebusiness adviser for business, finance, and accounting.

Junior-Year Admission. Students who plan to enter medical school or any other professional or graduate school at the end of their junior year at Rice can arrange to receive a Rice four-year bachelor's degree by submitting to the Committee on Examinations and Standing a degree plan that fulfills all normal university and departmental requirements for the bachelor's degree. Students *must* submit a degree plan before they begin graduate or professional training. The Committee on Examinations and Standing then reviews the degree plan submitted by each student and gives final approval.

Students who want to take advantage of this junior-year admission may apply no more than 30 to 40 semester hours (10 courses) in transfer credit (courses must be acceptable to the student's major department and the registrar).

Premedical and Predental Programs. The entrance requirements for U.S. medical and dental schools include one year each of general chemistry, organic chemistry,

physics, mathematics, biology, and English, plus laboratories required by the science courses. Because medical and dental schools seldom favor any one area of study, students may choose their majors according to their interests and capabilities. Their degree plans should provide them with both a broad cultural background and the necessary skills for an alternative career. Science or engineering majors will automatically satisfy most of the entrance requirements for medical or dental school, but students majoring in the humanities will need to make some adjustments in their study plans. Premedical and pre-dental students should discuss their degree plans with the health professions advisers.

Prelaw Program. All degree programs offered at Rice satisfy the academic requirements for admission to law school. While many prelaw students major in social sciences, no law school specifies particular courses or curricula as prerequisites to admission, and students majoring in humanities, sciences, engineering, or other areas are regularly admitted to law schools. Most schools require only a baccalaureate degree and the completion of the Law School Admission Test. When selecting a major, students should keep in mind the provision in The Official Guide to U.S. Law Schools (published by the Law School Admission Council/Law School Admission Services in cooperation with the American Bar Association and the Association of American Law Schools) that prelegal education should develop oral and written comprehension and expression, as well as creative thinking and critical understanding of human values. While no particular discipline is paramount, the prelaw adviser usually recommends that students take expository writing courses and beginning accounting and economics courses. Interested students should contact the prelaw adviser. The guide to law schools cited above, reference books, and the catalogs of many leading law schools are available in the prelaw office in the Office of Academic Advising, Ley Student Center.

Prebusiness Program. Business schools consider the following when admitting students to their Master of Business Administration (M.B.A.) programs:

- Scholastic aptitude, as evidenced by undergraduate grades and performance on the Graduate Management Admission Test (GMAT)
- Extracurricular activities
- Work experience
- Effective oral and written communication

While no specific undergraduate major is preferred, students should select a major (or majors) where their academic performance is likely to be the strongest. The prebusiness adviser recommends that students take ECON 211/212 Principles of Economics I and II and ACCO 305 Introduction to Accounting as courses helpful for graduating seniors seeking employment in the private or public sector (most schools prefer students with relevant full-time work experience). Calculus has become increasingly important to business schools as well.

Interested students should consult the prebusiness adviser early in their undergraduate years. Because business schools differ in their objectives, curricula, teaching methods, job placement possibilities, and admission standards, students should be familiar with the programs of different schools before applying. The prebusiness adviser can also suggest the kinds of work experience that schools typically prefer.

Reserve Officers' Training Corps (ROTC) Programs

Rice hosts a Naval ROTC program, and students may participate in Army ROTC through a cross-enrollment program with the University of Houston. These programs train select college students who, upon graduation, receive reserve commissions as officers in the United States Army, Navy, or Marine Corps.

Most students enroll in the ROTC programs at Rice at the beginning of the fall term.

While courses in naval science and military science are open to any student, they count as free electives and cannot satisfy a student's distribution requirements or departmental major requirements. The provost determines the credit assigned to each course in consultation with the Committee on the Undergraduate Curriculum. Performance in ROTC courses, however, weighs in the determination of probation, suspension, course load, and grade point average. Students suspended by the university for academic failure or other reasons are immediately discharged from the ROTC programs, as are students producing unsatisfactory course work and those lacking sufficient officer-like qualities, regardless of their academic performance.

For additional information on the ROTC programs and available scholarships, see both military science and naval science in the Departments and Interdisciplinary Programs and Courses of Instruction sections.

UNDERGRADUATE DEGREE CHART

School Department	Undergraduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
SCHOOL OF ARCHITECTURE		
	B.A., B.Arch.	B.A. majors in architecture and in architectural studies
GEORGE R. BROWN SCHOOL OF ENGINEERING		
Bioengineering	B.S.B.	Areas of concentration in cellular and molecular engineering, biomedical instrumentation and imaging, and biomaterials and biomechanics
Chemical Engineering	B.A., B.S.Ch.E.	Focus areas in bioengineering, environmental science and engineering, materials science and engineering, and computational engineering
Civil and Environmental Engineering	B.A., B.S.C.E.	Civil engineering: options in structural engineering, environmental engineering, and engineering management Environmental engineering: B.A. as double major with any other Rice major; see also civil engineering and chemical engineering for B.S. options
Computational and Applied Mathematics	B.A.	Numerical analysis, operations research, optimization, differential equations, and scientific computation
Computer Science	B.A., B.S.C.S.	Areas of concentration in architecture, artificial intelligence, computational science, foundations, human-computer interaction, and software systems
Electrical and Computer Engineering	B.A., B.S.E.E.	Areas of concentration in bioengineering; computer engineering; systems: control, communications, and signal processing; electronic circuits and devices; and quantum electronics and photonics
Mechanical Engineering and Materials Science	B.A., B.S.M.E., B.S.M.S.	Mechanical engineering: areas of concentration in biomechanics, fluid mechanics and thermal science, solid mechanics and materials, and system dynamics and control
Statistics	B.A.	Theoretical and applied training orientations; engineering, scientific, and business applications of probability and statistics; joint work in related departments
SCHOOL OF HUMANITIES		
Art and Art History	B.A., B.F.A.	Tracks in history of art and studio art; special fifth-year courses for B.F.A. candidates

School Department	Undergraduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
Education	No undergraduate degree offered	Leads to secondary teaching certificate in conjunction with B.A. in major field. See Education Certification.
English	B.A.	
French Studies	B.A.	
German and Slavic Studies	B.A.	German and German cultural studies, and Russian/Slavic studies
Hispanic and Classical Studies	B.A.	Spanish language and literature, Latin American studies, classics, Greek, Latin, and Portuguese
History	B.A.	
Kinesiology	B.A.	Areas of concentration in exercise science, sports medicine, and sports management
Linguistics	B.A.	Areas of concentration in language, cognitive science, second language acquisition, and language, culture, and society
Philosophy	B.A.	
Religious Studies	B.A.	Areas of concentration in religious traditions and/or methodology
JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT		
	No undergraduate degree offered	Four accounting courses open to all undergraduates
SHEPHERD SCHOOL OF MUSIC		
	B.A., B.Mus.	B.A. in music; B.Mus. in composition, music history, music theory, and performance; joint B.Mus./M.Mus. with fifth year of study
WIESS SCHOOL OF NATURAL SCIENCES		
Biochemistry and Cell Biology	B.A.	Part of an integrated biosciences curriculum
Chemistry	B.A., B.S.	Chemical physics major offered jointly with physics resulting in a B.S. degree
Ecology and Evolutionary Biology	B.A.	Part of an integrated biosciences curriculum
Earth Science	B.A., B.S.	Majors in geology and in geophysics
Mathematics	B.A.	300-level courses oriented toward problem solving and applications and 400-level and above oriented toward theory and proofs; preparation for graduate studies or high school teaching or other areas; ample opportunity for double-majoring, especially with CAAM, COMP, ELEC, PHYS, or STAT; abundance of courses in analysis, topology, geometry, algebra, etc.
Physics and Astronomy	B.A., B.S.	Majors in physics with specific options in applied physics, biophysics, computational physics, astrophysics, and astronomy; interdepartmental major in chemical physics
SCHOOL OF SOCIAL SCIENCES		
Anthropology	B.A.	Areas of concentration in archaeology and social/cultural anthropology
Economics	B.A.	Majors in economics and in mathematical economic analysis
Political Science	B.A.	
Psychology	B.A.	
Sociology	B.A.	

School Department	Undergraduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
INTERDEPARTMENTAL MAJORS		
Area Majors	B.A.	Requires approval of two or more departments, the Office of Academic Advising, and the Committee on Undergraduate Curriculum (see page 30)
Ancient Mediterranean Civilizations	B.A.	Anthropology, classical studies, Greek, Latin, history, history of art, linguistics, philosophy, and religious studies
Asian Studies	B.A.	Anthropology, art, history of art, history, humanities, linguistics, Chinese, Japanese, Korean, Sanskrit, political science, and religious studies
Cognitive Sciences	B.A.	Anthropology, cognitive sciences, computer science, electrical engineering, linguistics, philosophy, psychology, sociology, and statistics
Education Certification	No undergraduate degree offered	Leads to secondary teaching certificate in conjunction with B.A. in major field
Managerial Studies	B.A.	Accounting, computational and applied mathematics, economics, political science, psychology, and statistics
Medieval Studies	B.A.	History of art, classics, English, French, German, history, humanities, linguistics, Spanish, music, philosophy, political science, and religious studies
Policy Studies	B.A.	Environmental policy, government management, healthcare policy, international affairs, law and justice, business policy, and political management
Study of Women and Gender	B.A.	Anthropology, classics, English, French studies, German, history, humanities, linguistics, music, philosophy, religious studies, and sociology

Teacher Certification

Students in the teacher education program earn Texas state teacher certification at the secondary level. Subjects include art, English, French, German, health science, history, Latin, life science, mathematics, physical education, physical science, Russian, science, social studies, and Spanish. For more information on teacher certification programs at the undergraduate and graduate levels, see Education Certification in the Departments and Interdisciplinary Programs and Courses of Instruction sections.

Study Abroad and Exchange Programs

Rice-affiliated and Rice-sponsored programs provide students with opportunities to study throughout the world. Direct exchange programs allow Rice students to change places with university students from another country. Rice is affiliated with nearly 400 program sites worldwide, representing a diversity of program formats. Some offer direct enrollment in foreign universities, while others specialize in intensive language instruction, field research, or internships.

Each year more than 200 undergraduates from across the disciplines study away from campus and then apply the transfer credit earned toward their degrees. The study abroad advisers, in concert with the faculty advisers in each department, assist students in identifying the best programs for their individual interests and academic needs. In order to assure proper enrollment and transfer of credits and financial aid, students planning to study abroad must make their arrangements through the Department of International Programs. This includes arranging prior approval for transfer credit through the relevant academic department(s) and the registrar.

Detailed information on affiliated programs, including application forms, is available from the Department of International Programs (first floor, Ley Student Center).

Academic Regulations

All undergraduate students are subject to the academic regulations of the university. Students are responsible for making certain they meet all departmental and university requirements and academic deadlines. The Committee on Examinations and Standing administers the rules described below. Under unusual or mitigating circumstances, students may submit a written petition requesting special consideration to the committee. Students should address all correspondence to the committee in care of the vice president for student affairs.

Registration

Currently enrolled students preregister in April for the fall semester and in November for the spring semester. They complete registration at the beginning of each semester. Entering students complete their registration during Orientation Week before classes begin in August. The registration form must have the academic adviser's approval. To be properly registered, new students must complete, sign, and return a matriculation card. New students may not register or attend classes until they return a properly completed health data form and meet immunization and TB screening requirements. Immunizations required for admission are diphtheria/tetanus, measles, rubella, and mumps, with immunizations against hepatitis B and chicken pox recommended. The Mantoux tuberculin skin test is also required. A late fee of \$30 is charged for failure to submit a fully completed health data form by the required date. Each year, the Office of the Registrar publishes the specific deadlines for the semesters of that year.

Unless students elect a special payment plan, they must pay all tuition and fees for the fall semester by the end of the second week in August and for the spring semester by the end of the first week in January. Any student in arrears and therefore not registered as of the last day to drop classes will not be allowed to live on campus the next semester, nor will such students be allowed to receive credit for the nonregistered semester. Appeals to this policy must be addressed to the vice president for enrollment.

Students who do not register and who fail to request from the registrar an extension of the deadline in the Academic Calendar (pages vi–x) are considered withdrawn from the university by default. To be readmitted, students must be in good standing and must pay a late registration fee of \$95.

After the fourth week of classes, students may be readmitted by the vice president for enrollment *only* for good reason.

Drop/Add. During the first two weeks of the semester, students may add courses to their registration without penalty with appropriate adviser's approval. During the first four weeks, students may drop courses without penalty with appropriate adviser's approval. After the second week of the semester, the following conditions apply for adds and drops:

Undergraduate students in their first semester at Rice:

- Must obtain instructor's permission and the adviser's approval to add a course between the second and the end of the fourth week of classes
- May not add courses after the fourth week of classes
- May drop courses up to the last day of classes

All other students:

- Must obtain instructor's permission and the adviser's approval to add a course between the second and the end of the fourth week of classes
- May not add courses after the fourth week of classes
- May not drop courses after the end of the 10th week of classes, except with the approval of the Committee on Examinations and Standing (a \$35 fee is assessed for courses dropped after the 10th week by non-first-semester students)
- Students may not drop courses where the Honor Council has ruled a loss of credit.

Schedule of add fees:

Week 3	\$10	Week 7	\$30
Week 4	\$10	Week 8	\$30
Week 5	\$30	Week 9	\$30
Week 6	\$30	Week 10	\$30

Schedule of drop fees:

Week 3	\$0	Week 7	\$10
Week 4	\$0	Week 8	\$10
Week 5	\$10	Week 9	\$10
Week 6	\$10	Week 10	\$10

Schedule of drop fees for undergraduates in their first semester at Rice:

Weeks 3–4	\$0	Weeks 5–15	\$10
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Note to the above: weeks are defined as academic instruction; thus, spring breaks are not included in this calculation.

Course Load. Students at Rice normally enroll for 15 to 17 semester hours each semester. For most students, this allows them to complete the requirements for graduation in 8 semesters. Students must secure permission in writing from the vice president for student affairs before registering for courses, if they want to:

- Register for more than 20 credits
- Register or drop below 12 credits
- Register concurrently at another university

No student may receive credit for more than 20 credits in a semester, including courses taken elsewhere, without this prior written approval.

Students should also be aware that the registrar's office must report a student's part-time status to various groups, such as loan agencies, scholarship foundations, insurance companies, etc. It is in the student's best interest to determine if he or she will be affected in any way by part-time status.

Students may not register for more than 1 course at the same hour unless they receive permission from the instructors involved.

Repeated Courses

Students may not repeat courses for which they have received either advanced placement or transfer credit. Credit will not be counted twice for students who repeat these types of advanced credit.

Some Rice University courses may be repeated for credit. They are specifically noted in the *General Announcements* and on the registrar's website.

A matriculated student may repeat all other courses for credit; however, both grades

will be factored into the term and cumulative grade point average. Credit for these courses will only be counted once. (E.g., you took HIST 117 and received a grade of B. You repeated this course and received a grade of A. Both grades—the A and B—are included in your GPAs; however, you only receive three credits toward your degree. Both courses will appear on your transcript—one course marked “R.”)

Declaring Departmental Majors

In order to receive a bachelor’s degree, a student must complete the requirements for at least one major. Students declare their major using a form provided by the registrar. The department chair or designee must sign the form acknowledging the declaration. It is expected that the department will counsel the student about the requirements that must be met and the likelihood the student will be able to meet them. If the department believes a student is not well prepared for success in its major, it may express its reservations on the form. No department or program may, however, refuse to admit an undergraduate as a major, with the exception of the School of Architecture and the Shepherd School of Music or in the case of limitations of resources. In such cases, departments must publish criteria they will use to limit the number of majors together with their major requirements.

Students must declare a major prior to preregistration for the junior year and will not be permitted to register for the fall semester of the junior year without having declared a major. The deadline for notifying the Office of the Registrar of the major declaration is listed in the Academic Calendar for each year.

Students are free to declare a major at any time prior to this deadline and are always free to change the major declaration by completing the appropriate form with the registrar’s office. However, such a change may entail one or more additional semesters at the university. Area majors are an exception to this rule and must be declared by the fourth semester prior to graduation (see Area Majors below).

Once a student declares a major, the department or title of the major is noted on the student’s transcript, and a faculty adviser in the major department is assigned. Students and their advisers should regularly review progress towards their degrees. Introductory courses taken before formal designation of a major may be counted in fulfilling the major requirements.

For information on the specific requirements for any departmental major, students should consult the departmental listings and seek the advice of a faculty member in the department. It is the responsibility of the student to meet regularly with their advisers to review progress toward their degrees.

Area Majors

Should the traditional departmental majors or programs not meet their exact needs, students may develop an area major closer to their particular interests and career goals. Area majors differ from double majors in that the latter must conform to the requirements of both departments while the former is a single major: It may combine courses from two or more departments, but it maintains its own specific major requirements. Area majors are limited by the available academic resources and must be distinct from other majors offered at Rice. Students who elect to declare an area major may not use it to form a double major, and they must still meet all the other university graduation requirements.

Students are usually the ones to initiate an area major, working it out in conjunction with advisers from the Office of Academic Advising and with faculty advisers from each of the departments involved. After designing a comprehensive and substantial course of study and deciding on an appropriate title, all parties sign off on the plan. The chairs of the involved departments and the Committee on the Undergraduate Curriculum determines final approval. At that point, the Office of Academic Advising officially certifies the approved plan to the registrar and goes on to oversee the major on behalf of the faculty

advisers. Any change in the proposed requirements requires the approval of both the faculty advisers and the Committee on the Undergraduate Curriculum.

Interested students who are unsure which departments to approach should check with the Office of Academic Advising during their sophomore year. Students may not propose an area major if they are within three semesters of graduation unless the Committee on Examinations and Standing rules that exceptional circumstances warrant this action. Under no circumstances may students declare an area major in their final semester before graduation.

Second Four-Year Bachelor’s Degree

Currently enrolled undergraduates, Rice graduates with a bachelor’s degree, and graduates from other universities with a bachelor’s degree have the option of earning a *second* four-year bachelor’s degree at Rice in a different discipline. This degree must be a different bachelor’s degree from the one already held; for example, the holder of a B.A. degree may pursue course work leading to the B.S. or B.Mus. degree. Rice students should note that they can apply courses they completed at Rice as Class III students to the second degree only with the approval of the major department for that degree. (Class III students are students who already have college degrees and are taking courses for credit outside of a Rice degree program.)

Students Already Enrolled at Rice. To earn a second four-year bachelor’s degree, currently enrolled undergraduates who have not yet completed their first bachelor’s degree must:

- Be accepted for the second major by the major department
- Fulfill all requirements for the second degree
- Complete at least 30 additional semester hours at Rice beyond the hours required for their first degree (these hours are applied to the second degree)

Students seeking admission to this program should apply to the registrar. The application should include a written statement identifying both proposed majors and specifying an approved course program for each. It should also contain a statement from the chair or undergraduate adviser of each department involved, indicating that the proposed course program satisfies all major degree requirements.

Students with a Bachelor’s Degree from Rice. Rice graduates who wish to earn a different four-year bachelor’s degree must:

- Be accepted for the major by the major department
- Fulfill all requirements for the second degree
- Complete at least 30 additional semester hours at Rice beyond their first bachelor’s degree (these hours are applied to the second degree)
- Attend Rice full time for at least two semesters during the fall and/or spring terms beyond their first bachelor’s degree

The entire undergraduate record for these students continues cumulatively. Those seeking admission to this program should apply to the registrar. The application should include a written statement specifying the proposed major and course program for the second degree, a supporting letter from the chair of the major department, and an explanation of the student’s reasons for seeking a second degree.

Students with a Bachelor’s Degree from Another School. Other graduates who wish to earn a four-year bachelor’s degree in a different major from Rice must:

- Be accepted for the major by the major department
- Fulfill all requirements for the second degree
- Complete at least 60 semester hours at Rice (these hours are applied to their Rice degree)

- Attend Rice full time for at least four fall and/or spring semesters

Interested students should apply for admission through the Office of Admission, following procedures and meeting criteria similar to that for transfer applicants (see page 46). A complete application file includes the \$35 application fee, official transcripts of all undergraduate and graduate work, two letters of recommendation from the most recent college attended, and standardized test scores (the SAT, SAT I, or ACT).

Financial Aid and Housing. Students seeking information about financial aid available to participants in the second degree program should contact the Office of Student Financial Services. Students admitted to the second degree program may request assignment to a college, but they will have lower priority for on-campus housing than students enrolled for a first four-year bachelor's program. This means that housing will probably not be available.

Honors Programs

To enroll in the two-semester **Rice Undergraduate Scholars Program**, students register for HONS 470–471 Proposal Development and Research. This program is for juniors and seniors in all disciplines who are considering graduate study and an academic career after graduation. Students enroll in the program plan and execute independent research under the supervision of a sponsoring faculty member (they may apply for funding to cover expenses related to their projects). They meet once a week to discuss each other's work and to hear a range of presentations on life in academia. Students may apply in the spring of each year. For more information, contact the program's faculty co-director, James L. Kinsey, in the chemistry department.

Individual departments may offer undergraduates the option of honors program enrollment. These programs enable students to receive advanced training or to deepen their understanding of a given discipline through an intensive program of independent supervised research. Customary procedure is for students to submit a proposed project to their department's Undergraduate Committee, which helps them rework it, as needed, into a substantial but feasible proposal. Once accepted, students are assigned a faculty adviser to guide their research. The project concludes in an honors thesis, which the adviser and two readers evaluate, and an oral examination. Departments also use honors programs to formally recognize students who have shown outstanding work through their individual projects. Acceptance into a departmental honors program is at the discretion of the faculty. For specific requirements and procedures, students should contact the individual departments.

Transfer Credit

Courses taken at another college or university that are appropriate to the Rice curriculum may be approved for transfer credit toward a Rice undergraduate degree. This includes credit for summer school courses not taken at Rice, though no more than 14 semester hours of transfer credit taken in summer schools other than Rice may be applied to any Rice degree. Students must have taken the course at a U.S. academic institution accredited by a regional accrediting agency or with a study abroad program approved by the Department of International Programs and must have earned a grade of C- or the equivalent or better. Students may not transfer courses taken pass/fail or on a similar basis at other institutions. Courses that meet these requirements will be transferred to Rice by the Office of the Registrar as general credit with the designation TRAN. The Office of the Registrar will distinguish between credits that are upper-level and credits that are not upper level. TRAN credit will count toward the general hours needed for graduation under university requirements and for upper-level credit needed if it is designated by the Office of the Registrar as upper-level credit.

The Office of the Registrar, in conjunction with the academic departments, determines whether courses are appropriate for transfer to Rice as Rice equivalent courses. Individual departments may place additional restrictions on particular courses and/or institutions. Similarly, various majors and degree programs may limit the amount of transfer credit that students may apply to them. If courses transferred to Rice as TRAN credit are subsequently granted Rice equivalent course credit by the Office of the Registrar and academic department, the TRAN credit is reduced by the number of credit hours of the Rice equivalent course. The Rice equivalent is then listed on the student's transcript and satisfies the university and major requirements the Rice course satisfies. Courses may be evaluated for transfer directly as Rice equivalent courses, if appropriate, if the student completes the forms required by the Office of the Registrar. Students also may have to obtain departmental approval.

Because of these restrictions, students are strongly advised to seek prior approval from the registrar for courses for which students plan to receive Rice equivalent credit. The Office of the Registrar may require that students secure approval from the major department to receive Rice equivalent credit. Without prior approval, students cannot be certain that credit taken at another institution will be transferred as a Rice equivalent course and therefore count for major or specific university requirements.

If approved, the equivalent Rice course or the general TRAN credit, as the case may be, is entered on the student's record *after* the Office of the Registrar receives an official transcript from the other college or university. For credits obtained while studying abroad, the Office of the Registrar also must receive the necessary approval paperwork from Rice International Programs before transfer credit may be granted. Students may appeal to Rice International Programs to have credit granted from nonapproved study abroad programs. Such appeals generally should be justified by the curricular needs of the student. In addition, credit from non-U.S. degree-granting universities not part of a study abroad program must be approved by Rice International programs. Credit is generally determined on a pro rata basis. No grade is entered, and transferred courses have no effect on a student's Rice grade point average.

Students with much transfer credit should be aware of the general graduation requirements (listed on pages 18-20) that they must complete at least 60 semester hours at Rice, complete more than half of their upper-level degree work and more than half of their upper-level major work at Rice (students also should check their specific departmental major requirements).

Excused Absences

Students are expected to be in attendance at all of the classes for which they are registered during the entire course of the academic semester for which they are enrolled. The university understands, however, that students participating in university-sponsored extracurricular activities may, on rare occasions, need to miss a class session. As a matter of course, students should inform their instructors in advance of absences resulting from participation in university-sponsored activities, and faculty will normally give a reasonable opportunity to make up work missed on such occasions. Absences for activities other than university-sponsored events may also be negotiated on an informal basis between the student and the faculty member. Alternatively, absences may be formally excused on a case-by-case basis if a petition explaining the nature of the event, accompanied by suitable documentation, is submitted to the Committee on Examinations and Standing at least two weeks before the event.

Final Examinations

Most courses include final examinations, but the decision to give a final exam as a required part of the course rests with the instructor and the department. All tests and

examinations are conducted under the honor system (see page 8).

Examinations are considered final examinations when they:

- Cover more than the material learned since the last test, or
- Are the only exam in the course, or
- Require comprehensive knowledge of the entire course

Such exams may be given only during the final examination period.

Final examinations are normally three hours long. When instructors, for exceptional reasons, wish to give a longer examination, they schedule it as a take-home exam; even then, they may not exceed five hours. The “due date” for all take-home finals is the end of the final examination period.

University-sponsored events at which student attendance is required may be scheduled in or outside of Houston during the period from Monday through Saturday during the last week of classes, so long as no more than one day of classes and one night would be spent out of Houston from the previous Sunday night through Friday afternoon. Events scheduled on Saturday may involve travel on Friday evening and on Sunday. However, no events may be scheduled on Sunday and thereafter until the conclusion of the final examination period. Exceptions may be authorized only by the Committee on Examinations and Standing.

Grades (See also Faculty Grading Guidelines on pages 8–9.)

The Pass/Fail Option. Undergraduates may register for courses on a pass/fail basis. Such students:

- May not take more than 1 course as pass/fail per semester for each full year of residence (students studying in off-campus programs through Rice are considered to be in residence for the purpose of this rule)
- May not take more than 4 courses total as pass/fail (even if they are in a five-year degree program)
- May not take more than a total of 14 semester hours total as pass/fail
- May register for only 1 course as pass/fail in a semester
- May take courses on a pass/fail basis that are not used to satisfy the requirements of their major
- Must file the proper form for a course to be taken pass/fail no later than the posted deadline, usually the end of the 10th week of the semester

Note: If a student takes a course pass/fail that is required for their major (as indicated by their major department) the registrar will automatically replace the P with the grade earned.

Students may convert a pass/fail course to a graded course by filing the proper form with the registrar. The deadline is by the end of the fifth week of the following semester. Because they have the option of changing to a grade designation later, students should consider registering a course as pass/fail early in the semester.

Students should be aware that while a grade of P does not affect their grade point average, a grade of F is counted as a failure and is included into their GPA. Students who take a course during the Rice summer session as pass/fail should also be aware that this counts toward their allowable total of 4 courses.

Grade Symbols. Instructors are required to report a grade for all students (except auditors) whose names appear on the class list. They grade their students using the following conventional symbols: **A+**, **A**, **A-**, **B+**, **B**, **B-**, **C+**, **C**, **C-**, **D+**, **D**, **D-**, **F**. Students successfully completing a course pass/fail receive a **P**, while failure to complete the course successfully is indicated by an **F**.

Students may repeat courses previously failed, but the record of the first attempt (and grade) remains on the transcript, and both grades are included in grade point average calculations. If students repeat courses previously passed, credit is awarded only once

unless the course description states that students may repeat it for additional credit. In the latter case, each grade appears on the permanent record and is included in the grade point average.

Grade Designations. Under certain circumstances, special designations accompany the student’s grade. These designations do not affect the grade point average. For students who receive a designation of “incomplete” or “other,” the grade reflects a calculation that gives zero credit for work not completed. It does not become part of the student’s record (except as discussed below). For students who receive a W, indicating withdrawal from the university within the last five weeks of classes, the grade is based on the performance of the student up to the time of withdrawal. It does not appear on the student’s record and is used solely in determining the student’s eligibility for readmission. The special designations include the following:

INC (“Incomplete”)—Instructors report this designation to the registrar when a student fails to complete a course because of verified illness or other circumstances beyond the student’s control that occur during the semester. Students must complete the work, and instructors must submit a revised grade, by the end of the fifth week of the next semester; otherwise, the registrar’s office records the grade originally submitted. Students with an “incomplete” must be certain that tests, papers, and other materials affecting their grade or essential to completing a course requirement are delivered *by hand* to the appropriate professor or office with ample time for the instructor to grade the documents and submit the final grade to the Office of the Registrar by the end of the fifth week of the following semester. Loss or lateness because of mail service is not an acceptable excuse for failing to meet academic deadlines. A student who receives two or more “incompletes” in a semester may not enroll in the next semester for more than 14 semester hours. Students should also be aware that they may be placed on probation or suspension when the “incomplete” is changed to a grade, either by an instructor or by default.

(“Other”)—Instructors report this designation to the registrar when a student fails to appear for the final examination after completing all the other work for the course. Students must resolve the matter, and instructors must submit a revised grade, by the end of the first week of the second semester or by the end of the fourth week after commencement, whichever is applicable. If the registrar’s office does not receive a revised grade, the original grade submitted is recorded. A designation of “other” is also used if an accusation has been made to the Honor Council. As noted above, students should be aware that they may go on probation or suspension when the “other” is changed to a grade, either by an instructor or by default.

W (“Withdrew”)—This designation appears for each course in which students are enrolled at the time of their withdrawal from the university. Courses dropped by students before the “late drop” deadline are removed entirely from the transcript. Courses dropped, with the approval of the Committee on Examinations and Standing, after the deadline receive a W. When requests for late drops are denied by the committee, the registrar records the submitted grade. See Voluntary Withdrawal and Readmission under Withdrawals and Leaves (pages 37–39) for rules concerning withdrawal in the last five weeks of classes.

NG (“No Grade”)—This designation indicates that the instructor failed to report a grade. Instructors are responsible for resolving this situation as quickly as possible.

NC (“No Credit”)—This designation signals that no credit was granted for the course. It is only used for people auditing the course.

Grade Points. To compute grade point averages, letter grades are numbered as follows:

<i>Grade</i>	<i>Grade Points</i>	<i>Grade</i>	<i>Grade Points</i>
A+	4.33	C+	2.33
A	4.00	C	2.00
A-	3.67	C-	1.67
B+	3.33	D+	1.33
B	3.00	D	1.00
B-	2.67	D-	0.67
		F	0.00

Grade Point Averages. Grade point averages are calculated as follows. For each course, the credit attempted in semester hours and the points for the grade earned are multiplied. Then these products (one for each course) are added together, and the sum is divided by the total credit attempted. Grade point averages are reported each semester on the student's grade report and appear on unofficial transcripts. However, grade point averages are not included on official transcripts nor, like class ranks, are they reported to any external agency.

President's Honor Roll. This honor roll, published each semester, recognizes outstanding students. To be eligible, students must have earned grades in a total of 12 or more semester hours without receiving a grade of F. (Pass/Fail courses may not be counted.) Approximately 30 percent of the top undergraduates receive recognition each semester. While undergraduates enrolled in a four-year bachelor's degree program are always eligible for the President's Honor Roll, students enrolled in five-year bachelor's or master's programs are eligible only during their first 8 semesters.

Academic Discipline and Other Disciplinary Matters

Academic Probation. Students are placed on academic probation at the end of any semester if:

- Their grade point average for that semester is less than 1.67
- Their cumulative grade point average is less than 1.67 (this requirement is waived if the grade point average for that semester is at least 2.00)

The period of probation extends to the end of the next semester in which the student is enrolled. Students on probation (academic or disciplinary) may not be candidates for, or hold, any elected or appointed office, nor are they allowed to enroll in more than 17 semester hours.

Academic Suspension. Students are suspended from the university at the end of any semester if they:

- Earn grades that will place them on academic probation a third time
- Have a grade point average for the semester that is less than 1.00 (exceptions are made for students completing their first semester at Rice)

Students readmitted after a period of academic suspension will be suspended again if, in any succeeding semester, they fail to meet at least one of the following requirements:

- A cumulative and semester grade point average of at least 1.67
- A semester average of at least 2.00

The first suspension period is normally one semester; the second suspension period is at least two semesters. Students are not readmitted after a third suspension.

Students who are going to be suspended for academic performance are notified by the registrar after all final grades have been received by the faculty and posted to their

record. Suspension is lifted the first day of class of the semester when the student returns to the university. When students serve the nominal term of suspension but do not intend to return to Rice, suspension is lifted after permission from the Committee on Examinations and Standing is granted.

For students facing a first or second academic suspension who verify with the registrar and their department that they will complete their degree requirements in one semester if allowed to return, may have their suspension reduced to probation. Students may invoke this ruling only once for a given academic degree plan.

Students who graduate at the end of a semester under academic circumstances that would normally place them on probation or suspension will not have the terms "academic probation" or "suspension" placed on their transcript for that semester.

Disciplinary Probation and Suspension. The assistant dean of student judicial programs may place students on probation or suspension for an honor system violation or for other disciplinary reasons. Students on disciplinary suspension (including for an honor system violation) may not receive their degree even if they have met all academic requirements for graduation. They must leave the university within 48 hours of being informed of the dean's decision, though in cases of unusual hardship, the college master and assistant dean of student judicial programs may extend the deadline to one week. Any tuition refund will be prorated from the official date of suspension, which is determined by the registrar. While on disciplinary suspension, students may not run for, or hold, any elective or appointed office in any official Rice organization, nor may they serve as an Orientation Week adviser once they return to the university. Participation in student activities on and off campus and use of Rice facilities, including the student center, the colleges, the playing fields, the gym, and the computer labs, are limited to *enrolled* students.

Readmission After Suspension. Students seeking readmission after **academic suspension** should address a letter of petition to the Committee on Examinations and Standing, which must receive it at least one month before the beginning of classes. The petition should include two supporting letters from persons for whom the student has worked during the suspension period as a student or an employee. If the problems causing the previous difficulty appear to be resolved, the student generally is readmitted. Students returning from a second suspension must submit an academic program approved by the Office of Academic Advising before they are readmitted. These students must also maintain regular contact with that office throughout the semester. In some instances, the committee may postpone approval of readmission or rule that suspension is permanent. Under those circumstances, students desiring special consideration with regard to readmission should petition the committee in writing.

Students seeking readmission after leaving the university due to **disciplinary or other nonacademic action** should submit a petition in writing for review by the assistant dean of student judicial programs.

Rice Summer School. Although it may do so at its discretion, the Committee on Examinations and Standing does not normally place on probation or suspension students who perform poorly in the Rice Summer School. Students should be aware, however, that Rice Summer School grades are included in their grade point averages.

Withdrawals and Leaves

Voluntary Withdrawal and Readmission. Students may withdraw voluntarily from the university at any time during the semester up until the last day of classes. If they are in good academic standing at the time of their withdrawal, students are considered for readmission after they submit a written application to the vice president for student

affairs. If students withdraw within five weeks of the last day of classes, they must submit the written application to the Committee on Examinations and Standing for approval as well. If students withdraw for major medical or psychological/psychiatric reasons, however, they must meet the readmission conditions for an involuntary withdrawal (see below).

Students wishing to withdraw should inform their college master in person and give written notification to the vice president for student affairs, who notifies other offices of the university as necessary. If students withdraw within five weeks of the last day of classes, the committee takes into account their grades (which reflect their performance up to the day of withdrawal) when ruling on their readmission. Students whose grades would have led to suspension had they not withdrawn are treated, for purposes of readmission, as if they had been suspended. Such students must meet the requirements for readmission under academic suspension (see page 37).

Students who fail to give notice of withdrawal should expect to receive failing grades.

Involuntary Withdrawal. The university may insist on a student's involuntary withdrawal if, in the judgment of the vice president for student affairs, the student:

- Poses a threat to the lives or safety of him/herself or other members of the Rice community
- Has a medical or a psychological problem that cannot be properly treated in the university setting
- Has a medical condition or demonstrates behavior that seriously interferes with the education of other members of the Rice community

Students should submit written petitions for readmission after involuntary withdrawal to the vice president for student affairs, providing evidence that they have resolved the problems leading to their withdrawal. Some cases may require an interview with the director of the Rice Counseling Center, with the director of Student Health Services, or with their designees.

Unauthorized Withdrawal. Students who leave the university without first obtaining permission to withdraw are considered to have resigned. Although students who resign are not normally considered for readmission, they may petition first the Committee on Examinations and Standing, then the vice president of student affairs. Withdrawal without permission is noted on the transcript, but readmitted students may petition to have this notation expunged from their record by following the procedures described in the Code of Student Conduct.

Leave of Absence. Students may request a leave of absence from the university by applying in writing to the vice president for student affairs at any time before the first day of classes in the semester for which they are requesting leave. A leave of absence taken after the first day of classes is considered a voluntary withdrawal.

To gain readmission following an approved leave of absence of not more than four semesters, students need only notify the vice president for student affairs at least one month before the beginning of the semester that they intend to end their leave. After a leave of more than four semesters, they should apply in writing to the Committee on Examinations and Standing as if the leave were a voluntary withdrawal (see page 37).

Approval of a leave of absence is always contingent on the student's satisfactory completion of course work in the semester preceding the leave. Students performing poorly may have their approved leave converted to suspension.

Approved Leave to Study Abroad. Students wishing to take a leave of absence to study abroad and who intend to transfer credit back to Rice must complete an Approved

Leave for Study Abroad form and a transfer credit form (including required signatures). Forms are available from, and should be returned to, the Office of International Education, Ley Student Center. This approval process takes the place of the regular request for a leave of absence (see above). At the end of their foreign study and 30 days before classes begin at Rice, students must notify the director of international education, in writing, of their intention to either return to Rice or take a regular leave of absence.

Applicable Academic Graduation Requirements

Students enrolled in four- (or five-) year bachelor's programs may decide whether to operate under the graduation requirements in effect when they first registered at Rice or those in effect when they graduate. If they graduate more than seven (or eight) years after their initial registration, they must graduate under the regulations in effect at the time of their last readmission or those in effect when they graduate. Also, departments may review courses completed in a major more than seven (or eight) years prior to the student's anticipated graduation. If the department concludes that a course no longer satisfies the requirements of the major, it is not credited toward the major program, although it remains on the student's record.

Departmental major requirements may vary from year to year during the period between a student's matriculation and graduation. The department may, at its discretion, make any of these variations available to a student for completion of the major requirements. If a new degree program or major is created during the student's time at Rice, the new program will be available to a student as if the program appeared in the General Announcements at the time of matriculation.

Name Changes

In order to comply with a number of government agencies reporting requirements, the university must record the name of each student who is a U.S. citizen as the student's name appears on his or her Social Security card. Students who need to change their names on Rice University records and who are U.S. citizens must notify the Office of the Registrar and present a Social Security card, marriage license, divorce decree, or court order and picture identification when submitting the form. After the change is implemented, the name on the Rice University transcript will read as printed on the supporting document(s).

Change in Enrollment

The academic calendar lists deadlines for dropping or adding a class or section. This schedule is binding for all students. Adding or dropping a course, including transferring from one section to another or changing credit status in a course must be accomplished through completion of the appropriate forms and submission to the Office of the Registrar.

Transcript Policies

Transcripts are issued only at the request of the student. Transcript requests should be made at least three working days prior to the desired date of issue. A \$5 fee per transcript must be received before a transcript is issued.

Transcripts that have been presented for admission or evaluation of credit become a part of the student's permanent record and are not reissued. Transcripts from other institutions, if needed, must be sent to Rice University directly from the original issuing institution.

Student Records

Rice University assures the confidentiality of student educational records in accordance with state and federal laws, including the Family Educational Rights and Privacy Act. Student academic records are maintained primarily in the Office of the Registrar and in the academic department of the student's major, as well as various other offices around campus. All students have the right to review their records to determine their content and accuracy, to consent to disclosures of personally identifiable information as defined by law, and to file complaints with the Department of Education. Parents of dependent students, as defined by the Internal Revenue Code, who give evidence of the dependent status, have the same rights..

Release of Student Information from Educational Records

The disclosure or publication of student information is governed by policies of Rice University and the Family Educational Rights and Privacy Act.

A student's consent is required for the disclosure or publication of any informational which is a) personally identifiable and b) a part of the educational record. However, certain exceptions to this general rule, both in types of information which can be disclosed and in access to that information, are allowed by the regulations of the Family Educational Rights and Privacy Act. Rice may allow access to personally identifiable information without a student's prior consent to its faculty or staff who legitimately require this information to perform their instructional, supervisory, advisory, or administrative duties.

In accordance with the law, a student's prior consent is not required for disclosure of portions of the educational record defined by the institution as directory information. The following directory information may be released by the university:

1. Name, local and permanent address, and telephone number(s);
2. Date and place of birth and sex;
3. Classification and major and minor fields of study;
4. Participation in officially recognized activities and sports;
5. Weight and height of members of athletic teams;
6. Dates of attendance, degrees and awards received;
7. The most recent previous educational agency or institution attended by the student; and
8. Photographic image.

The information above, designated by the university as directory information, may be released or published by the university without a student's prior written consent unless exception is made in writing by the student or the parents of a dependent student. Students who prefer to avoid access to or release of directory information must notify the registrar in writing prior to the end of the second week of fall classes, and the university will withhold access to, or release of, directory information until further written instruction is received.

Students have a right to challenge the accuracy of their educational records and may file written requests to amend these records. The Office of the Registrar should be contacted for further information regarding the procedure to follow for questions or problems.

For complete information regarding the policies outlined above, please contact:

Rice University Registrar
Rice University
Office of the Registrar – MS 57
6100 Main Street
Houston, TX 77005-1892
Email: reg@rice.edu

Veterans Information

At Rice University, the Office of Veterans Affairs is managed through the Office of the Registrar. This office assists all veterans and their dependents who wish to receive VA educational benefits. The office also provides personal counseling, fee deferments, tutorial assistance, and work-study jobs.

Veterans who are planning to attend the university should contact the Office of Veterans Affairs at least two months prior to the date of entry. Such time is required to expedite the processing of paperwork for educational allowances from the Veterans Administration.

For certification of benefits, the student must be enrolled according to the following schedule:

Full Time	12 Credits	1/2 Time	6 Credits
3/4 Time	9 Credits	Less than 1/2 Time	5 Credits

For rate of monthly payment of educational allowances for veterans and dependents, please contact Office of Veterans Affairs.

For additional informational regarding other Veterans Educational Programs contact the Office of the Registrar 713-348-8031 or reg@rice.edu.

Application for Graduation

All students must complete an Application for Graduation Form available in the Office of the Registrar. This form is required for all students who plan to complete their degree requirements at the end of the fall or spring semester.

Academic Advising

Rice University is dedicated to providing the information, advising, resources, and support needed for our students to set goals for academic achievement and to design plans to succeed in reaching those goals. Rice is committed to a long tradition of academic advising by the faculty, primarily through the colleges and the departments and with the support of the Office of Academic Advising. Rice is further committed to providing academic assistance to students who need tutoring in difficult classes.

Academic advising for most new students at Rice occurs primarily in the residential colleges, provided by faculty associates. New students are assigned a divisional adviser based on their general areas of academic interest or proposed majors. There are four major undergraduate divisions—humanities, social sciences, natural sciences, and engineering. Architecture and music majors have advisers within those schools. Until a major is declared, the divisional adviser must approve registration and add/drop forms.

Students must declare a major prior to preregistration for the junior year, if not sooner, according to the deadline in the Academic Calendar (see Declaring Departmental Majors on Page 30). Once a major is declared, the primary source of academic advice is a faculty member who is a designated major adviser in the department or program. All students are strongly encouraged to consult with major advisers at any time prior to declaring the major.

The Office of Academic Advising, located in the Ley Student Center, is a source of advice for all students. In addition to providing support, resources, and training for divisional and major advising, the Office of Academic Advising provides guidance to students planning careers in the health professions and law, to students planning to attend graduate school, and to any student needing general academic advice.

The Rice Tutoring Program

Through the Office of Academic Advising, every student at Rice is entitled to free tutoring assistance, both individually and in small groups, on a limited basis. Details of the Rice Tutoring Program are available from the Office of Academic Advising.

Summer School for College Students

Rice Summer School for College Students, administered by the School of Continuing Studies, offers courses for credit to Rice students, visiting undergraduates, graduate students, and Class III students (see page 82–83). Two summer sessions are offered: in May and June–July. See Academic Calendar, pages vi–x. Taking 6 to 8 semester hours in one session is considered a full load. Interested students should complete the application form found on the summer school website at <http://scs.rice.edu/summercredit>. Admission is automatic for any Rice undergraduate or graduate student in good standing. Visiting students in good standing should send official transcripts, including spring semester grades, (mailed directly from their universities and colleges to the School of Continuing Studies) as well as the completed application. Acceptance in the Rice Summer School carries no implications for regular admission to Rice.

All applicants, including Rice students, should submit their applications to the Rice Summer School Office with the application fee and a tuition deposit. The remaining tuition is due in full at registration before the beginning of classes. Auditors of summer school courses, who are considered visiting students, must pay full tuition and fees. Limited financial aid is available for Rice students only.

It is essential that students apply by the deadlines listed on the summer school website. Courses that do not generate enrollments sufficient to cover their costs may be canceled. Students may apply after the deadline (but before the start of classes) by paying a late fee.

For more information, including tuition and registration information, students should contact the Rice Summer School Office at 713-348-4803, via e-mail at scsummer@rice.edu or online at <http://scs.rice.edu/summercredit/>.

Admission of New Students

From its beginning, Rice University has sought to maintain an academic program of the highest excellence for a small body of students. While the university's resources and programs have expanded over the past years, the total number of students who matriculate remains relatively small, approximately 650 students in each first-year class.

We seek students of keen intellect who will benefit from the Rice experience. Our admission process employs many different means to identify these qualities in applicants. History shows that no single gauge can adequately predict a student's preparedness for a successful career at Rice. For example, we are cautious in the use of standardized test scores to assess student preparedness and potential. In making a decision to admit or to award financial assistance, we are careful not to ascribe too much value to any single metric, such as rank in class, grade point average, or standardized test score.

We use a broader perspective that includes such qualitative factors as the overall strength and competitive ranking of a student's prior institution and the rigor of his or her particular course of study. Taken together with a student's test scores and academic record, these additional factors provide a sound basis to begin assessing the applicant's potential.

Beyond these objective tests of academic competence, we look for other, more

subjective qualities among applicants, such as creativity, artistic talent, and leadership potential. We believe that students who possess these attributes in combination with strong academic qualifications will benefit most from a Rice education. Through their contributions and interactions with others, they will enrich the educational experience of all students. These qualities are not revealed in test scores but are manifest in the breadth of interests and the balance of activities in their lives.

Rice University seeks to create on its campus a rich learning environment in which all students will meet individuals whose life experiences and world views differ significantly from their own. We believe that an educated person is one who is at home in many different environments, at ease among people from many different cultures, and willing to test his or her views against those of others. Moreover, we recognize that in this or any university, learning about the world we live in is not by any means limited to the structured interaction between faculty and students in the classroom but also occurs through informal dialogue between students outside the classroom.

To encourage our students' fullest possible exposure to the widest possible set of experiences, Rice seeks in its admission policies to bring bright and promising students to the university from a range of socioeconomic, cultural, and geographic origins. We seek students whose parents did not attend college, as well as students from families with a well-established history of college-level education. Rice places a premium on recruitment of students who have distinguished themselves through initiatives that build bridges between different cultural, racial, and ethnic groups. In so doing, we endeavor to craft a residential community that fosters creative, intercultural interactions between students, a place where prejudices of all sorts are confronted squarely and dispelled.

In assessing how well an applicant can contribute to enlivening the learning environment at Rice, we also try to determine the relative challenges that he or she may have faced. For economically disadvantaged students, this may mean achieving a high level of scholastic distinction while holding down a job in high school. For a first-generation college student, this might mean achieving high standards for academic success within an environment relatively indifferent to intellectual attainment. Or it might mean overcoming a disability to excel in sports, music, or forensics. For students who do not have particular disadvantages, we also look at whether they chose a more challenging road than the normal path through high school. This might mean an especially strenuous course of study, prolonged and in-depth engagement in a school project, or a particularly creative and wide-ranging set of extracurricular activities.

Our admission process precludes any quick formula for admitting a given applicant or for giving preference to one particular set of qualifications without reference to the class as a whole. An inevitable consequence of this approach is that some otherwise deserving and well-qualified students will not be admitted to Rice. By selecting a wide range of matriculants of all types, the admission process seeks to enrich the learning environment at Rice and thus increase the value of a Rice education for all students.

Due to the nature of the Rice education, Rice enrolls undergraduate degree candidates on a full-time basis only. **First-year applicants, architecture applicants, and international students may apply for the fall semester only.** Other applicants may apply to enter either the fall or spring semester.

Applicants are selected on a competitive basis in six academic divisions: architecture, engineering, humanities, music, natural sciences, and social sciences. Candidates should give careful consideration to the category under which they wish to be considered. However, once enrolled, most students are able to move freely among most divisions after consultation with their advisers. Music students must pursue the music program for at least the first year before changing divisions. The Schools of Music and Architecture maintain limited enrollments; all majors are subject to faculty approval.

Those offered admission are expected to complete the remainder of their high school courses with the same superior performance that led to their admission.

First-Year Applicants

There are four areas of focus generally used in evaluation of first-year candidates for admission: scholastic record as reflected by the courses chosen and the quality of academic performance, recommendations from high school, the application presentation of personal information and essays, and standardized testing (SAT I or ACT and three subjects from the SAT II).

The High School Record. Students must complete at least 16 college preparatory units as follows:

English	4	Laboratory science (e.g., biology,	
Social studies	2	chemistry, physics)	2
Mathematics	3	Additional credits in any of the	
A foreign language	2	categories above	3

The natural science and engineering divisions require trigonometry (pre-calculus) or other advanced mathematics courses and both chemistry and physics. Students may substitute a second year of chemistry or biology for physics.

Students admitted with academic deficiencies will be asked to complete the required work by taking high school or college-level courses during the summer before enrollment at Rice.

Note: Because of the admission competition to enter Rice, successful applicants generally have taken 20 or more college preparatory courses, many at the college level. Therefore, only those students who have more than 20 college preparatory courses may have the registrar consider for Rice credit their college courses taken in high school.

Transfer of Coursework Taken During High School. College-level courses taken during high school years may be considered for credit at Rice University on receipt of the following documentation:

1. An official transcript of all college courses sent directly from the college(s) attended to Rice University, Office of the Registrar. No college-level courses that appear only on the high school transcript will yield credits at Rice.
2. From each college attended, official verification that all courses were taken on the college campus, were taken together with students at that college, were taught by regular members of the college faculty, and were a part of the normal curriculum of the college. This type of documentation is normally obtained from the registrar's office of each college.
3. Official notification by letter from the high school principal or guidance counselor that the credit earned was not used to meet high school diploma requirements.

Recommendations. Candidates must submit evaluations from their guidance counselor and one teacher. The necessary forms are included in the application.

The Application. The application provides the committee with important information on the student's background and gives the applicant an opportunity to provide statements on his or her interests, experiences, and goals. Both the Rice application and the Common Application are accepted. *The application fee is \$35.* Students for whom this fee creates a hardship may apply for a waiver. Freshman applicants should provide proof of a fee waiver for the SAT I or ACT test or eligibility for the school lunch program. In any case, a letter from the student's high school counselor is required. Financial stress

created by application fees to other institutions is not considered a valid reason to grant a fee waiver.

Standardized Testing. The SAT I or ACT and three subject exams from the SAT II are required for admission. All applicants must submit three SAT II tests: one in writing and two others in fields related to the candidate's proposed area of study.

These exams are administered by the College Board and the American College Testing Program. Bulletins and test registration forms are available from high school counseling offices. The applicant is responsible for arranging to take the tests, and official score reports must be submitted before the student can be considered for admission. The College Board code for Rice is 6609. The ACT code is 4152.

Personal Interview. Although a personal interview is *not a requirement*, we *recommend* an interview for first-year applicants as an excellent opportunity to discuss the applicant's interests, needs, and questions. On-campus interviews are conducted by the admission staff and a select group of Rice senior students. Also, off-campus interviews are conducted throughout the United States by Rice alumni. Please consult the application packet or call the admission office for details.

Music Audition. Candidates to the Shepherd School of Music must arrange for an audition with a member of the music faculty.

Architecture Portfolio and Interview. Architecture applicants must submit a portfolio. An interview with a faculty member from the School of Architecture is strongly recommended.

Decision Plans

Early Decision Plan. Early Decision is designed for students who have selected Rice as their first choice. Students may initiate applications to other colleges but may make a binding Early Decision application to one college only.

Early Decision applicants must complete the required standardized testing on or by the October testing dates in the senior year. All other materials should be postmarked by November 1. Admission notices will be mailed by December 15. The committee will admit, defer, or deny Early Decision applicants. Deferred applicants are considered with the Regular Decision pool, and seventh-semester grades and additional standardized test scores will then be considered.

It is important to note that if admitted under Early Decision a candidate must withdraw all other college applications, may not submit any additional applications after accepting the offer, and must accept Rice's offer of admission by submitting a \$100 nonrefundable deposit by January 2. An additional \$50 housing deposit is required of those desiring on-campus accommodations.

Those accepted under Early Decision may receive an estimate of need-based financial aid by registering for the College Scholarship Service (CSS) PROFILE by October 1, and sending the PROFILE packet to CSS by November 1. Register for CSS PROFILE by calling 1-800-778-6888 or by visiting their website at www.collegeboard.com. CSS will mail you the PROFILE; complete and return it to CSS. Students may also complete the PROFILE online. The PROFILE number for Rice is 6609. Note that **official** financial aid offers may be made only after the Office of Student Financial Services has received the following documents (all of which should be completed after January 1):

- CSS PROFILE, priority date February 1
- Free Application for Federal Student Aid (FAFSA), priority date February 1

- Student and parent 2002 income tax and W-2 forms, priority date March 1

Interim Decision Plan. First-year applicants who complete their standardized testing on or before the December testing dates and who postmark all other materials by December 1 may be considered under the Interim Decision Plan. Decisions are mailed by February 10. The committee will admit, defer, or deny Interim Decision applicants. Deferred applicants are considered with the Regular Decision pool, and seventh-semester grades and additional standardized test scores will then be considered.

Interim Decision applicants who are offered admission must pay a \$100 registration deposit by May 1 to reserve a place in the incoming class. After May 1, deposits are not refundable. Those who desire a room on campus must pay an additional \$50 deposit.

Regular Decision Plan. Students who apply Regular Decision must postmark their materials by January 2 to receive notification by April 1. Candidates who miss the deadline must do so in full knowledge that they are in a less competitive position. Regular Decision applicants must complete their standardized tests by February.

Regular Decision applicants who are offered admission should submit a \$100 registration deposit by May 1 to reserve their places in the incoming class. After May 1, deposits are not refundable. Those who desire a room on campus must pay an additional \$50 deposit.

Accelerated Students

Rice University will accept applications from students who are completing high school in less than four years. It is important to note that these students will compete with other candidates who will be completing four years of high school. Therefore, it is the candidate's responsibility to demonstrate that he or she has exhausted *all* college preparatory course work at his or her school. Further, because of the residential focus and commitment to student self-governance at Rice, candidates must also demonstrate the maturity and personal development that would allow them to participate fully and responsibly in campus life. Because of the unique circumstances surrounding the accelerated student, it is strongly recommended that these candidates have an on-campus interview with a member of the admission staff before the application deadline.

Home-Schooled Applicants

The Committee on Admission and Financial Aid recognizes that each home-schooled applicant is in a unique educational program. To ensure that our evaluation process is fully informed, each home-schooled applicant is encouraged to provide clear, detailed documentation of his or her curriculum of study, assessment tools, and learning experiences. Rice requires two academic letters of recommendation from all applicants, and at least one of these letters must come from someone who is not related to the applicant.

Transfer Students

Students with superior records from two-year or four-year colleges or universities may apply as transfer candidates. Applicants for transfer admission must file the following with the Office of Admission:

- The written application
- Official transcripts of all high school and college work completed to date as well as courses in progress
- Two faculty recommendations
- A recommendation from the dean of students

- SAT I or ACT scores
- A \$35 application fee

Applications with the appropriate documents must be postmarked by April 1 for fall term admission and November 1 for spring term admission. Notification of the admission decision is mailed by June 1 and December 15, respectively. The criteria used in evaluating transfer applications are similar to those applied to applicants for the first-year class, except that special emphasis is given to performance at the college level. Because of the highly competitive nature of transfer admission, it is recommended that applicants have a minimum 3.20 (4.00 scale) grade point average on all college work. The SAT I or ACT must be taken by April 1 for fall application and November 1 for spring application. The SAT II is not required.

Students for whom the \$35 application fee creates a hardship may apply for a waiver. Transfer applicants must send a copy of the Student Aid Report that they receive after completing the Free Application for Federal Student Aid (FAFSA) along with a request for a fee waiver to the Office of Admission. Financial stress created by application fees to other institutions is not considered a valid reason to grant a fee waiver.

Transfer students must be registered in residence at Rice for at least four full semesters during the fall or spring terms and must complete no fewer than 60 semester hours before earning a Rice degree.

Advanced Placement/International Baccalaureate/Placement Tests

Students who score a 4 or 5 on the applicable Advanced Placement College Board examinations taken prior to matriculation at Rice are given university credit for corresponding Rice courses.

Students who receive a score of 6 or 7 on a higher-level International Baccalaureate exam will also receive course credit for the appropriate course.

Furthermore, during Orientation Week, entering students may take placement tests administered by various departments at Rice. On the basis of these tests, students may be advised to register for courses beyond the introductory level. In most cases, credit is not given for these tests.

Other Students

Please note that financial assistance is not available for visiting, Class III, second degree, dual enrollment, or auditing students.

Visiting Students. Students who wish to spend a semester or a year at Rice taking courses for credit to be applied toward their undergraduate degree at another school may apply for admission as visiting students through the Office of Admission. The student's application should be accompanied by the \$35 application fee, an official high school transcript, an official transcript of college work to date, an SAT I (SAT) or ACT score, and recommendations from the dean of students and a faculty member who has taught the student within the past academic year. Visiting student applications should be postmarked by April 1 for the fall semester and November 1 for the spring semester.

Visiting students are assigned membership to one of the residential colleges during their stay and are charged the same fees as other undergraduates. In a few classes where enrollment is limited because of space or other considerations, candidates for Rice degrees have priority over visiting students.

Visiting students may apply to transfer to Rice only after having left Rice for at least one semester.

Class III Students. Students with Class III standing at Rice have an undergraduate or graduate degree from an accredited college or university and are taking courses at Rice

for credit but not in a specific degree program. Students interested in this program should contact the Office of Graduate Studies.

Second Degree Students. An individual who has a bachelor's degree from another institution and desires another degree in a different area of focus may apply as a second degree student on a space-available basis. Students may only pursue a second degree that is different from their first degree. The application, a \$35 application fee, official transcripts of all undergraduate and graduate work, two faculty letters of recommendation and a recommendation from the dean of students from the most recent college attended, and standardized test scores (the SAT, SAT I, or ACT) are required to complete an application file. The deadline for fall semester admission is June 1 and the deadline for spring is November 1.

Second degree applicants with a prior bachelor's degree from Rice should apply to the Office of the Registrar. The application should include a written statement specifying the proposed major and course program for the second degree, a supporting letter from the chair of the major department, and an explanation of the student's reasons for seeking a second degree.

Dual Enrollment Students. Accelerated high school juniors and seniors who have taken all the courses in a given discipline available to them in high school may request admission to Rice for the purpose of taking one or more university-level courses as dual enrollment students. The written application, application fee of \$35, high school transcript, a teacher and a counselor recommendation from the applicant's high school, and an SAT I or ACT score should be sent to the Office of Admission by June 1 for the fall semester or December 1 for the spring semester. Home-schooled students must demonstrate that they have exhausted all other community resources before applying for dual enrollment at Rice. All dual enrollment students are limited to two courses per semester at Rice.

Tuition for new students is \$732 per semester hour plus a \$100 registration fee, the total not to exceed \$8,775. Tuition for returning dual enrollment students would be the rate (plus inflation) at which they first took dual enrollment courses at Rice. These charges are for the 2002–2003 school year and are subject to change in subsequent years. Financial assistance is not available for this program.

Auditors. Any interested person, including currently enrolled students, may audit one or more courses at Rice by securing permission of the instructor and by registering as an auditor with the registrar. The university grants no academic credit for such work. Audit credit does not appear on transcripts. Currently enrolled students may audit courses without charge. Rice alumni are charged a fee of \$260 per course per semester. All others are charged \$515 per course per semester for the privilege of auditing. Request to audit a class must be done during the first week of the semester.

Tuition, Fees, and Expenses

Charges for tuition, fees, and room and board are billed to students each semester. Students may pay the charges in full by the due date or in installments over the course of the semester. The fall semester due date is mid-July for freshmen and mid-August for all others, and the spring semester due date is the first week of January. The following costs apply to undergraduates in the 2002–2003 school year:

Tuition	Annual	Semester	Hour ²
Entering first-year and transfer students ¹	\$17,550	\$8,775	\$732
Students matriculating in 2001–02 ¹	\$16,850	\$8,425	\$702
Students matriculating in 2000–01	\$16,750	\$8,375	\$698
Students matriculating in 1999–2000	\$16,550	\$8,275	\$690
Students matriculating in 1998–99	\$16,100	\$8,050	\$672
Students matriculating in 1997–98	\$15,500	\$7,750	\$646

¹ Tuition indexed for five years

² By special permission only

Required Fees	Fall	Spring	Annual
Student activities ³	\$ 84.00		
Athletic events	\$100.00		
College	\$ 50.00		
Student health fee	\$148.00	\$148.00	
Shuttle	\$ 37.00		
Information Technology (on-campus)	\$200.00		
Total fees	\$619.00	\$148.00	\$767.00

Information Technology (off-campus) \$100.00

³ Fifth-year students in professional degree programs and students working toward a second bachelor's degree may pay a reduced student activities fee of \$13.70, which covers the Student Association, Student Organizations Activity, University Court, and Honor Council portions of the activity fee, and elect not to pay the college fee.

Room and Board	Annual	Semester
Room	\$ 4,450	\$2,225
Board	\$ 2,980	\$1,490

Any undergraduate who withdraws or takes an approved leave of absence and then gains readmission to the university pays the tuition applicable at their matriculation, plus annual Consumer Price Index increases for a period not to exceed six years. Starting with fall 2001 matriculants, the index period is not to exceed five years. After five/six years, students pay the tuition applicable to the entering class.

Refund of Tuition and Fees

Students who withdraw during the first two weeks of the semester are not charged tuition or fees for that semester. Students who withdraw during the third week must pay 30 percent of the semester's tuition, receiving a 70 percent refund. The amount of the refund drops by 10 percent at the beginning of each successive week that passes before withdrawal until the ninth week, after which no refund is made. Federal regulations require a refund calculation for all students receiving Title IV funds. The length of time during which a refund must be calculated is up to 60 percent of the payment period (semester). If a student withdraws on or before the 60 percent point in time, a portion of the Title IV funds awarded to a student (Pell Grant, Federal SEOG, Federal Perkins Loan, Federal Direct Subsidized, Unsubsidized, and Federal PLUS Loans, and the Texas LEAP Grant) must be returned, according to the provisions of the Higher Education Act as amended. The calculation of the return of these funds may result in the student owing a balance to the university and/or the Department of Education.

For students withdrawing after the second week of classes in a semester, fees or special charges (see pages 50–51) are not refunded. Similarly, students withdrawing or

taking leaves of absence in the spring semester do not receive a partial refund of fees paid for the full year. Students withdrawing at any time forfeit the \$100 enrollment deposit they paid as incoming students.

Students who receive approval to enroll with a course load of fewer than 12 hours during the first nine weeks of the semester may be entitled to a tuition rebate based on the same refund schedule used for withdrawing students. Any such rebate depends on the actual date by which the registrar's office processes the relevant drop form.

Students unable to resolve with the cashier's office any request for special consideration in connection with waivers, refunds, or adjusted payments on tuition, fees, and other charges should forward their appeals to the vice president for enrollment services. Resolution of waivers and refunds for room and board charges require the approval of the vice president for finance and administration.

Living Expenses

Residence fees cover dining hall costs and residence maintenance. They are established each year as needs dictate. For 2002–2003, the annual room and board charge for residence in a residential college is \$7,430. This charge includes the room and all the meals eaten during the year.

Housing. About 77 percent of Rice undergraduates live in the on-campus residential colleges. Information about the residential colleges and room application forms accompany the notice of admission sent to each new undergraduate. Room reservations cannot be made before notification of admission. Further information on housing in the residential colleges is available from the Office of Student Affairs, and information on off-campus housing is provided by the Office of Academic Advising.

When they receive their residential college room assignments for the academic year to follow, students must sign a housing agreement. To reserve their space, current students must sign a housing agreement by the date established in their respective colleges but no later than April 15. New students must make a \$50 deposit before May 1. These nonrefundable deposits are applied to the following semester's room and board charges.

Board. Meals are served cafeteria-style and are all-you-care-to-eat. The colleges provide three meals per day Monday through Friday, breakfast and lunch on Saturday, and lunch and dinner on Sunday. Meals are not served during the Thanksgiving holiday, at the mid-year break, over the fall and spring mid-term recesses, and during spring holidays. Information on optional meal plans is available from the College Food Service (<http://food.rice.edu/index.html>).

Payments and Refunds. Students may pay their residence fee in installments. The exact amounts and due dates appear in the Residential Housing Agreement. Students moving out of the college for any reason receive a refund (or a credit) of the reduced balance of board charges but must still pay the full room charge for the entire academic year. Possible exceptions in the case of academic suspension, Rice-sponsored study abroad, and family emergencies are treated on a case-by-case basis.

Special Charges

The following charges are separate from the regular fees. For charges due to late registration or course changes made after the deadlines, see Registration (page 28–30).

Preceptorship per semester	\$185.00
Internship per semester	\$185.00
Enrollment continuance fee (Study Abroad) per semester	\$125.00
Newspaper fee	\$9.00
Telecommunications fee (on-campus students) per semester	\$55.00
Late payment penalty	\$70.00
Undergraduate application fee	\$35.00
Part-time registration fee	\$100.00
Orientation Week room and board	\$205.00
Orientation Week room and board (coordinators)	\$155.00
Orientation Week (College fee)	\$190.00
Late registration fee	\$95.00
Failure to pre-register fee	\$45.00
Deferred payment plan late fee	\$25.00
College withdrawal: suspension	\$225.00
College withdrawal: breaking of lease	\$625.00
Diploma fee: sheepskin	\$85.00
Diploma fee: parchment	\$25.00
Diploma mailing fee: domestic	\$15.00
Diploma mailing fee: air mail	\$21.00
Diploma mailing fee: facsimile	\$5.00
Transcript fee	\$5.00
Replacement ID	\$10.00
Freshman parking permit	\$150.00

Health Insurance

All Rice students must have health insurance. Students may purchase insurance for the 2002–2003 school year through the university program developed for Rice students at a yearly premium of \$1,630 (Plan A) or \$995 (Plan B). Coverage is effective from 12:01 A.M., August 15, 2002, until 12:01 A.M., August 15, 2003. Dependent coverage is also available. A description of the policy, application form, and waiver form can be found on the Web at <http://studenthealthinsurance.rice.edu>. Student should submit either the application or waiver by August 15 each year.

Education Certification Program Fees

Students enrolling in the student teaching apprenticeship or internship plans must pay a \$185 registration fee for each semester. An additional \$25 fee (paid to the School of Continuing Studies) is due for each summer school session.

Delinquent Accounts

No student in arrears of any financial obligation to Rice as of the last day of registration for any semester can register for classes. The university will not issue certificates of attendance, diplomas, or transcripts at any time for a student whose account is in arrears.

Students who have not made satisfactory arrangements with the cashier for payment of current charges or who have moved on campus without a proper room contract may be dismissed from the university.

Transcripts

Transcripts are issued on written request to the Office of the Registrar. The registrar does not issue transcripts without the consent of the individual whose record is concerned. The charge of \$5 for each copy is payable in advance. Those requesting transcripts by mail should include payment with the request.

Financial Aid

The financial aid programs at Rice provide assistance to meet demonstrated need for university attendance for all admitted students. Through grants, endowments, low-interest loans, campus work opportunities, or a combination of these programs, Rice makes every effort to provide students and families sufficient assistance to meet their educational expenses. The financial aid program receives funding from many sources. Rice uses contributions from alumni and friends to establish and maintain scholarships and loan funds. Federal and state grants and work and loan programs also provide funds. Awards are based primarily on financial need and a computed Expected Family Contribution (EFC), although there are also attractive loan opportunities for students and families who have no need.

The university determines need for first-time students by having them register for the College Scholarship Service (CSS) PROFILE, and sending the PROFILE packet to CSS. Register for CSS PROFILE by calling 1-800-778-6888 or by visiting their website at www.collegeboard.com. CSS will mail you the PROFILE; complete and return it to CSS. Students may also complete the PROFILE online. The PROFILE number for Rice is 6609. First-time students also complete the Free Application for Federal Student Aid (FAFSA) and submit copies of student and parent income tax and W-2 forms.

The university determines need for continuing students by having them complete the FAFSA and the Rice Financial Aid Application; continuing students also submit student and parent 2002 income tax and W-2 forms. Returning students are not required to complete a PROFILE form.

“Need” is the amount required to meet the difference between each student’s total educational expenses and his or her family’s resources. Parents are expected to contribute according to their financial means, taking into account income, assets, home equity, number of dependents, and other relevant factors. Students are expected to contribute as well from their own assets and earnings, including appropriate borrowing against future earnings.

The brochure *Financing Your Education* explains the assistance programs in detail. Copies are available from the Office of Admission or the Office of Student Financial Services. The university also publishes budgets that realistically summarize student expenses, including living costs at home and on or off campus, personal expenses, and travel.

Need-Based Application Process

Rice University is a need-blind school. Applicants are admitted to the university regardless of their family’s ability to pay for college. Rice will meet 100% of financial need as determined by university calculations.

Rice considers applicants for all appropriate assistance administered by the university, including grants, scholarships, loans, and work. Students receive notification of an offer once their financial aid file is complete. Student Financial Services provides financial assistance only for coursework sponsored through Rice University.

To apply for financial assistance, first time students (including Early Decision students) must submit the following:

- CSS PROFILE, priority date February 1
- Free Application for Federal Student Aid (FAFSA), priority date February 1
- Student and parent 2002 income tax and W-2 forms, priority date March 1

Continuing students must submit the following:

- FAFSA, priority date April 15
- Rice Financial Aid Application, priority date April 15
- Student and parent 2002 income tax and W-2 forms, priority date April 15

Decision

All freshman aid applicants will also be required to submit both the student’s and parent(s)’ 2002 federal income tax forms by May 1, 2003.

Financial aid offers are made annually. Payment terms are specified in the Financial Aid offer letter. Because financial circumstances change from year to year, Rice conducts an annual review of need and offers need accordingly. For this reason, continuing students must complete and return the Rice University Application for Financial Aid to the university and file the FAFSA every year that they seek assistance.

The university, from time to time, may adjust its methods of computing financial need or its policies regarding the types of financial assistance that it offers so as to meet the financial needs of the largest possible number of students. Therefore, the amount and type of financial aid may change from year to year, even when the student’s financial situation appears to remain relatively stable.

Types of Financial Aid and Assistance

Student Loan Funds. To assist students and parents with educational financing, the Office of Student Financial Services participates in the following programs:

- **Stafford Student Loan.** These are low-interest loans made to students, attending school on at least a half-time basis. Subsidized Stafford loans require financial aid eligibility, but unsubsidized Stafford loans are available to all students. These variable loans are capped at 8.25%.
- **Parent Loan for Undergraduate Students (PLUS loan).** The PLUS loan is a low-interest loan to parents or legal guardians of dependent undergraduate students. Eligibility is not based on demonstrated financial need. This variable loan is capped at 9%.
- **Federal Perkins Loan Program.** The Federal Perkins Loan Program provides long-term federal loans for U.S. citizens and permanent residents. The amounts offered vary according to financial aid eligibility. The Federal Perkins Loan is a 5% interest-free loan while the student is enrolled in school.
- **College Access Loan.** The College Access Loan (CAL) is designed to assist the student whose family experiences difficulty in meeting the Estimated Family Contribution (EFC) to qualify. To qualify, the student must be a Texas resident or a National Merit Scholarship recipient.

A few endowments for student loans have been established at Rice primarily as memorial tributes. These funds exist separately from the normal financial aid program. Rice uses them to make emergency loans to students experiencing unexpected financial problems or showing additional need beyond regular eligibility.

All applications for these loans must be submitted to the Office of Student Financial Services.

Student Employment Programs. Opportunities for employment are available to students, either on or off campus, during the academic year. Students are eligible to work under the Federal Work-Study Program or the Rice University Work Program. Students interested in employment should access the Student Financial Services web page at <http://www.ruf.rice.edu/~fina/employmnet.htm>.

Deferred Payment Plan. Rice offers a deferred payment plan to enable families to finance students' educational costs. This plan divides each semester's charge over four installments. Applications and details are available to eligible students each semester at the time of billing. Students arrange for deferred payment through the Cashier's Office.

Vocational Rehabilitation

The Texas Rehabilitation Commission (TRC) provides assistance in paying tuition and nonrefundable fees for students who have certain disabling conditions. Once a TRC counselor approves their vocational objectives, students affected by orthopedic deformities, emotional disorders, diabetes, epilepsy, heart problems, and other disabling conditions are eligible for assistance. The TRC offers a range of services to help handicapped students become employable. Interested students should apply to the Texas Rehabilitation Commission.

Students with visual handicaps should contact the Texas State Commission for the Blind.

Financial Aid Policy

Undergraduates may receive a Rice University Tuition Grant and Rice endowed funds for eight semesters. However, undergraduates may receive federal and state aid beyond eight semesters, but not to exceed Rice's quantitative maximum.

Satisfactory Progress Policy for Financial Aid Recipients. The Higher Education Act of 1965, as amended by Congress, mandates that institutions of higher education maintain minimum standards of "satisfactory progress" for students to receive financial aid.

Required Grade Point Average. Students at Rice are placed on **financial aid probation** if at the end of any semester they have either of the following:

- A cumulative grade point average that is less than 1.67
- A grade point average for that semester that is less than 1.67

The period of probation extends to the end of the next semester that the student is enrolled at the university.

Except for those completing their first semester at Rice, students are **ineligible for financial aid** if at the end of any semester they earn either of the following:

- Grades that would result in financial aid probation for a third time
- A grade point average that is less than 1.00 for that semester

The period of financial aid ineligibility normally lasts at least one semester.

Students who regain financial aid eligibility will lose it again if in any succeeding semester they fail to achieve either of the following:

- A cumulative and semester grade point average of at least 1.67
- A semester grade point average of at least 2.00

Ineligibility a second time results in at least two semesters without aid. Normally students receive no further aid after a third ineligibility.

Required Semester Hours. Students failing to make "satisfactory progress" in course work may become ineligible for aid. Students must earn:

- At least 18 semester hours credit by the end of the first academic year
- At least 44 hours by the end of the second year
- At least 70 hours by the end of the third year
- At least 96 hours by the end of the fourth year

Students not receiving a bachelor's degree within the 120 hours maximum allowance will need to appeal to the director of student financial services for continued financial assistance.

The academic year commences with the first day of classes of the fall semester and continues to the first day of classes the following fall. Students denied financial aid because of insufficient semester hours regain eligibility only when they complete enough credits, including incomplete courses, to make up the shortage.

Return of Title IV Funds. Students who receive federal funds as part of their aid packages and do not complete an academic term may be subject to returning a portion of those funds. Contact Student Financial Services for information about the "Return of Title IV Funds" policy.

Termination of Aid and Appeal. The Office of Student Financial Services sends written notification to students qualifying for financial assistance who have not made minimum "satisfactory progress" and whose aid therefore is being terminated. At the end of the fall semester, the notice is sent to the student's college. At the end of the spring semester, the notice is sent to the most recent permanent address provided to the registrar by the student. In both cases, the office considers the notifications, once sent, to be delivered.

Any student ruled ineligible for financial aid due to lack of "satisfactory progress" may appeal such action to the director for student financial services. Students should send their appeals in writing to the director, who may take into account mitigating circumstances.

Regaining Eligibility. To regain eligibility, students must address a letter of petition to the director of student financial services, following the procedures for the readmission of suspended students; see Readmission After Suspension (page 37). Suspended students readmitted by the Committee on Examinations and Standing need not petition the director of student financial services.

Honor Societies

Honor societies at Rice include the following:

Phi Lambda Upsilon—national honorary chemical society promoting high scholarship and original investigation in all branches of pure and applied chemistry (Rice chapter: 1926)

Phi Beta Kappa—founded in 1776 at the College of William and Mary to recognize intellectual achievement and the love of learning among students in the liberal arts and sciences (Rice chapter: March 1, 1929)

Pi Delta Phi—organized to interest French students in competing for high standing in scholarship (Theta chapter at Rice: May 1930)

Society of Sigma Xi—for the promotion of research in science (Beta of Texas chapter at Rice: March 23, 1938)

Tau Beta Pi Association—organized to interest engineering students in competing for high standing in scholarship (Gamma of Texas chapter at Rice: December 18, 1940)

Delta Phi Alpha—to promote an interest in the German language and literature (Gamma Xi chapter at Rice: April 1949)

Sigma Delta Pi—to promote an interest in the Spanish language and literature (Rice chapter: May 14, 1953)

Tau Sigma Delta—national honor society in architecture and applied arts (Tau chapter at Rice: May 7, 1961)

Eta Kappa Nu—founded in 1904 at the University of Illinois for electrical engineering students, to stimulate and reward scholarship as well as assist and encourage its members to grow professionally throughout their lives (Rice chapter: January 1981)

Omicron Delta Epsilon—to promote study in economics (Rice chapter: 1981)

Psi Chi—founded in 1929 at Yale University to encourage, stimulate, and maintain excellence in scholarship and to advance the science of psychology (Rice chapter: April 23, 1990)

Undergraduate Student Life

Residential Colleges

All undergraduate students at Rice, whether they live on campus or not, are members of one of nine residential colleges. All colleges are coeducational.

Each college has faculty masters who live in a house next to the college. Reporting to the vice president for student affairs, the masters have overall responsibility for all aspects of student life in the college, especially for encouraging broad cultural and intellectual interests and for promoting self-discipline and effective self-government within the college. Upon agreement, the students and masters invite other members of the Rice faculty to become resident and nonresident associates of the college. Faculty associates act as advisers to the students and participate in the various activities of the college. Colleges also have nonfaculty university associates and community associates drawn from various professions in the Houston area.

Each college exists as a self-governing group of students. The elected officers and representatives are responsible to the masters and to the college membership for:

- Directing the college's cultural, social, and athletic activities
- Expenditure of college funds
- Maintaining order in the college

While uniformity among the colleges has never been sought and each college has developed its own particular interests and character, all seek to foster fellowship among their members and a mature sense of honor, responsibility, and sound judgment.

College Assignment. Each undergraduate, upon acceptance by the university, is designated a member of one of the colleges. Two students entering Rice for the first time may request assignment to the same college, but they may not designate which college. New students may also request membership in the same college as a close relative. Except for these cases, students have no individual choice of college.

Room and Board. College buildings include a dining hall and public rooms, which are available to both resident and nonresident members, and living quarters for approximately 215 students from all classes and all academic disciplines.

At present, Rice has room in its on-campus residential colleges for about 75 percent of its undergraduate students. Although most of the students who want to live in the colleges can be accommodated, demand usually exceeds the available number of rooms. The university makes every effort to provide housing in the colleges for all incoming

first-year students who wish to live on campus, but space cannot be guaranteed. Continuing students draw for rooms according to the priority system established in each college. No student is required to live on campus; however, those members of the colleges who live off campus are encouraged to eat in their colleges and to participate in college activities.

The College Food Service provides à la carte meals, with the exception of prepaid dinners. Its other services include:

- Assistance with special diets prescribed by a physician
- Sack lunches for students who must miss a meal due to a job conflict
- Sick trays for students when requested by the Student Health Service
- Alternate menu entrées, whenever possible, to accommodate students' religious practices

For more information on room and board, see Living Expenses (page 50).

College Courses. One of the colleges' important activities is their sponsorship of courses and workshops open to all students. By expanding course offerings outside the traditional departments, college courses promote the academic involvement of the colleges while introducing students to interdisciplinary topics of particular interest.

Students propose college courses during the semester before they are offered. Once approved by the masters and faculty associates of the college and by the vice president for student affairs and the provost, these college courses are offered for academic credit on the same basis as departmental courses. The registrar provides a list of college courses each semester during preliminary registration.

Student Government

All undergraduates are members of the Rice Student Association, which is governed through the Student Senate. The senate includes the president, two vice presidents, the secretary, the treasurer, the nine college presidents, and nine college senators.

Alleged violations of university or college rules are handled in accordance with the Code of Student Conduct. In most cases, original jurisdiction belongs to student courts. Students may appeal verdicts to the college masters or the assistant dean for student judicial programs, as appropriate with a final appeal to the vice president for student affairs. The student-staffed Honor Council conducts hearings and trials for alleged offenses against the honor system (see page 8). Rice retains ultimate authority in all matters of discipline and over all actions that affect its educational function or the safety and well-being of members of the university community.

Award Presentations. The Rice Student Association presents two coveted awards annually, one to a student and one to a faculty or staff member. The Rice Service Award, a memorial to Hugh Scott Cameron, first dean of students at Rice, is awarded to currently enrolled or former members of the association who have rendered distinguished service to the student body. The Mentor Recognition Award recognizes extraordinary service to the student body by a current member of the faculty or staff. A committee of faculty and students appointed by the association makes the selections.

Office of Student Activities

The Office of Student Activities, located in the Rice Memorial Center cloisters, oversees the activities of various campuswide student organizations. It also handles student requests for facilities and party permits, and it coordinates leadership development programs, including the annual leadership retreat and symposium.

Principal student organizations include the following:

- Rice Student Association, the student governing body

- Rice Program Council, which sponsors various events of current interest to the student body as well as social functions
- KTRU, the student-run radio station, operating 24 hours, seven days a week, on 91.7 FM
- Student publications (e.g., *Rice Thresher*, the student newspaper; *Campanile*, the yearbook; *The Rice Undergraduate: The Annual Academic Review*, a collection of peer-reviewed student papers; and *University Blue*, a literary and visual arts publication)

A large number of student organizations address special student interests, such as the Black Student Association, the Hispanic Association for Cultural Education at Rice, the Chinese Student Association, Rice Young Democrats, and Rice Republicans. There also are numerous clubs for such sports as sailing, rugby, lacrosse, volleyball, and soccer. Other special-interest groups include a premed society, forensic society, juggling club, and vegetarian club.

Many organizations are associated with special academic and professional disciplines, such as foreign language clubs, honor societies, and student affiliates of the American Chemical Society, the American Society of Civil Engineers, and the American Society of Mechanical Engineers.

The Rice Players, an extracurricular theater group of Rice students, faculty, and staff, present at least four productions each year and welcome participation by anyone interested in any aspect of theater production or management.

Rice students also maintain affiliations with a number of religious organizations. These include, but are not limited to, the Baptist Student Union, Canterbury Association, Catholic Student Association, Christian Science Organization, Hillel Society, Lutheran Student Association, Intervarsity Christian Fellowship, and the Wesley Foundation. Many of these clubs are assisted by local clergy who form the Joint Campus Ministry.

The Office of Student Organizations on the second floor of the Ley Student Center houses mailboxes for all student organizations. There is a student organization work space in the basement of the Rice Memorial Center that has office space, storage, and computers for student organization use.

Community Involvement Center/Rice Student Volunteer Program

Housed in the cloisters of the Rice Memorial Center, the Community Involvement Center works to develop a culture of service within the university by functioning as an advocate for community service, social responsibility, and an increased awareness of social and community issues. The center acts as a clearinghouse for resources and referrals involving local, national, and international community agencies and service opportunities. By making educational programs and information available, the center fosters a lifelong commitment to service among students, faculty, and staff. It also organizes alternative semester break service trips, volunteer fairs, beach cleanups, and other activities. The 10 student service organizations supported by the Community Involvement Center include Rice Habitat for Humanity, youth mentoring and tutoring programs, tutoring in English as a second language, Best Buddies, and the Rice Student Volunteer Program.

By heightening student awareness of community needs and generally raising social consciousness, the Rice Student Volunteer Program (RSVP) has organized volunteer projects for Rice students, faculty, and staff since 1985. The largest event of each semester is Outreach Day, a Saturday when approximately 500 students volunteer with more than 30 nonprofit agencies throughout the Houston area, learning how to take thoughtful action to build a stronger, more just community. With an office in the cloisters of the Rice Memorial Center, RSVP invites each student's involvement as an officer, a college representative, a committee member, a project organizer, or an

interested participant in any RSVP event.

Intercollegiate Speech and Debate

Consistently ranked in the top 10 nationally, the George R. Brown Forensic Society sponsors competition in the categories of Individual Events, Lincoln–Douglas, and Parliamentary Debate. The society provides students with the chance to hone their public speaking skills and to qualify for competition both at the American Forensic Association National Individual Events Tournament and at the National Parliamentary Debate Championships. Recognizing the importance of developing strong communication skills, the society has an open admissions policy, inviting students with little or no previous experience as well as those with extensive high school backgrounds to become members of one of the most successful teams at Rice.

Introduction

Since Rice opened in 1912, the university has recognized the importance of graduate study and research as a principal means of advancing knowledge. The first Doctor of Philosophy degree was awarded in 1918 in mathematics. Since that time, the graduate area has expanded to encompass the schools of architecture, engineering, humanities, management, music, natural sciences, and social sciences, as well as interdepartmental areas. The graduate program has steadily increased over time; Rice now enrolls approximately 1,700 graduate students and offers advanced degrees in 31 fields of study.

Graduate programs lead to either research or professional degrees. Research programs generally require the completion of a publishable thesis that represents an original and significant contribution to the particular field of study. Research degrees include the Doctor of Philosophy (Ph.D.), Doctor of Architecture (D.Arch.), Master of Arts (M.A.), and Master of Science (M.S.).

Professional programs provide advanced course work in several disciplines but do not generally include independent research. These programs lead to degrees in most of the major schools including many engineering disciplines. (See the charts on pages 64–67 for a complete listing of degrees offered.)

All degrees conferred by the university are awarded solely in recognition of educational attainments and not as warranty of future employment or admission to other programs of higher education.

For additional information on graduate programs and requirements, please go to <http://rgs.rice.edu>.

Graduate Degrees

Research Degrees

For general information on advanced degree work at Rice, see Requirements for Graduate Study (pages 68–70). Specific requirements for advanced research degrees in each field of study appear in the appropriate departmental pages (pages 85–251). Students seeking additional material should contact the appropriate department chair (see Department Information Chart on pages 74–77).

Ph.D. Programs. The Ph.D. degree is awarded for original studies in the departments listed in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (pages 64–67); in architecture, the equivalent degree is the D.Arch. Candidates receive a Ph.D. degree after successfully completing at least 90 semester hours of advanced study and concluding an original investigation that is formalized in an approved thesis. As final evidence of preparation for this degree, the candidate must pass a public oral examination. (See also Candidacy, Oral Examinations, and the Thesis on pages 70–72.) The residency requirement for the doctorate is four semesters of full-time study at the university.

Master's Programs. The M.A. degree is available in the departments listed in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (pages 64–67), including certain scientific fields of study. The M.S. degree is offered in the engineering and science fields also listed in the chart. Candidates may undertake the M.Arch., M.Arch. in Urban Design, and M.Mus. degrees as research degrees by adopting the thesis option. Candidates receive a master's degree after completing at

least 30 semester hours of study (including thesis hours), 24 hours of which must be taken at Rice. Master's programs require original work reported in a thesis and a public examination. Most students take three or four semesters to complete a master's degree (some programs may require more time). Students receiving a master's degree must be enrolled in a graduate program at Rice University for at least one semester.

Students may also pursue a nonthesis degree in certain departments. This degree would be based on alternative departmental requirements and would include, but not be limited to, the following:

- 30 semester hours of study
- 24 semester hours must be at Rice University
- Minimum residency is one semester of full-time study
- At least 15 hours of course work must be at or above the 500 level
- All courses must be in the relevant field

In certain departments, students may receive a master's degree (called an *Automatic Master's*) when they achieve candidacy for the doctoral degree. Students seeking a master's degree in this manner must submit a petition for the degree, signed by their department chair, to the Office of the Vice Provost for Research and Graduate Studies by February 1 of the year in which the degree is to be awarded. (See also Candidacy, Oral Examinations, and the Thesis on pages 70–72.)

Professional Degrees

Rice University offers advanced degree programs to prepare students for positions in a number of professional fields. The professional degrees listed in the Introduction (page 62) appear in the Graduate Degree and Interdepartmental and Cooperative Programs Charts (pages 64–67). In some departments, the professional degree also prepares the student for a doctoral-level program. All professional degrees are master's degrees with one exception: Candidates earn the D.M.A. after concluding a program of advanced music study.

For general information on advanced degree work at Rice, see Requirements for Graduate Study (pages 68–70). Requirements for professional degrees include the successful completion of 30 semester hours or more of upper-level courses (at the 300 level or higher) with at least 24 hours taken at Rice. Additional information and specific requirements for individual degrees appear, listed by department, in the Undergraduate Degree Chart (pages 25–27). Program information and application materials are also available from the department chairs (see Department Information Chart on pages 74–77).

Admission into a professional program is granted separately from admission into a research or thesis program. Students who wish to change from a thesis program to a professional degree program must petition their department in writing. Upon recommendation of the department and approval by the dean's office, the request is sent to the Office of Research and Graduate Studies for consideration and final approval. If approved, students who received tuition waivers while enrolled in the thesis program will be expected to repay the tuition before their professional degrees are awarded. Professional degree programs terminate when the degree is awarded. Students who wish to continue graduate study after completing a professional program must reapply for admission into a research program.

GRADUATE DEGREE CHART

School Department	Graduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
SCHOOL OF ARCHITECTURE		
	M.Arch., M.Arch. in Urban Design, D.Arch.	
GEORGE R. BROWN SCHOOL OF ENGINEERING		
Bioengineering	M.S., Ph.D.	Biochemical engineering, biological systems modeling, biomaterials, biomedical lasers, cellular and molecular engineering, controlled release technologies, metabolic engineering, phytoremediation, spectroscopy, systems engineering and instrumentation, thrombosis, tissue engineering, and transport processes.
Chemical Engineering	M.Ch.E., M.S., Ph.D.	Thermodynamics and phase equilibria, chemical kinetics and catalysis, optimization and process control, rheology and fluid mechanics, polymer science, biomedical engineering, enhanced oil recovery and cleanup of groundwater aquifers, and biochemical reactor engineering
Civil and Environmental Engineering	M.C.E., M.E.E., M.E.S. M.S., Ph.D.	Civil engineering: structural dynamics and control, structures and mechanics, reinforced and prestressed concrete, geotechnical engineering, computer-aided engineering, probability and random vibrations, reliability of systems, and solid mechanics Environmental science: environmental biology, chemistry, toxicology, geology, and planning; surface and groundwater hydrology; water and wastewater treatment; and urban and regional air quality. Environmental engineering: hydrology and water resources engineering; water and wastewater treatment, design, and operation; and numerical modeling
Computational and Applied Mathematics	M.C.A.M., M.C.S.E., M.A., Ph.D.	Numerical analysis, operations research, and differential equations; additional program in computational science and engineering (see Interdepartmental and Cooperative Programs)
Computer Science	M.C.S., M.S., Ph.D.	Algorithms and complexity, artificial intelligence and robotics, bioinformatics, compilers, distributed and parallel computation, graphics and visualization, operating systems, and programming languages
Electrical and Computer Engineering	M.E.E., M.S., Ph.D.	Bioengineering, communication and signal processing, computer architecture and networking, electro-optics, and device physics
Mechanical Engineering and Materials Science	M.M.E., M.M.S., M.S., Ph.D.	Mechanical engineering: mechanics, computational mechanics, stochastic mechanics, fluid dynamics, heat transfer, dynamics and control, robotics, biomedical systems, and aerospace sciences. Materials science: nanotechnology, metals physics, statistical mechanics, metallic solid thermodynamics, materials chemistry, aspects of composites, coatings and thin films, and interface science
Statistics	M.Stat., M.A., Ph.D.	Applied probability, Bayesian methods, bioinformatics, biomathematics, biostatistics, data analysis, data mining, density estimation, epidemiology, environmental statistics, financial statistics, image processing, model building, nonparametric function estimation, quality control, risk management, spatial temporal statistics, statistical computing, statistical genetics, statistical visualization, stochastic processes, and time series analysis

School Department	Graduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
SCHOOL OF HUMANITIES		
Art and Art History	No graduate degree offered	History of art; options in classical archaeology and media studies
English	M.A., Ph.D.	British and American literature and literary theory
French Studies	M.A., Ph.D.	French literature, language, and culture
German and Slavic Studies	No graduate degree offered	German and German cultural studies
Hispanic and Classical Studies	M.A.	Spanish language and literature
History	M.A., Ph.D.	U.S., European, and other history
Kinesiology	No graduate degree offered	
Linguistics	Ph.D.	Anthropological, applied, cognitive, field, functional or discourse, and English, German, or Romance linguistics; second language acquisition; and language typology and universals
Philosophy	M.A., Ph.D.	Specialization in medical ethics
Religious Studies	M.A., Ph.D.	Religion and contemporary cultures; scriptural interpretation; ethics and philosophy of religion; mysticism, psychology, and religious practices

JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT

M.B.A., M.B.A./Master of Engineering M.B.A./M.D. (with Baylor College of Medicine) M.B.A. for Executives	M.B.A. is a general management degree; however, students may have informal concentrations in the following areas: accounting, entrepreneurship, finance, general management, international business, information technology, marketing, operations management, organizational behavior and human resource management, healthcare management, and strategic management and planning; joint nonthesis degree option with all engineering disciplines
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SHEPHERD SCHOOL OF MUSIC

B.Mus./M.Mus., M.Mus., D.M.A.	Composition, choral and instrumental conducting, historical musicology, performance, and music theory Composition and selected areas of performance
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WIESS SCHOOL OF NATURAL SCIENCES

Biochemistry and Cell Biology	M.A., Ph.D.	Biochemistry, biophysics, developmental biology, cell biology, genetics, molecular biology, neurobiology, structure and function of nucleic acids and proteins, regulatory processes, biochemistry of lipids, enzymology, NMR and crystallography, cellular regulation, oxygen and electron transport, molecular genetics of plants, animals, fungi, bacteria, and bacteriophage
Chemistry	M.A., Ph.D.	Organic chemistry, inorganic chemistry, physical chemistry, nanotechnology, biological chemistry, and theoretical and computational chemistry
Ecology and Evolutionary Biology	M.A., Ph.D.	Biogeochemistry, wetland ecology, plant community and population ecology, insect diversity and community structure, behavioral ecology, sociobiology, and molecular evolution

School Department	Graduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
Earth Science	M.A., Ph.D.	Marine geology and geophysics; sedimentology, stratigraphy, paleoceanography, paleoclimatology, evolution of continental margins and carbonate platforms; tectonics, neotectonics, tectonophysics, geodynamics, mantle processes, planetology, and space geodesy; remote sensing, potential fields, reflection and lithospheric seismology, wave propagation and inverse theory; kinetics of fluid-solid interactions, low T aqueous geochemistry, petrology, and high T geochemistry
Mathematics	M.A., Ph.D.	Differential and algebraic geometry, ergodic theory, partial differential equations, probability and combinatorics, real analysis, complex variables, and geometric and algebraic topology
Physics and Astronomy	M.A., M.S., Ph.D.	Atomic and molecular physics, biophysics, particle physics, condensed matter physics, surface physics, space physics, astronomy, and theoretical physics
SCHOOL OF SOCIAL SCIENCES		
Anthropology	M.A., Ph.D.	Archaeology and social/cultural anthropology
Economics	M.A., Ph.D.	Econometrics, economic development, economic theory, industrial organization and regulation, international trade and finance, labor, macroeconomics/monetary theory, and public finance
Political Science	M.A., Ph.D.	American government, comparative government, and international relations
Psychology	M.A., Ph.D.	Cognitive-experimental psychology and industrial-organizational/social psychology, with tracks in engineering psychology, human-computer interaction, and neuropsychology

Interdepartmental and Cooperative Programs

Opportunities for graduate study are available in a number of interdisciplinary areas. The advanced degree programs listed in the Interdepartmental and Cooperative Programs Chart (below) are administered by the participating Rice departments. They represent fields of study in rapidly developing areas of science and engineering or those areas subject to multiple investigations and interests. Rice has also established ties with other Houston universities and the Texas Medical Center to enable graduate students to receive training in computational biology research, to earn separate degrees simultaneously, or to focus their doctoral study on the specialized field of medical ethics.

INTERDEPARTMENTAL AND COOPERATIVE PROGRAMS CHART

Program	Degrees Offered	Departments/Areas of Concentration
INTERDEPARTMENTAL PROGRAMS		
Applied Physics	Master's, Ph.D.	Departments in physics, chemistry, electrical and computer engineering, mechanical engineering and materials sciences, bioengineering, computational and applied mathematics, and physics and astronomy; sciences that underlie important new and emerging technologies. Contact: Rice Quantum Institute, 713-348-6356 or quantum@rice.edu

School Department	Graduate Degrees Offered	Additional Options or Areas of Concentration (within majors)
Computational Science and Engineering	Master's, Ph.D.	Modern computational techniques and use of powerful, new computers in research, development, and design involving the following departments: computational and applied mathematics, biochemistry and cell biology, geology and geophysics, computer science, chemical engineering, electrical and computer engineering, and statistics. Contact: 713-348-4805 or caam@caam.rice.edu
Education Certification	M.A.T.	Secondary teaching certification in conjunction with B.A. in major field
Environmental Analysis and Decision Making	Master's	Departments in computational and applied mathematics, statistics, civil and environmental engineering, chemistry, earth science, ecology and evolutionary biology, mechanical engineering and materials science, chemical engineering, sociology, electrical and computer engineering, management, and natural sciences. Contact Professional Master's Program: 713-348-3188 or profms@rice.edu
Materials Science and Engineering	Master's, Ph.D.	Departments in chemistry, electrical and computer engineering, mechanical engineering and materials sciences, chemical engineering, and physics. Contact: 713-348-4906 or mems@rice.edu
Nanoscale Physics	Master's	Departments in physics and astronomy, electrical and computer engineering, chemistry, management, and natural sciences. Contact Professional Master's Program: 713-348-3188 or profms@rice.edu
Systems Theory	Master's, Ph.D.	Departments in chemical engineering, mechanical engineering and materials sciences, economics, electrical and computer engineering, and mathematics. Contact: 713-348-4020 or elec@rice.edu

COOPERATIVE PROGRAMS

Joint Programs in Biomedical Ethics	M.A., Ph.D.	Religious studies degree with the University of Texas Health Science Center at Houston. Contact: 713-348-5201 or reli@rice.edu Philosophy degree with the Baylor College of Medicine and the Institute of Religion. Contact: 713-348-4994 or phil@rice.edu
Joint Program in Computational Biology	Training opportunities for Ph.D. students	Research in a lab setting, seminars and workshops, and access to advanced resources of W.M. Keck Center for Computational Biology (fellowships available); with Baylor College of Medicine and the University of Houston. Contact: 713-348-4752 or bioc@rice.edu
Joint Programs with Medical Colleges	M.D./Ph.D., M.D./M.A., M.D./M.S.	Combined M.D. and advanced research degree for research careers in medicine; with Baylor College of Medicine. Contact: 713-348-5869 or bioeng@rice.edu

Admission to Graduate Study

Graduate study is open to a limited number of extremely well-qualified students with a substantial background in their proposed field of study (this usually, though not always, means an undergraduate major in the field). Each department determines whether applicants have enough preparation to enter a given program, emphasizing the

quality of their preparation rather than the particular academic program they completed or the credits they earned.

Applicants for admission to graduate study should either contact the chair of the appropriate department for application forms and relevant information about the program or visit the department's website for on-line application information. The Graduate Studies website, <http://rgs.rice.edu>, also has links to the graduate departments' websites. The Department Information Chart (pages 74–77) lists department chairs with department phone/fax numbers and e-mail addresses. Applicants should send all application materials, including transcripts and test scores, to the department chair.

Application Process. An application for graduate study should include the completed application form, the application fee, transcript(s), recommendations, and writing samples, if required. Some departments require scores on the aptitude portion of the Graduate Record Examination (GRE) or the Graduate Management Admission Test (GMAT) and an appropriate advanced test; these should be sent directly to the admitting department.

To make sure scores are available when admission decisions are normally made, applicants should take the GRE by the December before the fall for which they are applying. The application deadline for the fall semester is February 1. Some departments, however, may specify an earlier deadline, and departments may occasionally consider late applications.

Admission depends on students' previous academic records, available test scores, and letters of reference from scholars under whom they have studied. Writing samples, portfolios, or statements of purpose may also be required. In general, applicants should have at least a 3.00 (B) grade point average in undergraduate work. Some departments require that applicants take the GRE or GMAT. See individual departmental listings for specific requirement information. Applicants whose native language is not English must take the TOEFL test and score at least 600 on the paper-based TOEFL or score at least 250 on the computer-based TOEFL. For those students who choose to take the IELTS in lieu of TOEFL, the minimum required score is 7.

Academic Regulations

Requirements for Graduate Study

Graduate students must meet the following minimums, deadlines, and course or grade requirements to graduate in good standing from the university. Some departments may have stricter policies and/or requirements.

Residency—Master's students must complete at least one semester enrolled in a graduate program at Rice University. Ph.D. students must be enrolled at least four semesters in full-time study at Rice University.

Full-time study—Semester course load for full-time students is 9 hours, or more as required by specific departments. Graduate programs at Rice generally require full-time study.

Part-time study—Admission of part-time students requires departmental permission, and students must register for at least 3 hours in a semester. All time-to-degree requirements apply to part-time students.

Time to degree—Ph.D. students are required to complete their program, including thesis defense, within ten years of initial enrollment in the degree program. Masters students are required to complete their program, including thesis defense, within five years of initial enrollment. In both cases, students have a

limit of six additional months from the date of defense to deposit their theses in the Office of Graduate Studies. These time bounds include any period in which the student was not enrolled or enrolled part-time, for whatever reason.

Time to candidacy—Ph.D. students must be approved for candidacy before the beginning of the ninth semester of their residency at Rice. Masters students must be approved for candidacy before the beginning of the fifth semester of their residency at Rice.

Time to defense—Ph.D. students must defend their theses before the end of the 16th semester of their residency at Rice. Masters students must defend their theses before the end of the eighth semester of their residency at Rice.

Time to submission of written thesis—After candidates successfully pass the oral examination in defense of the thesis, they must submit two signed copies of the thesis to the Office of Graduate Studies no later than six months from the date of the examination.

Credit for previous degrees—For students who enter a doctoral program with a master's degree, completed at Rice or elsewhere, departments should determine the amount of previous work, if any, that will be counted from the master's degree at issue toward the doctoral degree. Any such credit of one semester or more toward doctoral requirements will result in an equal reduction of the time allowed for (1) the achievement of candidacy, (2) the defense of the Ph.D. thesis, and (3) the total time to the doctoral degree. The maximum credit allowed for students with master's degrees from Rice will be six semesters, and the maximum credit allowed for students with master's degrees from outside Rice will be two semesters.

Minimum hours—Students must register for at least 3 hours in a semester.

Course registration—Students may register for courses of study and drop or add courses only with the approval of their adviser or the department chair.

Deadlines—Students must observe all deadlines listed in the Academic Calendar (pages vi–x).

Grades—In order to graduate, students must achieve at least a B- (2.67) grade point average in courses counted toward the graduate degree. Some programs and departments have more stringent standards. To compute grade point averages, the credit attempted in semester hours for each course and the points for the grade earned (from A = 4.00 to F = 0.00) are multiplied, then the products (one for each course) are added together and the sum is divided by the total credits attempted. See also Probationary Status (pages 72–73).

Pass/Fail—All students, except Class III students, may take course(s) Pass/Fail outside their department. They must file a course as Pass/Fail no later than the end of the 10th week of classes; however, they may later convert a Pass/Fail to a graded course by filing the appropriate paperwork with the registrar. Students should be aware that while a grade of P does not affect their Grade Point Average, a grade of F does.

Satisfactory/Unsatisfactory—Some departments may assign a grade of S or U. Students should be aware that while a grade of S or U does not affect their Grade Point Average, no credit will be awarded if a grade of U is received.

Departmental duties—In most research degree programs, students must undertake a limited amount of teaching or perform other services as part of their training. Assigned duties should not entail more than 10 hours per week, averaged over the semester, or extend over more than eight semesters.

Employment—Students receiving a stipend may accept employment only with the approval of the department. Students working for more than 20 hours per week are not normally eligible for full-time status.

Continuous enrollment—Students must maintain continuous program involvement and enrollment unless granted an official leave of absence. See Leaves or Withdrawals (page 72) for more information.

Candidacy, Oral Examinations, and the Thesis

Approval of Candidacy. Candidacy marks a midpoint in the course of graduate education. Achieving candidacy for the Ph.D. implies that a graduate student has: (a) completed required course work, (b) passed required exams to demonstrate his/her comprehensive grasp of the subject area, (c) demonstrated the ability for clear oral and written communication, and (d) shown the ability to carry on scholarly work in his/her subject area. Requirements for achieving candidacy for the thesis Masters degree are determined at the departmental level. Students enrolled in research degree programs submit their petitions for candidacy for a master's or doctoral degree through the department chair to the vice provost for research and graduate studies. In the petition sent to the vice provost, the department chair identifies the student's thesis director, recommends a thesis committee, certifies that the applicant has fulfilled the departmental requirements, and provides a transcript as evidence that work completed within the department is of high quality.

Students must file their applications for approval of Ph.D. and M.A./M.S. candidacy in the Office of Graduate Studies before November 1 for mid-year conferral and before February 1 for May commencement. Students may take the final oral examination in defense of their thesis only after the vice provost for research and graduate studies approves their candidacy. Ph.D. students must be approved for candidacy before the beginning of the ninth semester of their residency at Rice. Master's students must be approved for candidacy before the beginning of the fifth semester of their residency at Rice.

Thesis Committee. The thesis committee administers the oral examination for the student's thesis defense and has final approval/disapproval authority and responsibility for the written thesis.

A thesis committee comprises at least three members. Two, including the committee chair, must be members of the student's department faculty; in doctoral thesis committees, one member must be from another department within the university. At least three members of the committee must meet one of the following requirements:

- Tenured or tenure-track members of the Rice faculty
- Research faculty holding the rank of faculty fellow, senior faculty fellow, or distinguished faculty fellow
- Faculty who have been certified as thesis committee members by the vice provost for research and graduate studies

The committee chair need not be the thesis director. The chair, however, must be either a tenured or tenure-track member of the major department or a research faculty member of the major department. Additional members of the committee, who may or may not meet the above criteria, may be selected with the approval of the department chair. These would be in addition to the three required members.

Candidates are responsible for keeping the members of their committee informed about the nature and progress of their research. They also must establish a schedule for thesis completion and review. The members of the committee, in turn, should review the thesis in a timely way, approving a preliminary form of the thesis before scheduling the oral examination.

Oral Examination in Defense of Thesis. The public oral defense of a thesis is intended to be an examination of a completed body of work and should be scheduled only when the dissertation is essentially completed. The defense should be scheduled by the

student after consultation with the thesis adviser, who agrees that the thesis is completed and ready to be defended. A candidate must be enrolled in the semester in which his or her oral examination is held. For the purpose of the oral defense only, enrollment in a semester is considered valid through the Friday of the first week of class of the following semester.

At least one copy of the thesis must be available in the departmental office at least two calendar weeks prior to the date of the oral defense. Oral examinations for the doctoral degree must be announced in *Rice News* at least one week in advance. Oral examination announcements can be submitted to *Rice News* by entering the information into the RiceInfo online events calendar. (Specific instructions and the password needed for a calendar submission should be requested by sending e-mail to graduate@rice.edu when the student has set the date for the defense. The words "Rice News defense announcement" need to appear in the subject line of the e-mail.) When the event is entered into the events calendar, an automatically generated e-mail will be sent to *Rice News* with the information for the *Rice News* calendar.

Students should note that material printed in *Rice News* must be submitted at least two weeks before publication; the *Rice News* calendar editor can provide specific submission dates. Ph.D. candidates therefore should begin scheduling their oral defenses at least three weeks in advance. Should an oral examination for the Ph.D. fall during the summer, the posting of a notice in the RiceInfo events calendar, at least one week prior to the defense, suffices as a public announcement.

Oral examinations for the master's degree require only that public notice be posted on the department bulletin board one week in advance.

The length of the oral examination and the subject matter on which the candidate is questioned are left to the judgment of the committee. After candidates successfully pass the oral examination in defense of the thesis, they must submit two signed copies of the thesis to the Office of Graduate Studies no later than six months from the date of the examination. If the thesis is not ready for final signature by the end of the six-month period, the "pass" will be revoked and an additional oral defense will need to be scheduled. Extensions of this six-month period for completion without reexamination will be granted only in rare circumstances. Applications for an extension must be made by the candidate with the unanimous support of the thesis committee and approved by the vice provost for research and graduate studies. Students passing the oral examination on or before the end of the first week of classes of any semester do not have to register for that or any subsequent semester even though they may be continuing to make minor revisions to the final copy of their thesis.

Should a candidate fail, the committee chair may schedule a second examination. Students who fail a second time must withdraw from the university.

Students must send a copy of their approval of candidacy form, signed by the thesis committee signifying successful defense of the thesis, to the Office of Graduate Studies within one week after the oral examination. The original approval of candidacy form must be turned in when the thesis is submitted.

Ph.D. students must defend their theses before the end of the 16th semester of their residency at Rice. Master's students must defend their theses before the end of the eighth semester of their residency at Rice.

Thesis Regulations and Procedures. The thesis is the principal record of a student's work for an advanced degree. It is permanently preserved in the library. Instructions for thesis submission and guidelines for thesis formatting are provided by the Office of Research and Graduate Studies at the time of approval of candidacy. Additional copies of these instructions are available from the graduate studies office and can also be accessed on the Rice website at: <http://rgs.rice.edu/grad/policies/thesis>.

Students submitting a dissertation for the Ph.D., D.Arch., or D.M.A. must fill out a Survey of Earned Doctorates form. All students submitting theses, whether for

master's or doctoral degrees, must complete a University Microfilm contract. Students must pay their fees for microfilming and binding their theses to the cashier before submitting the two copies to the Office of Graduate Studies for approval. The thesis may be submitted to the Office of Graduate Studies at any time; however students must meet the deadline for the thesis submission listed in the Academic Calendar (pages vi-x).

Leaves or Withdrawals

Leave of Absence. A leave of absence is granted only by the Office of Graduate Studies upon the recommendation of the department chair and only to graduate students in good standing with the university. Students must obtain approval for a leave before the academic semester in question. These requests, approved by the department, must be received in the Office of Research and Graduate Studies prior to the first day of classes.

Leaves are not granted after students register for courses or after the registration period passes. Normally, students may take a leave of absence for no more than two consecutive semesters. Students must pay a reinstatement fee of \$75 upon their return from an official leave.

Withdrawal and Readmission. Students who wish to withdraw from Rice during the semester, for any reason, are to notify the chair of their academic department in writing (see Refund of Tuition and Fees, pages 49-50). Failure to register for any period without a leave of absence granted by the Office of Graduate Studies constitutes a de facto withdrawal. Students who later wish to resume study must reapply to the university. Readmission requires the recommendation of the department chair and the approval of the vice provost for research and graduate studies. Accepted students must pay a readmission fee of \$250.

Nonenrollment. Students may not do degree work at Rice or work involving Rice faculty or facilities during any period of nonenrollment, except during the period following successful oral defense prior to submission of the final thesis.

Drop/Add

During the first two weeks of classes, all students may change their registration without a penalty fee by adding or dropping courses with the appropriate adviser's approval. Students must obtain the instructor's permission and the adviser's approval to add a course between the second week and the end of the fourth week of classes. Students may not add courses after the fourth week of classes without the permission of the Office of Graduate Studies.

Students may not drop courses after the end of the 10th week of classes, except by approval of the Office of Graduate Studies (a \$35 fee is assessed for courses dropped after the 10th week by non-first-semester students). The student is to prepare a written petition that must be approved by the student's adviser and department chair and then forwarded to the vice provost for consideration.

Students who add or drop courses after the second week but before the deadlines noted above are charged for each drop/add form submitted according to the fee schedule (see page 29).

Academic Discipline

Probationary Status. Students whose cumulative grade point average or the average for the most recently completed semester falls below 2.33 are placed on probationary status; some departments may have more stringent standards. Although

the department in most cases sends the student a letter of warning, probationary status applies whether or not a letter has been issued. A second semester of probationary status leads to automatic dismissal by the Office of Graduate Studies unless the student's department presents a plea for exception that is approved by the vice provost for research and graduate studies. Departments are free to dismiss a student in the first semester of probationary status if they issue a warning before taking action.

Dismissal. Reasons for student dismissal include unsatisfactory progress (see above) or behavior judged by Rice to be disruptive or otherwise contrary to the best interests of either the university or the student.

Appeal

Students may petition the Office of the Vice Provost for Research and Graduate Studies regarding the application of any academic regulation. Petitions should go through department chairs and divisional deans, who will be asked to comment on their merits. In some cases, the vice provost will seek the advice of the Graduate Council. For appeals regarding nonacademic matters, see the following section on problem resolution.

Procedures for Resolution of Problems

Problems or conflicts may arise during a student's graduate education. Students should take responsibility for informing the appropriate faculty of any such problem. All parties involved should work together amicably with the goal of resolving the problem informally if at all possible. When attempts to resolve a problem informally do not meet with success, the following grievance procedure should be adopted.

1. The student should submit the grievance in writing to the departmental chair, who will then attempt to resolve the problem.
2. If the student remains unsatisfied, the problem should be presented to a departmental committee for resolution. This committee should be a standing committee and not the student's own review or dissertation committee. Both the student and the chair should submit a written record of their views to this committee.
3. If the student remains unsatisfied, the problem should be referred to a standing subcommittee designed at Graduate Council and composed of three faculty members (representing diverse disciplines within the university), one graduate student and the associate dean for graduate studies. A written report of proceedings at stage two should be presented to the chair of graduate council, for forwarding to the subcommittee, together with all other written materials generated during the investigation. The decision of this subcommittee will be considered final.

DEPARTMENT INFORMATION CHART

Department Chair	Phone, Fax, E-Mail, URL	Faculty Research Interests
SCHOOL OF ARCHITECTURE		
Lars Lerup (Dean)	713-348-4044 fax: 713-348-5277 arch@rice.edu	Architecture design, urbanism, theory, and practice
John J. Casbarian (Associate Dean)	713-348-5152	
GEORGE R. BROWN SCHOOL OF ENGINEERING		
Bioengineering: Larry McIntire	713-348-5869 fax: 713-348-5478 bioeng@rice.edu dacnet.rice.edu/~bioe/	Biochemical engineering, biological systems modeling, biomaterials, biomedical lasers, cellular and molecular engineering, controlled release technologies, metabolic engineering, spectroscopy, systems engineering and instrumentation, thrombosis, tissue engineering, and transport processes
Chemical Engineering: Kyriacos Zygourakis	713-348-4902 fax: 713-348-5478 ceng@rice.edu www.ruf.rice.edu/~che/	Transport and interfacial phenomena, thermodynamics, catalysis and reactor design, optimization and process control, rheology and fluid mechanics, polymer science, biomedical engineering, enhanced oil recovery and cleanup of ground-water aquifers, biochemical reactor engineering
Civil and Environmental Engineering: Joe Hughes	713-348-4949 fax: 713-348-5268 civi@rice.edu www.ruf.rice.edu/~ceedept/	Structural and foundation dynamics (e.g., earth-quake and offshore engineering), structural control, reinforced and prestressed concrete structures, application of probability theory to structural dynamics, experimental studies of structures, geotechnical engineering, and computer-aided engineering Surface and groundwater hydrology, biochemical process engineering, aquatic chemistry, environmental microbiology, physical-chemical processes, membrane processes, colloid chemistry, GIS and contaminant transport modeling, urban and regional air quality, earth systems, and environmental law
Computational and Applied Mathematics: Bill Symes	713-348-4805 fax: 713-348-5318 caam@rice.edu www.caam.rice.edu/	Operations research, mathematical programming, discrete and continuous optimization, numerical linear algebra, inverse problems, computational seismology, optimal design, partial differential equations, and numerical analysis
Computer Science: Moshe Y. Vardi	713-348-4834 fax: 713-348-5930 comp@rice.edu www.cs.rice.edu/	Algorithms and complexity, artificial intelligence and robotics, compilers, distributed and parallel computation, graphics and visualization operating systems and programming languages
Electrical and Computer Engineering: Don H. Johnson	713-348-4020 fax: 713-348-5686 elec@rice.edu www.ece.rice.edu	Bioengineering, communications and signal processing, computer architecture and networking, electro-optics, and device physics
Mechanical Engineering and Materials Science: Tayfun Tezduyar	713-348-4906 mems@rice.edu www.mems.rice.edu/	Mechanical engineering: mechanics, computational mechanics, stochastic mechanics, fluid dynamics, heat transfer, dynamics and control, robotics, biomedical systems, and aerospace sciences. Materials science: nanotechnology, metals physics, statistical mechanics, metallic solid thermodynamics, materials chemistry, aspects of composites, coatings and thin films, and interface science

Department Chair	Phone, Fax, E-Mail, URL	Faculty Research Interests
Statistics: Katherine B. Ensor	713-348-6032 fax: 713-348-5476 stat@rice.edu www.stat.rice.edu/	Applied probability, Bayesian methods, bioinformatics, biomathematics, biostatistics, data analysis, data mining, density estimation, epidemiology, environmental statistics, financial statistics, image processing, model building, nonparametric function estimation, quality control, risk management, spatial temporal statistics, statistical computing, statistical genetics, statistical visualization, stochastic processes, and time series analysis
SCHOOL OF HUMANITIES		
Art and Art History: Hamid Naficy	713-348-4234/4815 fax: 713-348-4039 arts@rice.edu www.ruf.rice.edu/~arts/	Art history: Greek and Roman art and archaeology, early Christian through 20th-century European art, and American art
Education:	713-348-4826	Secondary education (See Education Certification., below)
English: Susan Wood	713-348-4840 fax: 713-348-5991 engl@rice.edu english.rice.edu/	Medieval through 20th-century English literature, American literature, and theoretical bases of literary criticism and genre theory
French Studies: Bernard Aresu	713-348-4851 fax: 713-348-5951 fren@rice.edu www.ruf.rice.edu/~fren/	Medieval through contemporary literature, French literary theory, philosophy, and French cultural history
German and Slavic Studies: Harvey Yunis	713-348-4868 fax: 713-348-5964 germ@ruf.rice.edu german.rice.edu/	All periods of German literature, literature of East Germany, exile literature, medical philology and dialectology, genre theory, methods of criticism, cultural theory, and German cinema
Hispanic and Classical Studies: Maarten Van Delden	713-348-5451 fax: 713-348-4863 span@rice.edu www.ruf.rice.edu/~span/	Medieval, golden age, and modern peninsular Spanish literature, modern Spanish American literature, Hispanic linguistics, second language acquisition, and semiotics and literary theory
History: John Zammito	713-348-4948 fax: 713-348-5207 hist@rice.edu www.ruf.rice.edu/~hist/	Ancient, medieval history, modern British, French, German, and Balkan history, American Colonial history, Old and New South and Civil War history, legal, constitutional, intellectual, and recent history, military history, history of science, and East Asian and Latin American history
Linguistics: Philip Davis	713-348-6010 fax: 713-348-4718 ling@ruf.rice.edu linguistics.rice.edu/	General and cognitive-functional linguistics, syntax and semantics, discourse analysis, typology, language description and change, and computational linguistics
Philosophy: Steven Crowell	713-348-4994 philos@rice.edu www.ruf.rice.edu/~philos/	History of philosophy, metaphysics, ethics, medical ethics, social and political philosophy, and philosophy of law, language, and science
Religious Studies: William B. Parsons	713-348-5201 fax: 713-348-5486 reli@rice.edu reli.rice.edu/	Theological and medical ethics, New Testament and early Christianity, Indo-Tibetan thought and practice, history of Christianity, contemporary continental philosophy of religion, and psychology of religion, Judaism, and Islam

Department Chair	Phone, Fax, E-Mail, URL	Faculty Research Interests
JESSE H. JONES GRADUATE SCHOOL OF MANAGEMENT		
Gilbert R. Whitaker, Jr. (Dean)	713-348-4838 fax: 713-348-5251 ricemba@rice.edu jonesgsm.rice.edu/	Earnings management, change communication, financial reporting, accounting standard setting in different countries, stock market volatility, corporate governance, strategic management, decision making, corporate finance, securities markets, marketing strategy, customer satisfaction, corporate performance measurement, customer choice and attitude models, new product diffusion models, service operations, management, computer-human interaction, international business and trade, business-government relationships, leadership, firm valuation, brand equity, and business ethics
Robert A. Westbrook (Associate Dean)	713-348-5396	
Wilfred C. Uecker (Associate Dean)	713-348-5251 713-348-6060 fax: 713-348-5131 oed@rice.edu	
SHEPHERD SCHOOL OF MUSIC		
Anne Schnobelen (Interim Dean)	713-348-4854 fax: 713-348-5317 musi@rice.edu www.ruf.rice.edu/~musi/	Orchestral studies, performance, conducting, composition, theory, and music history
WIESS SCHOOL OF NATURAL SCIENCES		
Biochemistry and Cell Biology: Frederick Rudolph	713-348-4015 fax: 713-348-5154 bioc@rice.edu dacnet.rice.edu/~bioc/	Biochemistry, biophysics, developmental biology, cell biology, genetics, molecular biology, neurobiology, structure and function of nucleic acids and proteins, regulatory processes, biochemistry of lipids, enzymology, NMR and crystallography, cellular regulation, oxygen and electron transport, and molecular genetics of plants, animals, fungi, bacteria, and bacteriophage
Chemistry: Kenton Whitmire	713-348-5683 fax: 713-348-5155 chem@rice.edu www.chem.rice.edu/	Synthesis and biosynthesis of organic natural products, synthesis of small cycloalkanes, molecular recognition and biological catalysis, bioinorganic and organometallic chemistry, main group element and transition metal chemistry, high-pressure and high-temperature chemistry, fluorine chemistry, chemical vapor deposition, design of nanophase solids, molecular photochemistry and photophysics, infrared kinetic spectroscopy, laser and NMR spectroscopy, study of oriented molecular beams, theoretical and computational chemistry, and study of giant fullerene molecules, carbon nanotubes and their derivatives, polymer synthesis and characterization, molecular electronics, and molecular machines
Ecology and Evolutionary Biology: Ronald Sass	713-348-4919 fax: 713-348-5232 eeb@rice.edu eeb.rice.edu/	Biogeochemistry, wetland ecology, plant community and population ecology, behavioral ecology, sociobiology, molecular evolution, insect diversity, and community structure
Earth Science: Alan Levander	713-348-4880 fax: 713-348-5214 geol@rice.edu www.geophysics.rice.edu/	Marine geology and geophysics; sedimentology, stratigraphy, paleoceanography, paleoclimatology, evolution of continental margins and carbonate platforms; tectonics, neotectonics, tectonophysics, geodynamics, mantle processes, planetology, and space geodesy; remote sensing, potential fields, reflection and lithospheric seismology, wave propagation and inverse theory; kinetics of fluid-solid interactions, low T aqueous geo-chemistry, petrology, and high T geochemistry
Mathematics: Robin Forman	713-348-4829 fax: 713-348-5231 math@rice.edu math.rice.edu/	Differential and algebraic geometry, ergodic theory, partial differential equations, probability and combinatorics, real analysis, complex variables, and geometric and algebraic topology

Department Chair	Phone, Fax, and E-Mail	Faculty Research Interests
Physics and Astronomy: F. Barry Dunning	713-348-4938 fax: 713-348-4150 physics@rice.edu www.physics.rice.edu/	Atomic and molecular physics, biophysics, condensed matter and surface physics, nuclear and particle physics, theoretical physics, observational astronomy of star-forming regions, nebulae and galaxies, solar system studies, theoretical astrophysics and space plasma physics, and earth systems science
SCHOOL OF SOCIAL SCIENCES		
Anthropology: George Marcus	713-348-4847 fax: 713-348-5455 anth@rice.edu www.ruf.rice.edu/~anth/	Archaeology, anthropological linguistics, social/cultural anthropology, theory, history, and global change
Economics: Peter Hartley	713-348-4875 econ@rice.edu www.ruf.rice.edu/~econ/	Applied microeconomics, economic theory, econometrics, public finance, industrial organization, game theory, monetary economics, labor economics, and micro foundations of macroeconomics
Political Science: T. Clifton Morgan	713-348-4842 poli@rice.edu www.ruf.rice.edu/~poli/	Comparative government and political development in Western Europe and Latin America, American government including public policy, Congress and intergovernmental relations, and international relations and conflict
Psychology: Randi Martin	713-348-4856 fax: 713-348-5221 psyc@rice.edu www.ruf.rice.edu/~psyc/	Cognitive psychology, cognitive neuro-psychology, human factors, and industrial/organizational psychology
EDUCATION CERTIFICATION		
Meredith Skura	713-348-4826 Fax: 713-348-5459 educ@rice.edu www.ruf.rice.edu/~educ/	Secondary Education

Tuition, Fees, and Expenses

The tuition and fees for graduate students in this section are for the 2002–2003 academic year only and are subject to change in subsequent years. Current tuition and fees for all graduate students, full time and part time:

	Annual	Semester	Hour
Tuition—			
all schools except Jones School	\$18,500.00	\$ 9,250.00	\$1,030.00
Tuition—			
Jones School M.B.A.	\$23,250.00	\$11,625.00	\$1,292.00
Tuition—			
Jones School E.M.B.A. (2-year rate)	\$65,000.00		
Health service fee	\$ 296.00	\$ 148.00	
Graduate Student Association fee	\$ 20.00	\$ 10.00	
Shuttle fee	\$ 37.00		
Honor Council fee	\$ 2.00		
Student Organizations Fund	\$ 8.00		
Information technology fee	\$ 100.00		
Jones School activities fee	\$ 65.00		

Away Status. Students pursuing their studies outside of the Houston area (students on “away” status) must be registered and pay tuition but are not required to pay the fees listed above, with the exception of the information technology fee.

Reduced Tuition. After six semesters of full-time study in one degree program (excluding the summer semesters), continuing students enter a reduced-tuition category of \$1030 per year (\$515 per semester). Students who are admitted with a relevant master’s degree, i.e. a master’s degree that counts toward a doctoral program at Rice, may become eligible for reduced tuition earlier than those entering a doctoral program without a relevant master’s degree. Semesters credited toward reduced tuition will be limited to one degree program. In extraordinary circumstances, the Office of Graduate Studies may consider petitions for exceptions.

Health Insurance. All students, full time, part time, and those on away status, must also carry health insurance (see page 82).

Other Fees. Unless students elect a special payment plan, they must pay all tuition and fees for the fall semester by the middle of August, and for the spring semester by the end of the first week of January. Past these deadlines, a late payment penalty of \$70 will be assessed.

Other fees applicable under special circumstances:

Preceptorship (per semester)	\$185.00
Internship (per semester)	\$185.00
Enrollment continuance fee (Study Abroad) (per semester)	\$125.00
Graduate application fee	\$ 35.00
Jones School application fee: M.B.A.	\$100.00
Jones School application fee: E.M.B.A.	\$100.00
Part-time registration fee	\$100.00
Late registration fee	\$ 95.00
Failure to pre-register fee	\$ 45.00
Late course change fee	
Adds: Week 1–2	Free
Week 3–4	\$ 10.00
Week 5 and after	\$ 30.00
Drops: Weeks 1–4	Free
Weeks 5–10	\$ 10.00
Week 11 and after	\$ 35.00
Deferred Payment Plan late fee	\$ 25.00
Diploma fee: sheepskin	\$ 85.00
Diploma fee: parchment	\$ 25.00
Diploma mailing fee: domestic	\$ 15.00
Diploma mailing fee: air mail	\$ 21.00
Diploma mailing fee: facsimile	\$ 5.00
Transcript fee	\$ 5.00
Class III registration fee	\$100.00
Class III late application fee	\$ 65.00
Intramural fee	\$ 15.00
Readmission fee: graduate students only	\$250.00
Reinstatement fee: graduate students only	\$ 75.00
Replacement ID	\$ 10.00

For more information, see Refund of Tuition and Fees (pages 49–50).

For \$100 each, graduate students and their spouses may purchase from the Cashier’s Office an athletic events sticker, which admits them to all regularly scheduled Rice Athletic events.

Financial Aid

Fellowships, Scholarships, and Assistantships

A range of fellowships, scholarships, and assistantships are available at Rice. Most graduate students in degree programs requiring a thesis are supported by fellowships or research assistantships.

Rice Graduate Fellowships. Doctoral students with high academic records and strong qualifications receive support through Rice fellowships. In most cases, these fellowships provide a stipend plus tuition for the nine-month academic period. Departments may nominate particularly outstanding entering students for a Rice Presidential Fellowship.

Rice Graduate Tuition Scholarships. Students whose previous records show marked promise but for whom no graduate fellowships are available may receive full or partial graduate tuition scholarships, which do not include a stipend.

Research Assistantships. Usually funded from grants and contracts, research assistantships are available in many departments, especially in the Schools of Natural Sciences and Engineering. Qualified students (usually second-year or later) receive these awards to provide assistance on faculty research projects, work that usually contributes to the student’s own thesis. In some departments, a limited number of teaching assistantships may be available to advanced students.

Eligibility. Fellowship, scholarship, and assistantship recipients are selected by the individual departments, subject to the approval of the Office of Graduate Studies. Students should send their applications for such awards directly to the department involved.

To receive Rice fellowships, graduate tuition scholarships, or assistantship aid, students must be engaged in full-time graduate study; part-time students and students who are not enrolled are not eligible for such aid.

Students receiving stipends from fellowships or assistantships may not accept any regular paid employment on or off campus without the explicit permission of the department and the Office of Graduate Studies. Full-time students, whether receiving stipend support or not, may not accept paid employment in excess of 20 hours per week.

Loans and Work-Study Financial Aid

In addition to fellowships, scholarships, and assistantships, the Office of Student Financial Services offers need-based assistance in the form of loans and federal work-study employment. Interested students must file a Free Application for Federal Student Aid (FAFSA) and a Rice Graduate Financial Aid Application.

Subsidized Stafford Loans. Graduate students may process these loans through Rice up to a maximum eligibility of \$8,500 per year, as set by the Federal Government. No interest accrues and no payment is required under the following conditions:

- While a student is enrolled at least half time at Rice
- While a student is enrolled full time in any eligible post-secondary institution
- For six months after withdrawing from Rice

Repayment begins after this period, including a variable interest rate not to exceed 8.25 percent (adjusted each July 1) on the unpaid principal balance. Depending on the size of the total loan commitment, the standard repayment period is 10 years.

Unsubsidized Stafford Loans. Graduate students may use this program to borrow up to \$10,000 per year to an aggregate of \$73,000 (undergraduate and graduate combined). Interest on these loans accrues during the in-school and deferment periods, but students do not have to begin paying on the principal and interest until they leave Rice. The interest rate on the unpaid balance of the loan is a variable rate not to exceed 8.25 percent (adjusted each July 1). The standard repayment period is 10 years; a repayment period longer than 10 years may be available for some borrowers.

Federal Work-Study Employment. Federal work-study employment funding is available to students who meet eligibility criteria set by the federal government. Earnings are limited to the amount shown on the award letter.

Special Loan Programs. A Gulf Oil Corporation Foundation Loan Fund and the Benjamin S. Lindsey and Veola Noble Lindsey Memorial Loan Fund are available to help students working toward a degree meet their educational expenses, but funds are limited. Interested students may contact the Office of Student Financial Services. Those wishing to apply for a loan under either of these programs should begin the application process the summer before the academic year for which they are seeking assistance.

The Professor John A. S. Adams, Sr., Memorial Graduate Student Loan Fund. This fund provides financial assistance, in the form of loans, to graduate students at Rice University. Students wishing to apply for such a loan should obtain an application from the Office of Student Financial Services and return the completed application to that office. Guidelines for the program are:

- Individual loans are made for an amount not to exceed \$1,500.
- Loans are made for a period of up to one year and may be renewable on an annual basis.
- The interest rate applicable to an Adams' loan is determined by the university.
- Graduate students must be enrolled on a full-time basis to be eligible to apply for a loan and must maintain full enrollment during the full term of the loan.
- Upon completion, applications are submitted to the vice provost for research and graduate studies for approval.
- Loans are available during the full course of the academic year.
- Loans must be repaid before graduation.

Emergency Loan Fund. Established through gifts from the Graduate Wives Club of 1972–73, the Graduate Student Association, and various faculty members, this fund makes available emergency loans to help graduate students at Rice with short-term needs. Loans are limited to \$250 and must be repaid within three months. In lieu of interest, a charge of \$5 per loan is assessed to maintain the fund.

Other Fellowships, Honors, and Prizes. Provisions are made for a variety of fellowships, scholarships, and prizes available to graduates of this and other universities. Memorial fellowships that have been founded and endowed by gift or bequest on the part of friends of Rice University provide stipends enabling the holders to devote

their time to study and research in their chosen fields. There are also several industrial fellowships maintained by companies interested in the development of technical fields and the training of competent scientists, engineers, and business executives.

Persons desiring consideration for appointment as fellows should consult with the department in which they wish to do research. However, not all fellowships are available every year.

Graduate Student Life

Graduate Student Association

All full-time students in the graduate program are members of the Graduate Student Association, which is the sole organization representing graduate students as a body. The governing body of this organization is the Graduate Student Association Council, consisting of a representative from each department offering graduate study and a president, vice president, secretary, and treasurer elected by the council. Graduate students also participate in university affairs through their representatives on many standing and ad hoc university committees, such as the Graduate Council, the Research Council, and various department committees.

One of the functions of the Graduate Student Association is to encourage social interaction among graduate students from different departments. To that end, the association organizes a variety of social activities open to all members of the graduate student body.

Housing for Graduate Students

The Rice Graduate Apartments are housed in a garden-style complex located on a 2.7-acre site just north of campus. The project features attractive landscaping and good lighting in all common areas, designed to enhance both the security and the aesthetics of pedestrian, bike, auto paths, parking, and recreational areas. Electronically controlled gates for both pedestrian and vehicular paths are provided. Handicap accessibility also is an important feature. A shuttle bus travels back and forth between the apartments and campus.

There are 112 units, including one-bedroom, two-bedroom, four-bedroom, and efficiency apartments. The complex is designed with a centrally located space for social activities, a laundry room on each floor, a study room equipped with computers, enclosed areas with locks for bike racks, and two courtyards. Every apartment has a living area, a fully equipped kitchen, cable TV connection, and a network drop for a personal computer. Housing is assigned on a space-available basis. Call 713-348-GRAD (4723) for further information.

The Morningside Square Apartments are two-story 1950s-vintage units located in a quiet neighborhood adjacent to Rice Village. They are within a short walking distance to campus, restaurants, and shopping areas. The complex is attractively landscaped and offers gated and covered parking.

There are 53 units, including one-bedroom, two-bedroom, and three-bedroom apartments. The common hallways, bedrooms, and living rooms feature oak hardwood flooring. Kitchens are equipped with a refrigerator and gas range. All units have ceiling fans, a gas furnace, and window air conditioners. Basic cable TV is provided, and a coin-operated laundry is available on site. Apartments are assigned on a space-available basis. Call 713-524-1275 for further information.

The Information Desk, the Office of Student Activities, and the Graduate Student

Associations keep records of available rooms and apartments listed with the university by area landlords. The daily newspaper and a weekly *Greensheet* are other sources of rental housing information. Incoming graduate students should arrive in Houston several days early to allow themselves time to find suitable housing.

Health Requirements for Graduate Students

Paying the student health service fee gives graduate students access to both the Student Health Service and Rice Counseling Center (see pages 12–14). New graduate students may not register for or attend classes until they have completed and returned the health data form to Rice and met the immunization and TB screening requirements.

All graduate students must have health insurance. Students may purchase insurance through the university at two levels of coverage. Rice's group coverage for the 2002–2003 academic year is effective from 12:01 A.M., August 15, 2002, until 12:01 A.M. August 15, 2003. Dependent coverage is also available. A description of the policy, application form, and waiver form can be found on the Web at <http://studenthealthinsurance.rice.edu>. Student should submit either the application or waiver by August 15 each year.

Class III Students in Nondegree Programs

Students with a 3.00 (B) or better grade average and an undergraduate or graduate degree from an accredited college or university may apply for admission as Class III students. These students may take courses for credit without being admitted to a specific degree program. Registration requires the permission of the instructor and approval by the vice provost for research and graduate studies. All Class III applications to accounting and management courses require approval of the Jesse H. Jones Graduate School. Class III students must register for at least 3 hours and cannot take courses on a pass/fail or satisfactory/unsatisfactory basis. Class III students must receive at least a B for all classes taken or they will not be allowed to remain in the Class III program.

Students may not use courses taken under this arrangement to fulfill the requirements for a Rice degree unless and until they have been accepted into a degree program by an academic department (as well as, in the case of graduate students, by the vice provost for research and graduate studies) and received department approval; students are responsible for obtaining the proper approvals. Students may request that the department allow up to 3 courses taken as Class III to count toward their graduate degree.

Applications for Class III

Applications and course request forms are available from the Office of Graduate Studies. Official transcripts from all colleges and universities the student has attended should be mailed directly by the institutions to the Office of Graduate Studies. Students who were previously Class III students must complete a new application (without transcripts) for each such semester. All application materials are due by the workday closest to August 1 for fall semester courses and December 1 for spring semester courses. Late applications are not considered after classes have begun. Individuals applying as Class III students for the summer term should apply to the Summer School for College Students (see page 42).

Tuition and Fees for Class III

The tuition for 2002–2003 is \$1,030 per semester hour, plus a \$100 registration fee each semester. All fees are payable during registration, which students must complete during the second week of class. Students failing to submit their applications by the deadline must pay a late application fee of \$65, and students registering after the second week of class must pay a \$95 late registration fee. For some courses, students may be charged for computer time. If a class fills with degree students, instructors may drop Class III students up to the end of the third week of class. In that case, the tuition (less \$25 of the registration fee) will be refunded. Please see page 42 for information pertaining to summer school.

Ancient Mediterranean Civilizations

The School of Humanities

Director and Adviser

Michael Maas

Professors

James D. Faubion
Werner H. Kelber
Roderick J. McIntosh
Susan Keech McIntosh
Donald Ray Morrison
Harvey E. Yunis

Associate Professors

Hilary S. Mackie
Carol E. Quillen
Paula Sanders
Kristine Gilmartin Wallace

Assistant Professors

David Cook
Eva Haverkamp
Matthias Henze
Scott McGill
Caroline Quenemoen

Lecturer

Coulter George

Andrew W. Mellon Postdoctoral Fellow

Michael Decker

Degree Offered: B.A.

This interdisciplinary major in the cultures of ancient Greece and Rome, Judaism, early Christianity, and early Islam, as well as their antecedents, explores these traditions both for their intrinsic interest and for the contributions each has made to contemporary Western society. This combined focus on ancient cultural history in its broadest sense and on perspectives offered by cultural criticism enables students to examine the beginnings of the civilization in which they now participate.

Courses for this major address common questions about the transmission and transformation of cultures in the ancient Mediterranean world. Students examine sources, such as texts, artifacts, and institutions that illuminate the process. They study how shifting cultural centers and frontiers in this world are delineated, and they explore the general integration and disintegration of specific ancient cultures. This major also offers opportunities for archaeological fieldwork and study abroad.

Rice is a sponsor of the American School of Classical Studies at Athens, the American School of Oriental Research, and the Intercollegiate Center for Classical Studies in Rome. Students majoring in Ancient Mediterranean Civilizations are encouraged to study in these programs as well as in the College Year in Athens program.

Degree Requirements for B.A. in Ancient Mediterranean Civilizations

For general university requirements, see General Graduation Requirements (pages 18–20). Majors in Ancient Mediterranean Civilizations must compete at least 30 semester hours (10 courses). Students must take a core course (AMC 200, CLAS 207, or CLAS 208) near the beginning of their studies, and may select from the following courses to fulfill their requirements for the major.

Please note that not all courses listed below will be offered during the academic year. For a current list of all AMC courses that will be offered in fall 2002 and spring 2003, please visit the AMC website at <http://www.ruf.rice.edu/~amc>.

Core Courses

AMC 200 *Ancient Empires*
CLAS 207 *Greek Civilization: From Homer to Alexander the Great*
CLAS 208 *Roman Civilization*

Anthropology

ANTH 203 *Human Antiquity: An Introduction to Physical Anthropology and Prehistory*
ANTH 205 *Introduction to Archaeology*
ANTH 325 *Self, Sex, and Society in Ancient Greece*
ANTH 345 *The Politics of the Past: Archaeology in Social Context*
ANTH 362 *Archaeological Field Techniques*
ANTH 363 *Early Civilizations*
ANTH 377 *The Ancient City*
ANTH 460 *Advanced Archaeological Theory*
ANTH 474 *Advanced Seminar on the Prehistoric Landscape*

Classical Studies

CLAS 209 *Greek and Roman Drama*
CLAS 220 *The Novel in Classical Antiquity*
CLAS 222 *Perspectives on Greek Tragedy*
CLAS 225 *Women in Greece and Rome*
CLAS 315 *Socrates: The Man and His Philosophy*
CLAS 316 *Democracy and Political Theory in Ancient Greece*
CLAS 318 *The Invention of Paganism in the Roman Empire*
CLAS 335 *Myth and Storytelling: Ancient, Medieval, and Modern Traditions*
CLAS 337 *Epic and Novel*
CLAS 351 *Epic and Saga*
CLAS 352 *Periclean Athens*
CLAS 491 *Special Topics*
CLAS 492 *Special Topics*

Greek Studies

GREE 101 *Introduction to Ancient Greek I*
GREE 102 *Introduction to Ancient Greek II*
GREE 201 *Intermediate Greek I: Prose*
GREE 202 *Intermediate Greek II*
GREE 301 *Advanced Greek I*
GREE 302 *Advanced Greek II*
GREE 491 *Directed Reading*
GREE 492 *Directed Reading*

Latin

LATI 101 *Elementary Latin I*
LATI 102 *Elementary Latin II*
LATI 201 *Intermediate Latin I: Prose*
LATI 202 *Intermediate Latin II*
LATI 301 *Advanced Latin I*
LATI 302 *Advanced Latin II*
LATI 310 *Advanced Latin*
LATI 312 *Advanced Latin*
LATI 313 *Advanced Latin*
LATI 491 *Directed Reading*
LATI 492 *Directed Reading*

History

HIST 113 *God, Time, and History*
HIST 152 *Freshman Seminar in Ancient History*
HIST 200 *Ancient Empires*
HIST 202 *Introduction to Medieval Civilization: The Early Middle Ages*
HIST 207 *Greek Civilization: From Homer to Alexander the Great*
HIST 273 *Ancient and Medieval Jewish History: 70–1492*
HIST 281 *The Middle East from the Prophet Muhammad to Muhammad Ali*
HIST 283 *Women in the Islamic World*
HIST 306 *Politics and Society in Ancient Greece*
HIST 307 *Imperial Rome, from Caesar to Diocletian*
HIST 308 *The World of Late Antiquity*

- HIST 309 *Decline and Fall of the Roman Empire*
- HIST 316 *The Invention of Paganism in the Roman Empire*
- HIST 320 *Science in Antiquity and the Middle Ages*
- HIST 325 *Introduction to Medieval Civilization: The Early Middle Ages (enriched version)*
- HIST 373 *Ancient and Medieval Jewish History: 70–1492 (enriched version)*
- HIST 382 *Classical Islamic Cultures*
- HIST 445 *Jews and Christians: Perceptions of the Other*
- HIST 451 *Philosophies and Theologies of History*
- HIST 460 *Advanced Seminar in Ancient History*
- History of Art**
- HART 101 *Introduction to the History of Western Art: Prehistoric to Gothic*
- HART 205 *Architecture and the City I: Antiquity–17th Century*
- HART 229 *Independent Study in Early Christian, Byzantine, and Islamic Art*
- HART 310 *The First Civilizations*
- HART 311 *Art of the Ancient Aegean and Eastern Mediterranean*
- HART 312 *Greek Art and Architecture*
- HART 313 *The Discovery of the Mind*
- HART 314 *Art and Architecture in the Hellenistic World*
- HART 315 *Roman Art and Architecture*
- HART 316 *Greek Sculpture*
- HART 318 *Special Topics in Ancient Art*
- HART 319 *Independent Study in Ancient Art*
- HART 320 *Age of Augustus*
- Linguistics**
- LING 437 *History of Linguistics*
- Philosophy**
- PHIL 201 *History of Philosophy I*
- PHIL 301 *Ancient and Medieval Philosophy*
- PHIL 307 *Social and Political Philosophy*
- PHIL 327 *History of Social and Political Philosophy*
- PHIL 501 *Seminar in Ancient and Medieval Philosophy*
- Religious Studies**
- RELI 122 *The Bible and Its Interpreters*
- RELI 125 *Introduction to Biblical Hebrew I*
- RELI 126 *Introduction to Biblical Hebrew II*
- RELI 127 *Intermediate Biblical Hebrew*
- RELI 200 *The Bible in Western Tradition*
- RELI 221 *The Life of the Prophet Muhammad*
- RELI 223 *Qu'ran and Commentary*
- RELI 302 *Jewish–Christian Dialogue*
- RELI 307 *History of Christianity: The First Four Centuries*
- RELI 308 *Canonical Gospels: Narrative and Social Setting*
- RELI 350 *Sacred Scriptures in Monotheistic Faiths*
- RELI 370 *Dynamics of Classical Judaism*
- RELI 382 *Biblical Theology*
- RELI 383 *The Dead Sea Scrolls*
- RELI 410 *Apocalypse Then and Now*
- RELI 441 *Popular Religion in the Middle East*
- University Courses**
- UNIV 302 *Communication, Cognition, and Culture*

See AMC in the Courses of Instruction section.

Anthropology

The School of Social Sciences

Chair

George E. Marcus

Professors

James D. Faubion
 Benjamin Lee
 Roderick J. McIntosh
 Susan Keech McIntosh
 Julie M. Taylor
 Stephen A. Tyler

Associate Professor

Eugenia Georges

Assistant Professors

Christopher Kelty
 Hannah Landecker

Degrees Offered: B.A., M.A., Ph.D.

The major in anthropology has 2 areas of concentration: cultural anthropology and archaeology. The focus in cultural anthropology is on contemporary theoretical issues. By reading primary sources, students gain an exposure to the styles of argument and reasoning of a broad range of theorists. They can then engage in the ongoing discussion and definition of central problems within the field. Fieldwork and ethnography are important in the doctoral research.

In archaeology, the focus is on research skills in the library, the field, and the laboratory. Most students also develop at least one analytical skill, such as remote sensing, archaeological statistics, osteology, or geomorphology, drawing on the university's extensive laboratory and computer facilities.

Students may organize a major in one or both fields or combine a major in anthropology with one in another discipline.

Degree Requirements for B.A. in Anthropology

For general university requirements, see Graduation Requirements (pages 18–20). Students majoring in anthropology must:

- Complete a total of 30 semester hours of departmental courses (10 courses)
- Have a plan of study approved by the undergraduate adviser

With department approval, students may substitute for departmental courses at most 6 hours of courses from outside the major that are related to their plan of study. The department recommends that students intending to pursue graduate study acquire a reading knowledge of 1 or 2 European languages.

Honors Program. Majors considering a career in anthropology should apply to the honors program, as should those who wish to include advanced training and an intensive, individual research project in their undergraduate education. Anthropology faculty determine acceptance into the program. More information is available from the department office; see also Honors Programs (page 32).

Degree Requirements for M.A. and Ph.D. in Anthropology

Because each field of specialization offers different opportunities for training and different research orientations, the department seeks applicants with a defined interest in either cultural anthropology or archaeology; an undergraduate background in anthropology is desirable but not required. Entering students devise a detailed first-year plan of study and provisional plans for succeeding years in consultation with an adviser. The plan should emphasize broad training in the selected field before the eventual definition of a project for dissertation research. For general university requirements, see Graduate Degrees (pages 62–67).

M.A. Program. Graduate students may earn the M.A. only by obtaining approval of their candidacy for the Ph.D. For the M.A. as a terminal degree, students must complete:

- 30 semester hours of approved course work
- 1 of the 3 special papers required for the Ph.D.
- A thesis

Ph.D. Program. For the Ph.D. degree, students must accomplish the following:

- Complete 3 substantial papers, each emphasizing an analytical, research, and writing skill appropriate to their field of specialization (should be completed during the first two years of study)
- Demonstrate reading competency in 1 foreign language
- Prepare a satisfactory proposal for dissertation research, based in substantial part on field research
- Complete and defend the dissertation

Special Options. The department will arrange **seminars and tutorials** on any topic relevant to a student's training; these seminars may be conducted in supervisory consultation with scholars in other disciplines as well as with adjunct faculty. Students interested in the specialized field of **medical anthropology** may take advantage of the extensive resources of the Texas Medical Center through ties established with the University of Texas School of Public Health and Graduate School of Biomedical Sciences; students may earn degree credit for formal courses taken at both schools.

Financial Support. All first-year students receive the same level of support: a combination of graduate fellowships and tuition scholarships. These awards are renewed for a further two years of study.

See ANTH in the Courses of Instruction section.

Architecture

The School of Architecture

Dean

Lars Lerup

Associate Dean

John J. Casbarian

Professors

William T. Cannady

Albert H. Pope

Gordon G. Wittenberg, Jr.

Associate Professors

John Biln

Carlos Jimenez

Sanford Kwinter

Spencer W. Parsons

Assistant Professors

David Brown

Fares el-Dahdah

Dawn Finley

Keith Krumwiede

Nana Last

Lecturers

Louis DeLaura

Alan Fleishacker

James Furr

Nonya Grenader

Tom Lord

Mark Oberholzer

Frank S. White

Adjunct Lecturer

Stephen Fox

Visiting Critics

David Guthrie

Doug Oliver

William Williams

Visiting Professor

Danny M. Samuels

Mark Wamble

Degrees Offered: B.A., B.Arch., M.Arch., M.Arch. in Urban Design, D.Arch.

The principal goal of the School of Architecture is to contribute to a more humane environment. The school focuses on teaching and research, the development of a broad liberal education for undergraduates in the allied sciences and arts of architecture, and professional graduate and postgraduate education in architecture and urban design. Intimate student-faculty interaction, academic freedom, and unrestricted institutional cooperation within and outside the university are distinctive qualities of the architecture degree programs at Rice.

The undergraduate programs maintain a balance between academic studies and professional practice. Lectures and other public programs, visiting faculty, scholarly presentations, and the Preceptorship Program, which provides a one-year internship in outstanding architectural offices throughout the U.S., Europe, and Japan, all complement the school's core of distinguished teachers and practitioners.

The graduate programs have three areas of emphasis: architectural design, with particular attention paid to history, theory, and practice; urban design, where the concern is the emerging form of the American city; and research in computer visualization that uses the resources of the state-of-the-art Rice Advanced Visualization Lab.

Degree Requirements for B.A. in Architecture or Architectural Studies

For general university requirements, see Graduation Requirements (pages 18–20). The conditions specified here for each major also satisfy the university distribution requirements.

B.A. in Architecture. The curriculum for architecture majors is divided into a foundation sequence taken in the freshman and sophomore years and a preprofessional sequence taken in the junior and senior years. The foundation sequence consists of four semesters of design studios and other related courses in architecture. The first-semester studio develops basic design skills through directed explorations and problem-solving exercises in form, texture, color, material, and structures. In the subsequent 3 studios, through a carefully sequenced series of exercises, students are introduced to a broad range of architectural design issues, processes, and methods. Students are required to take 4 courses in the history and theory of art and architecture during the freshman and sophomore years in addition to two semesters of architectural technology. They must also complete university distribution requirements. It is recommended that students take an introductory drawing course during their first two years of study to develop visual skills.

Students who satisfactorily complete the foundation sequence may, upon approval of their major, enter the junior and senior year preprofessional sequence. The fall studios for the third and fourth years are organized around the workshop model and emphasize complex building/computer applications and urban design issues, respectively. The spring studios are vertically integrated, allowing students to select offerings emphasizing specialized design topics such as technology, landscape, historical precedent, and urban design. During the third and fourth years, students are required to take 2 additional technology courses and to fulfill all remaining school or university distribution requirements. Students wishing to pursue the professional degree in architecture may apply for admission to the Bachelor of Architecture (B.Arch.) degree program during the second semester of the fourth year.

B.A. in Architectural Studies. Students who have been admitted as architecture majors and who have successfully completed the two-year foundation program may choose the architectural studies curriculum. The first four semesters of the curriculum are identical to the foundation sequence of the architecture major except for the omission of 1 technology course. Subsequent requirements are the completion of 1 additional studio and 4 elective courses in architecture. The program provides basic preparation for later professional study while allowing students to pursue other academic interests in depth.

Bachelor of Architecture (B.Arch.) Program. The Bachelor of Architecture program is only open to students who have completed the undergraduate preprofessional architecture program at Rice. Upon admission, students are assigned a preceptorship, which takes place immediately after receipt of the Bachelor of Arts in Architecture degree. The preceptorship program balances academic learning with professional experience. Qualified students who have been admitted to the B.Arch. degree program are assigned to work for a year in the United States or abroad with leading architectural offices designated by the school as preceptors. The B.Arch. degree requires the successful completion of the B.A. in architecture, completion of the two-semester preceptorship, and completion of 2 graduate studios and 5 approved lecture or seminar courses.

Typical Curriculum for B.A. in Architecture

First Semester

ARCH 101 *Principles of Architecture I*
HART 101 *Introduction to History of Art*
PHYS 101 *Mechanics (with lab)*
LPAP 101 *Lifetime Physical Activities*
Approved architecture restricted distribution course in humanities

Second Semester

ARCH 102 *Principles of Architecture I*
ARCH 132 *Freshman Seminar*
HART 102 *Introduction to History of Art*
LPAP 102 *Lifetime Physical Activities*
MATH 101 *Single Variable Calculus*
Approved architecture restricted distribution course in humanities

Third Semester

ARCH 201 *Principles of Architecture II*
ARCH 207 *Introduction to the Design of Structures*
ARCH 345 *Renaissance and Baroque Architecture in Italy*
Studio Art Elective*
Elective*

Fourth Semester

ARCH 202 *Principles of Architecture II*
ARCH 214 *Design of Structures II*
ARCH 346 *Architecture and the City II*
Approved architecture restricted distribution course in social sciences
Elective*

Fifth Semester

ARCH 301 *Principles of Architecture III*
ARCH 315 *Design of Structures III*
Architectural Theory Elective
Elective*
Elective*

Sixth Semester

ARCH 302 *Principles of Architecture III*
ARCH 316 *Building Climatology*
Elective*
Elective*
Elective*

Seventh Semester

ARCH 401 *Principles of Architecture IV*
Elective*
Elective*
Elective*

8th Semester

ARCH 402 *Principles of Architecture IV*
Elective*
Elective*
Elective*

*All courses must be selected to satisfy both architecture major requirements and university distribution requirements.

Preceptors

Backen Arrigoni & Ross, Inc.
San Francisco

Cambridge Seven Associates
Cambridge

Gensler & Associates
London, Los Angeles, New York,
San Francisco

Michael Graves Architects and
Industrial Design
Princeton

HTA Architects
London

Kohn Pedersen Fox, Architects
London, New York

Machado–Silvetti Associates
Cambridge

Mitchell Giurgola
New York

NBBJ
Seattle

Ong & Ong Architects
Singapore

Pei, Cobb, Freed & Partners
New York

Cesar Pelli & Associates
New Haven

Renzo Piano Building Workshop
Genoa, Paris

Robert A. M. Stern Architects
New York

Venturi Scott–Brown & Associates
Philadelphia

Weiss/Manfredi Architects
New York

Zimmer Gunsul & Frasca
Los Angeles

Master of Architecture

The Master of Architecture (M.Arch.) program prepares graduates for a full range of professional activities in the field of architecture. It is offered to individuals who possess a bachelor's degree. Students follow a course of study in all four areas of the curriculum: design; history, theory, and criticism; structures, practice, and environments; and computing, logic, and representation. These areas of study are sustained by groups of courses from which students may choose offerings according to the requirements of their particular program. Strong emphasis is given to developing design skills, logic, and imagination through an intensive series of design studio courses. Students are also required to prepare an independent thesis before graduating. A potential exists for dual degrees.

The Master of Architecture program is accredited by the National Architectural Accrediting Board (NAAB). It leads to the degree of Master of Architecture, which qualifies graduates to take the state professional licensing examination after completing the required internship in an architectural office.

Programs of Study

There are three program options at the Master of Architecture level. Options 1, 2, and 3 differ according to the bachelor's degree received prior to entering the graduate program.

Option 1: Seven-Semester Program

Option 1 is offered to individuals who hold a four-year undergraduate degree with a major in a field other than architecture. Preference for admission is given to those who have completed a balanced education in the arts, sciences, and humanities. A minimum of two semesters of college-level courses in the history of art and/or architecture are recommended; so is a minimum of one semester of college-level courses in mathematics and physics. Previous preparation in the visual arts is also desirable and so are courses in philosophy, literature, and economics.

In order to graduate, students must complete a four-semester core curriculum (76 credit hours), which is followed by a three-semester advanced curriculum (57 credit hours). Course work in both core and advanced curricula consists of 7 studios (including thesis) and 20 distribution courses (133 credit hours).

Core Curriculum**First Semester**

ARCH 501 *Core Design Studio I*
ARCH 507 *Introduction to Design of Structures II*
ARCH 633 *Introduction to Computer Applications in Architecture*
ARCH 685 *Architecture and Society I*

Second Semester

ARCH 502 *Core Design Studio II*
ARCH 514 *Design of Structures II*
ARCH 636 *Computer Aided Design in Architecture*
ARCH 686 *Architecture and Society II*

Third Semester

ARCH 503 *Core Design Studio III*
ARCH 515 *Design of Structures III*
ARCH 683 *20th-Century History of Ideas in Architecture*
Dist. Elective (Comp., Log., and Repr.)

Fourth Semester

ARCH 504 *Architectural Problems*
ARCH 516 *Building Climatology*
ARCH 623 *Professionalism and Manag. in Architecture*
Dist. Elective (Hist., Theory, and Crit.)

Advanced Curriculum**Fifth Semester**

ARCH 601 *Architectural Problems*
Dist. Elective (Hist., Theory, and Crit.)
Dist. Elective (Comp., Log., and Repr.)
Elective

Sixth Semester

ARCH 602 *Architectural Problems*
ARCH 702 *Pre-Thesis Preparation*
Dist. Elective (Struct., Pract., and Env.)
Elective

Seventh Semester

ARCH 703 *Thesis Studio* or equivalent
Elective
Elective

Option 2: Five-Semester Program

Option 2 is offered to individuals who hold a four-year undergraduate degree with a major in architecture. Preference for admission is given to those who have successfully completed between four and six semesters of undergraduate design studio as well as undergraduate courses that are analogous to those given in the first year of Option 1. A minimum of two semesters of college-level courses in the history of art and/or architecture are recommended; so is a minimum of one semester of college-level courses in mathematics and physics.

Students in this program enter into the second year of the core curriculum (two semesters, 38 credit hours), followed by the advanced curriculum (three semesters, 57 credit hours). Course work in both core and advanced curricula consists of 5 studios (including thesis) and 14 distribution courses (95 credit hours).

Core Curriculum**First Semester**

ARCH 503 *Core Design Studio III*
 ARCH 515 *Design of Structures III*
 ARCH 683 *20th-Century History of Ideas
 in Architecture*
 Dist. Elective (Comp., Log., and Repr.)

Second Semester

ARCH 504 *Architectural Problems*
 ARCH 516 *Building Climatology*
 ARCH 623 *Professionalism and Manag.
 in Architecture*
 Dist. Elective (Hist., Theory, and Crit.)

Advanced Curriculum**Third Semester**

ARCH 601 *Architectural Problems*
 Dist. Elective (Hist., Theory, and Crit.)
 Dist. Elective (Comp., Log., and Repr.)
 Elective

Fourth Semester

ARCH 602 *Architectural Problems*
 ARCH 702 *Pre-Thesis Preparation*
 Dist. Elective (Struct., Pract., and Env.)
 Elective

Fifth Semester

ARCH 703 *Thesis Studio**
 Elective
 Elective
 *or an approved alternative

Option 3: Three-Semester Program

Option 3 is offered to individuals who hold a professional degree in architecture (B.Arch.), or its equivalent from a foreign university. Preference for admission is given to those who have significant practical experience in architecture and who have demonstrated high achievement in design.

In order to graduate, students must complete a three-semester advanced curriculum of elective courses. Course work consists of 3 studios (including thesis) and 8 distribution courses (57 credit hours).

First Semester

ARCH 601 *Architectural Problems*
 Dist. Elective (Hist., Theory, and Crit.)
 Dist. Elective (Comp., Log., and Repr.)
 Elective

Third Semester

ARCH 703 *Thesis Studio**
 Elective
 Elective
 *or an approved alternative

Second Semester

ARCH 602 *Architectural Problems*
 ARCH 702 *Pre-Thesis Preparation*
 Dist. Elective (Struct., Pract., and Env.)
 Elective

Thesis Requirement

All M.Arch. candidates are required to develop a thesis in partial fulfillment of graduate degree requirements. Students are asked to demonstrate their ability to independently undertake research and analysis as well as develop a hypothesis and a thorough demonstration of the thesis. This must take the form of either a research thesis (written thesis) or a thesis with a design demonstration (design thesis). Both thesis formats must address architectural consequences that may be derived from within or outside conventional boundaries of the architectural discipline.

Thesis preparation begins in the penultimate semester with a 3-hour independent study course leading to the submission of a thesis proposal and the selection of a thesis director plus two faculty members as readers. While the thesis is independent work carried out by the student under the direction of a chosen adviser, it is organized as a studio in the fall term of the academic year. The thesis studio provides a support setting for both formal and informal review processes throughout the thesis semester. In early January, thesis projects are reviewed by a panel of guest critics and publicly presented in the Farish Gallery.

Master of Architecture in Urban Design

The Master of Architecture in Urban Design (MAUD) program prepares graduates for a full range of professional activities in the field of urban design. It is offered to individuals who already hold a professional degree qualifying them for registration as architects or landscape architects. The MAUD program makes extensive use of Houston as a setting for case studies and design problems. During the first year, strong emphasis is given to developing design skills, logic, and imagination through an intensive series of urban design studio courses. Three additional courses in urban history, planning, and design are required each semester. Students are also required to prepare an independent thesis during their third semester.

Doctor of Architecture

Admission to the Doctor of Architecture program requires either a bachelor's or master's degree in architecture and a detailed statement of research concerns and anticipated array of investigation. A student entering with a master's degree normally takes three semesters of course work before the qualifying examination. A student with a bachelor's degree normally requires two to five semesters of course work before the qualifying examination. Preparation for doctoral candidacy may include a foreign language or computer skills. Specific course requirements are established individually when a student is admitted to the program.

After successful completion of all required course work, students may apply to take the qualifying examination after submitting a prospectus outlining their research programs for the doctoral dissertation. The dissertation must represent an original contribution to knowledge in the field of architecture. Completion and successful defense of the dissertation will take a minimum of one year. University requirements for thesis (dissertation) preparation and defense must be carefully followed. The time limit for successful defense of the dissertation is established by university policy. Students should not expect to complete the doctor of architecture program in less than four years of full-time study.

See ARCH in the Courses of Instruction section.

Art and Art History

The School of Humanities

Chair

Hamid Naficy

Professors

Karin L. Broker
Joseph Manca
Hamid Naficy
Basilios N. Poulos
George Smith
Geoffrey L. Winningham

Associate Professors

Brian Michael Huberman
Darra Keeton
Linda E. Neagley
Todd Porterfield
John Sparagana

Assistant Professors

Marcia Brennan
Hajime Nakatani
Caroline Quenemoen

Distinguished Lecturer

Thomas McEvelley

Visiting Lecturers

Charles Dove
Fraser Stables
Prince Thomas

Adjunct Lecturer

Heather Logan

Andrew W. Mellon Post

**Doctoral Fellow, Center for the
Study of Cultures and the
Department of Art and Art
History**

Nancy Deffebach

Degrees Offered: B.A., B.F.A.

Department of Art and Art History majors are students who declare a major in either the studio arts (printmaking, painting, drawing, photography, sculpture, or film production) or art history (history of art or film and media studies). Students are asked to select the track in the studio arts or art history, keeping the degree requirements listed below in mind. Each student also will be assigned to scheduled times during the year to discuss their selection of courses and any other matters of concern in the student's academic life (study and travel abroad, scholarships and internships, career goals or options, etc.).

Degree Requirements for B.A. in Art and Art History

For general university requirements, see Graduation Requirements (pages 18–20).

Single Major Track in Studio Art.

12 courses required:

- 1 basic drawing (ARTS 225)
- 1 printmaking (ARTS 311), photography (ARTS 205), or film (ARTS 327)
- 1 basic painting (ARTS 301 or 302)
- 1 creative three-dimensional design (ARTS 102 or 291) or sculpture (ARTS 365)
- 6 courses in the studio arts
- 2 courses in art history (open selections—qualified by course prerequisites and consultation with the studio art faculty adviser)

Double Major Track in Studio Art.

10 courses required:

- 1 basic drawing (ARTS 225)
- 1 printmaking (ARTS 311), photography (ARTS 205), or film (ARTS 327)
- 1 basic painting (ARTS 301 or 302)
- 1 creative three-dimensional design (ARTS 102 or 291) or sculpture (ARTS 365)
- 4 courses in the studio arts
- 2 courses in art history (open selections—qualified by course prerequisites and consultation with the studio art faculty adviser)

Transfer Credit. No more than 2 courses may be transferred out of 10 for a single studio major, or 8 for the double major. The 2 transfer credit courses must be studio practice courses required for all double majors. Advanced placement credit may not be used by art majors or double art majors to fulfill department requirements.

Single Major Track in Art History.

12 courses required:

1. Ten courses in art history.
Within these 10 art history courses, additional requirements and guidelines have been established:
 - a. Student majors must take HART 101 *Introduction to the History of Western Art I: Prehistoric–Gothic*, HART 102 *Introduction to the History of Western Art II: Renaissance–Present*, and 1 course in non-Western art history
 - b. 1 course must be a seminar.
 - c. For purposes of distribution, students must take at least 1 course focusing in a period before 1750, and at least 1 course focusing in a period after 1750.
 - d. 1 course outside the department may be taken for credit toward the major when approved in advance by the art history adviser.
 - e. 1 intern class may be taken for credit toward the major.
 - f. All student majors are strongly encouraged to take HART 390 *Theoretical Perspectives on Visual Arts* and to study a foreign language.
2. Two courses in the studio arts (open selection—qualified by course prerequisites and consultation with art history faculty adviser)

An honors program also is available in art history. Requirements are somewhat different for this program, including HART 407–408 *Senior Thesis*. Interested students should consult with the art history faculty adviser.

Double Major Track in Art History.

10 courses required:

1. Eight courses in art history.
Within these 8 art history courses, additional requirements and guidelines have been established:
 - a. Student majors must take HART 101 *Introduction to the History of Western Art I: Prehistoric–Gothic*, HART 102 *Introduction to the History of Western Art II: Renaissance–Present*.
 - b. Each student will be encouraged to take a variety of courses to include diversity in cultures and chronology as well as foreign languages.
 - c. 1 intern class may be taken for credit toward the major.
2. Two courses in the studio arts (open selection—qualified by course prerequisites and consultation with art history faculty adviser)

Degree Requirements for B.F.A.

Students with a B.A. degree in art from Rice or an equivalent degree from another university may enter the Bachelor of Fine Arts (B.F.A.) program, which consists of a fifth year of intensive study in the creative arts. Students with a B.A. in a major other than art may, in exceptional cases, be admitted. Information about application forms, deadlines, and admission standards is available from the chair of the department.

For the B.F.A. degree, students must complete a total of 30 semester hours in approved courses, or the equivalent in approved major electives, at the 300 level or above. In addition to the usual departmental upper-level courses, special fifth-year courses are offered for B.F.A. candidates only.

Degree Requirements for M.A. in Art History

Owing to a high number of vacant positions in the art history section, the master's program has been placed on hold for several years until those positions have been filled. Resumption of the graduate program is anticipated as soon as the faculty are in place.

Exhibitions and Arts Programs at Rice

Exhibitions and related activities organized by **Rice University Art Gallery** (Kimberly Davenport, director) enrich the teaching program of the Department of Art and Art History as well as the larger university and Houston community. The **Rice Media Center** mounts several photography exhibitions each year and sponsors the "Rice Cinema" film series, a public film program. Feature films include classic and contemporary titles, independent and experimental films, documentaries, international, foreign, and alternative cinema programs. The film series, which is intimately connected with the curriculum both in film and media studies and in film and photography production, includes frequent guest lecturers, panel discussions, and media events. The department also houses a **Visual Resources Center**, which currently holds approximately 300,000 slides and digital images related to the arts for teaching and research.

See **ARTS and HART in the Courses of Instruction section.**

Asian Studies

The School of Humanities and the School of Social Sciences

Director

Richard J. Smith

Professors

Anne C. Klein

Benjamin Lee

Stephen A. Tyler

Professor Emeritus

Fred R. von der Mehden

Associate Professors

Suchan Chae

Jeffrey Kripal

William Parsons

Nanxiu Qian

Assistant Professors

David Cook

Hajime Nakatani

Elora Shehabuddin

Sarah Thal

Kerry Ward

Senior Lecturers

Lilly C. H. Chen

Hiroko Sato

Lecturers

David Gray

Marshall McArthur

E. Douglas Mitchell

Steven Lewis

Guatami Shah

Chao-Mei Shen

Rina V. Williams

Meng Yeh

Degree Offered: B.A.

Asian Studies is an interdisciplinary major that explores the complex interaction between political, social, religious, and other important spheres of human life in Asia. Emphasis is placed not only on the diversity and achievements of Asian civilizations but also on the ways an understanding of Asia may shed new light on Western cultural traditions. The major is built around courses in the humanities and social science divisions and a team-taught interdisciplinary core course, Introduction to Asian Civilizations. Some "Residential College Courses" may qualify for Asian Studies credit.

Requirements: The undergraduate Asian Studies major will consist of 30 hours or more of course work. All majors must take the core course, ASIA 211, and 9 additional courses drawn from at least three of the departments offering courses in Asian studies. (See specific guidelines below.)

Degree Requirements for B.A. in Asian Studies

For general university requirements, see Graduation Requirements (pages 18–20). Students majoring in Asian Studies must complete 30 semester hours or more of major course work, including:

- ASIA 211 *Introduction to Asian Civilizations*
- 9 additional courses drawn from at least three of the departments offering courses in Asian studies (see below)
- 6 courses at the 300 level or above
- 2 years of a single Asian language (this may include an Asian language other than those offered by Rice), though students may count no more than four semesters of Asian languages toward the major.

Any changes in the requirements for the major must be approved by the director of Asian Studies.

One or more independent reading courses (ASIA 401 for the fall and ASIA 402 for the spring) taught by Asian Studies faculty in these departments may be counted toward the major. Students may also use certain residential college courses to fulfill their major requirements, subject to the approval of the director of Asian Studies.

The following courses, not all of which are taught every year, may be used to satisfy the major requirements. Note that a number of these courses are cross-listed.

Anthropology

ANTH 220 *Contemporary China* (also offered as HIST 220)
 ANTH 310 *Contemporary China* (enriched version of ANTH 220; also offered as HIST 310)
 ANTH 353 *Cultures of India*

Art and Art History

HART 370 *Arts of China*

Asian Studies

ASIA 139 *Introduction to Indian Religions* (also offered as RELI 139)
 ASIA 140 *Introduction to Chinese Religions* (also offered as RELI 140)
 ASIA 211 *Introduction to Asian Civilizations*
 ASIA 221 *The Life of the Prophet Muhammad* (also offered as RELI 221)
 ASIA 231 *The Enlightenment of the Body* (also offered as RELI 231)
 ASIA 240 *Gender and Politicized Religion* (also offered as WGST 240)
 ASIA 250 *Meditation, Mysticism, and Magic* (also offered as RELI 250)
 ASIA 280 *The Asian American Experience* (also offered as ENGL 280)
 ASIA 299 *Women in Chinese Literature* (also offered as CHIN 299 and WGST 299)
 ASIA 323 *The Knowing Body: Buddhism, Gender, and the Social World* (also offered as WGST 323 and SOCI 323)
 ASIA 330 *Introduction to Traditional Chinese Poetry* (also offered as CHIN 330)
 ASIA 332 *Chinese Films and Modern Chinese Literature* (also offered as CHIN 332)
 ASIA 333 *Taiwan Literature and Film* (also offered as CHIN 333)
 ASIA 334 *Introduction to Traditional Chinese Narrative* (also offered as CHIN 334)

ASIA 335 *Introduction to Classical Chinese Literature* (also offered as CHIN 335)
 ASIA 340 *Gender and Politicized Religion* (also offered as WGST 340)
 ASIA 344 *Korean Literature* (also offered as HUMA 344 and KORE 344)
 ASIA 345 *Origin and Development of Korean and Related Languages in East Asia* (also offered as HUMA 345 and KORE 345)
 ASIA 346 *Korean Culture and History* (also offered as KORE 346)
 ASIA 354 *Apocalyptic and Millennium Movements in Pre-Modern Asia* (also offered as RELI 354)
 ASIA 355 *Religion and Social Change in South Asia* (also offered as RELI 355)
 ASIA 363 *The Marriage of Heaven and Hell* (also offered as RELI 363)
 ASIA 365 *Mysticism and Meditation in China* (also offered as RELI 365)
 ASIA 369 *Film, Literature, and the Japanese Past* (also offered as HIST 369)
 ASIA 380 *The Asian American Experience* (also offered as ENGL 359)
 ASIA 360 *Transnational China: China and the Chinese Diaspora*
 ASIA 401 and 402 *Independent Reading*
 ASIA 432 *Islam in South Asia* (also offered as HIST 432 and WGST 432)
 ASIA 441 *Popular Religion in the Middle East* (also offered as RELI 441/525)

Chinese

CHIN 101 and 102 *Introduction to Chinese Language and Culture I and II*
 CHIN 201 and 202 *Introduction to Chinese Language and Culture III and IV*
 CHIN 211 and 212 *Accelerated Chinese Language and Culture I and II*

CHIN 299 *Women in Chinese Literature* (also offered as ASIA 299 and WGST 299)
 CHIN 301 and 302 *Intermediate Chinese Language and Culture I and II*
 CHIN 311 and 312 *Intermediate Accelerated Chinese Language and Culture I and II*
 CHIN 313 *Advanced Intermediate Chinese: Media Chinese*
 CHIN 330 *Introduction to Traditional Chinese Poetry* (also offered as ASIA 330)
 CHIN 332 *Chinese Films and Modern Chinese Literature* (also offered as ASIA 332)
 CHIN 333 *Taiwan Literature and Film* (also offered as ASIA 333)
 CHIN 334 *Introduction to Traditional Chinese Narrative* (also offered as ASIA 334)
 CHIN 335 *Introduction to Classical Chinese Literature* (also offered as ASIA 334)
 CHIN 346 *History of the Chinese Language* (also offered as LING 346)
 CHIN 399 *Chinese Teaching Practicum*
 CHIN 411 and 412 *Advanced Chinese Language and Culture I and II*
 CHIN 431 and 432 *Readings in Classical Chinese Literature*

English

ENGL 270 *Aspects of Modern Literature: Contemporary Themes in Asian American Literature*
 ENGL 280 *The Asian American Experience* (also offered as ASIA 280)
 ENGL 359 *The Asian American Experience* (also offered as ASIA 380)

Hindi

HIND 101 and 102 *Introduction to Hindi Language and Culture I and II*
 HIND 201 and 202 *Intermediate Hindi I and II*
 HIND 399 *Hindi Teaching Practicum*

History

HIST 219 *Patterns of the Chinese Past*
 HIST 220 *Contemporary China* (also offered as ANTH 220)
 HIST 221 *Japan in the World Until 1800*
 HIST 222 *Japan in the World Since 1800*
 HIST 250 *Traditional Chinese Culture*

HIST 310 *Contemporary China* (enriched version of HIST 220; also offered as ANTH 310)
 HIST 341 *Pre-modern China*
 HIST 342 *Modern China*
 HIST 352 *The Comparative Modernization of China and Japan*
 HIST 369 *Film, Literature and the Japanese Past* (also offered as ASIA 369)
 HIST 405 *Issues in Comparative History*
 HIST 421 *Japan in the World Until 1800* (enriched version of HIST 221)
 HIST 422 *Japan in the World Since 1800* (enriched version of HIST 222)
 HIST 432 *Islam in South Asia* (also offered as ASIA 432 and WGST 432)
 HIST 448 *Creating Modern Japan: The Meiji Restoration*
 HIST 449 *Nation, Empire, and War: Japan in the 1930s*
 HIST 450 *Traditional Chinese Culture* (enriched version of HIST 250)
 HIST 485 *Comparing Histories: Modernization, War, and Society in Germany and Japan*

Japanese

JAPA 101 and 102 *Introduction to Japanese Language and Culture I and II*
 JAPA 201 and 202 *Intermediate Japanese Language and Culture I and II*
 JAPA 301 and 302 *Advanced Japanese Reading and Composition I and II*
 JAPA 399 *Japanese Teaching Practicum*
 JAPA 498 and 499 *Independent Study*

Korean

KORE 101 and 102 *Introduction to Korean Language and Culture I and II*
 KORE 201 and 202 *Intermediate Korean Language and Culture I and II*
 KORE 301 and 302 *Advanced Korean I and II*
 KORE 344 *Korean Literature and Culture* (also offered as ASIA 344 and HUMA 344)
 KORE 345 *Origin and Development of Korean and Related Languages in East Asia* (also offered as LING 345 and ASIA 345)

KORE 346 *Korean Culture and History*
(also offered as ASIA 346)

Linguistics

LING 345 *Linguistic Structure of Korean*
(also offered as KORE 345)

LING 346 *History of the Chinese Language* (also offered as CHIN 346)

LING 351 and 352 *Introduction to Sanskrit I and II* (also offered as SANS 301 and 302)

LING 440 *The Chinese Novel*

LING 443 *Topics in Chinese Linguistics*

LING 451 and 452 *Advanced Sanskrit I and II* (also offered as SANS 401 and 402)

Political Science

POLI 351 *Politics of Southeast Asia*

POLI 460 *Seminar in Comparative Government*

Religious Studies

RELI 132 *Classical and Colloquial Tibetan* (also offered as TIBT 132)

RELI 139 *Introduction to Indian Religions* (also offered as ASIA 139)

RELI 140 *Introduction to Chinese Religions* (also offered as ASIA 140)

RELI 221 *The Life of the Prophet Muhammad* (also offered as ASIA 221)

RELI 231 *The Enlightenment of the Body* (also offered as ASIA 231)

RELI 250 *Meditation, Mysticism, and Magic* (also offered as ASIA 250)

RELI 322 *Introduction to Buddhism*

RELI 325 *Buddhism and the Female*

RELI 354 *Apocalyptic and Millennium Movements in Pre-Modern Asia* (also offered as ASIA 354)

RELI 355 *Religion and Social Change in South Asia* (also offered as ASIA 355)

RELI 363 *The Marriage of Heaven and Hell* (also offered as ASIA 363)

RELI 365 *Mysticism and Meditation in China* (also offered as ASIA 365)

RELI 441/525 *Popular Religion in the Middle East* (also offered as ASIA 441)

RELI 470 *Buddhist Wisdom Texts*

RELI 471 *Buddhist Meditation Theory: Women and Men*

Sanskrit

SANS 301 and 302 *Elementary Sanskrit I and II* (also offered as LING 351 and 352)

SANS 401 and 402 *Advanced Sanskrit I and II* (also offered as LING 451 and 452)

Sociology

SOCI 323 *The Knowing Body: Buddhism, Gender, and the Social World* (also offered as ASIA 323 and WGST 323)

Tibetan

TIBT 132 *Classical and Colloquial Tibetan* (also offered as RELI 132)

TIBT 532 *Classical and Colloquial Tibetan* (also offered as RELI 532)

University and Residential College Courses

JONE 311 *Indian Society and Politics*

UNIV 118 *The Classic of Changes (I Ching) in Asian and World Culture*

Women and Gender Study

WGST 240 *Gender and Politicized Religion* (also offered as ASIA 240)

WGST 299 *Women in Chinese Literature* (also offered as ASIA 299 and CHIN 299)

WGST 323 *The Knowing Body: Buddhism, Gender, and the Social World* (also offered as ASIA 323 and SOCI 323)

WGST 340 *Gender and Politicized Religion* (also offered as ASIA 240)

WGST 399 *Women in Chinese Literature* (also offered as ASIA 399 and CHIN 399)

WGST 432 *Islam in South Asia* (also offered as ASIA 432 and HIST 432)

See ASIA in the Courses of Instruction section.

Bioengineering

George R. Brown School of Engineering

Chair

Larry V. McIntire

Professors

Kyriacos Athanasiou
John W. Clark
David Hellums
Antonios G. Mikos
Ka-Yiu San
Kyriacos Zygourakis

Associate Professors

Fathi Ghorbel
Lydia Kavraki
Jennifer L. West

Assistant Professors

Bahman Anvari
Michael A. Barry
Rebekah Drezek
Michael Liebschner
Jianpeng Ma
Robert Raphael

Senior Faculty Fellow

Suzanne G. Eskin

Faculty Fellow

Jorge Torres

Lecturer/Director of Laboratory Instruction

Ann Saterbak

Adjunct Professors

William Brownell
Gregory R. D. Evans
Craig J. Hartley
José A. López
Joel L. Moake
Andrew Schafer
David Sears
Jacqueline Shanks
C. Wayne Smith
Kenneth Wu

Adjunct Associate Professors

David W. Chang
Michael H. Kroll
Michael Miller
Charles W. Patrick
Peter Saggau
Mark M. Udden
Mark E. K. Wong
Alan W. Yasko
Michael Yaszemski
George Zouridakis

Adjunct Assistant Professors

Daniel E. Epner
Karen K. Hirschi
Seongbong Jo
Jan F. M. Post
Rolando E. Rumbaut

Degrees offered: B.S.B., M.S., Ph.D.

Graduate and undergraduate programs in bioengineering offer concentrations in areas that include cellular and molecular engineering; bioinstrumentation, imaging, and optics; or biomaterials and biomechanics. Research areas include biochemical engineering, biological systems modeling, biomaterials, biomedical lasers, cellular and molecular engineering, controlled release technologies, metabolic engineering, spectroscopy, systems engineering and instrumentation, thrombosis, tissue engineering, and transport processes.

Undergraduate Program. The bioengineering undergraduate program will prepare students for careers in rapidly developing areas of biomedical engineering and bioprocessing. Our unified and comprehensive program leading to the B.S. degree in bioengineering will:

- Provide students with a fundamental understanding of the life and medical sciences
- Teach students to apply engineering principles in the life and medical sciences
- Develop their critical problem solving skills in bioengineering
- Develop their ability to communicate effectively and participate in interdisciplinary teams
- Expose students to a broad education that prepares them for diverse careers

Undergraduates in bioengineering will then have the training to pursue further education in graduate school or medical school or will have strong preparation for a career in the biotechnology industry.

The B.S.B. degree is organized around a core of required courses and a selection of elective courses from three specialization areas. The specialization electives provide a flexibility that can be used to create a focus in cellular and molecular engineering; bioinstrumentation, imaging, and optics; systems engineering and instrumentation; or biomaterials and biomechanics. Because of the number of options, students should consult early with departmental advisers to plan a program that meets their needs.

Degree Requirements for the B.S. Degree in Bioengineering

For general university requirements, see Graduation Requirements (pages 18–20). The curriculum for a B.S. degree in bioengineering requires 94 credit hours, which count toward the total of 134 hours required to graduate.

Preparation. Students considering a major in bioengineering should take as freshmen MATH 101 and 102 *Single Variable Calculus I and II*, CHEM 121 and 122 *General Chemistry*, PHYS 101 (or PHYS 111) or PHYS 125 *Mechanics*, PHYS 102 (or PHYS 112) or PHYS 126 *Electricity and Magnetism*, and CAAM 210 or CAAM 211 *Introduction to Engineering Computation*. Sophomore students should take MATH 211 and 212, CHEM 211, 212, 215, BIOS 201, and MECH 211. BIOE 252 *Bioengineering Fundamentals* should be taken in the first semester of the sophomore year. BIOE 322 and BIOE 324 *Systems Physiology* should be taken the second semester of the sophomore year.

Concentration Areas. Students in the B.S.B. program will choose courses from three specialization areas:

- Cellular and molecular engineering
- Bioinstrumentation, imaging, and optics
- Biomaterials and biomechanics

Students majoring in bioengineering must complete the following courses.

Core Courses

Bioengineering

BIOE 252 *Bioengineering Fundamentals*
 BIOE 322 *Systems Physiology*
 BIOE 324 *Physiology Lab Module*
 BIOE 332 *Thermodynamics*
 BIOE 342 *Tissue Culture Laboratory*
 BIOE 372 *Introductory Biomechanics/Biomaterials*
 BIOE 383 *Biomedical Instrumentation*
 BIOE 420 *Biosystems Transport and Reaction Processes*
 BIOE 441 *Advanced Bioengineering Laboratory*
 BIOE 452 *Bioengineering Design*

Biosciences

BIOS 201 *Introductory Biology*
 BIOS 301 *Biochemistry*
 BIOS 311 or 312 (1 hour) *Laboratory Module*
 BIOS 341 *Cell Biology*

Computational and Applied Mathematics

CAAM 210 or CAAM 211 *Introduction to Engineering Computation*
 CAAM 335 or CAAM 336 *Foundations of Applied Math*

Chemistry

CHEM 121 *General Chemistry*
 CHEM 122 *General Chemistry*
 CHEM 211 *Organic Chemistry*
 CHEM 212 *Organic Chemistry*
 CHEM 215 *Organic Chemistry Laboratory*

Math

MATH 101 *Single Variable Calculus I*
 MATH 102 *Single Variable Calculus II*
 MATH 211 *ODEs and Linear Algebra*
 MATH 212 *Multivariable Calculus*

Other Engineering

MECH 211 *Circuits Engineering Mechanics*

Physics

PHYS 101 or PHYS 111 or PHYS 125
Mechanics
 PHYS 102 or PHYS 112 or PHYS 126
Electricity and Magnetism

Please note that some of these courses may not be listed in the Courses of Instruction section of this publication. As these courses become available, they will be listed in the schedule of courses.

Specialization Areas

Four bioengineering-area elective courses, at least 2 of which must be at the senior level, will be required in one of the three areas:

- Cellular and molecular engineering
- Bioinstrumentation, imaging, and optics
- Biomaterials and biomechanics

The elective courses in these concentration areas will be announced in future course listings.

Graduate Program. The bioengineering graduate program at Rice educates its students so that they can directly interact with physicians and cell and molecular biologists, while still excelling in the quantitative capabilities so important for engineering applications.

Degree Requirements for the M.S. and Ph.D. Degrees in Bioengineering

For general university requirements, see Graduate Degrees (pages 62-67).

M.S. Program. Candidates for the M.S. degree must:

- Complete at least 18 semester hours of foundation, supporting, and advanced courses with high standing
- Fulfill a teaching requirement
- Submit an original research thesis
- Defend the thesis in a public oral examination

Ph.D. Program. Candidates for the Ph.D. degree must:

- Complete at least 36 approved semester hours of foundation, supporting, and advanced courses, with high standing. With departmental approval, the course requirements may be reduced to not less than 22 hours for students already holding an M.S. degree.
- Fulfill a teaching requirement. After their first two semesters in residence, students may be asked to spend the equivalent of 6 to 10 hours per week for a total of three semesters on teaching assignments.

- Pass the Ph.D. qualifying examinations. All Ph.D. students must pass the Ph.D. qualifying examinations usually given during the first year of study. The qualifying examinations are comprehensive tests on the knowledge acquired in the bioengineering foundation courses.
- Submit a thesis proposal. Ph.D. students must submit and successfully defend their thesis proposals by the end of their fifth semester in residence.
- Complete a three to six month industrial internship. This requirement may be waived for those with adequate previous industrial experience.
- Submit a thesis that provides evidence of their ability to carry out original research in a specialized area of bioengineering.
- Defend the thesis in a public oral examination.

Graduate students take required courses and electives in the following areas:

- Cellular and molecular engineering
- Bioinstrumentation, imaging, and optics
- Biomaterials and biomechanics

See BIOE in the Courses of Instruction section.

Biosciences

Biochemistry and Cell Biology

The Wiess School of Natural Sciences

Chair

Frederick B. Rudolph

Professors

Kathleen Beckingham
 George N. Bennett
 Zenaïdo Camacho
 Raymon M. Glantz
 Richard H. Gomer
 Jordan Konisky
 Kathleen Shive Matthews
 John Steven Olson
 Ronald J. Parry
 Charles R. Stewart

Professors Emeriti

James Wayne Campbell
 Graham Palmer
 James B. Walker

Associate Professors

Bonnie Bartel
 Janet Braam
 Susan L. Gibson
 Michael C. Gustin

Seiichi P.T. Matsuda
 Edward P. Nikonowicz
 Michael Stern

Assistant Professors

Mary Ellen Lane
 Kevin R. MacKenzie
 James A. McNew
 Yousif Shamoo
 Scott F. Singleton

Lecturers/Laboratory

Coordinators

Beth Beason-Armendarez
 David R. Caprette
 M. Susan Cates

Adjunct Professor

George N. Phillips, Jr.
 Florante A. Quiocho

Faculty Fellow

Marian Fabian

Ecology and Evolutionary Biology

The Wiess School of Natural Sciences

Chair

Ronald L. Sass

Professors

Paul A. Harcombe
 David C. Queller
 Joan E. Strassmann
 Calvin H. Ward

Professors Emeriti

Frank M. Fisher, Jr.
 Charles Philpott
 Stephen Subtelny

Assistant Professors

Lisa Meffert
 Evan Siemann

Adjunct Assistant Professors

Nancy Grieg
 Rosine Hall

Huxley Fellows

Kevin Foster
 William Rogers

Lecturer/Laboratory

Coordinator

Barry Sullender

Degrees Offered: B.A., M.A., Ph.D.

The undergraduate curriculum in the biosciences is administered jointly by two departments: the Department of Biochemistry and Cell Biology and the Department of Ecology and Evolutionary Biology. This curriculum offers majors in biochemistry and in biology. Courses in the biosciences include animal behavior, animal biology, biochemistry, biophysics, cell biology, developmental biology, ecology, endocrinology, evolutionary biology, genetics, immunology, microbiology, molecular biology, neurobiology, and plant biology.

The graduate programs in biochemistry and cell biology focus on topics in biochemistry, biophysics, cell biology, development, genetics, molecular biology, and neurobiology. In the ecology and evolutionary biology program, the focus is on behavior, biogeochemistry, molecular evolution, plant community ecology, population biology, sociobiology, and wetland ecosystems.

Degree Requirements for B.A. in Biosciences

For general university requirements, see Graduation Requirements (pages 18–20). Students majoring in biosciences must complete at least 48 semester hours of courses at the 300 level or higher. The total semester hours at graduation should be at least 129 hours (128 hours if students choose the PHYS 101/102 option, and 132 hours if they choose the MATH 111/112 option). All biosciences majors must complete the following:

Mathematics

MATH 101/102 *Single Variable Calculus I and II*
MATH 211 *Ordinary Differential Equations and Linear Algebra*

Chemistry

CHEM 121/122 *General Chemistry with Laboratory*
CHEM 211/212 *Organic Chemistry*
CHEM 215 *Organic Chemistry Lab*

Physics

PHYS 125/126 *General Physics I and II*

Biosciences

BIOS 201/202 *Introductory Biology*
BIOS 301 *Biochemistry*
BIOS 211 *Introductory Lab in Biological Sciences* (2 credit hours)
BIOS 213 *Introductory Lab in Ecology and Evolutionary Biology*
BIOS 311 *Lab in Protein Purification*

Any 2 of the following advanced laboratory courses:

BIOS 312 *Lab Module in Molecular Biology I*
BIOS 313 *Lab Module in Molecular Biology II*
BIOS 314 *Lab in Cell and Developmental Biology*
BIOS 315 *Lab in Physiology*
BIOS 316 *Lab in Ecology*
BIOS 317 *Lab in Behavior*
BIOS 318 *Lab in Microbiology*
BIOS 319 *Tropical Field Biology*
BIOS 320/BIOE 342 *Lab in Tissue Culture*
BIOS 530 *NMR Spectroscopy and Molecular Modeling*
BIOS 532 *Spectroscopy*
BIOS 533 *Computational Biology*
BIOS 535 *Practical X-Ray Crystallography*

Options. One of the advanced laboratory course requirements may be satisfied by taking any of the following: (1) STAT 305 (if used to satisfy a lab requirement, this may not also be used to satisfy a lecture course requirement); or (2) BIOS 310, if taken for at least 2 credits; or (3) HONS 470/471, if the research supervisor is from one of the biosciences departments or if the research is biological in nature and preapproved by the student's adviser; or (4) BIOS 401/402, one semester may be used to meet an advanced

laboratory course requirement, and the other semester may be used to meet the requirement for a group A or B course. Students may substitute MATH 111 *Fundamental Theorem of Calculus* and MATH 112 *Calculus and its Applications* for MATH 101. They may substitute CHEM 151/152 *Principles of Chemistry* for CHEM 121/122. Although PHYS 125 and 126 are the preferred physics courses for biosciences majors, students who want to keep open the option of a different major may satisfy the physics requirement by taking PHYS 101 or 111 *Mechanics* and PHYS 102 or 112 *Electricity and Magnetism* (with their respective labs).

Course Sequence. Students should take the 100-level mathematics and chemistry courses in the freshman year, the 100-level physics courses and the 200-level biosciences courses in either the freshman or the sophomore year, and the 200-level chemistry courses in the sophomore year. Those with a limited background in chemistry should complete CHEM 121/122 before taking BIOS 201/202. Taking BIOS 201/202 in the freshman year gives students earlier access to upper-level courses, and is recommended for students with sufficient chemistry preparation.

Undergraduate Research. Undergraduate majors are encouraged, but not required, to pursue independent supervised research in BIOS 401/402 Undergraduate Honors Research; those who do must register concurrently in BIOS 411/412 Undergraduate Research Seminar and complete a thesis. Students may also undertake research projects in BIOS 310 *Undergraduate Independent Study* and HONS 470/471. See Honors Programs (page 32).

Biochemistry Major. Students majoring in biochemistry must take the following in addition to those required of all biosciences majors.

- BIOS 352 *Physical Chemistry for Biosciences* or CHEM 311/312 *Physical Chemistry*
- BIOS 302 *Biochemistry*
- BIOS 341 *Cell Biology*
- BIOS 344 *Molecular Biology and Genetics*
- 1 additional bioscience course from Group A
- 1 additional course for 3 or more hours at the 200 level or higher in mathematics, physics, computer science, statistics, or computational and applied mathematics; or BIOS 322, BIOS 325, or BIOS 334
- 1 additional course for 3 or more hours at the 300 level or higher in chemistry or Group A biosciences

Students may substitute 1 semester of honors research, BIOS 401 or 402, for 1 of the elective courses from Group A if their faculty supervisor is from the Department of Biochemistry and Cell Biology. NEUR 511 and 512 may be substituted for one Group A course. Biochemistry majors are assigned an adviser from the biochemistry and cell biology department.

Biology Major. Students majoring in biology must take the following in addition to the courses that are required of all biosciences majors:

- 2 biosciences courses from Group A
- 1 biosciences course from Group B
- 4 additional biosciences courses from Groups A and/or B

Students may substitute STAT 305 Introduction to Statistics for Biosciences for one of the last 4 courses provided that STAT 305 has not been used to satisfy a lab requirement.

Students may also substitute 1 semester of honors research, BIOS 401 or 402, for one of the courses from Group A, if their faculty supervisor is from the Department of Biochemistry and Cell Biology, or from Group B, if their supervisor is from the

Department of Ecology and Evolutionary Biology. NEUR 511 and 512 may be substituted for one Group A course. The recommended courses for those taking a limited number of Group A courses are BIOS 302 *Biochemistry*, BIOS 341 *Cell Biology*, BIOS 344 *Molecular Biology and Genetics*, and BIOS 352 *Physical Chemistry for Biosciences*.

Students who choose to specialize in ecology and evolutionary biology should choose their 4 additional biosciences courses from Group B. Students who choose cell and molecular biology for their specialization should choose their 4 additional biosciences courses from Group A. Specialization is not required, and students may switch from one to the other if they wish. Biology majors are assigned an adviser from one of the two biosciences departments according to their specialization; those electing a general biology program may request advisers from either department. Students interested in environmental careers should consult with the ecology and evolutionary biology department for a list of recommended courses. See also Environmental Studies listings (page 173) and Environmental Science Double Major (pages 129–130).

Admission Requirements for Accelerated B.A./Ph.D. Program in Biochemistry and Cell Biology

Qualified undergraduates at Rice may apply for admission to the biochemistry and cell biology graduate program in their senior year. This allows them to complete certain course requirements for graduate studies at the same time as their upper-level undergraduate degree requirements; laboratory research performed as part of their undergraduate thesis project can serve as the initial phases of their Ph.D. thesis work. Students thus should be able to obtain their Ph.D. degree more quickly—approximately three years after earning their B.A. degree.

Criteria for admission include academic performance (grade point average of 3.30 or higher), high scores on the Graduate Record Examination (GRE), motivation, previous research experience, and personal qualities. The department Graduate Admissions Committee makes the selection.

Interested students must complete two and one-half years (or their equivalent) of undergraduate studies at Rice before applying for enrollment in the accelerated B.A./Ph.D. program. To continue in the program, they must:

- Take the GRE before receiving the B.A. degree and earn scores greater than 80 percent in the analytical and quantitative tests
- Maintain a B average in all courses in their senior year

The usual graduate requirements will apply for continuation in the program.

Degree Requirements for M.A. and Ph.D. in Biochemistry and Cell Biology

Admission. Applicants for graduate study in the Department of Biochemistry and Cell Biology must have:

- B.A. degree in biochemistry, biology, chemistry, chemical engineering, physics, or some equivalent
- Strong ability and motivation, as indicated by academic record, Graduate Record Examination (GRE) scores, and recommendations

Although the department offers an M.A. degree in biochemistry and cell biology, only on rare occasions are students who do not intend to pursue the Ph.D. degree admitted to the graduate program. The department provides a program guide titled “Graduate Program for Biochemistry and Cell Biology,” which is updated annually. For general university requirements, see Graduate Degrees (pages 62–67).

Both Ph.D. and M.A. Programs. Most of the formal course studies will be completed in the first year of residence to allow the students to commence thesis research at the end of their second semester at Rice. During the first year, all graduate students will be advised by the Graduate Advisory Committee (current composition: Braam, Gustin, MacKenzie, and Stern). This committee will determine the formal course program to be taken during the first year in residence. Students are required to have training in biochemistry, cell biology, genetics, and physical chemistry or biophysics. If students lack formal training in these subjects, they are required to take the equivalent background courses during their first year. The corresponding courses at Rice include the following:

BIOS 301 *Biochemistry*
 BIOS 302 *Biochemistry*
 BIOS 311, 312, 313 *Laboratories for the Biosciences*
 BIOS 341 *Cell Biology*
 BIOS 344 *Molecular Biology and Genetics*
 BIOS 352 *Physical Chemistry for the Biosciences*

BIOS 800 *Graduate Research* (rotations in first year)
 UTHSC GS210051 *Ethical Dimensions of the Biomedical Sciences*

Students must also take 2 units from the following set of advanced courses:

BIOS 525 *Plant Molecular Biology* (1 unit)
 BIOS 530, 532, 533, 535 *Graduate Laboratory Modules in Molecular Biophysics* (1/2 unit each)
 BIOS 545 *Advanced Molecular Biology and Genetics* (1 unit)
 BIOS 588 *Advanced Cell and Developmental Biology* (1 unit)

All Ph.D. students are required to take the following graduate-level courses:

BIOS 575 *Introduction to Research*
 BIOS 581, 582 *Graduate Research Seminars*
 BIOS 583 *Molecular Interactions*
 BIOS 587 *Research Design, Proposal Writing, and Professional Development*

Students should complete BIOS 583 and BIOS 587 in their first and second years, respectively, and they will be responsible for the content of those course programs in their admission to candidacy examination (see below). Students also gain teaching experience by serving as discussion leaders and graders in undergraduate sections during their second year. Safety and ethics presentations are provided for first-year students.

Evaluation of Progress in Graduate Study. The Graduate Advisory Committee evaluates each student’s undergraduate record and identifies any deficiencies to be corrected (usually in the first year). Thesis advisers may require additional course work of a more specialized nature. Students must complete all additional courses before taking the admission to candidacy examination.

At the end of each semester, the department chair, in consultation with the committee and faculty, reviews student performance in the formal course work; after students complete two semesters at Rice, the faculty conducts a review. Students must maintain at least a B average and demonstrate outstanding motivation and potential for research.

Evaluation after the first year includes:

- Ongoing review of research progress by the thesis research adviser
- A research progress review examination given each year by the student’s Research Progress Review Committee
- Presentation of research progress at least once a year after the second year until submission of a complete doctoral thesis

- Completion of an oral admission to candidacy examination before the beginning of the student's sixth semester
- Defense of the Ph.D. thesis research and text in a final public seminar presentation and oral examination attended by the student's Thesis Committee

M.A. Program. All the above requirements and evaluation procedures apply to M.A. candidates with the following exceptions. The research progress review examination held during the M.A. student's second full year, which is identical in format to that for Ph.D. students, replaces the admission to candidacy examination; no other preliminary examination is held before the final oral defense of the master's thesis. M.A. candidates must complete a thesis and make a public oral defense of their research work to their Thesis Committee and other interested parties.

Degree Requirements for M.S., M.A., and Ph.D. in Ecology and Evolutionary Biology

Admission. Applicants for graduate study in the Department of Ecology and Evolutionary Biology must have:

- B.A. degree or equivalent
- Scores from the Graduate Record Examination (GRE), including the advanced examination in biology
- Strong background in biology
- Completed course work in physics, mathematics (including calculus), and chemistry (including organic chemistry)

These requirements do not preclude admission of qualified applicants who have majored in areas other than biology. Deficiencies should be made up during the first year of residence; some may be waived at the discretion of the student's faculty adviser and the department chair.

Entering students will meet with a faculty adviser to form a course of study for the first year. All first-year students will demonstrate basic proficiency in ecology and evolutionary biology EITHER by completing one ecology course (from the following choices: BIOS 322, BIOS 324, BIOS 325, BIOS 329, or BIOS 336) and one evolutionary biology course (from the following choices: BIOS 321 or BIOS 334) OR by performing satisfactorily on a written examination that tests basic knowledge in both ecology and evolutionary biology.

All graduate students are required to complete the following graduate-level courses: BIOS 561 *Topics in Evolution*, BIOS 562 *Topics in Behavioral Biology*, BIOS 563 *Topics in Ecology*, BIOS 568 *Topics in Biological Diversity*, BIOS 585/586 *Graduate Seminar in Ecology and Evolutionary Biology*. Students may substitute BIOS 432 *Advanced Evolutionary Biology* for BIOS 561 or BIOS 562. Students are required to complete two semesters of BIOS 591 *Graduate Teaching*. Students typically complete a Ph.D. in no less than 3 and no more than 5 years.

M.S. Program. In addition to the general university requirements and those listed above, the Master of Science in Ecology and Evolutionary Biology requires 10 hours of research credit.

M.A. Program. In addition to the general university requirements and those listed above, the Master of Arts in Ecology and Evolutionary Biology requires the completion and public defense of a thesis embodying the results of an original investigation.

Ph.D. Program. In addition to the general university requirements and those listed above, applicants for the Ph.D. degree in Ecology and Evolutionary Biology must:

- Maintain a grade average of B or better in courses taken in the department and satisfactory grades in courses taken outside the department
- Pass the admission to candidacy examination given by the Graduate Advisory Committee (this examination may be oral and/or written)
- Complete an original investigation and a doctoral thesis worthy of publication in a scientific journal
- Present a departmental seminar on the research
- Publicly defend the doctoral thesis

See BIOS in the Courses of Instruction section.

Center for the Study of Languages

The School of Humanities

Interim Director

Michel Achard

Senior Lecturers

Aman Attieh (*Arabic*)

Lilly C. Chen (*Chinese*)

Evelyne Datta (*French*)

Raquel Gaytan (*Spanish*)

Marcela Salas (*Spanish*)

Hiroko Sato (*Japanese*)

Jane Verm (*Spanish*)

Lecturers

Veronica Albin (*Spanish*)

Maria Alvarez (*Spanish*)

Suzana Bloem (*Portuguese*)

Patricia Brogdon-Gómez (*Spanish*)

Brigitte Crull (*French*)

Ombretta Frau (*Italian*)

Christa Gaug (*German*)

Robin Martinez (*Spanish*)

Marshall McArthur (*Chinese*)

Harry Roddy (*German*)

Guatami Shah (*Hindi*)

Chao-mei Shen (*Chinese*)

Meng Yeh (*Chinese*)

Elsa Zambosco-Thomas (*Spanish*)

The Center for the Study of Languages (CSL) was founded in August 1997 to promote and enhance the study of languages at Rice University. The role of the center is to establish innovative approaches to language education, expand opportunities for language learning across the curriculum, and increase Rice students' participation in study and work abroad. To accomplish these goals, CSL regularly sponsors professional development for instructors and graduate students in language departments.

CSL organizes workshops, lectures, and seminars as forums for departmental discussions of curricular design, assessment, and technology integration.

Through CSL, two cross-listed graduate seminars are offered: In the fall, students can take FREN 610, GERM 510, LING 610, or SPAN 610; in the spring, FREN 611, GERM 611, LING 611, or SPAN 611.

A sequence of 3 undergraduate courses on cross-cultural awareness are offered: UNIV 321, UNIV 322, and UNIV 323.

Chemical Engineering

The George R. Brown School of Engineering

Chair

Kyriacos Zygourakis

Professors

Constantine Armeniades
Walter G. Chapman
George J. Hirasaki
Larry V. McIntire
Antonios G. Mikos
Clarence A. Miller
Marc A. Robert
Ka-Yiu San
Mark Weisner

Professors Emeriti

William W. Akers
Sam H. Davis
Derek C. Dyson
Joe W. Hightower
Riki Kobayashi

Research Professor

Jesse David Hellums

Associate Professor

Jennifer L. West

Assistant Professors

Jacqueline L. Goveas
Nikolaos Mantzaris
Matteo Pasquali
Michael S. Wong

Adjunct Professor

G. D. Fisher

Adjunct Associate Professors

Thomas W. Badgwell
Waylon V. House
Glenn A. Taylor

Adjunct Assistant Professors

R. Donald Bartusiak
David A. Hokanson

Lecturers

Kenneth R. Cox
Herbert C. McKee

Degrees Offered: B.A., B.S.Ch.E., M.Ch.E., M.S., Ph.D.

This major gives undergraduates a sound scientific and technical grounding for further development in a variety of professional environments. Courses in mathematics, chemistry, physics, and computational engineering provide the background for the chemical engineering core, which introduces students to chemical process fundamentals, fluid mechanics, heat and mass transfer, thermodynamics, kinetics, reactor design, process control, and process design. Course electives may be used to create a focus area in one of the following four disciplines: bioengineering, environmental engineering, materials science/engineering, and computational engineering. Upon completing either the flexible B.A. requirements or the more scientific and professional B.S.Ch.E. requirements, students may apply for a fifth year of study leading to the nonthesis Master of Chemical Engineering (M.Ch.E.) degree. A joint M.B.A./M.Ch.E. degree is also available in conjunction with the Jesse H. Jones Graduate School of Management.

Students admitted for graduate studies leading to the M.S. or Ph.D. degrees must complete a rigorous program combining advanced course work and original research that must be formalized in an approved thesis. Graduate research is possible in a number of areas, including thermodynamics, interfacial phenomena, complex fluids, polymer science and rheology, process control and optimization, reaction engineering and catalysis, reservoir engineering, biotechnology, and biomedical engineering.

Degree Requirements for B.S. in Chemical Engineering

For general university requirements, see Graduation Requirements (pages 18–20). The B.S. degree is accredited by the Accreditation Board for Engineering and Technology (ABET). Through careful selection of other engineering and science courses, a student can develop a focus (or concentration) area in any of the following 4 engineering disciplines: environmental science/engineering, bioengineering, materials science/engineering, and computational engineering. These elective programs can be completed within the framework of a B.S. in chemical engineering and will be recognized as a separate item on a student's transcript. Students majoring in chemical engineering must complete 100 hours in specified courses for a minimum of 132 hours at graduation. They must complete the following courses.

Chemistry

CHEM 121/122 *General Chemistry with Laboratory*
or CHEM 151/152 *Honors Chemistry with Laboratory*
CHEM 211/212 *Organic Chemistry*
CHEM 217 *Organic Chemistry Lab*
CHEM 311/312 *Physical Chemistry*
Any 2 of CHEM 212, CHEM 311, or CHEM 312

Chemical Engineering

CENG 301 *Chemical Engineering Fundamentals*
CENG 303 *MATLAB, FORTRAN and MAPLE for Chemical Engineers*
CENG 305 *Computational Methods for Chemical Engineers*
CENG 343 *Chemical Engineering Lab I*
CENG 390 *Kinetics and Reactor Design*
CENG 401/402 *Transport Phenomena I and II*
CENG 403 *Equipment Design*
CENG 404 *Process Design*
CENG 411/412 *Thermodynamics I and II*
CENG 443 *Chemical Engineering Lab II*
CENG 470 *Process Dynamics and Control*

Mathematics

MATH 101/102 *Single Variable Calculus I and II*
MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus* or equivalent honors courses
CAAM 336 *Differential Equations in Science and Engineering*
or MATH 381 *Introduction to Partial Differential Equations*

Physics

PHYS 101 or 111 *Mechanics*
PHYS 102 or 112 *Electricity and Magnetism*

Mechanical Engineering

MECH 211 *Engineering Mechanics*

Other Courses

1 approved basic science course
3 courses from the following:
ELEC 243 *Electrical Circuits*
MSCI 301 *Materials Science*
CIVI 300 *Mechanics of Solids*
ENVI 434 *Chemical Transport and Fate in the Environment*
BIOE 420 *Biosystems Transport and Reaction Processes*
BIOE 460 *Biotechnological Processes*
ENVI 411 *Air Resource Management*
or see requirements for focus areas in environmental science/engineering, bioengineering, materials science/engineering, and computational engineering

The undergraduate curriculum is designed so that outstanding students interested in careers in research and teaching may enter graduate school after earning either bachelor's degree.

Degree Requirements for B.A. in Chemical Engineering

Students pursuing the B.A. degree in chemical engineering must meet all of the requirements for the B.S.Ch.E. degree except for the following courses: CENG 404 and CENG 470, the additional "basic science" course, and the 3 "other engineering" courses. Free electives may be substituted for these 6 courses to reach at least 132 semester hours for graduation.

Prerequisites for Chemical Engineering Courses. Before undergraduates may register for courses in chemical engineering at the 300 level and above, they must satisfy the following prerequisites.

For CENG 301

Math 101/102
CHEM 121/122 or CHEM 151/152
Corequisite: CENG 303

For CENG 390

CENG 301, 303, and 305
MATH 211/212

For CENG 401

CENG 411
MATH 211/212
PHYS 101/102
Co/Prerequisite: CENG 305

For CENG 402

CENG 401
Co/Prerequisites: CAAM 336 or MATH 381

With the written consent of the instructor, students may register for a course without completing the required prerequisite(s). Waivers, however, are not transferrable.

Degree Requirements for M.Ch.E., M.S., and Ph.D. in Chemical Engineering

For general university requirements, see Graduate Degrees (pages 62–67).

M.Ch.E. Program. For the M.Ch.E. degree, students must complete at least 30 hours of courses beyond those counted for their undergraduate degree. At least 6 of the courses taken must be upper-level courses in chemical engineering and 1 must be an approved mathematics course. The chemical engineering courses selected should include process design (two semesters) and process control, unless courses in these subjects were taken during the student's undergraduate studies.

M.S. Program. Candidates for the M.S. degree must:

- Complete at least 18 approved semester hours with high standing
- Submit an original research thesis
- Defend the thesis in a public oral examination

Ph.D. Program. Candidates for the Ph.D. degree must:

- Demonstrate competence in the areas of applied mathematics, thermodynamics, transport processes, and chemical kinetics and reactor design by passing qualifying examinations, usually during the first year of study
- Complete at least 36 approved semester hours with high standing (with department approval, the course requirements may be reduced to 24 hours for students already holding an M.S. degree)
- Submit a thesis that provides evidence of their ability to carry out original research in a specialized area of chemical engineering
- Defend the thesis in a public oral examination

See CENG in the Courses of Instruction section.

Chemistry

The Wiess School of Natural Sciences

Chair

Kenton H. Whitmire

Professors

Andrew R. Barron
 W. Edward Billups
 Philip R. Brooks
 Robert F. Curl, Jr.
 Paul S. Engel
 Graham P. Glass
 John S. Hutchinson
 James L. Kinsey
 John L. Margrave
 Ronald J. Parry
 Ronald L. Sass
 Gustavo E. Scuseria
 Richard E. Smalley
 James M. Tour
 R. Bruce Weisman
 Kenton H. Whitmire
 Lon J. Wilson
Associate Professors
 Vicki L. Colvin
 Seiichi P. T. Matsuda
Assistant Professors
 Victor Behar
 Cecilia Clementi

Jeffrey Hartgerink
 Anatoly Kolomeisky
 Scott F. Singleton

Adjunct Professors

Marco Ciufolini
 Tohru Fukuyama
 Peter Harland
 Michael Metzker
 Graham Scott
 M. Robert Willcott

Instructor

Sue Wiediger

Lecturers

Lawrence B. Alemany
 Mary E. R. McHale

Distinguished Faculty Fellows

Robert H. Hauge
 Ken A. Smith

Senior Faculty Fellow

Bruce R. Johnson

Faculty Fellow

Valery Khabashesku

Visiting Professor

Raphael Levine

Degrees Offered: B.A., B.S., M.A., Ph.D.

Recognizing the wide range of studies encompassed by chemistry, the department encourages undergraduates to explore offerings in other departments such as mathematics, computational and applied mathematics, biochemistry, and physics as well as upper-level courses in chemistry. An interdepartmental major is offered in chemical physics. Taking advantage of the department's extensive facilities, each B.S. degree candidate carries out a program of individual research under the supervision of a faculty member.

Graduate studies emphasize individual research, together with a fundamental understanding of chemistry beyond the students' specific interests. Faculty research interests include the synthesis and biosynthesis of organic natural products; the synthesis of small cycloalkanes, molecular recognition, and biological catalysis; bioinorganic and organometallic chemistry; main group element and transition metal chemistry; the chemistry of group 13 (III) elements; high-pressure and high-temperature chemistry; fluorine chemistry; chemical vapor deposition; the design of nanophase solids; molecular photochemistry and photophysics; infrared kinetic spectroscopy, laser and NMR

spectroscopy; the study of oriented molecular beams; theoretical and computational chemistry; and the study of giant fullerene molecules carbon nanotubes and their derivatives, polymer synthesis and characterization, molecular electronics, and molecular machines.

Degree Requirements for B.A. in Chemistry

For general university requirements, see Graduation Requirements (pages 18–20). Students choosing to receive a B.A. in Chemistry must have a total of at least 120 semester hours at graduation, including the following courses required of all majors.

Core Courses

Chemistry

CHEM 121/122 *General Chemistry with Laboratory*
(or CHEM 151/152 *Honors Chemistry with Laboratory*)
CHEM 211/212 *Organic Chemistry*
CHEM 215 *Organic Chemistry Lab*
CHEM 311/312 *Physical Chemistry*
CHEM 351 *Introductory Module in Experimental Chemistry I*
CHEM 352 *Introductory Module in Experimental Chemistry II*
CHEM 353 *Introductory Module in Analytical Methods*
CHEM 360 *Inorganic Chemistry*

Mathematics

MATH 101/102 *Single Variable Calculus I and II*
(or MATH 121/122)
MATH 211 *Ordinary Differential Equations and Linear Algebra*
MATH 212 *Multivariable Calculus*
(or MATH 221/222 *Honors Calculus III and IV*)

Physics

PHYS 101 or 111 *Mechanics*
PHYS 102 or 112 *Electricity and Magnetism*

Other

NSCI 230 *Computation in the Natural Sciences* (or equivalent)

To ensure that students receive suitable breadth in their laboratory experience, advanced module selections must be approved by the student's major committee. Other advanced laboratory courses from chemically related disciplines (biochemistry, materials science, environmental engineering, etc.) may be substituted for these advanced modules, with approval of the committee. Chemistry majors may also substitute 2 advanced organic laboratory module credit hours for CHEM 215, with

Additional Lecture Courses

At least 1 course from the following:
CHEM 401 *Advanced Organic Chemistry*
CHEM 430 *Quantum Chemistry*
CHEM 495 *Transition Metal Chemistry*

Additional Laboratory Courses

At least 3 advanced laboratory module credit hours from the following list:
CHEM 373 *Advanced Module in Fullerene Chemistry*
CHEM 374 *Advanced Module in Synthetic Chemistry*
CHEM 375 *Advanced Module in Inorganic Chemistry*
CHEM 376 *Advanced Module in Materials Chemistry*
CHEM 377 *Advanced Module in Catalysis*
CHEM 381 *Advanced Module in Physical Chemistry, A*
CHEM 382 *Advanced Module in Physical Chemistry, B*
CHEM 383 *Advanced Module in Instrumental Analysis, A*
CHEM 385 *Advanced Module in Polymer Chemistry*
CHEM 391 *Advanced Module in Catalysis*
CHEM 435 *Methods of Computational Quantum Chemistry*

approval of the committee. Three hours of CHEM 491 (taken for one entire semester) may be substituted for 1 advanced laboratory module if no other CHEM 491 credit is taken in the same semester.

Students in the chemistry B.A. major must satisfy the university distribution requirements and complete no fewer than 64 semester hours in addition to the departmental requirements for the chemistry major, giving a minimum total of 120 hours for graduation.

Degree Requirements for B.S. in Chemistry

The core chemistry, math, physics, and NSCI 230 requirements for the B.S. degree are the same as those for the B.A. degree. PHYS 201 *Waves and Optics* and PHYS 202 *Modern Physics* are recommended but not required.

In addition to the core requirements, the B.S. degree requires the following additional course and laboratory work:

- 2 courses from the **Additional Lecture Courses** list
- 3 advanced modules from the **Additional Laboratory Courses** list. As with the B.A. degree, 2 advanced laboratory modules may be substituted for CHEM 215 with departmental approval.
- At least 3 semester hours in undergraduate research (CHEM 491) in no less than 2-hour segments. With departmental approval, students may satisfy this requirement with HONS 470/471, which requires participation in CHEM 491 meetings. Students may also satisfy 3 of the 6 required hours in upper-level courses with additional research.
- 6 hours credit in upper-level courses (300 level or higher) in chemistry, mathematics, computational and applied mathematics, physics, biochemistry, or other subjects with adviser approval.

Students in the chemistry B.S. major must satisfy the distribution requirements and complete no fewer than 60 semester hours in addition to the departmental requirements for the chemistry major, giving a minimum total of 128 hours for graduation.

American Chemical Society Certification. The Rice Department of Chemistry is on the approved list of the Committee on Professional Training of the American Chemical Society and so can certify that graduates have met the appropriate standards. The B.A. degree is not certifiable. For certification, students must complete:

- All degree requirements for the B.S. degree listed above
- CHEM 495 *Transition Metal Chemistry*
- A department-approved course in biochemistry
- 9 hours total in upper-level courses from chemistry, physics, mathematics, computational and applied mathematics, biochemistry, or other courses in science or engineering with the approval of the department. The required course in biochemistry listed above counts toward this total.

A foreign language, preferably German, is recommended.

Chemical Physics Major. The chemical physics major leading to a B.S. degree is offered in conjunction with the Department of Physics. Students take upper-level courses in both chemistry and physics, focusing on the applications of physics to chemical systems. Students majoring in chemical physics must complete the following courses:

Core Courses**Chemistry**

CHEM 121/122 *General Chemistry with Laboratory*
 or CHEM 151/152 *Honors Chemistry with Laboratory*
 CHEM 211 *Organic Chemistry*
 CHEM 311/312 *Physical Chemistry*

Physics

PHYS 101 or 111 *Mechanics*
 PHYS 102 or 112 *Electricity and Magnetism*
 PHYS 201 *Waves and Optics*
 PHYS 202 *Modern Physics*
 PHYS 231 *Elementary Physics Lab II*
 PHYS 301 *Intermediate Mechanics*
 PHYS 302 *Intermediate Electrodynamics*

Mathematics

MATH 101/102 *Single Variable Calculus I and II*

or MATH 121/122
 MATH 211 *Ordinary Differential Equations and Linear Algebra*
 MATH 212 *Multivariable Calculus*
 or MATH 221/222 *Honors Calculus III and IV*

Additional Courses

1 course from CHEM 212 or CHEM 360
 2 courses from PHYS 311, PHYS 312, CHEM 430, or CHEM 415
 6 hours from CHEM 215, CHEM 351, CHEM 352, CHEM 373–391, CHEM 435, PHYS 331, or PHYS 332. Up to 2 hours of independent research (CHEM 491 or PHYS 491/492 may be counted toward this requirement.)
 2 courses from NSCI 230, CAAM 211, CAAM 212, or mathematics or computational and applied mathematics at the 300 level or above

Admission Requirements for Accelerated B.S./Ph.D. Program in Chemistry

The high level of training provided in the Rice B.S. program enables certain specially-qualified undergraduates to enter an accelerated program that allows them to complete a Ph.D. degree within two or three years after receiving their B.S. degree. Students electing this option must begin their research during the summer following their junior year and continue the research by taking CHEM 491 during their senior year.

Degree Requirements for M.A. and Ph.D. in Chemistry

For general university requirements, see Graduate Degrees (pages 62–67). Students who have completed course work equivalent to that required for a B.A. or B.S. in chemistry may apply for admission to the Ph.D. program. For more information, see Admission to Graduate Study (pages 67–68).

M.A. Program. Students are NOT normally admitted to study for an M.A. degree. However, this degree is sometimes awarded to students who do not wish to complete the entire Ph.D. program. Candidates for the M.A. degree must:

- Complete 6 one-semester courses
- Produce a thesis that presents the results of a program of research approved by the department
- Pass a final oral examination

Students who are admitted to Ph.D. candidacy may apply for an automatic master's degree.

Ph.D. Program. The Ph.D. is primarily a research degree. Graduate education is aimed at developing each student's ability to conduct independent, creative research and to develop habits of inquiry that will ensure continuing intellectual development throughout their careers. The completion of the Ph.D. program is expected to take no more than five years of full-time study. Ph.D. students must:

- Complete 6 one-semester graduate-level courses. No courses are specified. Courses are chosen with the approval of the student's advisory committee and/or faculty adviser. Courses should be at the 400 level or higher. Certain 300 level courses in other departments may be acceptable with departmental approval.
- Pass an examination involving a written and oral presentation of an original research proposal. The written proposal must conform to the format and guidelines established by the department. The guidelines are available in the department office. The proposal must be given to the committee at least one week before the date of the examination. The examination, including any follow-up work deemed necessary by the committee, must be completed within two months of the end of the student's fourth semester.
- In addition to the course work listed above, the student must participate in CHEM 600, 601, or 602 each semester that the student is in residence.
- The student is required to participate in CHEM 700, Teaching Practicum, for four semesters.
- Submit and defend a publishable thesis that represents an original and significant contribution to the field of chemistry.

See CHEM in the Courses of Instruction section.

Civil and Environmental Engineering

The George R. Brown School of Engineering

Chair

Joseph B. Hughes

Professors

Philip B. Bediant
Ahmad J. Durrani
Arthur A. Few, Jr.
Joseph B. Hughes
Mason B. Tomson
Pol D. Spanos
Anestis S. Veletsos
Calvin H. Ward
Mark R. Wiesner
Professors Emeriti
Ronald P. Nordgren
John E. Merwin

Associate Professors

Panos Dakoulas
Satisht Nagarajaiah
Assistant Professors
Matthew P. Fraser
Michael Terk
Adjunct Professors
James B. Blackburn
Jean-Yves Bottero
Carroll Oubre
Adjunct Assistant Professor
Charles J. Newell

Lecturers

Milton Hanks
Moyeen Haque
Stergios Liapis
John E. Merwin
Pat H. Moore
James Murtha
John M. Sedlak
Ed Segner, III
Tauqir Sheikh
Christof Spieler

Degrees Offered: B.A., B.S.C.E., M.C.E., M.E.E., M.E.S., M.S., Ph.D.

Civil and Environmental Engineering (C&EE) is a broad and diverse field of study that offers students an education with several degree options. The most flexible degree options are at the bachelor's level, where students can major in civil engineering or complete a double major with any other Rice University major. The double major has two tracks, one in environmental engineering sciences (EES), and the other in environmental sciences (ES). For students desiring an accredited professional degree, the B.S.C.E. is offered with sub-specialization in one of three areas of concentration: structural engineering, environmental engineering, or engineering management. Three nonthesis graduate degrees (M.C.E., M.E.E., and M.E.S) are available to students who desire additional education and specialization in civil engineering, environmental engineering, or environmental sciences. Joint M.B.A./Master of Engineering degrees are also available in conjunction with the Jesse H. Jones Graduate School of Management.

Students admitted for graduate study leading to M.S. or Ph.D. degrees must complete a rigorous course of study that combines advanced course work with scholarly research culminating in the public defense of a written thesis. Graduate research is carried out in a range of areas reflecting the interests of the department's faculty. Examples include structural engineering and mechanics, earthquake engineering, geotechnical engineering, computer-aided design, hydrology, water resources and water quality engineering, air pollution and its control, and hazardous waste treatment.

Degree Requirements for B.S.C.E. in Civil Engineering

The B.S.C.E. degree is a professional degree accredited by the Accreditation Board for Engineering and Technology (ABET). Students in the B.S. program may choose among the three specialization options as follows:

- structural engineering
- environmental engineering
- engineering management

For the B.S.C.E. degree, students must have a total of at least 134 semester hours at graduation, including the following required courses:

General Science (39 hours)

MATH 101 *Single Variable Calculus I*
MATH 102 *Single Variable Calculus II*
CHEM 121 *General Chemistry with Laboratory*
CHEM 122 *General Chemistry with Laboratory*
PHYS 101 *Mechanics with Laboratory*
PHYS 102 *Electricity and Magnetism with Laboratory*
MATH 211 *Ordinary Differential Equations and Linear Algebra*
MATH 212 *Multivariable Calculus*
CAAM 210 or CAAM 211 *Introduction to Engineering Computation*
STAT 310 *Probability and Statistics*
CAAM 335 *Matrix Analysis*—or equivalent

1 of the following:

CHEM 211 *Organic Chemistry*
or PHYS 201 *Waves and Optics*
or BIOS 201 *Introductory Biology*

Core Engineering (41 Hours)

CIVI 211 *Engineering Mechanics*
CIVI 300 *Mechanics of Solids I*
CIVI 302 *Strength of Materials Laboratory*
CIVI 304 *Structural Analysis I*
CIVI 306 *Steel Design*
CIVI 363 *Applied Fluid Mechanics*
ENVI 403 *Principles of Environmental Engineering*
CIVI 403 *Reinforced Concrete Design*
CIVI 404 *Reinforced Concrete Laboratory*
ENVI 412 *Hydrology and Watershed Analysis*
CIVI 451 *Introduction to Transportation*
CIVI 470 *Basic Soil Mechanics*
CIVI 480 *Senior Design Project*
CIVI 479 *Introduction to Project Development*
ENVI 512 *Hydrology Design Laboratory*

1 of the following:

MSCI 301 *Materials Science*
or ELEC 243 *Introduction to Electronics*
or MECH 200 *Classical Thermodynamics*
or COMP 260 *Visual Methods for Science and Engineering*
or any other approved elective

Structural Engineering Option: (12 hours)

CIVI 570 *Foundation Engineering*
CIVI 305 *Structural Analysis II*
CIVI 400 *Mechanics of Solids II*
500 Level Approved Elective

Environmental Engineering Option: (12 hours)

ENVI 306 *Global Environmental Law and Sustainable Development*
or any other approved ENVI course
ENVI 411 *Air Resource Management*
ENVI 434 *Chemical Transport and Fate in the Environment*
500 Level Approved Elective

Engineering Management Option: (12 hours)

CIVI 322 *Engineering Economics and Management*
ACCO 305 *Introduction into Accounting*
or any other approved MGMT course
CAAM 376 *Introduction to Management Science*
500 Level Approved Elective

Recommended Electives: (12 hours)

ENGI 302 *Ethical Decision-making for Engineers*
ENGI 321 *The Professional Engineer: Roles and Responsibilities*
CIVI 201 *Civil Engineers and the World We Build*
ENVI 201 *Introduction to Environmental Systems*
CIVI 251 *Plane Surveying*

See Civil Engineering website for a complete list.

Required Courses:	80 hours
Specialization Option:	12 hours
Free Electives:	18 hours
University Distribution:	24 hours
B.S. Civil Engineering Requirement:	134 hours

Degree Requirements for B.A. in Civil Engineering

For general university requirements, see Graduation Requirements (pages 18–20). For the B.A. degree, students majoring in civil engineering must have a total of at least 120 semester hours at graduation. The B.A. is not accredited as a professional degree; detailed requirements are available from the department office.

Degree Requirements for B.A. in Environmental Science and Engineering (as a double major)

The Department of Civil and Environmental Engineering offers the B.A. as a double major with any other major at Rice University. The double major has two tracks, one in environmental engineering sciences (EES), and one in environmental sciences (ES). Faculty from the Wiess School of Natural Sciences work with C&EE faculty in offering courses, advising, and administering the ES track of this double major. The double major is designed to accommodate:

- Students wishing to obtain a solid preparation for later graduate study in environmental engineering, environmental science, or other careers as environmental professionals (e.g., environmental economics or environmental law), and
- Students pursuing nonenvironmental careers (e.g., historians, lawyers, mechanical engineers, chemists) who will nonetheless benefit from a knowledge of the environmental dimensions of problems and issues they will confront.

The 68-semester-hour (minimum) double major in environmental science and engineering may be taken in conjunction with *any* stand-alone major offered in any school of the university. The EES track is highly recommended for students wishing to pursue graduate study in environmental engineering. Students wishing to obtain an ABET-accredited degree in engineering should pursue the environmental specialization within the B.S.C.E. or through a similar offering provided by the Department of Chemical Engineering. Students choosing the ES track are encouraged to select one of the following participating faculty members from the Wiess School of Natural Sciences as their adviser:

John Anderson (*Earth Science*)

Andre Droxler (*Earth Science*)

Arthur Few (*Physics and Astronomy and Environmental Science*)

F. M. Fisher (*Ecology and Evolutionary Biology*)

P. A. Harcombe (*Ecology and Evolutionary Biology*)

William Leeman (*Earth Science*)

D. Queller (*Ecology and Evolutionary Biology*)

R. L. Sass (*Ecology and Evolutionary Biology*)

Dale Sawyer (*Earth Science*)

J. E. Strassmann (*Ecology and Evolutionary Biology*)

A. Thornhill (*Ecology and Evolutionary Biology*)

The key components of the double major include:

- Foundation course work in mathematics, physics, chemistry, and biology required in both tracks.
- A set of 5 undergraduate core courses, required of all double majors, that acquaint undergraduates with a range of environmental problems encountered by scientists, engineers, managers, and policy makers. Core courses in the EES track cover the breadth of water, soil, and air media within the context of engineering technologies and approaches to problem solving, and stress quantitative analytical tools used to address environmental problems. Core courses in the ES track stress the components of the global environment and their interactions.

- 24 semester hours of environmental electives, in both tracks, from four categories: (1) social sciences and business, (2) humanities and architecture, (3) natural sciences, and (4) engineering. Students may petition to have electives, in addition to those currently listed, apply toward the double major.

Specific Course Requirements for a Double Major (B.A.) in Environmental Science and Engineering include:

General Prerequisites

CHEM 121 or 151 *General Chemistry with Laboratory*

CHEM 122 or 152 *General Chemistry with Laboratory*

MATH 101 *Single Variable Calculus I*

MATH 102 *Single Variable Calculus II*

PHYS 101 or 125 or 111 *Mechanics*

PHYS 102 or 126 or 112 *Electricity and Magnetism*

BIOS 201 *Introductory Biology*

BIOS 202 *Introductory Biology* (Environmental sciences track only)

1 of the following 2 courses:

NSCI 230 *Computation in Natural Science*

(Environmental sciences track only)

MATH 211 *Ordinary Differential Equations and Linear Algebra*

(Environmental engineering sciences track only)

Core Courses: Environmental Sciences Track

BIOS 325 *Ecology*

GEOL 326 *Environmental Geology*

PHYS 443 *Atmospheric Science*

(or ENVI 411 *Air Resource Management*)

2 of the following 3 courses:

ENVI 401 *Introduction to Environmental Chemistry*

ENVI 412 *Hydrology and Watershed Analysis*

GEOL 451 *Analysis of Environmental Data*

Core Courses: Environmental Engineering Sciences Track

ENVI 401 *Introduction to Environmental Chemistry*

ENVI 403 *Principles of Environmental Engineering*

ENVI 411 *Air Resource Management*

ENVI 412 *Hydrology and Watershed Analysis*

ENVI 434 *Chemical Transport and Fate in the Environment*

Sample Curriculum in the Environmental Engineering Sciences Track

Freshman Year

Fall

MATH 101 *Single Variable Calculus I*

PHYS 101 *Mechanics*

CHEM 121 *General Chemistry with Laboratory*

Electives

HPER 101

Spring

MATH 102 *Single Variable Calculus II*

PHYS 102 *Electricity and Magnetism*

CHEM 122 *General Chemistry with Laboratory*

Electives

HPER 102

Sophomore Year

Fall

MATH 211 *Ordinary Differential Equations*

BIOS 201 *Introductory Biology*

Environmental Elective*

Environmental Elective

Spring

Environmental Elective

Environmental Elective

*ENVI 201 *Introduction to Environmental Systems* recommended as environmental elective

Junior Year	Senior Year
Fall ENVI 401 <i>Introduction to Environmental Chemistry</i> Environmental Elective Environmental Elective	Fall ENVI 403 <i>Principles of Environmental Engineering</i> ENVI 434 <i>Chemical Transport and Fate in the Environment</i> Environmental Elective
Spring ENVI 411 <i>Air Resource Management</i>	Spring ENVI 412 <i>Hydrology and Watershed Analysis</i> Environmental Elective

24 semester hours of environmental electives are required, with at least 6 semester hours of course work from each of four categories. Consult the faculty adviser or Department of Environmental Science and Engineering for a list of approved electives.

Sample Curriculum in Environmental Sciences Track

Freshman Year	Sophomore Year
Fall MATH 101 <i>Single Variable Calculus I</i> PHYS 101 <i>Mechanics</i> CHEM 121 <i>General Chemistry with Laboratory</i> Electives HPER 101	Fall NSCI 230 <i>Computation in the Natural Sciences</i> BIOS 201 <i>Introductory Biology</i> Environmental Elective Environmental Elective
Spring MATH 102 <i>Single Variable Calculus II</i> PHYS 102 <i>Electricity and Magnetism</i> CHEM 122 <i>General Chemistry with Laboratory</i> Electives HPER 102	Spring BIOS 202 <i>Introductory Biology</i> Environmental Elective Environmental Elective
Junior Year	Senior Year
Fall BIOS 325 <i>Ecology</i> GEOL 326 <i>Environmental Geology</i> Environmental Elective	Fall GEOL 451 <i>Analysis of Environmental Data</i> or ENVI 401 <i>Introduction to Environmental Chemistry</i> Environmental Elective Environmental Elective
Spring PHYS 443 <i>Atmospheric Science</i> or ENVI 411 <i>Air Resource Management</i> Environmental Elective	Spring ENVI 412 <i>Hydrology and Watershed Analysis</i>

24 semester hours of environmental electives are required, with at least 6 semester hours of course work from each of four categories. Consult the faculty adviser or Department of Environmental Science and Engineering for a list of approved electives.

Degree Requirements for M.C.E., M.E.E., M.E.S., M.S., and Ph.D.

Admission. Applicants pursuing graduate education in structural engineering, structural mechanics, and geotechnical engineering should have a B.S.C.E. with a significant emphasis on structural engineering, but students with other undergraduate degrees may apply if they have adequate preparation in mathematics, mechanics, and structural analysis and design. Courses such as engineering technology or construction technology, however, do not represent adequate preparation. Applicants for the M.E.E. and the M.E.S. must have a B.S. or B.A. in related areas of science and engineering. Successful applicants typically have at least a 3.00 (B) grade point average in undergraduate work and high Graduate Record Examination (GRE) scores. For general university requirements, see Graduate Degrees (pages 62–67) and Admission to Graduate Study (pages 67–68).

M.C.E. Program. The Master of Civil Engineering (M.C.E.) is a professional nonthesis degree requiring 30 hours of study. Students with a B.S. in Civil Engineering are eligible to apply. Areas of study include structural dynamics, offshore technology, reinforced concrete and prestressed concrete, reliability of systems, random vibrations, soil dynamics, soil-structure interaction, and structural control. For general university requirements, see Graduate Degrees (pages 62–67). To earn a M.C.E. degree, students must:

- Complete 30 semester hours of approved courses

M.B.A./M.C.E. Program. For general university requirements, see Graduate Degrees (pages 62–67). See also Accounting and Management. To earn a M.B.A./M.C.E. degree, students must:

- Complete 24 semester hours of civil engineering courses
- Complete 52 semester hours of business administration courses

M.E.E. Program. The Master of Environmental Engineering (M.E.E.) is a professional nonthesis degree requiring 30 hours of study. Students who have a B.S. degree in any field of engineering may apply. Areas of study include hydrology and water resources engineering, water treatment, water chemistry, air pollution and its control, and hazardous waste treatment. Although the program is open to all qualified applicants, candidates usually are completing undergraduate programs in environmental engineering and wish to extend their education into a fifth year of specialized study.

M.E.S. Program. The Master of Environmental Science (M.E.S.) is a professional nonthesis degree requiring 30 hours of study. To enter the M.E.S. program, applicants must have a B.A. or B.S. degree in any of the natural or physical sciences. Areas of study include hydrology and water resources engineering, water treatment, water chemistry, air pollution and its control, and hazardous waste treatment. Although the program is open to all qualified applicants, candidates typically are completing undergraduate programs in environmental science and wish to extend their education into a fifth year of specialized study.

M.S. Program. The Master of Science degree is offered in both Civil Engineering and Environmental Engineering. For general university requirements, see Graduate Degrees (pages 62–67). To earn a M.S. degree, students must:

- Complete at least 24 semester hours of approved courses. For students studying Environmental Engineering this must include one course each in environmental chemistry, water treatment, hydrology, and air quality (comparable course work completed previously may be substituted for the core courses)

- Select a thesis committee according to department requirements and conduct original research in consultation with the committee
- Present and defend in oral examination an approved research thesis

Students take the oral exam only after the committee determines the thesis to be in an acceptable written format for public defense. Normally, students take two academic years and the intervening summer to complete the degree.

Students intending to extend their studies into the Ph.D. degree program should note that the department does not grant an automatic M.S. degree to candidates who have not written a satisfactory master's thesis.

Ph.D. Program in Civil Engineering. For general university requirements, see Graduate Degrees (pages 62–67). To earn a Ph.D. degree in Civil Engineering, students must:

- Complete at least 48 semester hours of approved courses with high standing
- Pass a comprehensive preliminary examination testing the candidate's knowledge of the field and ability to think in a creative manner
- Pass an oral qualifying examination on the proposed thesis research and related topics
- Complete a thesis that constitutes an original contribution to knowledge
- Pass a final public oral examination on the thesis and related topics

Ph.D. Program in Environmental Engineering. To earn a Ph.D. degree in environmental engineering sciences, candidates must successfully accomplish the following (spending at least four semesters in full-time study at Rice):

- Complete 90 semester hours of approved course work with high standing
- Pass a preliminary written examination on the field of environmental engineering sciences
- Pass a qualifying examination on course work, proposed research, and related topics
- Complete a dissertation indicating an ability to do original and scholarly research
- Pass a formal public oral examination on the thesis and related topics

Ph.D. candidates in environmental engineering sciences take the preliminary exam, administered by department faculty, after two semesters of course work. Candidates who pass this exam then form a doctoral committee according to department requirements. The qualifying examination administered by the doctoral committee after candidates develop a research proposal evaluates their preparation for the proposed research and identifies any areas requiring additional course work or study.

See CIVI and ENVI in the Courses of Instruction section.

Classics

The School of Humanities

Professor
Harvey Yunis

Associate Professor
Hilary S. Mackie
Assistant Professor
Scott McGill

Lecturers
Coulter George
Kristine Gilmartin Wallace

Degree Offered: B.A.

The Classics major offers instruction in the Greek and Latin languages, in Greek and Roman literature (studied in the original and in translation), in the classical civilizations surveyed as a whole, and in particular themes, genres, and periods of classical culture and its influence through subsequent ages.

We recognize that students come to the study of ancient Greece and Rome with a whole spectrum of different kinds of interest. Some will want to concentrate on learning the ancient languages and reading the classical texts in the original Greek or Latin. Others will desire a broader introduction to the cultures of Greece and Rome and their legacy. Still others will be looking for some combination of these two approaches. With this in mind, the Classics major provides maximum flexibility without sacrifice of focus. We cater to students who wish to prepare for graduate school in Classics and also to students who are interested in Greek and Roman culture for other reasons and who wish to take a less specialized approach. Students will be able to explore ancient Greece and Rome from a variety of different angles and with whatever emphasis best suits their individual needs and goals.

To satisfy the requirements for the Classics major, students must complete 30 semester hours of courses listed under “Greek,” “Latin,” and “Classics.” Courses listed under “Greek” and “Latin” concentrate on the acquisition of language skills and on the reading and interpretation of texts in the original languages. Courses listed under “Classics” explore, in translation, the literature, history, philosophy, art, and other aspects of Greek and Roman civilization and also the effect that Greece and Rome have had on literature and other traditions in the West. These courses in translation regularly include freshman seminars.

Classics majors will also, if they wish, have the opportunity to engage in research. In the final semester of study, a student majoring in Classics may enroll in CLAS 493, in which the student writes a senior thesis on a topic of the student’s choice in close consultation with a particular faculty member.

Further information on the Classics major is available from faculty members. Faculty also help students arrange travel to Greece or Italy, whether to work on a dig or to study at the Intercollegiate Center for Classical Studies in Rome.

Degree Requirements for B.A. in Classics

For general university requirements, see Graduation Requirements (pages 18–20).

Students majoring in Classics must complete at least 30 semester hours (10 courses) listed under “Greek,” “Latin,” or “Classics.” The precise combination of Greek, Latin, and Classics courses is to be determined by the student in consultation with the undergraduate coordinator, in such a way as to ensure an individual course of study that is tailored to the student’s own interests and goals.

Courses taught in other departments, such as History, Philosophy, and Art History, may be cross-listed in Classics and count towards the Classics major.

Note: the requirements for the Classics major have changed. The new requirements (above) will be effective for students declaring a Classics major in 2002–03 or later. (Others should consult the *General Announcements* for 2001–02, or talk to the undergraduate coordinator.)

See CLAS, GREE, and LATI in the Courses of Instruction section.

Cognitive Sciences

The School of Social Sciences

Director

Eric Margolis

Professors

John W. Clark, Jr.
 Philip W. Davis
 Richard E. Grandy
 Stephen L. Klineberg
 Randi C. Martin
 Daniel Osherson
 Stephen A. Tyler
 Michael Watkins
Professors Emeriti
 James E. Copeland
 Sydney M. Lamb

Associate Professors

Suzanne E. Kemmer
 David M. Lane
 Eric Margolis
 Devika Subramanian

Assistant Professors

Michel Achard
 Michael Barlow
 Michael Byrne
 Nancy Niedzielski
 Geoffrey Potts
 Tony Ro

Degree Offered: B.A.

The cognitive sciences provide a multidisciplinary study of the mind. Researchers in this field seek to understand such mental phenomena as perception, thought, memory, the acquisition and use of language, learning, concept formation, and consciousness.

Research projects in the cognitive sciences may involve observing the development of mental skills in children, programming computers to engage in complex problem solving, or analyzing the nature of meaning. Methods include observation and analysis, model building, experimentation, and the computer simulation of mental structures and processes. Some investigators focus on relationships between brain structures and behavior, some work with computer simulation, and others work at more abstract philosophical levels.

Degree Requirements for B.A. in Cognitive Sciences

Students planning to major in cognitive sciences should take 1 or more of the following courses during their first and second years: PSYC 101 Introduction to Psychology, PHIL 103 Philosophical Aspects of Cognitive Science, LING 200 Introduction to the Scientific Study of Language, PSYC 203 Introduction to Cognitive Psychology. Students should try to complete the required 200-level core courses (see below) by the end of their sophomore year.

For general university requirements, see Graduation Requirements (pages 18–20). Cognitive sciences majors will be required to take a total of 7 core courses (see below) plus 5 additional courses. For some of the core courses, students may select from two or more options. Any of these options not used to satisfy the core may be used to satisfy the additional course requirements. Among the 5 additional courses, a minimum of 3 and a maximum of 4 of these courses should be in an area of concentration. The available areas of concentration are: linguistics, philosophy, psychology, neuroscience, and applied cognitive sciences. Suitable courses in the first 3 of these areas are listed below under their respective department headings. Suitable courses in neuroscience include any of the 3- or 4-credit courses under the neuroscience course heading below or: BIOS 421

Neurobiology, CSCI 420 Brain and Behavior, ELEC 481 Fundamentals of Systems Physiology and Biophysics, LING 411 Neurolinguistics, and PSYC 362 Biopsychology. Appropriate courses in the applied cognitive sciences concentration include PSYC 441 Human-Computer Interaction (required of all students in this concentration), PSYC 340 Research Methods, PSYC 370 Introduction to Human Factors, COMP 360 Computer Graphics, and PSYC 409 Methods in Human-Computer Interaction.

Honors program. Students in the honors program will conduct an independent research project of either one or two semesters under the guidance of one or more faculty members in the cognitive sciences program. Students intending to go into this program should consult with one or more faculty about their project before the end of their junior year. Their proposals must be accepted by their adviser(s) and the director of the program by the end of the semester preceding initiation of the project—that is, during the spring of the junior year for projects beginning in the fall, and during the fall of the senior year for projects beginning in the spring. In cases where the director is the adviser, the proposal must be approved by an additional member of the Cognitive Sciences Steering Committee. Students in the program will enroll in one or both of CSCI 481 Honors Project (fall, 3 hours) and 482 Honors Project (spring, 3 hours). Students who undertake a two-semester project will be allowed to continue into the second semester only if their adviser(s) judge(s) that they have made substantial progress during the first semester. At the end of the project, each student in the honors program will make an oral presentation of his/her project at a meeting to which all cognitive science students and faculty will be invited and will submit a final written project report to his/her adviser(s) and to the director of the program.

Core Courses

COMP 200 *Elements of Computer Science* (3 hours)
 or COMP 210 *Introduction to Principles of Scientific Computation* (4 hours)
 COMP 440 *Artificial Intelligence*
 or CSCI 410 *Computational Modeling of Cognitive Processes*
 or PSYC 352 *Formal Foundations of Cognitive Sciences*
 or LING 317 *Language and Computers*
 LING 200 *Introduction to the Scientific Study of Language*
 or LING 300 *Linguistic Analysis*
 LING 306 *Language and the Mind*
 or LING 315 *Semantics*
 PHIL 305 *Mathematical Logic*
 or PHIL 312 *Philosophy of Mind*
 PSYC 203 *Introduction to Cognitive Psychology*
 PSYC 351 *Psychology of Perception*
 or PSYC 362 *Biopsychology*

Additional Courses

Cognitive Sciences
 CSCI 390 *Supervised Research in Cognitive Science*
 CSCI 410 *Computational Modeling of Cognitive Processes*
 CSCI 420 *Brain and Behavior*
 CSCI 481/482 *Honors Project*

Computer Science
 COMP 212 *Intermediate Programming*
 COMP 440 *Artificial Intelligence*
 COMP 450 *Algorithmic Robotics*

Linguistics
 LING 200 *Introduction to the Scientific Study of Language*
 LING 300 *Linguistic Analysis*
 LING 301 *Phonetics and Phonology*
 LING 306 *Language and the Mind*
 LING 315 *Semantics*
 LING 317 *Language and Computers*
 LING 402 *Syntax and Semantics*
 LING 403 *Modern Linguistic Theory*
 LING 411 *Neurolinguistics*
 LING 412 *Language and Intelligence*
 LING 467 *Computational Projects*
 LING 490 *Discourse Analysis*

Neuroscience

NEUR 500 *Functional Neuroanatomy and Systems Neuroscience*
 NEUR 501 *Cognitive Neuroscience I*
 NEUR 502 *Cognitive Neuroscience II*
 NEUR 503 *Molecular Neuroscience I and II*
 NEUR 504 *Cellular Neurophysiology I and II*
 NEUR 505 *Optical Imaging in Neuroscience*
 NEUR 506 *Learning and Memory*
 NEUR 511, 512 *Integrative Neuroscience Core Course* (two semesters)
 NEUR 515 *Neural Development*

Note: Many of these courses are taught by Baylor College of Medicine faculty and listings may change year to year. Check the Neuroscience website <http://www.ruf.rice.edu/~neurosci/> for the latest listings.

Philosophy

PHIL 103 *Philosophical Aspects of Cognitive Science*
 PHIL 303 *Theory of Knowledge*
 PHIL 305 *Mathematical Logic*
 PHIL 312 *Philosophy of Mind*
 PHIL 353 *Philosophy of Language*
 PHIL 357 *Incompleteness, Undecidability, and Computability*

See CSCI in the Courses of Instruction section.

Psychology

PSYC 308 *Memory*
 PSYC 309 *Psychology of Language*
 PSYC 340 *Research Methods*
 PSYC 351 *Psychology of Perception*
 PSYC 352 *Formal Foundations of Cognitive Science*
 PSYC 360 *Thinking*
 PSYC 362 *Biopsychology*
 PSYC 409 *Methods in Human-Computer Interaction*
 PSYC 441 *Human-Computer Interaction*

Other Departments

ANTH 406 *Cognitive Studies in Anthropology and Linguistics*
 BIOS 421 *Neurobiology*
 ELEC 201 *An Introduction to Engineering Design*
 ELEC 481 *Fundamentals of Systems Physiology and Biophysics*
 ELEC 498 *Introduction to Robotics*
 STAT 300 *Model Building*

Computational and Applied Mathematics

The George R. Brown School of Engineering

Chair

William W. Symes

Professors

John Edward Akin (joint: MEMS)
 Michael M. Carroll (joint: MEMS)
 Steven J. Cox
 Danny C. Sorensen
 William W. Symes
 Richard A. Tapia

Professors Emeriti

Robert E. Bixby
 Sam H. Davis (joint: CENG)
 John E. Dennis
 Angelo Miele (joint: MEMS)
 Paul E. Pfeiffer
 Henry Rachford
 Chao-Cheng Wang (joint: MEMS)

Associate Professors

Liliana Borcea
 Nathaniel Dean
 Matthias Heinkenschloss
 Yin Zhang

Assistant Professors

Mark Embree
 Petr Kloucek

Adjunct Professors

J. Bee Bednar
 Richard Carter
 Evin Joyce Cramer
 Elmer Eisner
 Roland Glowinski
 Emilio J. Nuñez
 Donald W. Peaceman
 Michael B. Ray
 Jacques R. Tabanou
 Phuong A. Vu

Adjunct Associate Professors

Amr El-Bakry
 Michael W. Trosset

Adjunct Assistant Professors

Charles Audet
 Aladin M. Boriek
 Cassandra M. McZeal

Research Professors

Robert E. Bixby
 John E. Dennis

Faculty Fellows

Alan Carle
 Michael Fagan

Degrees Offered: B.A., M.C.A.M., M.C.S.E., M.A., Ph.D.

Courses within this major can provide foundations applicable to the many fields of engineering, physical sciences, life sciences, behavioral and social sciences, and computer science. Undergraduate majors have considerable freedom to plan a course of study consistent with their particular interests. The professional degree (M.C.A.M.), for persons interested in practicing within this field, emphasizes general applied mathematics, operations research and optimization, and numerical analysis, while the M.A. and Ph.D. programs concentrate on research. Faculty research interests fall in the four general areas of numerical analysis and computation, physical mathematics, operations research and optimization, and mathematical modeling in physical, biological, or behavioral sciences.

A further advanced degree program in computational science and engineering (C.S.E.) addresses the current need for sophisticated computation in both engineering and the sciences. Such computation requires an understanding of parallel and vector capabilities and a range of subjects including visualization, networking, and program-

ming environments. An awareness of a variety of new algorithms and analytic techniques is also essential to maximizing the power of the new computational tools.

A joint M.B.A./Master of Engineering degree is also available in conjunction with the Jesse H. Jones Graduate School of Management.

Degree Requirements for B.A. in Computational and Applied Mathematics

Students majoring in computational and applied mathematics are required to complete the 51 semester hours spelled out in the following program of study.

Introductory Courses: Typically completed during the first two years

MATH 101 and 102 *Single Variable Calculus I and II*
 (or honors equivalent)
 MATH 211 *Ordinary Differential Equations and Linear Algebra*

MATH 212 *Multivariable Calculus*
 COMP 110 *Computation in Science and Engineering*
 CAAM 210 or 211 *Introduction to Engineering Computation*

Intermediate Courses: Typically completed by the end of the third year

CAAM 321 *Introduction to Real Analysis*
 CAAM 322 *Introduction to Real Analysis II*
 CAAM 335 *Matrix Analysis*

CAAM 336 *Differential Equations in Science and Engineering*
 (or STAT 310 *Probability and Statistics*
 or STAT 331 *Applied Probability*)

Advanced Courses: Two full-year sequences chosen from the following 5 areas

Numerical Analysis
 CAAM 451 *Numerical Linear Algebra*
 CAAM 453 *Numerical Analysis and Ordinary Differential Equations*

Differential Equations
 CAAM 436 *Partial Differential Equations I*
 CAAM 437 *Partial Differential Equations II*

Operations Research
 CAAM 471 *Linear Programming*
 CAAM 475 *Integer and Combinatorial Optimization*

Scientific Computation
 CAAM 420 *Computational Science I*
 CAAM 421 *Computational Science II*

Optimization
 CAAM 454 *Optimization Problems in Computational Engineering and Science*
 CAAM 460 *Optimization Theory*

Electives
 At least 3 courses, at or above the 300 level, selected upon consultation with the CAAM undergraduate adviser. The department strongly recommends that majors include ENGL 308 *Engineering Communications* among their electives.

Degree Requirements for M.C.A.M., M.A., and Ph.D. in Computational and Applied Mathematics

Admission. Admission to graduate study in computational and applied mathematics is open to qualified students holding bachelor's or master's degrees (or their equivalent) in engineering, mathematics, or the physical, biological, mathematical, or behavioral sciences. Department faculty evaluate the previous academic record and

credentials of each applicant individually. For general information, see Graduate Degrees (pages 62–67) and Admission to Graduate Study (pages 67–68).

Applicants should be aware that it normally takes one to two years to obtain a master's degree and three to five years to obtain a doctorate (a master's degree is not a prerequisite for the doctoral degree).

M.C.A.M. Program. This professional degree program emphasizes the applied aspects of mathematics. The M.C.A.M. degree requires satisfactory completion of at least 30 semester hours of course work approved by the department.

M.A. Program. For an M.A. in computational and applied mathematics, students must:

- Complete at least 30 semester hours at the graduate level, including 5 courses in computational and applied mathematics, in addition to thesis work
- Produce an original thesis acceptable to the department
- Perform satisfactorily on a final public oral examination on the thesis

For students working toward the Ph.D. degree, successful performance on the thesis proposal fulfills the master's thesis requirement.

Ph.D. Program. For a Ph.D. in computational and applied mathematics, students must:

- Complete a course of study approved by the department, including at least 2 courses outside the major area
- Perform satisfactorily on preliminary and qualifying examinations and reviews
- Produce an original thesis acceptable to the department
- Perform satisfactorily on a final public oral examination on the thesis

Financial Assistance. Graduate fellowships, research assistantships, and graduate scholarships are available and are awarded on the basis of merit to qualified students. Current practice in the department is for most doctoral students in good standing to receive some financial aid.

Degree Requirements for M.C.S.E. and Ph.D. in Computational Science and Engineering

C.S.E. Program Area. Recognizing the increasing reliance of modern science and engineering on computation as an aid to research, development, and design, the Department of Computational and Applied Mathematics, in conjunction with the Departments of Biochemistry and Cell Biology, Earth Science, Computer Science, Chemical Engineering, Electrical and Computer Engineering, Environmental Science and Engineering, and Statistics, has established an advanced degree program in an area called computational science and engineering (C.S.E.). The program focuses attention on modern computational techniques and provides a resource of training and expertise in this area.

The program is administered by a committee of faculty chosen by the deans of engineering and natural sciences, with ultimate oversight by the provost. The Computational Science Committee (CSC) helps students design an appropriate course of study and sets the examination requirements.

Students may enter the C.S.E. program either directly or indirectly through one of the participating departments (see list above). In all cases, however, students must fulfill the admissions requirements of one department, which acts as their associated department. Students then meet the normal requirements for graduate study within that

department in every way (including teaching and other duties) except that the curriculum and examination requirements are set by the CSC.

M.C.S.E. Program. This program's intent is to produce professional experts in scientific computing able to work as part of an interdisciplinary research team. Training is concentrated in state-of-the-art numerical methods, high-performance computer architectures, use of software development tools for parallel and vector computers, and the application of these techniques to at least one scientific or engineering area. For general university requirements, see Graduate Degrees (pages 62–67).

For the M.C.S.E. degree, students must complete at least 30 semester hours of course work approved by the CSC; no more than 2 of the courses may be taken at the 300 level, taken outside the C.S.E. program area, or satisfied by transfer credit. Each student's program of study must meet the requirements listed below. Modification of requirements can be requested by petition.

Required Courses

COMP 412 *Compiler Construction*
(or ELEC 425 *Computer Systems Architecture*)

CAAM 420 *Computational Science I*
(taken as soon as possible)

CAAM 421 *Computational Science II*
(taken as soon as possible)

1 course from the following:

CAAM 451 *Numerical Linear Algebra*

CAAM 452 *Computational Methods for*

Differential Equations

CAAM 453 *Numerical Analysis—*

Ordinary Differential Equations

CAAM 454 *Optimizing Problems*

in Computational Engineering and Science

CAAM 471 *Linear Programming*

Computational Science Electives

4 courses selected from an approved list of COMP or CAAM courses (at least 2 courses at the 500 level)

Open Electives

2 approved courses other than CAAM or COMP courses at the 300 level or above (a computational project taken within a participating department also satisfies this requirement)

Application Areas

An appropriate sequence of courses from a participating application area at the 300 level or above

Ph.D. Program. Study at the doctoral level seeks to advance the field through original research. For general university requirements, see Graduate Degrees (pages 62–67). For the Ph.D. in computational science and engineering, students must:

- Complete a course of study approved by the CSC, including at least 2 courses outside the major area
- Perform satisfactorily on preliminary and qualifying examinations and reviews
- Complete 2 courses or a reading examination on an approved foreign language
- Produce an original thesis acceptable to the CSC
- Perform satisfactorily on a final public oral examination on the thesis

See CAAM in the Courses of Instruction section.

Computer Science

The George R. Brown School of Engineering

Chair

Keith Cooper

Professors

Robert S. Cartwright, Jr.
 Ronald N. Goldman
 G. Anthony Gorry
 Kenneth W. Kennedy, Jr.
 Moshe Y. Vardi
 Joe D. Warren
 Willy E. Zwaenepoel

Adjunct Professors

Jack Dongarra
 Geoffrey Fox
 Charles Henry

S. Lennart Johnsson

Associate Professors

Alan L. Cox
 Peter Druschel
 Dave Johnson
 Lydia Kavradi
 Devika Subramanian

Adjunct Associate Professors

P. Read Montague
 Scott K. Warren

Assistant Professors

Scott Rixner
 Walid Taha
 Dan Wallach

Adjunct Assistant Professor

Vikram Adve

Senior Faculty Fellow

John Mellor-Crummey

Research Scientists

Bradley Broom
 Zoran Budimlic
 Robert Fowler

Richard Hanson

Guohua Jin

Charles Koelbel

Linda Torczon

Lecturers

Ian Barland

Ed Chen

John Greiner

Dung “Zung” Nguyen

Stephen Wong

Postdoctoral Research

Associate

Doron Bustan

Joint Appointments

(with Electrical and Computer Engineering) Professor

J. Robert Jump

Associate Professors

Joseph Cavallaro

Peter Varman

Assistant Professor

Edward Knightly

(with Psychology)

Professor

Daniel N. Osherson

(with Chemistry)

Professor

James Tour

Computer science is concerned with the study of computers and computing, focusing on algorithms, programs and programming, and computational systems. The main goal of the discipline is to build a systematic body of knowledge, theories, and models that explain the properties of computational systems and to show how this body of knowledge can be used to produce solutions to real-world computational problems. Computer science is the intellectual discipline underlying information technology, which is widely accepted now as the ascendant technology of the next century. Students in computer science at Rice benefit from the latest in equipment and ideas as well as the flexibility of the educational programs. The research interests of the faculty include algorithms and complexity, artificial intelligence and robotics, compilers, distributed and parallel computation, graphics and visualization, operating systems, and programming languages.

The department offers two undergraduate degrees: the Bachelor of Arts degree (B.A.) and the Bachelor of Science in Computer Science degree (B.S.C.S.). The department offers two master's degrees: the professional Master of Computer Science degree (M.C.S.) and the research-oriented Master of Science degree (M.S.). The department also offers a doctoral degree (Ph.D.).

A joint M.B.A./Master of Engineering degree is also available in conjunction with the Jesse H. Jones Graduate School of Management.

Degree Requirements for B.A. in Computer Science

For general university requirements, see Graduation Requirements (pages 18–20). The undergraduate program in computer science has been designed to accommodate a wide range of student interests. The program is sufficiently flexible for a student to customize it to her or his interests. A student can develop a broad educational program that couples computer science education with a variety of other fields in engineering, natural sciences, the humanities, or social sciences. Alternatively, a program might be designed for a student preparing for graduate study in computer science or possibly for a career in computing and information technology.

The undergraduate program consists of required core courses, which are introductory courses covering material required of all majors; required breadth courses, which are upper-level courses ensuring knowledge in a broad range of areas; and electives that give students the freedom to explore specific interests. Students majoring in computer science must complete between 58 and 60 semester hours of courses in these three categories.

Core Courses (8 courses for a total of 28 hours, required for all majors, usually taken in the freshman and sophomore years)

MATH 101/102 *Single Variable*

Calculus I and II

COMP 210 *Introduction to Principles of Scientific Computation*

COMP 212 *Intermediate Programming*

COMP 280 *Mathematics of Computer Science*

COMP 314 *Applied Algorithms and Data Structures*

COMP 320 *Introduction to Computer Organization*

1 course from the following:

MATH 211 *Ordinary Differential*

Equations and Linear Algebra

MATH 221 *Honors Calculus III*

Degrees Offered: B.A., B.S.C.S., M.C.S., M.S., and Ph.D.

Breadth Courses (7 courses for a total of 23 hours, required for all majors, usually taken in the junior and senior years) (* = preferred choice)

STAT 331* or 310 <i>Probability</i>	COMP 311 or 412 <i>Programming Languages</i>
CAAM 353 <i>Numerical Analysis</i>	COMP 481 or 482 <i>Theory</i>
MATH 355* or CAAM 335 <i>Linear Algebra</i>	COMP 421 <i>Operating Systems</i> ELEC 326 <i>Digital Circuits</i>

Electives (2 courses for a total of 6 to 8 hours in computer science at the 300 level or higher). One of these may be an independent study project.

For a B.A. degree in computer science, a total of at least 120 semester hours is required.

Degree Requirements for B.S. in Computer Science

The B.S. degree is designed for students who are interested in a more in-depth study of computer science in order to prepare themselves for a professional career in the computing industry. To receive a B.S. degree, a student must complete all the requirements of the B.A. degree (i.e., core, breadth, and electives), with the addition of PHYS 101/102 (or PHYS 111/112) (7 hours) to ensure a strong scientific background. In addition, the student must complete the depth component. This component consists of a coherent set of four or five courses specializing in some area of computer science. The same course cannot satisfy both the breadth requirement and the depth requirement. Students can adopt a preset depth component or design their own components, consisting of at least 15 hours. B.S. degree plans have to be approved by departmental advisers by no later than the end of the junior year. Sample curricula are listed on the departmental website; more information is available from department advisers. The computer science requirements of the B.S. degree total 79 to 81 semester hours. For a B.S. degree in computer science, a total of 128 semester hours is required.

Degree Requirements for M.C.S., M.S., and Ph.D. in Computer Science

Master's Programs. For general university requirements, see Graduate Degrees (pages 62–67). The professional M.C.S. degree is a terminal degree for students intending to pursue a technical career in the computer industry. To earn the M.C.S. degree, students must successfully complete 30 semester hours of course work approved by the department and following the plan formulated in consultation with the department adviser.

Areas of concentration for the M.C.S. include algorithms and complexity, artificial intelligence, compiler construction, distributed and parallel computing, graphics and geometric modeling, operating systems, and programming languages. The professional program normally requires three semesters of study.

The M.C.S. degree with a concentration in Bioinformatics is for students intending to pursue a technical career in the biotechnology industry. Students learn to integrate mathematical and computational methods to analyze biological, biochemical, and biophysical data. This program requires prior background in computer science, biosciences, and mathematics. To earn this degree, students must successfully complete 40 hours of approved course work meeting departmental requirements. This program normally requires four semesters of study.

The M.S. degree is a research degree requiring a thesis in addition to course work.

Ph.D. Program. The Ph.D. degree is for students planning to pursue a career in computer science research and education. The doctoral program normally requires four to six years of study. To earn a Ph.D. in computer science, students must:

- Meet departmental course requirements
- Complete a COMP 590 project by the end of the third semester
- Complete a master's thesis by the end of the fifth semester, if a previous master's thesis has not been approved by the graduate committee
- Pass a qualifying examination in an area of specialization within seven semesters after entering the Ph.D. program
- Conduct original research, submit an acceptable Ph.D. thesis proposal, and successfully defend the thesis proposal
- Submit an acceptable Ph.D. thesis that reports research results and pass a final oral defense

Students who successfully meet the first three requirements are awarded the Master of Science degree. Students successfully meeting all requirements, plus any departmental and university requirements, are awarded the Ph.D. degree.

Financial Assistance. Fellowships and research assistantships are available to students in the Ph.D. program. Both provide a monthly stipend for the academic year and cover all tuition expenses. More substantial monthly stipends may be available during the summer for students working on departmental research projects. In all cases, continued support is contingent on satisfactory progress in the program. Ph.D. students also are expected to assist in the teaching and administration of undergraduate and graduate courses.

Additional Information. For further information and application materials, write the Department of Computer Science—MS 132, Rice University, P.O. Box 1892, Houston, Texas 77251-1892.

See COMP in the Courses of Instruction section.

Earth Science

The Wiess School of Natural Sciences

Chair

Alan Levander

Professors

John B. Anderson
Hans G. Avé Lallemand
Richard G. Gordon
William P. Leeman
Dale S. Sawyer
Manik Talwani

Associate Professors

Gerald R. Dickens
André W. Droxler
Andreas Luttgé
Colin A. Zelt

Assistant Professors

Cin-Ty Lee
Adrian Lenardic
Julia Morgan

Adjunct Professors

K. K. Bissada
Carlos A. Cramez
Stephen H. Danbom
Jeffrey J. Dravis
Robert B. Dunbar
Paul M. Harris
Garry D. Jones
M. Turhan Taner
John C. Van Wagoner
Gerard M. Wellington
James L. Wilson

Adjunct Associate Professors

James Pindell
W. C. Rusty Riese

Adjunct Assistant Professors

Vitor Abreu
Robert Herrick
Scott A. Morton
Paul D. Spudis
Gabor Tari
Yitian Xiao

Degrees Offered: B.A., B.S., M.A., Ph.D.

The undergraduate program in geology focuses on a strong core of courses in all areas of earth materials, processes, and history, as well as in allied sciences. Students also gain experience with analytical equipment, computer systems, and in fieldwork. The undergraduate geophysics major combines courses that apply physics to the study of the earth's interior with course work in geology and mathematics. The program emphasizes computational geophysics and reflection seismology. A second major can lay the foundation for a career in environmental geology, and students may also acquire certification in courses toward science as a teaching field.

Advanced graduate work is available in marine geology and paleoceanography, stratigraphy, carbonate and siliciclastic sedimentology, igneous petrology, geochemistry, structural geology, regional tectonics, global plate tectonics, reflection and crustal seismology, and computational geophysics and geodynamics. Ideally, programs of study and research incorporate more than one of these specialties.

Degree Requirements for B.S. in Geology

For general university requirements, see Graduation Requirements (pages 18–20). Completing the requirements of this major as well as university graduation requirements will involve completing about 129 credit hours. Students must complete the following courses:

Earth Science

ESCI 101 *The Earth*
or ESCI 102 *Evolution of the Earth*
or ESCI 107 *Oceans and Global Change*
or ESCI 108 *Crises of the Earth*
ESCI 105 *Introductory Lab for Earth Science*
ESCI 311 *Mineralogy and Optics*
ESCI 312 *Petrology*
ESCI 331 *Structural Geology*
ESCI 332 *Sedimentology*
ESCI 334 *Geological and Geophysical Techniques*
ESCI 390 *Field Geology*
ESCI 442 *Exploration Geophysics I*
ESCI 444 *Exploration Geophysics II*
or ESCI 446 *Solid Earth Geophysics*

Math and Other Sciences

MATH 101/102 *Single Variable Calculus I and II*
MATH 211 *Ordinary Differential Equations and Linear Algebra*
CHEM 121/122 *General Chemistry with Laboratory*
or CHEM 151/152 *Honors Chemistry with Laboratory*
PHYS 101 or 111 *Mechanics*
PHYS 102 or 112 *Electricity and Magnetism*
NSCI 230 *Computation in Natural Science*
or CAAM 210 *Introduction to Engineering Computation (C)*
or CAAM 211 *Introduction to Engineering Computation (F)*
or COMP 210 *Introduction to Principles of Scientific Computation*

Required Electives. Majors must also complete at least 12 hours in additional science and engineering courses at the 300 level or higher from an approved list; double majors must complete only 6 hours.

Environmental Geology. Students interested in careers in environmental geology are encouraged to take some of the following courses as electives.

ESCI 353 <i>Environmental Geochemistry</i>	ENVI 401 <i>Introduction to Environmental Chemistry</i>
ESCI 326/426 <i>Environmental Geology</i>	ENVI 406 <i>Introduction to Environmental Law</i>
ESCI 451 <i>Analysis of Environmental Data</i>	ENVI 412 <i>Hydrology and Watershed Analysis</i>
ESCI 454 <i>Geographic Information Science</i>	
ENVI 306 <i>Global Environmental Law and Sustainable Development</i>	

In addition, students may consider a second major in environmental science and engineering.

Degree Requirements for B.S. in Geophysics

Completing the requirements for this major as well as university graduation requirements will involve completing about 129 credit hours. Students must complete the following courses:

Earth Science

ESCI 101 *The Earth*
 or ESCI 102 *Evolution of the Earth*
 or ESCI 107 *Oceans and Global Change*
 or ESCI 108 *Crises of the Earth*
 ESCI 105 *Introductory Lab for Earth Science*
 ESCI 311 *Mineralogy and Optics*
 or ESCI 332 *Sedimentology*
 ESCI 331 *Structural Geology*
 ESCI 334 *Geological and Geophysical Techniques*
 ESCI 390 *Field Geology*
 ESCI 461 *Seismology I*
 ESCI 442 *Exploration Geophysics I*
 ESCI 444 *Exploration Geophysics II*
 ESCI 446 *Solid Earth Geophysics*
 ESCI 441 *Geophysical Data Analysis*
 or ESCI 462 *Tectonophysics*
 or ESCI 464 *Global Tectonics*

Math and Other Sciences

MATH 101/102 *Single Variable Calculus I and II*
 MATH 211 *Ordinary Differential Equations and Linear Algebra*
 MATH 212 *Multivariable Calculus*
 CHEM 121/122 *General Chemistry with Laboratory*
 or CHEM 151/152 *Honors Chemistry with Laboratory*
 PHYS 101 or 111 *Mechanics*
 PHYS 102 or 112 *Electricity and Magnetism*
 PHYS 201 *Waves and Optics*
 PHYS 231 *Elementary Physics Lab II*
 NSCI 230 *Computation in Natural Science*
 or CAAM 210 *Introduction to Engineering Computation (C)*
 or CAAM 211 *Introduction to Engineering Computation (F)*
 or COMP 210 *Introduction to Principles of Scientific Computation*

Degree Requirements for B.A. in Geology

For general university requirements, see Graduation Requirements (pages 18–20). Students completing the B.A. program should have a total of at least 120 hours at graduation. Students must complete the following courses:

Earth Science

ESCI 101 *The Earth*
 or ESCI 102 *Evolution of the Earth*
 or ESCI 107 *Oceans and Global Change*
 or ESCI 108 *Crises of the Earth*
 ESCI 105 *Introductory lab for Earth Science*
 ESCI 311 *Mineralogy and Optics*
 ESCI 312 *Petrology*
 ESCI 331 *Structural Geology*
 ESCI 332 *Sedimentology*
 ESCI 334 *Geological and Geophysical Field Techniques*

Math and Other Sciences

MATH 101/102 *Single Variable Calculus I and II*
 CHEM 121/122 or CHEM 151/152 *General Chemistry I and II*
6 credits from the following list
 BIOL 201/202 *Introductory Biology I and II*
 BIOL 211, 213 *Biology Lab Modules*
 MATH 211 *Differential Equations*
 PHYS 101/102, 125/126 *Introductory Physics*
 NSCI 230, CAAM 210/211, COMP 210 *Programming*

Required Electives. Students must also complete at least 12 hours in additional courses in Science and Engineering (including ESCI) at the 200 level or higher, from an approved list.

Undergraduate Independent Research

The department encourages, but does not require, both geology and geophysics undergraduate majors to pursue independent supervised research in ESCI 481/482 Research in Earth Science. See also Honors Programs (page 32).

Degree Requirements for M.A. and Ph.D. in Earth Science

All incoming students should have a strong background in physics, chemistry, and mathematics and should have, or should acquire, a broad grounding in fundamental earth science. The department encourages applications from well-qualified students with degrees in the other sciences and mathematics. For general university requirements, see Graduate Degrees (pages 62–67). The requirements for the M.A. and Ph.D. in earth science are similar, but the Ph.D. demands a significantly higher level of knowledge, research skills, and scholarly independence. Most students need at least two years beyond the bachelor's degree to complete the M.A. and at least two years beyond the M.A. degree for the Ph.D.

Candidates determine, with their major professor and advisory committee, a course of study following the *Guidelines for Advanced Degrees in the Department of Earth Science* distributed to all incoming students. For both degrees, candidates must:

- Complete 20 semester hours of course work at the 400 level and above (or other approved courses), not including research hours
- Pass a written preliminary exam
- Maintain a grade point average of 3.00 (B) or better
- Prepare a written thesis
- Produce a publishable thesis that represents an original contribution to science
- Defend the research and conclusions of the thesis in an oral examination

Students of exceptional ability with a bachelor's degree and department approval may work directly toward the Ph.D., in which case the course of study is equivalent to that required for both degrees; performance on the examinations and the thesis, however, should be at the level required for the Ph.D.

Because the graduate programs require full-time study and close interaction with faculty and fellow students, the department discourages students from holding full (or nearly full) time jobs outside the university. Outside employment must be approved by the chair.

See ESCI in the Courses of Instruction section.

Economics

The School of Social Sciences

Chair

Peter Hartley

Professors

Dagobert L. Brito
 Bryan W. Brown
 James N. Brown
 John B. Bryant
 Mahmoud El-Gamal
 Malcolm Gillis
 Simon Grant
 Peter Mieszkowski
 Hervé Moulin
 Joon Park
 Robin C. Sickles
 Ronald Soligo
 George R. Zodrow
Professors Emeriti
 Donald L. Huddle
 Gordon W. Smith

Associate Professors

Eli Berman
 Suchan Chae
 Yoosoon Chang
 Marc Peter Dudey

Assistant Professors

Anna Bogomolnaia
 Juan Carlos Cordoba
 Yuka Ohno

Adjunct Professors

Bruce M. Lairson
 John Michael Swint

Adjunct Associate Professor

Charles E. Begley

Degrees Offered: B.A., M.A., Ph.D.

Undergraduates may major in either economics or mathematical economic analysis. The latter is recommended for students who intend to continue on to graduate work in economics or pursue a business or governmental job in which analytical and quantitative skills are required.

The eight major fields available for graduate study are econometrics, economic development, economic theory, industrial organization and regulation, international trade and finance, labor, macroeconomics and/or monetary theory, and public finance.

Degree Requirements for B.A. in Economics or Mathematical Economic Analysis

Economics Major. All economics majors must complete a minimum of 10 courses with a grade point average of at least 2.00.

(1) These courses include 9 economics courses and 1 course in quantitative analysis as specified in (4) below. Major requirements are not reduced for multiple majors, although some courses can satisfy the requirements for more than one major. (Please note that students may not pursue a double major in economics and mathematical economic analysis.)

(2) The following courses are required for all economics majors:

- ECON 211 *Principles of Economics I*
- ECON 212 *Principles of Economics II*
- ECON 370 *Microeconomic Theory*

- And either ECON 355 *Financial Markets and Institutions*, ECON 375 *Macroeconomic Theory*, or ECON 455 *Money and Financial Markets*.

We suggest that economics majors take ECON 211 and 212 in the freshman year and take ECON 370 in the first semester of their sophomore year, leaving the junior and senior years for advanced electives. This plan is optional, but please note that failure to take prerequisite courses in earlier years may cause scheduling problems in later years.

(3) Given that item (2) has been satisfied, at least 3 of the remaining 5 required economics courses must be selected from the following courses in applied economics.

ECON 301 <i>History of Economic Analysis</i>	ECON 448 <i>Corporation Finance</i>
ECON 355 <i>Financial Markets and Institutions</i>	ECON 450 <i>World Economic and Social Development</i>
ECON 375 <i>Macroeconomic Theory</i>	ECON 451 <i>The Political Economy of Latin America</i>
ECON 415 <i>Labor Economics</i>	ECON 452 <i>Principles of Islamic Economics</i>
ECON 416 <i>Economic History of the U.S., 1700–1945</i>	ECON 455 <i>Money and Financial Markets</i>
ECON 417 <i>Comparative History of Industrialization</i>	ECON 461 <i>Urban Economics</i>
ECON 420 <i>International Economics</i>	ECON 472 <i>Introduction to Game Theory</i>
ECON 421 <i>International Finance</i>	ECON 480 <i>Environmental and Energy Economics</i>
ECON 430 <i>Comparative Economic Systems</i>	ECON 481 <i>Health Economics</i>
ECON 435 <i>Industrial Organization</i>	ECON 482 <i>Distributive Justice—A Microeconomic Approach</i>
ECON 436 <i>Government Regulation of Business</i>	ECON 483 <i>Public Finance—Tax Policy</i>
ECON 437 <i>Economics of Information, Common Property Resources, and Public Goods</i>	ECON 484 <i>Public Expenditure Theory and Social Insurance</i>
ECON 438 <i>Economics of Law I</i>	ECON 485 <i>Contemporary Economic Issues</i>
ECON 439 <i>Economics of Law II</i>	ECON 486 <i>Contemporary Economic Issues</i>
ECON 440 <i>Risk, Uncertainty and Information</i>	ECON 495 <i>Senior Seminar</i>
ECON 445 <i>Managerial Economics</i>	

Please note that if you count ECON 355, 375, or 455 as 1 of the required courses in item (2), you may not also count that course as 1 of the 3 courses satisfying item (3).

(4) The quantitative methods course may be selected from the following.

ECON 382 <i>Probability and Statistics</i>	CAAM 322 <i>Introduction to Real Analysis II</i>
ECON 400 <i>Econometrics</i>	CAAM 335 <i>Matrix Analysis</i>
ECON 446 <i>Applied Econometrics and Economic Modeling</i>	CAAM 336 <i>Differential Equations in Science and Engineering</i>
ECON 475 <i>Integer and Combinatorial Optimization</i>	CAAM 353 <i>Computational Numerical Analysis</i>
ECON 477 <i>Mathematical Structure of Economic Theory</i>	CAAM 376 <i>Introduction to Management Science</i>
ACCO 305 <i>Introduction to Accounting</i>	CAAM 378 <i>Introduction to Operations Research</i>
CAAM 210 <i>Introduction to Engineering Computation</i>	CAAM 400 <i>Case Studies in Applied Mathematics</i>
CAAM 211 <i>Introduction to Engineering Computation</i>	
CAAM 321 <i>Introduction to Real Analysis</i>	

CAAM 435 <i>Ordinary Differential Equations</i>	COMP 440 <i>Artificial Intelligence</i>
CAAM 436 <i>Partial Differential Equations I</i>	COMP 480 <i>Concrete Mathematics</i>
CAAM 437 <i>Partial Differential Equations II</i>	COMP 482 <i>Design and Analysis of Algorithms</i>
CAAM 451 <i>Numerical Linear Algebra</i>	STAT 305 <i>Introduction to Statistics for Biosciences</i>
CAAM 452 <i>Computational Methods for Differential Equations</i>	STAT 310 <i>Probability and Statistics</i>
CAAM 453 <i>Numerical Analysis and Ordinary Differential Equations</i>	STAT 331 <i>Applied Probability</i>
CAAM 454 <i>Optimization Problems in Computational Engineering and Science</i>	STAT 381 <i>Introduction to Applied Probability</i>
CAAM 460 <i>Optimization Theory</i>	STAT 400 <i>Econometrics</i>
CAAM 471 <i>Linear Programming</i>	STAT 410 <i>Introduction to Statistical Computing and Linear Models</i>
CAAM 474 <i>Theory of Linear Inequalities</i>	STAT 421 <i>Introduction to Time Series Analysis</i>
CAAM 475 <i>Integer and Combinatorial Optimization</i>	STAT 431 <i>Mathematical Statistics</i>
CAAM 483 <i>Markov and Martingale Sequences—Renewal Processes</i>	STAT 450 <i>Practicum in Statistical Modeling</i>
COMP 212 <i>Intermediate Programming</i>	STAT 486 <i>Market Models</i>
COMP 312 <i>Program Construction</i>	Or an equivalent or higher-level course approved in advance by the chairman of the undergraduate committee.
COMP 314 <i>Applied Algorithms and Data Structures</i>	

(5) We strongly recommend that students take two semesters of calculus (MATH 101/102 or MATH 111/112) and a course in probability and statistics (ECON 382/STAT 310). Failure to take these courses will limit the range of electives available to the student.

(6) No more than 3 of the 9 economics courses may be transferred from other schools. Additional transfer credits in economics may count toward meeting university graduation requirements but not toward fulfillment of the departmental major requirements. The required course in quantitative analysis may also be transferred. AP credits do not count as transfer credits. In order to transfer either ECON 211 or ECON 212, the student must pass a qualifying examination. Students wishing to take either the ECON 211 or ECON 212 qualifying examination must apply to the economics department office in Baker Hall 266B. For additional information on transfer credits, consult “Procedures for Transfer Credit,” available in the economics department office.

(7) Students may graduate with “Honors in Economics” by achieving a B+ (3.33) average in all economics courses and doing two semesters of independent research (for details, consult “Economics 403/404—Senior Independent Research,” available in the Economics Department Office).

(8) For additional course information, consult “Economics Course Descriptions,” compiled by the Rice chapter of the Omicron Delta Epsilon National Economics Honor Society.

(9) Please note that it is primarily the responsibility of the student to satisfy all degree requirements, including the “University Credit Requirements” and “University Distribution Requirements” specified in the *General Announcements*. Consult with the appropriate departmental adviser, who must sign all registration forms for each major.

(10) Students who are considering either graduate work in economics or a business or governmental job in which analytical and quantitative skills are required should seriously consider obtaining the alternative major in mathematical economic analysis.

Mathematical Economic Analysis Major. Students majoring in mathematical economic analysis must take at least 16 courses.

(1) The major in mathematical economic analysis is designed for students who are interested in graduate work in economics or a business or governmental job in which analytical and quantitative skills are required.

(2) Students must choose between the 2 majors offered by the economics department; that is, students may not double major in economics and mathematical economic analysis. Major requirements are not reduced for students with multiple majors.

(3) A minimum of 16 courses (*) in 6 areas is required. These courses must include:

(a) 5 courses in Economic Principles:

ECON 211 <i>Principles of Economics I</i>	ECON 477 <i>Mathematical Structure of Economic Theory</i>
ECON 212 <i>Principles of Economics II</i>	ECON 375 <i>Macroeconomic Theory</i>
ECON 370 <i>Microeconomic Theory</i>	

(b) 3 courses in Applied Economics, selected from:

ECON 301 <i>History of Economic Analysis</i>	ECON 448 <i>Corporation Finance</i>
ECON 355 <i>Financial Markets and Institutions</i>	ECON 450 <i>World Economic and Social Development</i>
ECON 415 <i>Labor Economics</i>	ECON 451 <i>The Political Economy of Latin America</i>
ECON 416 <i>Economic History of the U.S., 1700-1945</i>	ECON 452 <i>Principles of Islamic Economics</i>
ECON 417 <i>Comparative History of Industrialization</i>	ECON 455 <i>Money and Financial Markets</i>
ECON 420 <i>International Economics</i>	ECON 461 <i>Urban Economics</i>
ECON 421 <i>International Finance</i>	ECON 472 <i>Introduction to Game Theory</i>
ECON 430 <i>Comparative Economic Systems</i>	ECON 480 <i>Environmental and Energy Economics</i>
ECON 435 <i>Industrial Organization</i>	ECON 481 <i>Health Economics</i>
ECON 436 <i>Government Regulation of Business</i>	ECON 482 <i>Distributive Justice—A Microeconomic Approach</i>
ECON 437 <i>Economics of Information, Common Property Resources, and Public Goods</i>	ECON 483 <i>Public Finance—Tax Policy</i>
ECON 438 <i>Economics of Law I</i>	ECON 484 <i>Public Expenditure Theory and Social Insurance</i>
ECON 439 <i>Economics of Law II</i>	ECON 485 <i>Contemporary Economic Issues</i>
ECON 440 <i>Financial Theory</i>	ECON 486 <i>Contemporary Economic Issues</i>
ECON 445 <i>Managerial Economics</i>	
ECON 446 <i>Applied Econometrics and Economic Modeling</i>	

(c) 1 additional 400-level course in Applied Economics as listed in (b) or a course in advanced analysis, selected from:

ECON 475 <i>Integer and Combinatorial Optimization</i>	CAAM 454 <i>Optimization Problems in Computational Engineering and Science</i>
CAAM 451 <i>Numerical Linear Algebra</i>	CAAM 460 <i>Optimization Theory</i>
CAAM 452 <i>Computational Methods for Differential Equations</i>	CAAM 471 <i>Linear Programming</i>
CAAM 453 <i>Numerical Analysis and Ordinary Differential Equations</i>	CAAM 474 <i>Theory of Linear Inequalities</i>
	CAAM 475 <i>Integer and Combinatorial Optimization</i>

CAAM 483 *Markov and Martingale Sequences—Renewal Processes*
 STAT 421 *Introduction to Time Series Analysis*

STAT 450 *Practicum in Statistical Modeling*
 STAT 486 *Market Models*

(d) 1 course in Econometrics: ECON 400 *Econometrics*

(e) 5 courses in Mathematics and Statistics:

- MATH 101 *Single Variable Calculus I*
- MATH 102 *Single Variable Calculus II*
- MATH 211 *Ordinary Differential Equations and Linear Algebra*
- MATH 355 *Linear Algebra or CAAM 335 Matrix Analysis*
- MATH 212 *Multivariable Calculus* or MATH 221 *Honors Calculus III*
- ECON 382/STAT 310 *Probability and Statistics*
 or STAT 410 *Introduction to Statistical Computing and Linear Models*
 or STAT 431 *Mathematical Statistics*

(f) 1 Senior Seminar or Senior Research: ECON 495/496 *Senior Seminar* or
 ECON 403/404 *Senior Independent Research*

(4) No more than 3 of the required economics courses and 2 of the required Mathematics (or computational and applied mathematics or statistics) courses may be transferred from other schools. Additional transfer credits in economics, mathematics, computational and applied mathematics or statistics may count toward meeting university graduation requirements but not toward fulfillment of the departmental major requirements. AP credits do not count as transfer credits. In order to transfer either 211 or 212, the student must pass a qualifying examination. Students wishing to take either the 211 or 212 qualifying examinations must apply to the economics department office in Baker Hall 266B. For additional information on transfer credits, consult “Procedures for Transfer Credit,” available in the economics department office.

(5) Students may graduate with “Honors in Mathematical Economic Analysis” by achieving a B+ (3.33) average in the 16 courses required for the major and any other economics electives taken.

(6) For additional course information, consult “Economics Course Descriptions,” compiled by the Rice chapter of the Omicron Delta Epsilon National Economics Honor Society.

(7) Please note that it is primarily the responsibility of the student to satisfy all degree requirements, including the “University Credit Requirements” and “University Distribution Requirements” specified in the *General Announcements*. Consult with the appropriate departmental adviser, who must sign all registration forms for each major.

Substituting Economics Graduate Courses for Undergraduate Courses.

Undergraduate majors satisfying the course prerequisites may, subject to the approval of the instructor and of the departmental undergraduate program chair, substitute certain graduate courses for undergraduate courses. Only highly motivated students with excellent aptitudes for economics and a strong background in mathematics should consider making such substitutions. Typically, but not necessarily, such students will be majors in mathematical economic analysis. Permitted substitutions are as follows:

- ECON 501 for ECON 370 (if student has completed ECON 211 at Rice)
- ECON 502 for ECON 375 (if student has completed ECON 212 at Rice)
- ECON 504 for ECON 382
- ECON 510 for ECON 400
- Furthermore, ECON 505 and ECON 508 also may be taken by undergraduates and

may be used toward satisfying MTEC requirements. Specifically, ECON 505 could be used as 1 of the courses in the applied economics category or in the advanced analysis category, while ECON 508 could be used only in the advanced analysis category.

Note that this set of substitutable graduate courses includes 6 of the 7 courses required during the first year of the Ph.D. program at Rice. Accordingly, such advanced course work would be excellent preparation for graduate study in economics or in some related field such as finance. Taking such graduate courses should also open more opportunities for the student who will be seeking employment immediately after graduation.

The Five-Year M.A. Program

Advanced undergraduate students can, subject to the approval of the departmental five-year M.A. adviser, enter our five-year M.A. program. In this program, a student who has taken advantage of the full menu of graduate course substitutions available could, with an additional year of study at Rice, earn an M.A. in economics.

To obtain the M.A. degree, students must satisfy all of the requirements for Ph.D. candidacy. In particular, students must pass general examinations in microeconomic theory and in macroeconomic theory and econometrics, must pass an examination in a specialized field of study in economics, and must complete an original research project (a dissertation prospectus) that could be developed into a Ph.D. dissertation under the supervision of a faculty member. This work could be an extension of a paper written as a senior independent research project (ECON 403/404). In some cases, at the discretion of the independent research adviser, the paper produced in ECON 403/404 may fulfill this requirement. Finally, the first-year graduate requirement to take ECON 507 Mathematical Economics would be waived with the approval of the departmental five-year M.A. adviser.

Note that any student who subsequently decides to enter the economics Ph.D. program at Rice would be given graduate credit for all 500 level economics courses completed while an undergraduate. The completion of the Ph.D. dissertation typically requires at least one additional year of research (but no additional courses) beyond the M.A. degree.

Students who opt for the five-year M.A. degree program will have different backgrounds and interests on entering Rice and will choose to pursue this option at different stages in their academic careers. The following illustrates two (of many) possible paths to satisfying the MTEC major requirements, while at the same time completing all of the requirements for the M.A. degree over a five-year period.

Courses: Sample Path One

The student enters with AP credit for ECON 211/212 and MATH 101/102, and has an early interest in the five-year M.A. program.

Freshman Year

ECON 370, 375, 477, and MATH 211/
212

Junior Year

ECON 502, 504, 505, 510, and 1 course
from Applied Economics category

Sophomore Year

ECON 501; 1 course from Applied
Economics category; and MATH
355 or CAAM 310

Senior Year

ECON 403/404 and ECON 508

Fifth Year
Complete all remaining graduate courses and pass all remaining examinations required to achieve Ph.D. candidacy.

(Note that with AP credit for MATH 101/102, but not for ECON 211/212, the student could substitute ECON 211/212 for ECON 370 and ECON 375 in the freshman year.)

Courses: Sample Path Two

The student has no relevant AP credit and/or decides to enter the five-year M.A. program only near the end of the sophomore year.

Freshman Year
ECON 211/212 and MATH 101/102

Senior Year
ECON 504, 510, 403/404, and 1 course from applied economics category

Sophomore Year
ECON 370, 375, 477, and 1 course from applied economics category;
MATH 211/212

Fifth Year
Complete all remaining graduate courses and pass all remaining examinations required to achieve Ph.D. candidacy.

Junior Year
ECON 501, 502, 505, 508;
MATH 355 or CAAM 310

Degree Requirements for Ph.D. in Economics

Preparation for Ph.D. Program. Applicants to the Ph.D. program should have had at least two semesters in calculus and one in linear algebra. Students who have not met these requirements may complete these prerequisites as Class III students (pages 82–83) before being admitted to the graduate program. All applicants are required to take the Graduate Record Exam.

Requirements. For general university requirements, see Graduate Degrees (pages 62–67). Candidates for the Ph.D. degree usually spend from two to two and one-half years in full-time course work and at least one year writing the dissertation; four to five years is a reasonable goal for completing the program. For the Ph.D., students must:

- Complete an approved program of at least 14 courses not including ECON 593/594 *Workshop in Economics I* and ECON 595/596 *Workshop in Economics II*
- Complete an approved program of at least 4 sections of ECON 593/594 *Workshop in Economics I* and ECON 595/596 *Workshop in Economics II*
- Perform satisfactorily on written general examinations in economic theory and econometrics
- Demonstrate proficiency in a major field by taking the relevant courses in that field and performing satisfactorily on a written examination
- Complete and defend orally a doctoral dissertation setting forth in publishable form the results of original research

See ECON in the Courses of Instruction section

Education

The School of Humanities

Professor

Linda M. McNeil

No degree is offered through the Education Department. This department offers opportunities for students to explore the background, purposes, and organization of American schools as well as the major issues facing education today. Research seminars allow students to engage in projects in a wide range of topics significant to education. Most courses require observation in the classroom.

Please see the section on Education Certification under Interdepartmental Majors for information on the three teacher education plans offered at Rice: (1) a secondary teaching certificate in combination with the undergraduate degree in the elected subject field(s), (2) a Master of Arts in Teaching (M.A.T.), and (3) a postbaccalaureate plan for Class III students that involves taking those courses and state examinations needed for certification but that does not confer a degree.

Education Certification

Chair

Meredith Skura

Professor

Linda M. McNeil

Adjunct Professor

Roland B. Smith, Jr.

Lecturers

Jean Ashmore

Eileen Coppola

Lissa Heckelman

Carolynne White

Heidi Ziemer

Adjunct Lecturers

Wallace Dominey

Elnora Harcombe

Anne Papakonstantinou

Degrees Offered:

Secondary Teaching Certificate in conjunction with B.A. in major field, M.A.T.

Students in the teacher education program at Rice show a commitment to teaching, a strong record of scholarship in their subject areas, and promise as thoughtful, engaging teachers. The program emphasizes a sound liberal arts education; extensive knowledge of the subject(s) or area(s) to be taught; professional knowledge, including the relevant historical, philosophical, social, and psychological bases of education; and skills in classroom teaching, which include working with both children and adults. Graduates emerge from the program fully prepared for the teaching profession, trained in a multitude of teaching styles and methods to meet the needs of the diverse student population in schools today.

Rice offers three teacher education plans: (1) a secondary teaching certificate in combination with the undergraduate degree in the elected subject field(s), (2) a Master of Arts in Teaching (M.A.T.), and (3) a postbaccalaureate plan for Class III students that involves taking those courses and state examinations needed for certification but that does not confer a degree. All three plans include student teaching in the Rice Summer School for Grades 8–12. While maintaining its academic integrity, the Rice program complies with state of Texas certification requirements. Students seeking additional information about the teacher education program are encouraged to meet with education faculty.

Texas Teaching Credential. Rice is approved by the state of Texas to offer teacher preparation programs in the following fields: art, English, French, German, health science, history, Latin, life sciences, mathematics, physical education, physical science, Russian, science, social studies, and Spanish.

After satisfactory completion of the Rice program, which includes the state-mandated ExCET or TExES examinations, students are recommended for a Texas teaching credential. The Texas Education Agency then awards a Texas Provisional Teaching Certificate (Grades 8–12).

Student Teaching, Apprenticeship (Plan A) and Internship (Plan B) programs are available. Unpaid *apprenticeships* are for undergraduates who wish to complete the teacher education program in four years and two six-week summer sessions. Candidates enroll for the summer sessions following their junior and senior years. Apprentices create and teach courses under the supervision of experienced master teachers and university faculty in the Rice Summer School for Grades 8–12.

Paid *internships* are undertaken by Master of Arts in Teaching candidates, by some Class III students, and by undergraduates who begin earning certification in their senior year. Under this plan, students serve one apprenticeship in the Rice Summer School and are then supervised through their first semester of a full-time, paid internship in a neighboring, cooperating school system. Permission for the internship is contingent upon completing a successful apprenticeship.

Requirements for Secondary Teaching Certificate

Admission. Students may apply to the Rice University Education Certification Office for admission to the teacher education program if they show:

- Attainment of junior standing at Rice (bachelor's degree for M.A.T. candidates) by the semester of admission to the program
- Grades of C- or better in all semester hours attempted in their teaching field(s), with an overall grade point average of 2.5 or better
- Evidence of adequate physical vigor to perform as a teacher in a classroom
- Exemption or satisfactory scores on all required preprofessional skills tests
- A completed Plan of Study approved by department representatives and the major field adviser is required before admission to the program is complete

Completion of Program. To complete the program, students must:

- Be exempted from or pass the state's Texas Academic Skills Program (TASP) exam prior to enrolling in any education courses
- Complete the courses specified by the major field adviser(s). Lists of courses for each subject are available in the Education Certification Office.
- Complete 18 hours in professional education courses as follows:
either: EDUC 301/501 *Philosophical, Historical, and Social Foundations of Education* or EDUC 330/530 *The American High School*
EDUC 305/505 *Educational Psychology*
EDUC 420 *Curriculum Development*
3 hours in the appropriate seminar(s) in teaching methods
6 hours in student teaching (see following)
- Satisfy a state requirement for computer literacy by completing one course in computer use or by taking the department proficiency exam. EDUC 340 *Computers in Education* is recommended.
- Complete all university and program requirements specified for undergraduates, M.A.T. candidates, or nondegree (Class III) candidates
- Make grades of C- or better in all teaching field courses and education courses (B- or better for M.A.T. students)
- Pass appropriate ExCET or TExES exams

Apprenticeship Plan (Plan A)

(For students beginning certification in junior year and for some Class III students)

Junior Year

EDUC 301 *Philosophical, Historical, and Social Foundations of Education*
or EDUC 330 *The American High School*
EDUC 305 *Educational Psychology*
EDUC 410–416 *Relevant seminar(s) in teaching methods*
EDUC 420 *Curriculum Development*
EDUC 440 *Supervised Teaching: Summer School*

Senior Year

EDUC 420 *Curriculum Development*

After Graduation

EDUC 440 *Supervised Teaching: Summer School*

Requirements for M.A.T.

Admission. Applicants must have a bachelor's degree, scholarly ability, and an interest in teaching, and they must have taken the Graduate Record Examination (GRE) aptitude test. Education faculty review each application. A limited number of tuition waivers is available. See Admission to Graduate Study (pages 65–68). Admitted students must pass or be exempted from the state's Texas Academi7 Skills Program (TASP) exam *prior* to enrolling in any education courses.

Degree Requirements. For general university requirements, see Graduate Degrees (pages 60–65). The M.A.T. is a professional degree program for students who want to qualify for secondary school teaching following a liberal arts education. Most candidates entering the program have had no professional education courses. By completing the program, candidates fulfill all requirements for a Texas Provisional Teaching Certificate for grades 8–12. To earn the professional M.A.T. degree, students must complete, with grades of B- or higher, at least 33 semester hours (the need to remove deficiencies may require additional courses for certification). Requirements are as follows:

- Courses in secondary school educational theory, teaching strategies, educational practice, and evaluation
- Graduate or upper-level courses in the relevant teaching field(s) taken at Rice
- Supervised full-time teaching for one summer in the Rice Summer School for Grades 8–12, including design and implementation of courses, teaching, and evaluation
- Approval to begin an internship, based on a successful summer school teaching experience
- Supervised teaching internship for one semester in a cooperating secondary school, including the accompanying seminar

The cooperating school districts pay a regular salary for internship teaching, which covers the small cost of graduate tuition.

Internship Plan (Plan B)

(For students beginning certification in senior year, for some Class III students, and for M.A.T. students)

Before Graduation

EDUC 301/501 *Philosophical, Historical, and Social Foundations of Education*
or EDUC 330/530 *The American High School*
EDUC 305/505 *Educational Psychology*
EDUC 410–416 *Relevant seminar(s) in teaching methods*
EDUC 420 *Curriculum Development*

After Academic Year

EDUC 440 *Supervised Teaching: Summer School*
EDUC 540 *Internship* (paid internship in the fall in a local, accredited secondary school)

Requirements for Class III Certification

A nondegree (Class III) plan leading to secondary teacher certification is available for those who have earned a B.A. but do not choose to pursue a graduate degree. Candidates complete all requirements for secondary teacher certification, including professional education courses and courses in their selected fields. Interested students should direct their queries to the Education Certification Office.

Higher Education Act Title II Reports

The Higher Education Act (HEA) of the U.S. Congress requires each institution of higher education with a teacher preparation program enrolling students receiving federal assistance under this Act to report annually "to the State and the general public" certain information. This information consists of the pass rate of program completers on assessments required by the state for teacher licensure or certification, the statewide pass rate on those assessments, and other basic information on the teacher preparation program.

Rice University's Teacher Education program is accredited by the State of Texas. The first year pass rate for program completers on assessments required by the state for 2000–01 was 100% compared with 88% for the overall state pass rate. The combined cumulative pass rate for program completers on assessments required by the state for 1999–2001 was 100% compared to 93% for the overall state pass rate. A total of 20 students were enrolled in the program in 2000–01. The students spent an average of 40 hours per week in supervised student teaching with a student/faculty ratio of 2-to-1. Rice teacher education program graduates are regularly recruited by school districts in the Houston and surrounding areas because of their innovative ideas, leadership abilities, and dedication to the teaching profession.

See EDUC in the Courses of Instruction section.

Electrical and Computer Engineering

The George R. Brown School of Engineering

Chair

Don H. Johnson

Professors

Behnaam Aazhang
Athanasios C. Antoulas
Richard G. Baraniuk
Joseph R. Cavallaro
John W. Clark, Jr.
Naomi J. Halas
Don H. Johnson
J. Robert Jump
Erzsébet Merényi
Michael Orchard
Frank K. Tittel
William L. Wilson, Jr.
James F. Young

Professors Emeriti

James Boyd Pearson, Jr.
Thomas A. Rabson

Associate Professors

Edward W. Knightly
Robert D. Nowak
Peter J. Varman

Assistant Professors

Junichiro Kono
Daniel Mittleman
Vijay Pai

Adjunct Professors

Richard Barton
Akhil Bidani
John Byrne
Scott Cutler
Wayne Giles
Thomas Harman
Dirar Khoury
T. Randall Lee
Jorma Lilleberg
Gerd Marowsky
Alexander Oraevsky
Peter Saggau
Steve Sheafor
Markus Sigrist
Michael Smayling
Chiyeko Tsuchitani

Faculty Fellows

Hyeokho Choi
Rudolf H. Riedi
Ashutosh Sabharwal

Lecturers

Richard P. Massey
James B. Sinclair
James D. Wise

Degrees Offered: B.A., B.S.E.E., M.E.E., M.S., Ph.D.

The electrical and computer engineering department strives to provide high quality degree programs that emphasize fundamental principles, respond to the changing demands and opportunities of technology, challenge the exceptional abilities of Rice students, and prepare these students for roles of leadership in their chosen careers.

In support of this goal, the electrical and computer engineering department's objectives are to provide its undergraduate students with:

- A solid foundation in the fundamentals of electrical and computer engineering, mathematics, and science, enabling them to adapt easily to technological developments that will occur during their careers
- An in-depth exposure to one area of electrical and computer engineering, emphasizing its relationship to the basic framework of the discipline and to other appropriate topics outside that framework

- Courses and projects that actively involve them in their own education and enhance their ability to formulate and solve real-world design and research problems
- A broad education outside of engineering and science that emphasizes the role of electrical and computer engineering in society and builds the leadership skills necessary to deal with the increasing impact of technology

Graduate and undergraduate programs in electrical and computer engineering offer concentrations in areas that include system and control theory, bioengineering, communications, quantum electronics and lasers, computer systems, and electronic materials, devices, and circuits. Bioengineering is primarily a graduate program, although undergraduates may take introductory courses in this field as electives or as part of their specialization area courses.

Undergraduate Program. The department offers two undergraduate degrees, the Bachelor of Arts (B.A.) and the Bachelor of Science in Electrical Engineering (B.S.E.E.). The B.A. program is highly flexible, permitting a student to tailor the program to his or her interests, be they broad or highly focused. The B.S.E.E. degree is approved by the Accreditation Board for Engineering and Technology (ABET); requires more scientific and professional courses, for a total of at least 134 semester hours; and has fewer electives. Outstanding students interested in careers in research and teaching may enter graduate school after either bachelor degree. Both degrees are organized around a core of required courses and a selection of elective courses from five specialization areas. Each student's program must contain a depth sequence in one area and courses from at least two areas to provide breadth. The specialization electives provide a flexibility that can be used to create a focus, such as optical communications, that crosses traditional areas. Because of the number of options, students should consult early with departmental advisers to plan a program that meets their needs.

The B.A. degree provides a basic foundation in electrical and computer engineering that the student can build upon to construct a custom program. Because of its flexibility and large number of free electives, the B.A. can be combined easily with another major to create an interdisciplinary program. This may be particularly appropriate for students planning further study in law, business, or medicine.

The B.S.E.E. is the usual degree taken by those students planning a career of engineering practice. It is accredited by ABET and can reduce the time required to become a licensed professional engineer. Accreditation and professional licensing are important for some careers, and many states require licensure for those providing engineering services directly to the public, for example, as a consultant. The program for the B.S.E.E. degree requires greater depth than the B.A. degree but still provides considerable flexibility. Students who place out of required courses but who do not have credit must substitute other approved courses *in the same area*.

The requirements for the two degrees are grouped into four categories, listed below. The specific courses required for each degree are listed in the section for that degree.

Basic Mathematics and Science Courses

MATH 101 *Single Variable Calculus I*
MATH 102 *Single Variable Calculus II*
CAAM 335 *Matrix Analysis* or MATH 355 *Linear Algebra*
MATH 212 *Multivariable Calculus*
PHYS 101 *Mechanics*
PHYS 102 *Electricity and Magnetism*
CHEM 121 *General Chemistry*
PHYS 201 *Waves and Optics*

Core Courses

ELEC 241 *Fundamentals of Electrical Engineering I*
ELEC 242 *Fundamentals of Electrical Engineering II*
ELEC 301 *Introduction to Signals* (or COMP 212 *Intermediate Programming*)
ELEC 305 *Introduction to Physical Electronics*

Core Courses (cont.)

ELEC 320 <i>Introduction to Computer Organization</i>	ELEC 391 <i>Professional Issues in Electrical Engineering</i>
ELEC 326 <i>Digital Logic Design</i>	ELEC 331 <i>Applied Probability</i>

Restricted Electives**Computation**

CAAM 210 <i>Introduction to Engineering Computation</i>
CAAM 211 <i>Introduction to Engineering Computation</i>
COMP 210 <i>Introduction to Principles of Scientific Computation</i> (COMP 210 is a prerequisite for many other computer courses.)

Laboratory

ELEC 201 <i>Introduction to Engineering Design</i>
ELEC 303 <i>Systems Laboratory</i>
ELEC 327 <i>Digital Logic Design Laboratory</i>
ELEC 423 <i>VLSI Design II</i>
ELEC 433 <i>Communications Systems Lab</i>
ELEC 465 <i>Physical Electronics Lab</i>
ELEC 490 <i>Electrical Engineering Projects</i>

Specialization Areas. The following groups of courses focus on specific areas within electrical and computer engineering. The systems area involves the study of processing and communicating signals and information through systems of devices, control and robotics, signal and image processing, and communications. The computer engineering area provides a broad background in computer systems engineering, including computer architecture, hardware engineering, software engineering, and computer systems performance analysis. The physical electronics area encompasses studies of electronic materials, semiconductor and optoelectronic devices, lasers, and photonics.

Computer Engineering

COMP 212 <i>Intermediate Programming</i>
COMP 311 <i>Programming Languages</i>
ELEC 322 <i>Applied Algorithms and Data Structures</i>
ELEC 421 <i>Operating Systems and Concurrent Programs</i>
COMP 410 <i>Software Construction Methodology</i>
COMP 413 <i>Distributed Program Construction</i>
COMP 422 <i>Parallel Computing</i>
ELEC 422 <i>VLSI Design</i>
ELEC 424 <i>Computer Systems Design</i>
ELEC 425 <i>Computer Systems Architecture</i>
ELEC 426 <i>Digital Systems Design</i>
ELEC 428 <i>Computer Systems Performance</i>
ELEC 429 <i>Introduction to Computer Networks</i>

Bioengineering

ELEC 481 <i>Computational Neuroscience</i>
ELEC 482 <i>Physiological Control Systems</i>
ELEC 483 <i>Introduction to Biomedical Instrumentation and Measurement Techniques</i>

Systems: Control, Communications, and Signal Processing

ELEC 301 <i>Introduction to Signals</i>
ELEC 302 <i>Introduction to Systems</i>
ELEC 430 <i>Communication Theory and Systems</i>
ELEC 431 <i>Digital Signal Processing</i>
ELEC 436 <i>Control Systems I</i>

Electronic Circuits and Devices

ELEC 342 <i>Electronic Circuits</i>
ELEC 427 <i>Pulse and Digital Circuits</i>
ELEC 435 <i>Electromechanical Devices and Systems</i>
ELEC 442 <i>Advanced Electronic Circuits</i>
ELEC 443 <i>Power Electronic Circuits</i>
ELEC 462 <i>Semiconductor Devices</i>

Quantum Electronics

PHYS 202 <i>Quantum Mechanics</i>	ELEC 463 <i>Lasers and Photonics</i>
ELEC 306 <i>Electromagnetic Fields and Devices</i>	ELEC 465 <i>Physical Electronics Practicum</i>
ELEC 361 <i>Electronic Materials and Quantum Devices</i>	ELEC 563 <i>Introduction to Solid-State Physics</i>
ELEC 462 <i>Semiconductor Devices</i>	

The department may add or delete courses in the areas. In addition, graduate courses and equivalent courses from other departments may be used to satisfy area requirements with permission; consult with departmental advisers for the latest information. A course can satisfy only one program requirement. ELEC 491/492 may be used to satisfy requirements in any area, depending on the nature of the design project.

Degree Requirements for B.S. in Electrical Engineering

For general university requirements, see Graduation Requirements (pages 18–20). Students completing the B.S.E.E. program must have a total of at least 134 semester hours in order to graduate.

Basic Mathematics and Science. Students must take all of the courses listed under basic mathematics and science courses. They must also take additional math and science courses, approved by the department, to bring their total to 32 hours.

Core Courses. Students must take all of the courses listed under core courses, except that they need take only 1 of ELEC 301 and COMP 212.

Restricted Electives. 1 computation course and 1 laboratory course.

Specialization Areas. Students in the B.S.E.E. program choose courses from 2 or more specialization areas. Students must take at least 7 specialization courses, including at least 4 courses in one area and courses from at least 2 different areas. Students taking either ELEC 301 or COMP 212 to satisfy a core course requirement may not use that course to satisfy a specialization area requirement. Because of the number of options, students should consult early with department advisers to plan a program that meets their needs. Students going on to a technical career or graduate school may need to use unrestricted electives to create a coherent program.

Design Component. At least 1 of the specialization area courses must be an approved design course.

Degree Requirements for B.A. in Electrical and Computer Engineering

For general university requirements, see Graduation Requirements (pages 18–20). Students completing the B.A. program must have a total of at least 120 semester hours at graduation.

Basic Mathematics and Science. Students in the B.A. program must take all of the courses listed under basic mathematics and science courses, with the following exceptions: CHEM 121 is not required, and MATH 355 Linear Algebra, MATH 381 Introduction to Partial Differential Equations, or CAAM 353 Computational Numerical Analysis may be taken instead of ELEC 331.

Core Courses. All of the courses listed under core courses are required for the B.A. degree, except for COMP 212, ELEC 301, and ELEC 391. Students also have the following options: CAAM 353 Computational Numerical Analysis may be taken instead of MATH 212, and CHEM 121 General Chemistry may be taken instead of PHYS 201.

Restricted Electives. 1 computation course and 1 laboratory course.

Specialization Areas. A 2-course sequence in 1 area and courses from at least 2 areas.

Degree Requirements for M.E.E., M.S., and Ph.D. in Electrical and Computer Engineering

For general university requirements, see Graduate Degrees (pages 62–67). Students should also consult department advisers for specific courses of study.

Master's Degree Programs. A candidate for the professional M.E.E. degree must complete an approved sequence of 10 advanced courses, totaling at least 30 hours. At least 4 of these must be technical courses at the 500 level or higher. At least 7 of the courses must be technical courses at the 400 level or higher. All 10 courses must be at the 300 level or higher and 2 credit hours or more. Specialization is possible in the general areas of bioengineering, signal processing, communication and control theory, electro-optics and physical electronics, and computer science and engineering. A candidate for the M.S. degree must complete both an approved course of study and an approved research program, culminating in an acceptable thesis. (The M.S. degree is not a terminal degree but part of the Ph.D. program.)

A joint M.B.A./Master of Engineering degree is also available in conjunction with the Jesse H. Jones Graduate School of Management.

Ph.D. Program. Candidates should expect to spend a minimum of three academic years of graduate study in this program. Normally, candidates complete the requirements for an M.S. degree as part of the Ph.D. program. For the Ph.D., students must:

- Obtain high standing in an approved course program
- Perform satisfactorily on qualifying examinations
- Complete a satisfactory dissertation of independent and creative research
- Pass a final oral examination

See **ELEC** in the **Courses of Instruction** section.

English

The School of Humanities

Chair

Susan Wood

Professors

Jane Chance
 Terrence Arthur Doody
 Linda P. Driskill
 J. Dennis Huston
 Walter Whitfield Isle
 Helena Michie
 Wesley Abram Morris
 Robert L. Patten
 Meredith Skura
 Edward A. Snow

Professors Emeriti

Max Apple
 Edward O. Doughtie
 Alan Grob
 John Meixner
 David Lee Minter
 William Bowman Piper

Associate Professors

José F. Aranda, Jr.
 Scott S. Derrick
 Lucille P. Fultz
 Betty Joseph
 Colleen R. Lamos
 Caroline Levander
 Susan Lurie

Assistant Professors

Krista Comer
 Elizabeth A. Dietz
 Sarah Ellenzweig
 Kirsten Ostherr

Writer in Residence

Marsha Recknagel

Lecturers

Jill “Thad” Logan
 Mary L. Tobin

Lecturers on Theatre

Mark Ramont
 Patricia Rigdon

Degrees Offered: B.A., M.A., Ph.D.

The undergraduate program offers opportunities for students to improve their expository writing skills and explore literature while learning to appreciate it critically. The department also offers a variety of courses in creative writing, including poetry, fiction, and creative nonfiction. In addition, it also is home to the Theatre Program, which offers courses in theatre and dramatic literature. The graduate program in English offers concentrations in all fields of British and American literature and literary theory.

Degree Requirements for B.A. in English

For general university requirements, see Graduation Requirements (pages 18–20). Students majoring in English must complete 36 semester hours in English with at least 24 hours in courses at the 300 level or above. A double major requires 30 hours in English with at least 18 hours in the upper-level courses. HUMA 101 and 102 may be counted toward the English major. All English majors must take the following:

- ENGL 210 *Major British Writers: Chaucer to 1800*
- ENGL 211 *Major British Writers: 1800 to Present*
- ENGL 260 *Introduction to the Study of American Literature*
- 3 hours in upper-level courses in each of the following areas: (1) English literature before 1800, (2) English literature after 1800, and (3) American literature

The department recommends that all English majors take courses in English and American history and, if they plan to do graduate work, at least 6 hours of upper-level courses in a foreign language.

Degree Requirements for M.A. and Ph.D. in English

For general university requirements, see graduate Degrees (pages 62-67). As part of their training, graduate students participate in both the teaching and research activities of the department. Upon entering, students will be assigned a Program Advisory Committee (PAC), consisting of two or three faculty members. In consultation with their PAC, students will design their own individualized program structured by the minimal requirements listed below. For more detailed information, please ask for a copy of the Department's Program Outline.

M.A. Program. The English department does not have an M.A. program, but offers the M.A. degree to those Ph.D. students who have achieved candidacy and are in the process of completing their doctorate, and to qualified Ph.D. students who leave the program before completing their doctorate. To receive an M.A. students must:

- Satisfactorily complete at least 30 hours of graduate work in English at Rice University. Courses must be those that count towards the Ph.D. in English. These include: courses numbered in the 500s and 600s in the English department excluding 510, 601/602, 603/604; up to 2 approved graduate or equivalent courses taken in other departments; and up to 2 approved courses in the English department numbered 400 and above. Courses taken to fulfill the language requirement are excluded. Students must satisfactorily complete ENGL 600 and distribution requirements for the Ph.D. (See below.)
- Satisfactorily complete 2 Teaching Assistantships (ENGL 601/602). These do not count toward the 30-hour requirement.

Ph.D. Program. To gain admission to Ph.D. candidacy, students must satisfy the first seven of the following requirements, and they must receive approval for their dissertation prospectus from the Department's Graduate Committee. To earn a Ph.D. in English, candidates must also complete the last 2 requirements. Students must:

(1) Satisfactorily complete at least 33 hours of course work plus ENGL 510, exclusive of the thesis. Courses can include: graduate courses in the English department numbered 500 to 600, excluding 510, 601/602, 603/604; up to 2 approved undergraduate courses in the English department; and up to 2 approved courses in another department.

(2) Satisfactorily complete the following 2 required courses: ENGL 600, Professional Methods, and ENGL 605, Third-Year Writing Workshop. These count toward the 33-hour requirement.

(3) Satisfactorily complete the distribution requirement, which consists of 2 approved courses on literature before 1800 and 2 after 1800. These count toward the 33-hour requirement.

(4) Satisfactorily complete the teaching requirement by serving twice as a teaching assistant, by completing ENGL 510/511 Pedagogy, and by teaching a lower-level course designed in conjunction with the instructor of ENGL 510. ENGL 510 does not count toward the 33-hour requirement.

(5) Pass a six-hour written preliminary examination focusing on two lists of books,

one representing the full range of a literary period as defined by the student and his or her preliminary committee, the other representing a second literary period, a single author, a genre traced over a period of time more comprehensive than that covered by the first list, or a particular theoretical or critical approach studied with reference to its own history and traditions as well as to the historical field of the first exam.

(6) Complete a dissertation prospectus that proposes a topic and an approach, offers a context to the topic in terms of work already done, that offers an outline of chapters or sections, and that includes a substantial bibliography.

(7) Complete a dissertation that demonstrates a capacity for independent and original work of high quality.

(8) Pass an oral exam on the dissertation and related fields of study.

Financial Support. Within the limits of available funds, qualified students may receive graduate scholarships or fellowships for up to four years. To qualify for this continuing financial aid, students must be approved for candidacy for the Ph.D. by the beginning of their seventh semester at Rice (fifth semester for those entering with an M.A.).

See ENGL in the Courses of Instruction section.