

University of Pittsburgh

**GRADUATE AND
PROFESSIONAL BULLETIN
2000 • 2003**

USING THIS BULLETIN

Students who are interested in or accepted to any of the University of Pittsburgh's graduate or professional programs other than those leading to the first-professional degrees offered by the University (MD, JD, LLM, PharmD, or DMD) will find useful most of the sections of this bulletin. Descriptions of the University, its regulations, and its services are included in the sections prior to the program-specific information in the Schools, Departments, and Programs section of the bulletin.

Students interested in first-professional programs (MD, JD, LLM, PharmD, or DMD) can ignore much of the bulletin prior to the First-Professional Programs section, but should familiarize themselves with the general information on the University, as well as the section on Campus Facilities & Student Services, and the University-wide policies detailed in Rights and Responsibilities. The Schools of Medicine, Law, Dental Medicine, and Pharmacy appear in the Schools, Departments, and Programs section for programs leading to the graduate and professional advanced degrees as well as in the First-Professional Programs section since these schools offer both types of programs. Faculty are listed by their department or program at the end of the school.

Students should note that the listings of requirements and procedures for admissions, registration, and other information listed in the sections prior to the more program-specific information provided in the Schools, Departments, and Programs section of this bulletin represent the minimum requirements and basic procedures. Students should consult the information on their specific school, program, and department for detail on additional or stricter requirements and procedures.

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UNIVERSITY OF PITTSBURGH



THE UNIVERSITY OF PITTSBURGH

ABOUT THE UNIVERSITY

The University of Pittsburgh is an internationally respected center of learning and research, offering exceptional educational opportunities in the humanities, sciences, and professions. The University's mission is to advance teaching, research, and public service. This tripartite commitment enables the University to serve others by:

- educating diverse students from the region, the nation, and the world;
- expanding the boundaries of knowledge, discovery, and technology; and
- enhancing quality of life in the western Pennsylvania region and beyond.

HISTORY

The University began in the Pennsylvania wilderness as the Pittsburgh Academy in 1787, the year the U.S. Constitution was adopted. Thirty-two years later, the Pittsburgh Academy became the Western University of Pittsburgh, and in 1908, the school changed its name to the University of Pittsburgh.

The recognition of graduate study at the University of Pittsburgh began with the awarding of Master of Arts degrees in 1836. By 1870, over 30 MA degrees had been awarded. These degrees were conferred for study beyond the Bachelor of Arts degree. In 1884, Chancellor Milton Goff set up a two-year professional study program leading to either a Master of Philosophy (predecessor of the Master of Science degree) or a Master of Arts degree and a three-year program leading to a Doctor of Philosophy degree. Before admission to these programs, each student was required to show proficiency in three areas of study. Both master's and doctoral candidates were required to prepare and defend theses.

In 1906, new rules were formulated for graduate study, requiring students to be in residence and requiring the completion of one year of study or 30 credits for the master's degree and three years or 90 credits for the doctoral degree. The catalogues of 1908 and 1909 announced the establishment of the Graduate School with five departments offering courses for the Doctor of Philosophy degree. These departments, plus five others, offered courses for the Master of Arts degree.

In 1910, a faculty committee drafted proposals, adopted by the board of trustees in 1913, making the Graduate School an independent administrative unit of the University and authorizing the selection of a Graduate Council. The Graduate School was grouped into three divisions (Humanities, Social Sciences, and Natural Sciences) in 1947. Until 1956, the administration of graduate study was the responsibility of the dean of the Graduate School and the Graduate Council. At that time, the individual schools and the three divisions were given direct administrative responsibility for their graduate programs in accord with the regulations established by the University Council on Graduate Study—formerly the Graduate Council. In 1968, the dean of the Graduate School retired from his administrative role, and the position he had held was discontinued. General responsibility for the

University's graduate programs was assigned to the provost pending reorganization of the University's graduate structure. The University Council on Graduate Study, the University administration, and members of the Graduate Faculty cooperated in drafting a proposed reorganization of graduate study, which was approved by written ballot by the entire Graduate Faculty and, in turn, accepted by Chancellor Wesley Posvar. This organizational structure became effective July 1, 1971 and is still the official structure.

Thus, during the 200-plus year history of the University, graduate education has grown to encompass the Faculty of Arts and Sciences and all 13 of the professional schools, which share a commitment to meet the nation's need for well-educated researchers, scholars, and leaders of professions and the tri-state region's need for trained professionals.

A private institution for most of its past, the University of Pittsburgh became state-related in 1966, establishing a relationship with the Commonwealth of Pennsylvania that continues to benefit both partners. Today, as an elected member of the prestigious Association of American Universities, the University of Pittsburgh claims its place among the top public research universities in the nation.

ACCREDITATION

The University of Pittsburgh, including its four regional campuses, is accredited by the Middle States Association of Colleges and Schools' Commission on Higher Education. In addition, schools, programs, and departments may be accredited by discipline-specific accrediting bodies. *See Schools, Departments, and Programs section of this bulletin for this information.*

ACADEMIC ORGANIZATION AND PITTSBURGH CAMPUS OVERVIEW

An independent, state-related, coeducational institution, the University of Pittsburgh's Pittsburgh campus offers a multitude of degree-granting and other programs housed in 16 undergraduate, graduate, and professional schools. The University system includes the Pittsburgh campus and four regional campuses at Bradford, Greensburg, Johnstown, and Titusville; the regional campuses offer undergraduate programs only.

More than 90 buildings are located on the Pittsburgh campus, which covers 132 acres in the culturally rich Oakland neighborhood. At the heart of the campus stands a central landmark—the Cathedral of Learning, a 42-story Gothic tower, which is the tallest school building in the western hemisphere. The Cathedral contains the remarkable Nationality Rooms: 26 classrooms, each of them designed to reflect a distinct culture.

On the Pittsburgh campus, over 3,400 faculty serve 25,900 students, including 9,100 graduate and 16,800 undergraduate students. Alumni accomplishments range from managing Fortune 500 corporations, to writing best-selling novels, to unlocking the secrets of DNA...and more.

The University of Pittsburgh remains a place of enduring tradition and vitality, true to the work ethic of western Pennsylvania, rich in intellectual rigor, and committed to preparing students for their lives and careers.

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WEB ADDRESS

For more information on the University of Pittsburgh, see the University's Web site at <http://www.pitt.edu/>.

ORGANIZATION OF GRADUATE AND PROFESSIONAL EDUCATION AT THE UNIVERSITY

While the University Council on Graduate Study (<http://www.pitt.edu/~graduate/ucgs.html>), acting for the Graduate Faculty, develops minimum standards for graduate work throughout the University, the immediate responsibility for developing and administering graduate programs is assigned to the deans and Graduate Faculty members of the several schools and the Faculty of Arts and Sciences. This responsibility applies both to the traditional MA, MS, and PhD

programs and to programs leading to advanced professional degrees, except for first-professional degrees (i.e., the MD, JD, LLM, PharmD, and DMD). The provost has responsibility for the general supervision of graduate and professional programs, including first-professional degree programs, throughout the University, giving leadership to the deans and faculties in maintaining high standards of instruction and research.

Faculty are appointed to the Graduate Faculty by the provost upon recommendation by the dean on the basis of an appraisal by the faculty of a department or other appropriate faculty group. Graduate Faculty are competent in graduate instruction and in supervision of student research at all levels and are active in advancing knowledge through their own research.

APPLICATION FOR ADMISSION

Graduate admissions to the University of Pittsburgh are handled by the particular graduate school or program; there is no central admissions office for graduate and professional schools at the University.

This section details only the University requirements and procedures for admission to the University. The Graduate Admissions Office of each school provides admissions information for prospective students to that school. *Schools' admissions requirements are listed under the Schools, Departments, and Programs section of this bulletin.*

The admissions information in this section is subject to change at any time. It is intended to serve only as a general source of information.

GRADUATE ADMISSIONS

Decisions regarding admission are based on an overall evaluation of all the credentials submitted by the candidate and in accord with the availability of faculty, facilities, and student support necessary to meet the applicant's expressed academic and research needs and interests. Many departments or programs have a limited number of places available. *Interested students should refer to the Schools, Departments, and Programs section of this bulletin in addition to the general admission information provided here.*

APPLICATION PROCEDURES

Students seeking admission should call or write for application forms and descriptive materials to the school or program of intended graduate study. In many cases, application materials are available online; prospective students are encouraged to check the Web site of their programs of interest. *See Schools, Departments, and Programs sections of this bulletin for contact information.*

Students should then return to the department or school the completed application forms and a check (not cash) for the application fee payable to the University of Pittsburgh. Generally, students applying online have the option of paying application fees online via credit card or by sending a check. The application fee is required of all applicants and is non-refundable; it does not apply toward the payment of tuition. *The fee varies from school to school, so prospective students should refer to the information on the relevant school in the Schools, Departments, and Programs section of this bulletin for the specific application fee required or go to that school's or department's Web site.*

Applicants must also request that the registrars of all undergraduate and any graduate schools attended send official transcripts of their records to the department or school of intended graduate study. In addition, many schools and departments require additional material. These materials may include any or all of the following: scores achieved on standardized examinations such as the Graduate Record Examination or the Graduate Management Admission Test, letters of recommendation, term papers written during previous study, evidence of work/life experience, evidence of motivation for graduate study, and a statement of career objectives. Applicants should arrange for a personal interview if requested by the department or school.

APPLICATION DEADLINES

See the Schools, Departments, and Programs sections of this bulletin for specific application deadlines, but note that students applying for fellowships and assistantships should file their applications at the earliest possible date. Applicants interested only in admission may be considered up to the deadline dates, but postponing applications may entail the risk that available spaces will be filled. Some programs admit students only for a particular term, so prospective students are encouraged to check with the school and program for specific admissions information.

GRADUATE ADMISSIONS OF INTERNATIONAL STUDENTS

Students from other countries should start the application process for admission nine to 12 months in advance of the date of intended enrollment and complete the process no less than three months before the registration date for the student's first term. Some schools may require even earlier applications. Applicants wanting to be considered for financial assistance must submit completed applications much earlier. Requests for application forms should be directed to the school in which the student wishes to enroll. All applicants should also take note of specific school and program requirements, such as the Graduate Record Examination (GRE scores). *Specific requirements are listed in the Schools, Departments, and Programs section of this bulletin.*

INTERNATIONAL STUDENT APPLICATION DEADLINES AND APPLICATION FEE

International students should contact the individual department or program to which they are applying to determine the required application deadlines for submitting a completed application, financial aid form, and application fee. Many programs have their application materials online via their Web sites. In general, international students should submit applications no less than three months before the term in which they want to begin taking classes. The deadlines and fees vary according to the school and program to which the student is applying. The fee must be submitted in the form of a check or money order made payable to the University of Pittsburgh. *See the individual school's international application information in the Schools, Departments, and Programs section of this bulletin for details or go to the school's or department's Web site.*

INTERNATIONAL STUDENT ACADEMIC BACKGROUND AND CREDENTIALS

The minimum requirement for admission to a graduate program is the completion of a bachelor's degree from an accredited institution in the United States or the completion of a level of education that the University of Pittsburgh deems comparable to a bachelor's degree from a regionally accredited U.S. institution.

Applicants are required to submit official original academic credentials. Official original academic credentials that are issued in a language other than English must be accompanied by a certified English translation. In addition, in cases where the grade reports, academic record, examination results, or transcript does not attest to the awarding of a degree or other academic qualification, a certified copy of the original certificate or diploma awarding the degree or qualification must be submitted. Certificates or diplomas that are

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issued in a language other than English must be accompanied by a certified English translation.

ENGLISH LANGUAGE PROFICIENCY REQUIREMENTS

Graduate students must possess sufficient proficiency in English to enable them to understand lectures, participate successfully in class discussion, and, in general, to be able to study without being hindered by language problems. To facilitate determination of proficiency, official results of the Test of English as a Foreign Language (TOEFL) are required if the applicant's native language is not English; this applies even if English has been the medium of instruction. A minimum score of 550 or higher on the TOEFL is required for admission to graduate study (or a TOEFL score of 213 on the computer-based test).

All students with a TOEFL score less than 650 (or 280 on the computer-based test) may be required by the department, program, or school to take the Michigan Test of English Proficiency upon arrival. Based on the test results, students may be required by their academic department to take courses in English as a foreign language before registering for graduate courses or may be required to take one or two such English courses in addition to graduate courses.

Any student scoring over 650 on the paper-based test (over 280 on the computer-based test) is exempted from further testing. The requirement to submit the results of the TOEFL may be waived if the applicant has recently received a satisfactory score on other tests of English language proficiency or has recently earned a degree from a regionally accredited institution in the United States.

The Educational Testing Service administers the TOEFL test at testing centers throughout the world. Students may take the test either in a traditional paper format or on a computer. Further information, testing dates, and test applications are available directly from the Test of English as a Foreign Language, Box 6151, Princeton, New Jersey, 08541, USA or by contacting a U.S. Consulate, an office of the U.S. Information Agency, an office of the U.S. Educational Commission, or a binational center. Information about the TOEFL is also available on the World Wide Web at <http://www.toefl.org/>. Applicants seeking September enrollment must take the TOEFL no later than the preceding March.

International students who are non-native speakers of English can contact the English Language Institute (ELI) on the University of Pittsburgh campus for assistance in meeting English proficiency requirements and taking the TOEFL. *See the Campus Facilities & Student Services section of this bulletin, page 9, for more information on the ELI.*

ENGLISH LANGUAGE FLUENCY FOR TEACHING ASSISTANTS/ FELLOWS

Teaching assistants (TAs) and teaching fellows (TFs) who are non-native speakers of English must be evaluated through a test designed to assess spoken English and English comprehension, approved by the Office of the Provost and administered by the English Language Institute (ELI). The Office of the Provost in consultation with ELI will establish minimum scores acceptable to permit a TA/TF to teach. Individual academic centers or departments may require higher scores than the established University minimums. All TAs/TFs with unsatisfactory scores on this test will be given non-teaching assignments and are required to take special course work until they attain a passing score. An unsatisfactory score at the time of reappointment is sufficient cause for nonrenewal of the student's TA/TF appointment. *See relevant school section in Schools, Departments, and Programs for more details.*

FINANCIAL SUPPORT AND VISA DOCUMENTS

While admission decisions are not based on financial support information, all applicants who are not U.S. citizens or Permanent Residents must submit a Financial Support Statement with their applications, even if applying for financial aid from the department. An award may not cover the entire cost of studies.

The Office of International Services cannot issue the document needed to apply for a student visa to enter the United States or to transfer non-immigrant status to the University of Pittsburgh until evidence of financial support adequate to cover the entire program of study has been submitted. Therefore, submission of a Financial Support Statement with an application will facilitate the issuance of a visa document.

ADDITIONAL INTERNATIONAL STUDENT REQUIREMENTS

The University of Pittsburgh reserves the right, even after arrival and enrollment, to make individual curricular adjustments whenever particular deficiencies or needs of a student are identified. In such instances, students may be required to take, at their own expense and without receiving credit, courses in English as a foreign language (*see English Language Proficiency Requirements above*) or courses prerequisite to their course of study to make up deficiencies.

It is strongly recommended that students arrive in Pittsburgh at least two weeks before the start of the term to allow sufficient time to make housing arrangements and take part in the orientation program conducted by the Office of International Services. In addition, the advising section of the Office of International Services, located in 708 William Pitt Union, offers assistance on a wide range of matters of concern to students from other countries. Call (412) 624-7120 or see <http://www.pitt.edu/~osaweb/ois/oisinfo.html> for more information.

ADMISSIONS STATUS

Admission may be granted or denied only by the dean of the school or his or her designee. However, non-immigrant students may be denied visa documents for non-academic reasons by the Office of International Services. Acceptable students are admitted to graduate study in a specific department or school with "full," "provisional," or "special" graduate status depending on their qualifications and objectives. The qualifications described below represent the minimum standards of the University. These may be made more stringent or specific at the option of the department or school.

FULL GRADUATE STATUS

For admission to full graduate status, an applicant must be a graduate of an accredited U.S. college or university and must be considered qualified for advanced study by the department or school. This normally is demonstrated by a B average (a quality point average of 3.00 on a 4.00 scale) or better in the total undergraduate program. (Note: the **Faculty of Arts and Sciences** requires a B average in the major field of study, and some of that school's departments require higher levels of achievement.) If students with less than a B average present alternative evidence (such as completion of an advanced degree or successful relevant work experience) of superior ability, they may be considered for full graduate status on the recommendation of the department of proposed graduate study. Only students with full graduate status may take the PhD preliminary evaluation, take the

MA/MS or PhD comprehensive examination, be considered for the award of an advanced degree or certificate, or be graduated.

PROVISIONAL GRADUATE STATUS

Applicants who are graduates of a recognized college or university but who do not qualify for admission to full graduate status because of deficiencies in either their undergraduate program or their scholastic achievement may be considered for provisional graduate status if strong supporting evidence of their ability to complete a graduate program is provided. Courses taken to remove deficiencies do not contribute toward completion of graduate degree requirements. Transfer from provisional to full graduate status is initiated and recommended by the department and is possible only after removal of deficiencies and other conditions noted at the time of admission and satisfactory progress in graduate work.

A student on provisional or special status or on probation is not eligible to take the PhD preliminary evaluation, to take the MA/MS or PhD comprehensive examination, or to be graduated.

SPECIAL STATUS

Students may be granted temporary admission as “special status” under the following circumstances:

1. Students who are seeking advanced degrees but who are unable to meet the deadline for filing all required credentials for admission may be granted temporary admission provided they present acceptable evidence concerning their qualifications for graduate study. Regular admission must be accomplished within the first term of registration.
2. Students who are not seeking an advanced degree but who have specific qualifications for one or more courses, including courses required for learning or certification, may register for such courses subject to review by the department and the dean of the school. Schools providing such an opportunity may specify the number of credits or courses for which a student may enroll while in this status and should also clearly specify the limitations on transfer of such credits toward a graduate degree if the student is subsequently admitted to a graduate degree program.

See Schools, Departments, and Programs section for specific requirements connected to special status students.

GUARANTEES AND EARLY ADMISSION TO GRADUATE AND FIRST-PROFESSIONAL PROGRAMS

Undergraduate students receiving an academic merit scholarship who indicate certain professional programs (including communication science, dental medicine, education, law, medicine, physical therapy, and public and international affairs) as their intended field of study on the Freshman Application to the University of Pittsburgh will be

automatically reviewed for guaranteed admission into that professional program. Early application is recommended, as spaces are limited.

Exceptionally able undergraduate University of Pittsburgh students may be admitted to full graduate status if their graduate and undergraduate schools have approved early admission as a permitted option and have established standards and procedures, and if the student needs no more than 24 credits to complete the baccalaureate degree. Credits earned while enrolled in the graduate program may also be counted toward fulfilling undergraduate degree requirements. *See Schools, Departments, and Programs section for further information on the possibility of early admission to specific programs.*

TUITION DEPOSIT

Once a student is admitted to a program, some of the graduate and professional schools at the University of Pittsburgh require a tuition deposit of \$100 to \$500 to secure the student's place in the incoming class. *Students should refer to Financial Issues: Tuition, Fees, Loans, & Scholarships, page 6, or to the admissions information for their specific school to determine the amount required for the tuition deposit.*

DEFERRED ADMISSION

If a department or school so approves, a student may defer admission for one year without having to complete any additional applications. If approved, the student is sent a new admission letter. Approval of a student's request to defer admission does not necessarily mean that any financial aid awarded is also deferred. *See Aid Deferrals, page 8, for more information on deferring financial aid.*

READMISSION

A student who has not registered for at least one credit or full-time dissertation study during a 12-month period will be transferred automatically to inactive status and must file an application for readmission to graduate study (and pay the application fee) before being permitted to register again. Inactive students cannot apply to graduate, nor take preliminary or comprehensive exams. Readmission is not automatic nor does it necessarily reinstate the student to the academic status enjoyed prior to becoming inactive. When readmitted, the student must be prepared to demonstrate proper preparation to meet all current admission and degree requirements. Readmission is automatic, however, for students who receive prior approval for a formal leave of absence.

CHANGING THE FIELD OF GRADUATE STUDY

A student already admitted to graduate study and desiring to change a major department of graduate study must file an application for such a change in the office of the dean or the department of the school the student wishes to enter. The application for admission to the new department will be evaluated in the same manner as an application from a new student.

FINANCIAL ISSUES: TUITION, FEES, LOANS, & SCHOLARSHIPS

TUITION

TUITION DEPOSIT

Some graduate and professional schools at the University of Pittsburgh require tuition deposits to secure the admitted student's place in the incoming class. These deposits are non-refundable and are applied toward the student's first term tuition costs. The schools that require deposits and the specific amounts are as follows:

<u>School</u>	<u>Amount</u>
Katz Graduate School of Business	
MBA Program	\$200
PhD Program	\$100
School of Dental Medicine	\$500
School of Health and Rehabilitation Sciences*	
MPT Program	\$250
School of Information Sciences	\$100
School of Law	
Due April 15	\$200
Due June 15	\$300
School of Medicine	\$100
School of Nursing (Anesthesia)	\$250
Graduate School of Public and International Affairs	\$200
Graduate School of Public Health	\$100

* NOTE: The other programs in the **School of Health and Rehabilitation Sciences** (MA, MS, and PhD) do not require a tuition deposit.

FULL TUITION

Graduate students enrolled for nine to 15 credits during the Fall and Spring Terms are considered full-time and pay a flat tuition rate. Students enrolled for one to eight credits are considered part-time and pay for individual credits. Students enrolled in the Summer Term also pay for individual credits, regardless of how many credits are taken (The **Katz Graduate School of Business** is an exception: full-time MBA students pay a flat rate in the Summer Term). See *Deferred Payments and Payment Adjustments sections below for information regarding tuition payment plans.*

Tuition rates are school specific. Students pursuing two degrees or a degree and a certificate simultaneously must list one as the primary academic program and may list the other as a secondary academic program on the registration form; students are billed at the tuition rate of the primary academic program. Please refer to the tuition rate for the school in which you are enrolled. The University's tuition chart is online at <http://www.ba.pitt.edu/irweb/tuition/tuithmpg.htm>.

RESIDENCY/REDUCED TUITION

Students who reside in the Commonwealth of Pennsylvania may be eligible for reduced tuition through state appropriations (*see Eligibility for Reduced Tuition below*). Eligibility is determined by criteria outlined in the *University of Pittsburgh Guidelines for Determining Eligibility for Reduced Tuition Rates*, available online at <http://www.bc.pitt.edu/sfs/paycenter.htm#TF>.

ELIGIBILITY FOR REDUCED TUITION

Assessment of full tuition or reduced tuition is based on whether the student is a permanent resident of the Commonwealth of Pennsylvania. Full tuition is charged to non-residents. A student who has lived in Pennsylvania for a continuous period of 12 months before enrollment in any institution of higher education in the state may be eligible for reduced tuition. The student must be a citizen of the United States or have an immigrant or permanent visa. For a student less than 21 years of age, both the student and parent(s) or legal guardian(s) must meet the residency requirements for eligibility.

FINANCIAL OBLIGATION OF STUDENTS

The University of Pittsburgh has the right to withhold services if a student defaults on any financial obligation until repayment arrangements have been made that are satisfactory to the office or department to which the debt is owed.

FEES

MANDATORY FEES

The following are mandatory fees assessed to students each term (current rates are available online at <http://www.ba.pitt.edu/irweb/tuition/tuithmpg.htm>):

- Student Activity Fee
- Student Health Fee
- Computer and Network Service Fee
- Security, Safety, and Transportation Fee

SPECIAL SERVICE FEES

These fees may be charged for University transactions that are processed beyond deadlines, due dates, and specified time limits.

COURSE FEES

Certain courses have fees associated with enrollment in the course. These courses are identified in the *Schedule of Classes and Course Descriptions*. The *Schedule of Classes* is online at <http://www.pitt.edu/~srfsweb/crinPgCrsInfo.htm>.

PROGRAM FEES

Certain graduate and first-professional programs have fees associated with enrollment in the program. These are typically fees for equipment or required insurance. See the *Schools, Departments, and Programs section of this bulletin for more information.*

FINANCIAL AID

Financial assistance for graduate students can be provided in the form of teaching and research appointments, fellowships, traineeships, tuition scholarships, and loans. The type of aid available depends on the school or program to which the student is admitted; students are encouraged to contact their school directly for more information about the types of financial assistance available. Admission to graduate study does not necessarily carry any implications concerning the award of financial aid.

TEACHING AND RESEARCH APPOINTMENTS

Students may receive financial support as teachers or researchers in their respective programs. In these positions, students are either teaching assistants (TAs), teaching fellows (TFs), graduate student assistants (GSAs), or graduate student researchers (GSRs). These appointments are generally for two terms at a time; guidelines covering these appointments and their current salary ranges are available through links from the University's Graduate Studies Web page at <http://www.pitt.edu/~graduate/>. In recognition of academic merit, the University offers TA/TF/GSA/GSR scholarships including tuition, fees (excluding the student activity fee), and individual medical insurance coverage. TAs/TFs/GSAs and GSRs can also purchase family medical coverage (for spouse and/or dependent children) by paying the difference between the premium costs for the individual option and the family option.

The University's policy concerning Teaching Assistants and Teaching Fellows, dealing with appointments, reappointments, terminations, benefits, and responsibilities, is contained in the *University TA/TF/GSA Policy Statement*, sent to all new Teaching Assistants. The University's policy concerning Graduate Student Researchers is contained in the *University GSR Policy Statement*, sent to all new GSRs. *The Teaching Assistant/Teaching Fellow/Graduate Student Assistant Policy Statement can also be found on page 28 of this bulletin under Rights and Responsibilities, and the University Graduate Student Researcher Policy Statement can be found on page 27.*

Students receiving these academic appointments must follow the relevant University policies as they apply to faculty and staff of the University of Pittsburgh; *see Rights and Responsibilities section of this bulletin for details.* For more information on what teaching and research positions may be available in a given program, *see the relevant information in Schools, Departments, and Programs.*

TEACHING ASSISTANTS (TA)

Teaching Assistants (TAs) are graduate students who have not qualified for an appointment as a teaching fellow. The duties of a TA might include teaching recitation sections, monitoring quizzes, assisting in laboratory instruction, or participating in related activities involving undergraduate programs. Full appointments usually require approximately 20 assigned hours per week.

TEACHING FELLOWS (TF)

Teaching Fellows (TFs) are graduate students more educationally advanced or experienced than a TA, typically holding the equivalent of a master's degree. The salaries for TFs are slightly higher than those for TAs. Full appointments usually require approximately 20 assigned hours per week.

GRADUATE STUDENT ASSISTANT (GSA)

Graduate Student Assistants (GSAs) are graduate students who perform duties to assist in the educational or research mission of the University, but do not teach classes, recitations, or labs. GSAs might assist a faculty member in library research, editorial duties, or similar academic tasks. Full appointments usually require approximately 20 assigned hours per week.

GRADUATE STUDENT RESEARCHER (GSR)

Research grants funded by government and private agencies provide a variety of full- and part-time research positions for graduate students. Most, but not all, of the GSR positions, which are also referred to as Graduate Research Assistants, are in projects that are directly related to the thesis or dissertation research of the student; all provide the student with valuable research training and experience.

FELLOWSHIPS AND TRAINEESHIPS

There are a variety of fellowships and traineeships available from the University of Pittsburgh and many other organizations that provide funding to students needing financial assistance and/or showing evidence of academic excellence. These awards may include a stipend, a tuition scholarship, health care coverage, or all three. Among the fellowships available from the University to students across a broad range of disciplines are the following:

PROVOST'S DEVELOPMENT FUND

This program is intended to provide financial support and development opportunities for women and disadvantaged students pursuing the doctorate or professional degree that would qualify them for an academic or administrative appointment. Financial assistance will be made available on the basis of need and merit. Any U.S. citizen or permanent resident who is enrolled in or admitted to a graduate program at the University is eligible. Ideally, the candidate would be in the advanced stages of the PhD program so that support for one year would complete the program. Applications are available from the Office of the Provost, 801 Cathedral of Learning, or online at <http://www.pitt.edu/~cedeno/pdfapp99.html>.

OWENS FELLOWSHIPS

A bequest of Samuel T. Owens Jr. makes fellowships available at the University of Pittsburgh for needy students who show promise of high academic achievement. These fellowships carry an annual stipend of \$2,000. The fellowships may be used in payment of tuition, books, and living expenses during the academic year for which the award is granted. Owens Fellowships are not available for a single term. Application forms are available in the University Office of Admissions and Financial Aid, Masonic Temple, Pittsburgh, PA 15260, (412) 624-7488. The deadline for application is usually in April.

For more information on specific fellowships and traineeships available to students in a particular program, see the Schools, Departments, and Programs section of this bulletin.

SCHOLARSHIPS

Scholarships from the University of Pittsburgh are a form of merit- and need-based financial aid. Outside scholarships are also applied toward tuition and other mandatory educational expenses. Scholarships do not have to be repaid.

STAFFORD LOANS

Stafford Loans are long-term, low interest rate loan programs available to degree-seeking students enrolled on at least a half-time basis. The amount of the loan is dependent upon financial need, but for a graduate student it could be as high as \$18,500 per academic year. While there is no deadline for applying, Stafford Loans can take as many as 60-90 days to be approved; therefore, students who intend to start graduate school in the Fall Term should start the loan process no later than May 15.

Financial aid application procedures are outlined in the University of Pittsburgh's *Financial Aid Booklet* and online at <http://www.pitt.edu/~oafa>. Information on Stafford Loans is available online at <http://www.finaid.org/loans/studentloan.phtml>; the University's Graduate Admissions and Financial Aid site (<http://www.pitt.edu/~graduate/admissions.html>) includes links to loan information for graduate students.

LIFETIME LEARNING TAX CREDITS

Taxpayers are eligible to claim a non-refundable Lifetime Learning Credit against their federal income taxes for the qualified tuition and related expenses of students who are enrolled in eligible educational institutions. Through 2002, the amount that may be claimed as a credit is equal to 20 percent of the taxpayer's first \$5,000 of out-of-pocket qualified tuition and related expenses for all the students in the family. After 2002, the credit amount is equal to 20 percent of the taxpayer's first \$10,000 of out-of-pocket qualified tuition and related expenses. Qualified tuition and related expenses for graduate-level education are eligible for the Lifetime Learning Credit.

For more information on Lifetime Learning Credits, see http://www.ed.gov/inits/hope/tax_qa/sec2.html.

DEFERRED PAYMENTS

AID DEFERRALS

Once students have applied for and been notified of financial aid eligibility, they may defer payments by obtaining a Financial Aid Deferral form in the Office of Admissions and Financial Aid and then submitting the form to the Student Payment Center. Whether a deferral of aid is allowed is dependent upon the type of aid awarded.

DEFERRED TUITION PAYMENT PLAN

Students in good financial standing with the University and registered during the Fall, Spring, or Summer Terms for three or more credits are eligible to participate in a deferred tuition payment plan to pay current term charges in three installments. First-time participants in the plan must make these arrangements in person at the Student Payment Center. Thereafter, participants may elect a mail option.

There is a \$20 fee each time a student sets up a payment plan, and an interest charge of 1% monthly on the unpaid principal is added to the remaining two installment payments. For more information on the deferred tuition payment plan, please contact the Student Payment Center via E-mail at payment@srfs.pitt.edu or online <http://www.bc.pitt.edu/sfs/paycenter.htm>.

PAYMENT

University statements may be paid by cash, check, or credit card; however, cash cannot be mailed or dropped into the Student Payment Center's depository. The University accepts Discover, MasterCard, and Visa credit card payments in person, by mail, or telephone. The Student Payment Center is located in room G-7 of Thackeray Hall. The mailing address is P.O. Box 371998, Pittsburgh, PA 15250-7998, and the phone number is (412) 624-7550.

Due dates are clearly designated on billing statements and are always the 17th of the month. Failure to pay the amount due (or to arrange a deferred tuition payment plan by the due date) will result in a late payment fee for students without a valid deferral.

If students who have a tuition scholarship (for example, via a TA/TF/GSR/GSA appointment) receive a tuition statement indicating that their tuition has not been paid, they should immediately contact the school or department administering the scholarship for assistance in correcting the error.

CHECK AND CREDIT CARD ADJUSTMENTS

As appropriate, payment made by check may be refunded to students. Adjustments to credit cards are made to the payer's credit card account and will be reflected on the Discover, MasterCard, or Visa monthly statement.

CAMPUS FACILITIES & STUDENT SERVICES

ACADEMIC RESOURCES

The University of Pittsburgh has a wide variety of academic resources that provide the infrastructure to aid students with their research and computing needs.

UNIVERSITY LIBRARY SYSTEM

271 Hillman Library
(412) 648-7710
E-mail: feedback@library.pitt.edu
Web site: <http://www.library.pitt.edu>

The University Library System (ULS) of the University of Pittsburgh is represented by 14 libraries located on the Pittsburgh campus, the Allegheny Observatory Library, the Archives Service Center, and a storage facility at UPARC in Harmarville. The ULS is a member of the Association of Research Libraries (ARL), the Oakland Library Consortium (OLC), and Pennsylvania Academic Library Connection, Inc. (PALCI). Through membership in several Pennsylvania consortia of libraries, cooperative borrowing arrangements have been developed with other Pennsylvania institutions.

Other University of Pittsburgh libraries include the Barco Law Library and the Health Sciences Library System (*see below for detail*), both located in Pittsburgh, as well as the four regional campus libraries—Bradford, Greensburg, Johnstown, and Titusville.

The University of Pittsburgh libraries and collections provide an abundant amount of information and services to the faculty, students, staff, administrators, and researchers of the University. In fiscal year 1999, the University's collections totaled nearly four million volumes, nearly four million pieces of microforms, and 26,000 subscriptions (these subscriptions include more than 24,000 print subscriptions and nearly 2,000 electronic journals). Also, through the Graduate and Professional Student Association (GPSA), interlibrary loan grants of up to \$25 a year are available to all graduate and professional students at the University to help offset the increasing costs of interlibrary loans between University of Pittsburgh libraries and those on other campuses. (*See <http://www.pitt.edu/~gpsa2/>.*)

Under the administration of the University Librarian, the University Library System (ULS) includes the following libraries and collections:

- Hillman (main), which houses:
 - African-American
 - Buhl (social work)
 - East Asian
 - Government Documents
 - Latin American Studies
 - Special Collections
- Allegheny Observatory
- Business Information Center
- Center for American Music
- Chemistry
- Computer Science

- Darlington Memorial
 - American History
- Engineering
- Fine Arts
- Information Sciences
- Langley
 - Biological Sciences
 - Neuroscience
 - Psychology
- Mathematics
- Music
- Physics/Astronomy
- Public and International Affairs/Economics

The Hillman Library is the largest library facility with seating for 1,530 users. It offers an open stack arrangement and an extensive range of library services. In addition to the main collection, which is comprised primarily of humanities and social sciences subject areas, the Hillman Library is comprised of seven other libraries and collections, maps, national, and international newspapers, and microform facilities.

PITTCAT is the University of Pittsburgh's online library catalog, offering author, title, subject, and keyword access to materials in all University libraries. PITTCAT currently contains bibliographic holdings and circulation information for more than three million titles, representing most of the book and periodical collections in all University libraries. In addition, the University libraries provide access to many remote resources for University of Pittsburgh faculty, students, and staff, including Digital Dissertations, EBSCOhost, InfoTrac, CIS Compass, MUSE, JSTOR, Science Direct, Web of Science, netLibrary, and numerous other electronic journals. PITTCAT and the other databases are available through the ULS Web site at <http://www.library.pitt.edu>.

BARCO LAW LIBRARY

The Barco Law Library, occupying three floors of the five-story Law School Building, is available to anyone needing to use its resources for legal research purposes. Likewise, the Government Document collection is available for use by the public at large. Call (412) 648-1323 for more information or see the library's Web site at <http://www.law.pitt.edu/library>.

HEALTH SCIENCES LIBRARY SYSTEM

The Health Sciences Library System (HSLs) at the University of Pittsburgh is comprised of three distinct libraries that support the educational, research, patient care, and service activities of the schools of the health sciences (**Medicine, Dental Medicine, Pharmacy, Health and Rehabilitation Sciences, Nursing, Public Health**) and the UPMC Health System. This library system includes the Falk Library, the Nursing Collection in the Learning Resources Center of the School of Nursing, and the Western Psychiatric Institute and Clinic (WPIC) Library.

Falk Library of the Health Sciences serves as the flagship of the HSLs. It is located on the second floor of Scaife Hall. The library houses

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more than 300,000 print volumes and receives approximately 2,000 journal subscriptions. The Falk Library collection also includes a special History of Medicine collection. In addition to the library's print collection, the Computer and Media Center (CMC) includes videotapes, audiotapes, more than 100 public computers, and over 300 microcomputer software packages.

WPIC Library is one of the world's most comprehensive resources in psychiatry and the behavioral sciences, with approximately 70,000 books, 420 journals, and 600 audio tapes. The WPIC Library collection also includes 550 videotapes held at the Benedum Audiovisual Center. The Nursing Library is located on the second floor of Victoria Hall and includes about 10,000 books and 150 journal titles.

HSL Online, a digital clinical library, offers access through the World Wide Web to current biomedical databases, full-text journals, major full-text clinical and subspecialty textbooks, clinical practice guidelines, and current drug and toxicology information. HSL Online includes the following databases and information services: MEDLINE, AIDSLine, CancerLit, Bioethicsline, HealthStar, CINAHL, PsycINFO, Evidence-Based Medical Reviews, Micromedex, MDConsult, STAT!Ref, Harrison's Principles of Internal Medicine, Lippincott's Primary Care Online, and Scientific American Medicine Online.

For information about the Health Sciences Library System and its resources, or to access HSL Online, see <http://www.hsls.pitt.edu/>, or E-mail medlibq+@pitt.edu.

COMPUTING SERVICES AND SYSTEMS DEVELOPMENT

CONTACT INFORMATION

728 Cathedral of Learning
Phone: (412) 624-4357
Web site: <http://technology.pitt.edu/>

Computing Services and Systems Development (CSSD) is the comprehensive service center for the University of Pittsburgh's computing support and systems development environment. A number of those services provided by CSSD are detailed below. For a full discussion of CSSD's services, consult the Web page listed above.

CAMPUS COMPUTING LABS

CSSD operates six primary computer labs on the Pittsburgh campus, providing students with access to Intel, Macintosh, and UNIX workstations and an array of software applications needed to fulfill the demands of students' academic endeavors. The six computing labs are located at 1077 Benedum Hall, G27/G62 Cathedral of Learning, 1E01 Posvar Hall, First Floor Hillman Library, 230 David Lawrence Hall, and C114 Sutherland Hall. The 230 David Lawrence Hall lab is open 24 hours a day, seven days a week. For hours of operation for all campus computing labs, please call (412) 624-5061.

NETWORK AUTHORIZATION ACCOUNTS

All enrolled students are eligible for a network authorization account (NAA). The NAA will permit a student to establish a user ID and a password to provide access to the University's network resources, a Mulberry E-mail account, the Internet/WWW, the University Library System's PITTCAT system, and a printing allowance at the campus computing labs. All students who wish to use the University computing resources, including the ability to access their schedules and grades online or to shop at the e-Store, must have a network authorization account. Accounts are issued at any of the campus computing labs. Password re-set and other account modifications must be made

between 8:30 a.m. and 5:00 p.m. at the Accounts Office at the 230 David Lawrence Hall lab. Please contact the CSSD Help Desk at (412) 624-HELP (624-4357) for assistance with accounts.

NETWORK PORT CONNECTIVITY

Students can access the University's network from home with their network authorization account and a modem through the remote access modem pool. Please contact the CSSD Help Desk at (412) 624-HELP (624-4357) for assistance.

COMPUTER CONSULTING SERVICES

CSSD has a staff of skilled information technology (IT) professionals who are available to help troubleshoot problems 24 hours a day, seven days a week. CSSD consultants are available to help with problems such as network connectivity, software difficulties, or even hardware malfunctions. Please call the CSSD Help Desk at (412) 624-HELP (624-4357) for assistance.

COMPUTER SALES AND DIGITAL CERTIFICATION

University of Pittsburgh students, faculty, and staff have access to the e-Store, an online retail provider of hardware, software, and peripherals, for their computing needs. Shopping at the e-Store requires a network authorization account and a digital certificate ID. Please see the e-Store's Web site at <http://e-Store.pitt.edu/> for University-recommended computer systems and for instructions on obtaining a digital certificate. Call the CSSD Help Desk at (412) 624-HELP (624-4357) for more information.

COMPUTING WORKSHOPS AND TRAINING

CSSD offers Quickstart classes, a series of short courses designed to orient new and experienced users to the University's network, the Mulberry E-mail environment, and the selection of software applications available in the campus computing labs. CSSD also offers a selection of Java and Microsoft certification courses for students. For additional information and a schedule of classes, please see the CSSD Workshop site at <http://www.pitt.edu/~workshop> or call the CSSD Help Desk at (412) 624-HELP (624-4357).

NETWORK SERVICES

The Network Services area of CSSD is responsible for the development and maintenance of the University's information technology network supporting voice, video, and data. The backbone of the University-distributed computing services is PittNet, a network based on Ethernet technology that serves the diverse communications needs of the entire University community. For additional information, please see the Network Services site at <http://technology.pitt.edu/network/index.html> or call (412) 624-4357.

RESEARCH AND ACADEMIC SUPPORT

A number of centers at the University support teaching, research, and academic skills for graduate students in a variety of fields. Those centers are detailed below in alphabetical order.

CENTER FOR BIOTECHNOLOGY AND BIOENGINEERING

The Center for Biotechnology and Bioengineering is a leading center for research in biology and bioengineering. The center's headquarters, a new 80,000 square foot building located in a high-technology business park near the University, houses 100 researchers actively pursuing projects in the center's main programs in applied enzymology, cell culture, biomaterials, gene therapy, and artificial organs. The center's goals include training new generations of scientists; accelerating the process of innovation in biotechnology and

bioengineering; and providing assistance to the industrial community through industrially supported applied projects.

For more information on the center, call (412) 383-9700 or see the center's Web site at <http://www.pitt.edu/~biotech/>.

CENTER FOR INSTRUCTIONAL DEVELOPMENT & DISTANCE EDUCATION (CIDDE)

The Center for Instructional Development & Distance Education (CIDDE) was established to strengthen the instructional development and support services available to faculty and teaching assistants. The Center enables faculty to identify and use technology and other instructional resources available to them.

CIDDE provides faculty and teaching assistants with a primary contact point for many of the instructional services they need, and it also assists in developing and supporting distance education programs and courses. CIDDE also hosts an orientation for new TAs each fall and provides ongoing training seminars for teaching assistants wanting to develop their teaching skills. For more information, visit CIDDE at 4227 Fifth Avenue (Masonic Temple), call (412) 624-3335, or visit CIDDE's Web site at <http://www.pitt.edu/~ciddeweb/>.

CENTER FOR PHILOSOPHY OF SCIENCE

The Center for Philosophy of Science promotes scholarship and research, encourages scholarly exchanges, and fosters publications in the philosophy of science as well as in the philosophically informed history of science and related fields. The center is dedicated to bridging the gulf between the sciences and the humanities by helping to develop and disseminate a philosophical understanding and appreciation of the sciences. The center pursues its mission not only locally and regionally, but also nationally and internationally. The center sponsors a visiting fellows program, an annual lecture series, a number of colloquia and workshops, and a variety of other programs. Like other centers at the University of Pittsburgh, the Center for Philosophy of Science is a unit for research rather than teaching. For more information on the center, visit the center in room 817 of the Cathedral of Learning, or on the Web at <http://www.pitt.edu/~pittcntr/>.

ENGLISH LANGUAGE INSTITUTE

The English Language Institute (ELI) provides credit-bearing English as a Second Language (ESL) courses for students admitted to the University's degree programs, as well as intensive instruction in ESL for people who need to meet proficiency requirements to enter a university. Credit courses are offered in speaking, writing (including the research paper), and reading/vocabulary. Through the **School of Engineering**, a technical writing for ESL graduate course is provided. During the summer, the ELI offers five-week ESL programs for students entering MBA and MPIA graduate programs. Non-credit courses cover reading, writing, listening, speaking, and grammar. For more information, call (412) 624-5901, E-mail elipitt+@pitt.edu, stop by room 2816 Cathedral of Learning, or visit the Institute's Web site at <http://www.eli.pitt.edu>.

INSTITUTIONAL REVIEW BOARD

The Institutional Review Board (IRB) is charged with overseeing and approving all research at the University involving humans as subjects. For more information on the IRB's policies and practices, call (412) 692-4370 or see the IRB's Web site at <http://www.ofres-hs.upmc.edu/irb/irb.htm>.

LEARNING RESEARCH AND DEVELOPMENT CENTER (LRDC)

The Learning Research and Development Center (LRDC) is a multidisciplinary research center whose mission is to understand and

improve learning by children and adults in the organizational settings in which they live and work: schools, museums, and other informal learning environments, and workplaces.

Fields of research include: processes of learning; learning in schools and museums; education improvement; education policy and practice; learning and technology; and learning and work. For more information, visit the center's Web site at <http://www.lrdc.pitt.edu>.

LEARNING SKILLS CENTER

The Learning Skills Center (LSC) offers free learning support services for University of Pittsburgh students, staff, and faculty. The math component provides tutoring for the University's introductory math courses and individual consultation for improving study strategies and confidence in math. Individual and group study skills services are available through the study skills component. In the study skills workshop, students learn, discuss, and practice strategies for improving textbook reading, lecture note taking, memory, time management, and test performance. Individual appointments can also be made for general study skills, for suggestions on how to study specific subjects, or for help in reducing test anxiety.

Supplemental Instruction groups are conducted by the LSC for traditionally difficult introductory courses to give students the opportunity to learn and practice effective study strategies while studying the content of the course. The reading component provides diagnostic services, individualized programs in comprehension and vocabulary, and speed reading workshops.

For more information, contact the center at (412) 648-7920, room 311 William Pitt Union (open Monday through Friday from 8:30 a.m. to 5:00 p.m. and some weekday evenings), or see <http://www.lsc.pitt.edu>.

OFFICE OF MEASUREMENT AND EVALUATION OF TEACHING (OMET)

The Office of Measurement and Evaluation of Teaching (OMET) provides services to the University community related to student evaluation of teaching, the scoring of objective classroom tests, the administration of paper-and-pencil and computer-based admission and certification examinations, and consultation regarding research design and analysis. Instructors teaching a class, lab, or recitation can receive student feedback about their teaching by completing a request form that is available in both their respective departments and in G-39 CL (call 624-6147 for information). Information about test scoring and administration is available in G-33 CL (call 624-6440). OMET's Web site is located at <http://www.pitt.edu/NewPittInfo/omet.html#stu>.

OFFICE OF RESEARCH

The Office of Research is charged with administrative responsibility for all University research and related activities involving extramural sponsorship. The Office of Research serves as both a center of advocacy for research and related activities and a facilitator of the research environment. The functional areas supported by Office of Research staff include information services on potential sources of funding, project and proposal development assistance, and grants and contracts administration for both pre-award and selected post-award tasks. All funding proposals submitted by University personnel must be transmitted to and reviewed by Office of Research staff to assure adherence to internal and external policies and procedures. For more information on the office's services, call (412) 624-7400, visit 350 Thackeray Hall, or see <http://www.pitt.edu/~offres/>.

UNIVERSITY CENTER FOR INTERNATIONAL STUDIES (UCIS)

The University Center for International Studies (UCIS) is the central coordinating and support mechanism for the international activities of the University of Pittsburgh. As a University-wide center, UCIS supports multidisciplinary programs of research and instruction in international and area studies, linking departments and schools of the University. It connects the University with private and public sector institutions, other universities, and institutions in other countries to strengthen the University's international dimension of teaching, research, and public service. UCIS aids students in their acquisition of international knowledge through certificate programs, study abroad programs, curriculum developments, and seminars; assists faculty in their international research, teaching, and service; and develops and manages international programs and projects. The center offers graduate certificate programs through its four area studies centers (Asian Studies, Latin American Studies, Russian and East European Studies, and West European Studies), all of which are designated by the federal government as National Resource Centers. Area studies certificates give evidence of language proficiency and area knowledge, which students find useful for international careers or for advanced degrees with a focus in a particular world area.

For more information, contact UCIS at 4G Posvar Hall, (412) 648-7390, or <http://www.ucis.pitt.edu/index.html>.

UNIVERSITY CENTER FOR SOCIAL AND URBAN RESEARCH (UCSUR)

Established in 1972 to carry out basic and applied social science research, the University Center for Social and Urban Research (UCSUR) is a focal point for collaborative interdisciplinary and multidisciplinary studies. Faculty from the University's **Faculty of Arts and Sciences** and the professional schools participate in UCSUR's research programs. More than 60 federal, state, and local agencies, and foundations support the basic and applied research of the Center.

UCSUR is the major survey research facility at the University of Pittsburgh. The center provides opportunities for faculty collaboration in the development of research projects. It also provides state-of-the-art survey research facilities and other services to assist in formulating and executing research projects; information and technical services for local governments, community groups, and educational institutions; and primary and secondary data acquisition and analysis.

UCSUR is a Pennsylvania State Data Center research affiliate responsible for helping local academic institutions, businesses, governments, and other organizations in Southwestern Pennsylvania access and analyze U.S. Bureau of the Census data.

For more information on UCSUR, call (412) 624-5442 or see <http://www.pitt.edu/~ucsur/>.

WRITING CENTER

The Writing Center, located in the University's English department, offers tutoring assistance for students who need help with their writing in any class. Tutors will help solve writing problems with students but will not edit or write text. Students may drop in any time, but it is best to call for an appointment. The Writing Center is open Monday through Friday and also has some evening hours. For more information, call (412) 624-6556, stop by room 501 Cathedral of Learning, or see <http://www.pitt.edu/~englweb/writecent.html>.

SERVICES FOR NEW TEACHING ASSISTANTS

The University has a variety of support mechanisms for new teaching assistants to help them develop and improve their teaching skills. Each fall, the Center for Instructional Development & Distance Education (CIDDE) hosts an orientation for new TAs. The program includes required workshops led by experienced TAs and faculty on promoting academic integrity and creating an inclusive classroom. Elective workshop topics address issues such as teaching in labs, teaching recitations, and dealing with difficult situations. A panel of professors and students describe the University's undergraduate population to new TAs. For registration information, call (412) 624-6671. CIDDE also publishes a Teaching at Pitt handbook that includes helpful information for new TAs.

Also, CIDDE and the Office of Measurement and Evaluation of Teaching (OMET) provide further training and evaluation for teaching assistants (*see above for detail on CIDDE and OMET*).

HOUSING

Pittsburgh has a number of pleasant residential neighborhoods with private homes that have been converted to apartments. Many graduate and professional students live in Oakland, where the University is located, or in the surrounding neighborhoods of Shadyside, Squirrel Hill, Highland Park, and Mount Washington. All of these areas are within walking distance or easy commuting distance of the University. Public bus transportation is widely available and is free (inside Allegheny County limits) to University students.

Ruskin Hall is the only residence hall on campus for graduate students. It is designated as living space for graduate students studying medicine, law, or other health-related professionals. Students interested in Ruskin Hall should contact the Property Management Department (*see below*).

HOUSING RESOURCE CENTER

The Housing Resource Center provides assistance to students, staff, and faculty in identifying, renting, leasing, or purchasing suitable living accommodations. The Housing Resource Center provides the following: information on University-owned apartments; an apartment-roommate matching service; a sublet service; maps of Pittsburgh and surrounding areas; rental tips; campus shuttle schedules; free local telephone service to contact landlords; and listings of apartments inspected and approved by the City of Pittsburgh. Call (412) 624-6998, visit the office at 127 North Bellefield Street, or see <http://www.pitt.edu/~property/hrc.html>.

PROPERTY MANAGEMENT

The Department of Property Management manages several off-campus apartment buildings near the University for students, faculty, and staff. For more information on the buildings and how to make a rental application, call (412) 624-9900, visit the office at 127 North Bellefield Avenue, or see <http://www.pitt.edu/~property/pm.html>.

STUDENT RESOURCES

The University is committed to providing a high quality of life for its students and towards that end supports a variety of offices and activities designed to aid students in realizing their potential and having a fulfilling campus life.

AFFIRMATIVE ACTION

In addition to its work with developing, implementing, and monitoring the University's affirmative action program, the Office of Affirmative Action is responsible for receiving, investigating, and mediating complaints from any members of the University community who believe they have been discriminated against or harassed on the basis of their race, color, religion, national origin, ancestry, sex, age, marital status, familial status, sexual orientation, disability, or status as a disabled veteran or a veteran of the Vietnam era. Individuals may request information and advice anonymously if they wish. The privacy of all parties will be respected. The office is located in room 901 of the Cathedral of Learning and the phone is (412) 648-7860. See <http://www.hr.pitt.edu/general/Affirm.htm> for further information on the office's services and the University's affirmative action policy.

ATHLETICS

The University offers a variety of opportunities for students to participate in athletics on the intramural and club levels as well as on-campus facilities for group sports and individual exercise.

VARSITY SPORTS

The University offers nine varsity sports each for men (baseball, basketball, cross country, diving, football, soccer, swimming, indoor and outdoor track, and wrestling) and women (basketball, cross country, diving, gymnastics, soccer, swimming, tennis, indoor and outdoor track, and volleyball). For tickets, scheduling, or other information about these sports, call (412) 648-8200 or visit the Pittsburgh Panthers Web site at <http://www.pittsburghpanthers.com>.

INTRAMURAL AND CLUB SPORTS

New outdoor playing fields are available behind the renovated Cost Sports Center. Call (412) 648-8210 for more information or visit the intramural program's Web site at <http://www.pitt.edu/~soeforum/hpred/intramurals/Imexperi.html>.

Sports clubs offer participation in a wide array of sports such as cycling, crew, hockey, and rugby. Contact the Student Organization Resource Center at 119 William Pitt Union, (412) 624-7116 for a complete list of sports clubs, or visit the club site at <http://www.education.pitt.edu/intramurals/>.

SPORTS FACILITIES

There are a variety of sports facilities available for use by individuals and groups. In Trees Hall, there are two swimming pools (call 412-648-8210 for pool information), a weight room, and courts for basketball, racquetball, handball, and squash. The Fitzgerald Field House also has two basketball courts and a 220-yard indoor track (call 412-648-8213 for schedule of available times). The Cost Center has nine indoor tennis courts, and fitness centers are available at Bellefield and Lothrop Halls. Bellefield Hall also has a swimming pool. The new Convocation and Events Center, scheduled to open on the Pitt Stadium site in 2001, will house a large student recreation and fitness center, among other amenities.

BOOK CENTERS

The University owns and operates two bookstores on campus: the Book Center and the Health Book Center. The Book Center, located at 4000 Fifth Avenue, carries textbooks for most University courses, as well as a general book selection, school supplies, and sundries such as art supplies, stationery, greeting cards, and calendars. Call (412) 648-1455 or see <http://www.pitt.edu/~bookctr/> for more information. The Health Book Center, located at 3527 Forbes Avenue, carries all course books for the **Schools of Medicine, Dental Medicine, Health & Rehabilitation Sciences, Nursing, Pharmacy, and Public Health**. Call (412) 648-8915 or see <http://www.pitt.edu/~bookctr/hbc.htm> for more information.

CHILD CARE

The University Child Development Center provides care and early childhood education to children of faculty, staff, and students of the University of Pittsburgh. Children range in age from six weeks through six years and participate in a wide range of programs that include full- and part-time infant, toddler, and preschool options and full-day kindergarten. There is a school-age summer program as well. The center serves the University as a laboratory school and the greater community as a model of early childhood excellence. There is a lengthy waiting list and prospective parents are encouraged to put children on that list as soon as possible. It is acceptable to put an unconceived child on the list in the interest of prudent planning. The Center is located at 635 Clyde St. and is open from 7:00 a.m. to 6:00 p.m., Monday through Friday. For more information, call (412) 383-2100 or see <http://www.hr.pitt.edu/ucdc/child.html>.

COUNSELING CENTER

The University Counseling Center provides free, confidential services to all students. The staff consists of psychologists, psychiatrists, and career counselors. Services include individual counseling, group counseling and the Career Resource Center. Students may come to the center for assistance with problems of an emotional, social, marital, academic, or career nature. The Center is located in room 334 of the William Pitt Union and is open year-round from Monday through Friday from 9 a.m. to 5 p.m., with additional hours from 6:00 p.m. to 9:00 p.m. on Monday nights during the Fall and Spring Terms. Call (412) 648-7930 for an appointment or see <http://www.pitt.edu/~counsel> for more information.

DISABILITY RESOURCES AND SERVICES

The Office of Disability Resources and Services (DRS) provides a broad range of support and services to assist students with disabilities. Services include, but are not limited to, the following: tape-recorded textbooks, sign language interpreters, adaptive computer technology, Braille copy, and non-standard exam arrangements. DRS can also assist students with accessibility to campus housing and transportation. Contact the DRS at (412) 648-7890 (voice or TDD) in room 216 of the William Pitt Union, or see <http://www.pitt.edu/~osaweb/drs/drs.html> for more information.

FOOD SERVICES

The Department of Food Services operates several cafeterias and food courts on campus and administers a meal plan for students, including graduate and professional students. Cafeterias or food courts are located in the following University buildings: Tower A, Tower C, William Pitt Union, Cathedral of Learning, Sutherland Hall, Mervis

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Hall, Benedum Hall, and Posvar Hall. Call (412) 648-2164 or see <http://www.pitt.edu/~food/> for more information.

The University of Pittsburgh Medical Center also operates a cafeteria on the 11th floor of Scaife Hall.

HEALTH CARE AND STUDENT HEALTH SERVICE

All full-time students pay a Student Health Fee each term to cover a variety of services at the Student Health Service, which is located in Suite 500, Medical Arts Building, 3708 Fifth Avenue. The Student Health Service is a multi-service healthcare facility that offers outpatient clinical services, gynecology, and family planning, as well as comprehensive health education programs. Call (412) 383-1800 or see <http://www.pitt.edu/~studhlth> for more information.

The University of Pittsburgh Pharmacy, located in the same suite as the Student Health Service, offers over-the-counter and prescription medication, often at lower prices than available elsewhere. Call (412) 383-1850 or see <http://www.pitt.edu/~pittrx> for more information.

Students should have health insurance to protect themselves in the event of illness or injury. Also, some schools may require students to carry insurance as a condition of their enrollment, particularly when students may be in contact with blood-borne pathogens. A direct pay medical insurance plan, underwritten by MEGA Life and Health Insurance Company, is available to students registered at the University for three or more credits. While not a full-coverage plan, this plan is designed to provide a student's basic health care needs, including services not offered at the Student Health Service such as hospitalization and emergency care. Students may enroll in the MEGA plan only during certain enrollment periods. Applications, enrollment deadlines, and further information on the plan are available at the Student Health Service, Suite 500, Medical Arts Building, 3708 Fifth Avenue, Pittsburgh, PA 15260, (412) 383-1800, or by contacting the Office of Risk Management at (412) 624-0621.

Teaching Assistants, Teaching Fellows, Graduate Student Assistants, and Graduate Student Researchers with eligible academic appointments are currently eligible to enroll in a managed care plan. The University will cover the cost of this insurance for these eligible graduate students. Coverage is available for eligible spouses and dependents by paying the difference between the individual and dependent options through a monthly payroll deduction. Students supported by fellowships and traineeships may be eligible to purchase membership in this insurance plan by paying the full cost of the coverage through a monthly deduction.

ID CENTER

Every student, faculty, and staff member at the University must get an ID card from the ID Center, located in room 107 McCormick Hall. The PittCard is used to access a variety of campus buildings and to take advantage of on-campus services, including libraries, computer labs, student discounts, and the like. The card also affords access to off-campus benefits such as free bus rides on Port Authority Transit (*see Parking and Transportation*).

To obtain a PittCard, students must have registered for classes, and must present some form of photo identification, such as a driver's license or passport. If a student does not have any photo identification, several forms of signature ID, such as credit or bank cards or a social security card must be presented. Students may also use a birth certificate as a form of non-photo identification.

There is no charge for the initial PittCard. However, there is a \$20 replacement fee for lost, stolen, or damaged cards. Call (412) 624-7643 (624-7632 after hours) or see <http://www.pitt.edu/~idcenter/index.html> for more information.

INTERNATIONAL SERVICES

The Office of International Services provides services on matters relevant to international students and scholars. Among the services provided are the evaluation of foreign academic credentials for applicants to the University of Pittsburgh with education outside the United States; the issuance of visa documents; orientation for new international students; counseling on personal, social, and financial matters; information and advising on regulations of the Immigration and Naturalization Service and other government agencies, as well as the processing of documents for enrolled international students for travel and employment. To contact the Office of International Services, phone (412) 624-7120, fax (412) 624-7105, or E-mail ois@pitt.edu. The office's mailing address is Office of International Services, 708 William Pitt Union, University of Pittsburgh, Pittsburgh, PA 15260-5071.

PARKING AND TRANSPORTATION

The University provides a variety of parking and transportation services, both on and off campus, some of which are detailed below. For more complete information, call the University Department of Parking, Transportation, and Services' 24-hour hotline at (412) 624-8800 or see <http://p-and-t.parktran.pitt.edu/>.

PARKING SERVICES

A limited number of parking permits are available for graduate and professional students living in Ruskin Hall and for those students who commute from off-campus. Permits are sold on a first-come, first-served basis. Daily student commuter parking is also available in several lots located throughout the campus. No permit is required for these facilities; charges are based on daily or hourly rates. Commuter students may also purchase parking permits at the Center for Biotechnology and Bioengineering, an off-campus lot connected to main campus by a shuttle. Evening/weekend student parking permits are available to those who do not need to park until after 3:50 p.m. on weekdays. For more information, contact the Parking Office, 204 Brackenridge Hall, (412) 624-4034.

RIDESHARING

Daily commuter students can save money by sharing a ride with other students. A free, computerized matching service is available to find names and phone numbers of others interested in sharing a ride. Call (412) 624-0687 for more information.

PITTSBURGH CAMPUS TRANSPORTATION SYSTEM

University of Pittsburgh students may ride all of the Pitt buses and shuttles for free by showing a valid University ID. In addition, students are permitted two guest riders (space permitting). Buses and shuttles normally have a 25- to 35-minute route. Detailed maps and time schedules are available in the lobbies of many campus buildings, libraries, and residence halls.

VAN CALL

An on-call Van Call is available from 7 p.m. until 3 a.m. Sunday through Wednesday, and from 7 p.m. until 5 a.m. Thursday through Saturday, to transport students from campus to a residence or from a residence to campus. This service is only available for those not on a fixed shuttle route and within the following area around the campus: South—Second

Avenue/Center for Biotechnology and Bioengineering parking; North—Baum Boulevard; West—Robinson/Craft Avenue; and East—Morewood Avenue. Van Call will also pick up students at the downtown Greyhound bus station on Sundays only. Students may call (412) 624-1700 to have the on-call van dispatched to their location.

PORT AUTHORITY

University of Pittsburgh students may ride any Port Authority bus, incline, or trolley within Allegheny County for free by showing their valid University ID card. Port Authority bus schedules are available at the Transportation Office in Forbes Pavilion, the Parking Office at Brackenridge Hall (room 204), and in the lobby of the William Pitt Union.

BICYCLE REGISTRATION PROGRAM

Registration of bicycles is recommended as a deterrent to theft, to help in the identification of lost or stolen bicycles, and to help the Department of Parking, Transportation, and Services better accommodate cyclists at the University. Registration is free. Bicycle rack parking is also free. Bicycle parking maps, regulations, and safety tips are available from the department. Bicycle lockers may be rented for \$40 per term, plus a \$10 refundable locker key deposit. Call (412) 624-0687 for more information.

PITT ARTS

PITT ARTS is a program designed to provide the University's students with access to and information about the many cultural institutions in Pittsburgh. The program's Web site gives information about a wide range of events in music, film, theater, visual arts, lectures, museums, and other cultural programming both on campus and in the city at large; it also provides information about volunteering for different cultural organizations in the city. PITT ARTS has programs designed for both resident and commuting students, including providing free access during the Fall and Spring Terms for all University students with a valid ID to several museums in Oakland: Phipps Conservatory and the Carnegie Museums of Art and Natural History.

PITT ARTS and the Department of Parking, Transportation, and Services also sponsor the Cultural Bus for the convenience of Pitt students every Sunday through the Fall and Spring terms. The Cultural Bus (number 17U) departs from the William Pitt Union, on Bigelow Boulevard, beginning at 12:00 noon. The 17U Cultural Bus takes students to some of Pittsburgh's key cultural destinations, including the Andy Warhol Museum, Heinz Hall, the Senator John Heinz Regional History Center, the Mattress Factory, and the Carnegie Science Center. Schedules are available at the William Pitt Union Parking Office (204 Brackenridge Hall), and Transportation Office, 3525 Forbes Avenue, and online at the Parking and Transportation Web site: <http://p-and-t.parktran.pitt.edu/>.

For more information, visit PITT ARTS at <http://www.pitt.edu/~pittarts/>.

PLACEMENT SERVICE

Graduate and professional students should consult with their faculty mentors as well as departmental, program, or school placement services as their primary source for guidelines on career development specific to their discipline. As a secondary resource, the University Placement and Career Services, though mainly designed to assist undergraduates, has a variety of services that may be of use to graduate and professional students.

Placement and Career Services is designed to work with students at each step of the Pitt Pathway, a developmental model for career planning and implementation. Specific services that assist students in implementing their plan and beginning their job search include an on-campus recruiting program, a resume referral service, current job postings posted on the Web site and on job boards, and use of an alumni volunteer database entitled AlumNet. Placement and Career Services helps students establish contact with employers in the fields of business, government, health care, education, industry, and private research. A credential service maintains letters of recommendation files that are sent at the request of the student to prospective employers and graduate schools. PCS also maintains a part-time/summer job database for students interested in temporary or part-time work on and off campus. For more complete information on services provided by Placement and Career Services call (412) 648-7130, stop by room 224 William Pitt Union, or see <http://www.placement.pitt.edu>.

PUBLIC SAFETY

The Department of Public Safety provides police and security services to the University community. For emergency calls dial 811 from on-campus phones or (412) 624-2121 from off-campus phones. The University of Pittsburgh Police Department's main headquarters is located in G1N30 Posvar Hall. For general information calls (non-emergency), dial (412) 624-4040. For more information on the Department of Public Safety, see <http://www.pitt.edu/~police/>.

SEXUAL ASSAULT SERVICES

The Office of Sexual Assault Services provides individual and group counseling designed to alleviate the trauma associated with sexual assault and sexual harassment. University of Pittsburgh students who have been sexually assaulted or who have experienced some form of sex discrimination are eligible for services. Emergency, medical, legal, and police support are provided. Students are assisted in negotiating course schedule or room changes and in obtaining medical, legal, and counseling resources available to them within the University and local communities.

The peer education program is an integral component of Sexual Assault Services. P.E.E.R.S. (Peer Educators for an Environment Free of Rape and Sexual Exploitation) is a volunteer student outreach program whose mission is to create an awareness of the dynamics of sexual assault on the Pitt campus, promote healthy relationships and effective communication, and reduce the occurrence of sexual victimization.

For more information, call (412) 648-7856, visit 926 William Pitt Union or see <http://www.pitt.edu/~saserv>, or call (412) 648-7844.

STUDENT GOVERNMENT

The Graduate and Professional Student Association (GPSA) is the official umbrella graduate and professional student organization at the University of Pittsburgh. GPSA is made up of graduate student organizations (GSOs) from each of the schools at the University. The purpose of GPSA is to represent both the academic and non-academic interests of all graduate and professional students and to provide student-initiated and student-controlled services. GPSA coordinates efforts with graduate student organizations from the different University graduate and professional schools and provides graduate student representation on key University-wide committees. The GPSA also has a limited amount of funding to support student scholarship, including funding for student travel to academic conferences, for

interlibrary loans, and for academic programs sponsored by individual schools within the University. For more information, see the GPSA Web site at <http://www.pitt.edu/~gpsa2>.

STUDENT ORGANIZATIONS

Over 250 certified student organizations provide a myriad of opportunities for extracurricular activity. In addition to student government, media, publications, and programming organizations, there are clubs for sports, recreation, performing arts, politics, religion, service, professional and academic pursuits, ethnic and cultural enrichment, and many other specialized interests. A complete list of certified student organizations is available from the Office of Student Activities (140 William Pitt Union, 412-648-7830, or see <http://www.pitt.edu/~studact/>).

SURVIVAL SKILLS AND ETHICS PROGRAM

The Survival Skills and Ethics Program sponsors a series of monthly workshops and activities designed to help train graduate and professional students in the skills necessary for success during and after their time at the University. These skills include the ability to communicate both orally and in writing, to learn and teach, to obtain and keep a job, to manage stress and time, and to behave responsibly. Graduate and professional programs often do not provide comprehensive training in all of these areas; the Survival Skills & Ethics Program encourages the development of mechanisms for assisting graduate and professional students in developing these skills.

For more information on workshops and other services provided by the program, call (412) 624-7098, visit 4K57 Posvar Hall, or see <http://www.pitt.edu/~survival/>.

VETERANS SERVICES

The staff of the Office of Veterans Services assists veterans, war orphans, and veterans' dependents in obtaining and using their VA educational benefits. In addition to these services, the office implements the VA work-study program. The staff serves as the veterans' representative with the University, the Veterans Administration, and other related agencies. The office is located in room G-3 of Thackeray Hall. Call (412) 648-7885 or see <http://www.pitt.edu/~srfswweb/vetPgVetServ.htm> for more information.

WILLIAM PITT UNION

The William Pitt Union, built just over 100 years ago as the Schenley Hotel, has been extensively remodeled and renovated. The union is located across Bigelow Boulevard from the Cathedral of Learning and serves as the focal point for campus activities, student organizations, and the Division of Student Affairs. The union features a recreation center, arcade, food service, information service, art gallery, TV room, dance studio, lounges, meeting rooms, student organization offices, ticket office, dining rooms, and several multi-use spaces for programs. To reach the union's information desk, call (412) 648-7815.

GENERAL ACADEMIC REGULATIONS

ADVISING

The quality of education that graduate students receive is greatly enhanced with good academic advising at all stages of their program. Given the diversity of these needs, each school and program must determine the best way to provide these services. Each program should have a document describing its view of good graduate advising practices and a clear policy on how good graduate advising is assessed and rewarded. For more information on academic advising at the graduate level, see Elements of Good Academic Advising at <http://www.pitt.edu/~provost/advising.html>.

Students are encouraged to consult with the individual school for school-specific advising services. In addition, the online *Schedule of Classes* can be a useful advising tool (see <http://www.pitt.edu/~srfsweb/crseinPgCrInfo.htm>) in planning a course of study.

ALLOWABLE CREDITS

There are certain limitations on the credits that can be earned towards a graduate degree at the University of Pittsburgh. Those limitations are detailed below.

ACCEPTANCE OF TRANSFER CREDITS

Students who have completed graduate courses in degree-granting graduate programs at other accredited institutions prior to admission to the University of Pittsburgh should submit official transcripts from those institutions at the time they apply so that the courses can be evaluated for transfer credit. In no case may the total number of credits transferred exceed the maximum number stated in the sections of this bulletin pertaining to advanced degree requirements. *For more detail, see credit requirement information in the sections on Regulations Pertaining to Master of Arts and Master of Science Degrees, Professional Master's Degrees, or Doctoral Degrees as well as the relevant program information in Schools, Departments, and Programs.* Grades (and quality points) are not recorded for credits accepted by transfer.

Transfer credits will not be accepted for courses in which a grade lower than B (QPA=3.00) or its equivalent has been received. No credit will be granted toward an advanced degree for work completed in extension courses, correspondence courses, courses delivered electronically, or those offered in the off-campus center of another institution unless those courses are approved for equivalent graduate degrees at that institution and the institution has an accredited program.

The completion of requirements for advanced degrees must be satisfied through registration at the Pittsburgh campus of the University of Pittsburgh. Graduate students already enrolled may, when approved in advance by their department and the dean, spend a term or more at another graduate institution to obtain training or experience not available at the University of Pittsburgh and transfer those credits toward the requirements for an advanced degree at the University of Pittsburgh. In such instances, neither the University nor any of its

components is responsible for providing any financial assistance to the graduate student.

COURSE WORK ACCEPTABLE AS GRADUATE CREDIT

A substantial proportion of courses acceptable toward a graduate degree should be designed explicitly for graduate students. Introductory graduate-level (master's-level) courses are numbered 2000-2999, and those at an advanced graduate-level (doctoral-level) are numbered 3000-3999. To be eligible for a master's degree, a student must have completed at least four courses (12 credits) or one-half the total number of credits submitted for the degree, whichever is greater, at the graduate-level (2000 or 3000 series). Doctoral students must complete additional graduate-level courses as determined by his or her department or school. No lower-level undergraduate courses numbered 0001-0999 may be applied toward a graduate degree.

CREDIT BY COURSE EXAMINATION

Some schools at the University offer credit by course examination. Each school authorized to offer graduate courses clearly specifies in its section of this bulletin whether or not students may obtain credit toward a degree in this fashion and, if so, for which courses. A school granting graduate credit for life or work experience will do so only through the option of credit by examination.

CROSS REGISTRATION CREDITS

Students may register for graduate courses at Carnegie Mellon University, Duquesne University, the Pittsburgh Theological Seminary, and Robert Morris College under the Pittsburgh Council on Higher Education (PCHE) cross registration agreement. Such work, if approved in advance by the student's advisor, will not be considered as transfer credit and may be counted for credit toward a graduate degree; the grade earned will be used in computing the student's quality point average. *See also Cross Registration in Registration section of this bulletin.*

ENROLLMENT IN GRADUATE COURSES AS AN UNDERGRADUATE

University of Pittsburgh undergraduate students with sufficient preparation are permitted to enroll in certain graduate courses at the University following procedures determined by each school. The graduate credits earned may be counted toward the undergraduate degree if approved by the student's school. These may not be counted as credits toward a graduate degree except as noted below.

Undergraduate students who need fewer than 15 credits to complete requirements for the baccalaureate degree and who intend to continue study toward an advanced degree may be permitted during their final term to register for graduate courses that will later apply toward a graduate degree. The student must obtain written permission from the school of proposed graduate study that the courses may count when and if the student is admitted into the graduate degree program. This privilege should not be granted if the proposed total program exceeds a normal full-time load. Although these credits will appear

on the undergraduate transcript, they will not count toward fulfilling undergraduate degree requirements. They will be posted as advanced standing credits on the graduate transcript.

REGISTRATION

REGISTERING FOR CLASSES

After being admitted to a graduate program, students may register for classes with their academic advisor. The registration period for a term or session is published in the University's *Schedule of Classes* (see <http://www.pitt.edu/~srfsweb/crseinPgCrInfo.htm>), in course descriptions, on calendars (including the University's Academic Calendar at <http://www.pitt.edu/~provost/calendar.html>), and in numerous other publications.

Students registering for the first time are advised to complete registration well before the beginning of the term. Typically, the first day of classes is the last day for students to register. After the start of classes, registration for new and continuing students is permitted only in unusual circumstances and only with the written approval of the dean and the payment of a late registration fee.

Many students have the convenience of processing their registration form online in their school or advisor's office. Students may also process their registration form in the Registration Office, G-1 Thackeray Hall.

Students are required to have the signature of their academic advisor on the registration form. The student's signature on the registration form creates a financial obligation to the University of Pittsburgh. Once students have registered, they may view their class schedules online at <http://student-info.pitt.edu>.

FULL-TIME AND PART-TIME STUDY

Students must be officially admitted to the University to be eligible to register for classes. Graduate students who register for nine to 15 credits in the Fall or Spring Term are full-time students and are assessed the tuition rate for their school (for detail, see <http://www.ba.pitt.edu/irweb/tuition/tuithmpg.htm>). A school may require students enrolled in a degree program to register for more than nine credits. Students who register for fewer than nine credits are part-time students and are billed on a per-credit basis. During the Summer Term and Summer Sessions, most students are billed on a per credit basis regardless of the number of credits taken. At the **Katz Graduate School of Business**, full-time MBA students are billed a flat rate in the Summer Term (since this is a one-year program, tuition is spread over three terms).

Doctoral students who have completed all credit requirements for the degree, including any minimum dissertation credit requirements, and are working full-time on their dissertations may register for full-time dissertation study, which carries no credits or letter grade but provides students full-time status. Students so enrolled are assessed a special tuition fee but are still responsible for paying the full-time computer and network, security/transportation, student health service, and activity fees. Students must consult with the dean's office of their school for permission to register for full-time dissertation study.

MAXIMUM CREDITS PER TERM

No student is permitted to register for more than 15 graduate credits without written permission from the dean of the academic center in which the student is pursuing a degree. Graduate students who register for more than 15 credits will be billed for each additional credit that exceeds their full-time tuition rate. Exceptions include the following:

- The **Katz Graduate School of Business** allows its full-time MBA students to register for up to 18 credits in the Fall and Spring Terms before additional per credit tuition charges apply.
- The **School of Law** has no maximum number of credits in its first-professional programs for billing purposes, but permission of the associate dean is required to register for more than 15 credits per term.
- The **Graduate School of Public Health** allows students pursuing the Master of Health Administration or the Master of Public Health in Environmental and Occupational Health to take up to 16 credits during their first year of study.
- The **School of Social Work** allows its students to register for 16 credits in the Fall Term before additional per credit tuition charges apply.

Individual schools and departments may restrict the maximum program of any or all of their graduate students.

REGISTRATION STATUS AT GRADUATION

All graduate students must register for at least one credit or full-time dissertation study during the 12-month period preceding graduation (that is, must be on active status) and must be registered for the term in which they plan to graduate. Waivers may be obtained by submitting a written request to the registrar from the dean of the school. The request should be based on extenuating circumstances, e.g. inability of the student's dissertation committee to meet during the final term when a student has given reasonable notice or the student has completed all degree requirements in a previous term.

INACTIVE STATUS

Students who have not registered for at least one credit or full-time dissertation study (eligible doctoral students) during a 12-month period are transferred to inactive status and must file an application for readmission to graduate study (application fee required) before being permitted to register again. Students on inactive status cannot apply to graduate or take preliminary or comprehensive examinations. Also, students on inactive status are not eligible to use University facilities and should not expect to receive counseling from the faculty or active supervision by their advisor and committee.

ADDING AND DROPPING COURSES

Students may add and drop course(s) only during the add/drop period. The dates for the add/drop period are listed in the University's *Schedule of Classes*, in course descriptions, on calendars (including the University's Academic Calendar at <http://www.pitt.edu/~provost/calendar.html>), and in numerous other publications. Students who no longer wish to remain enrolled in a course after the add/drop period has ended may withdraw from the course or resign from the University. See *Monitored Withdrawal from a Course or Resigning from the University*.

AUDITING COURSES

With the consent of the school and instructor, students may choose to audit a course. To audit a course, a student must register and pay tuition for the course. The N grade is not counted toward graduation or the QPA.

CROSS REGISTRATION

Carnegie Mellon University, Duquesne University, the Pittsburgh Theological Seminary, Robert Morris College, and the University of Pittsburgh offer graduate students the opportunity for cross registration in graduate programs in the five institutions in the Fall and Spring Terms. Credits earned by cross registration in graduate courses at Carnegie Mellon, Duquesne University, the Pittsburgh Theological Seminary, and Robert Morris College, when approved in advance by the student's graduate advisor, are accepted as University of Pittsburgh credits for the purpose of the calculation of the quality point average and the completion of degree requirements. Each department at each institution retains the authority to establish the prerequisites for admission and the maximum enrollment in its own courses and to grant priority in registration to its own graduate students.

Cross registration is only available in the Fall and Spring Terms. Only full-time students may cross register. Students who cross register do not pay tuition to the host institution; however, they are responsible for any additional fees associated with the course such as laboratory fees, books, and the like. During the summer, students may attend one of the above colleges as guest students, but they must pay that institution's tuition and fees. Students are discouraged from cross registering during their term of graduation to avoid any delays in the receipt of course credit needed to graduate. Students should meet with their advisor before they cross register. *See also Cross Registration Credit.*

REGISTERING FOR TWO INDEPENDENT DEGREE PROGRAMS SIMULTANEOUSLY

Students may pursue two independent graduate degrees simultaneously in two different schools within the University or two different departments within the same school. Normally, such students should be enrolled for no more than a total of 15 credits per term. Special approvals and regulations apply before a student is allowed to register for courses in pursuit of two independent graduate degrees. *See Special Academic Opportunities, page 30, for further detail.*

REGISTERING FOR COOPERATIVE-, DUAL-, AND JOINT-DEGREE PROGRAMS

Dual- and joint-degree programs result in two degrees being awarded. Requirements for these programs include all or most of the requirements of two distinct academic degree programs. Dual programs exist within a single school; joint programs exist between two or more schools; cooperative programs are administered by two or more institutions. Before registering for courses in pursuit of a cooperative-, dual-, or joint-degree program, a student must be admitted to both programs. *See Special Academic Opportunities, page 30, for further detail.*

MONITORED WITHDRAWAL FROM A COURSE

After the add/drop period has ended, students may withdraw from a course that they no longer wish to attend by completing a Monitored Withdrawal Request form in the office of the school offering the course.

Students must process the Monitored Withdrawal Request form within the first nine weeks of the term in the fall and spring. Because summer sessions vary in length, students should check the summer *Schedule of Classes* for those deadlines. Students should check with the school offering the course for the last day to submit a Monitored Withdrawal Request form. The grade "W" will appear on the student's grade report and transcript. There is no financial adjustment to students' tuition or fee obligations involved in withdrawing from courses, but withdrawing may jeopardize satisfactory academic progress, financial aid, and assistantships or fellowships.

RESIGNING FROM THE UNIVERSITY FOR A SPECIFIC TERM

If students decide to drop all of their courses after the add/drop period has ended and before 60% of the term or session has been completed, they must resign from the University for that term. Official resignation from the University requires students to contact the Student Appeals Office. Students have several options. They may resign in person, by mail, or by calling (412) 624-7585 where students may leave a message 24 hours a day, including weekends and holidays. An R grade will appear on the student's academic transcript. Tuition is prorated from the date of the student's notification to the Student Appeals Office of the student's desire to resign, unless 60% of the term has been completed, in which case there is no refund.

After the 60% point in time of the term or session has passed, students who wish to terminate their registration may process withdrawal from all classes only with the permission of their academic dean. If the reason for withdrawal is medical or psychological in nature, the academic dean may consult with the director of Student Health Service prior to making a determination. There is no financial adjustment associated with this procedure, which results in the assignment of W grades for the courses.

GRADING & RECORDS

QPA AND GPA

Quality Point Average (QPA) and Grade Point Average (GPA) are numerical indications of a student's academic achievement. QPA is the average of letter grades earned toward a degree. GPA is the average of total letter grades earned.

ACADEMIC STANDARDS

An average of at least B (QPA=3.00) is required in the courses that make up the program for any graduate degree. A student with full graduate status is automatically placed on probation whenever his or her cumulative QPA falls below 3.00. Each school determines the restrictions placed on a student on probation. *See Probation, Suspension, and Dismissal for further detail.*

GRADING SYSTEM

The University of Pittsburgh has a standard letter grade system (*see Letter Grades below*). Some additional grading options are available in some courses as determined by the school and the instructor (*see sections below on University Grading Options and Other Grades*). Students are subject to the grading system of the school in which they are taking the course.

UNIVERSITY GRADING OPTIONS

Individual schools may elect to offer one of the following grade options for its courses:

LG	Letter Grade
H/S/U	Honors/Satisfactory/Unsatisfactory
S/N	Satisfactory/Audit
LG and H/S/U	Letter Grade & Honors/Satisfactory/Unsatisfactory
LG and S/N	Letter Grade & Satisfactory/Audit

From among the grading options approved by the school, each department identifies those it deems acceptable for its courses. Furthermore, each course instructor may specify, within the grading options approved by the school and department, which grading options may be selected by students taking his or her course.

Students should choose a grading option from those listed with the course in the *Schedule of Classes*. Grade Option/Audit Request forms for graduate courses are not required and will not be accepted by the Office of the Registrar. Schools establish their own deadlines and procedures for processing grade option and audit requests.

Students receive the grade H or S for satisfactory work and U for unsatisfactory work. The grades H and S are counted toward graduation but not the student's QPA. The grades N and U are not counted toward graduation or the QPA. The S grade indicates adequate graduate attainment; in evaluating thesis or dissertation research, an instructor may only use the S/N grading option.

Students may audit a course and receive an N grade with the consent of the instructor and school offering the course. However, to audit a course, a student must register and pay tuition for the course. The N grade is not counted toward graduation or the QPA.

LETTER GRADES

The University's letter grade system for graduate courses (not first-professional) is as follows:

Grade		Quality Points
A+	=	4.00
A	=	4.00 Superior Attainment
A-	=	3.75
B+	=	3.25
B	=	3.00 Adequate graduate-level attainment
B-	=	2.75
C+	=	2.25
C	=	2.00 Minimal graduate-level attainment
C-	=	1.75
D+	=	1.25
D	=	1.00
D-	=	0.75
F	=	0.00 Failure

Courses in the first-professional programs (DDM, JD, LLM, MD, PharmD) use a different letter grade system; students should refer to

the relevant school's text in the First-Professional Programs section of this bulletin.

OTHER GRADES: INCOMPLETE, WITHDRAW, RESIGN

Upon a student's completion of a course, one of the grades listed below may appear on the student's transcript in lieu of one of the options selected by the student and/or instructor under University Grading Options. None of these grades carries quality points. Students should consult with their individual school for information on any school-specific regulations regarding these grades.

G GRADE

The G grade signifies unfinished course work due to extenuating personal circumstances. Students assigned G grades are required to complete course requirements no later than one year after the term in which the course was taken. After the deadline has passed, the G grade will remain on the record, and the student will be required to re-register for the course if it is needed to fulfill requirements for graduation.

I GRADE

The I grade signifies incomplete course work due to nature of the course, clinical work, or incomplete research work in individual guidance courses or seminars.

W GRADE

The W grade signifies that a student withdrew from course. *See Withdrawing from Courses for more information.*

R GRADE

The R grade indicates that a student has resigned from the University. *See Resigning from the University for more information.*

Z GRADE

The Z grade indicates that an instructor has issued an invalid grade.

REPEATING COURSES

A student may repeat any course in which a grade of B- or lower is received if an authorization to repeat the course is given by the student's advisor and/or department. A school may restrict the type and/or number of different courses that may be repeated during one degree program. The grade earned by repeating a course is used in lieu of the grade originally earned, although the original grade is not erased from the transcript. No course may be repeated more than twice. No sequence course may be repeated for credit after a more advanced course in that sequence has been passed with a B or higher grade. The repeated course must be the same as that in which the original grade was earned. In extenuating circumstances, a department chair, with the dean's approval, may substitute another course of similar content. Grades of W, R, or N reported for the repeated course will not be counted as a course repeat. To initiate only the last course grade being computed in the QPA, a Course Repeat Form must be filed with the dean's office.

CHANGING GRADES

Only the instructor of a course may change a student's grade by submitting a Change of Grade Card. All grade changes require the authorization of the dean of the school from which the original grade was issued. While each school may determine a time limit for grade changes, they should be processed no later than one year after the initial grade was assessed. Changes in I grades are exempt from this one-year policy.

ACADEMIC RECORD

The academic record is not an official University transcript, but a document containing a student's complete University of Pittsburgh academic history. In addition to the information provided on the transcript (as listed below), the academic record provides students and advisors with admission data, academic events, and advanced standing/placement/transfer credit information. Students with no outstanding financial obligations to the University can receive one free copy of their academic records each term in G-3 Thackeray Hall. For more information, send E-mail to transcert@pdc.srfs.pitt.edu.

GRADE REPORT

At the end of each term, a grade report is prepared by the Office of the University Registrar and mailed to the student, provided that all charges have been paid. This report shows the total credits carried, the grade received in each course, and total quality points earned. Shortly after the term ends, students can also access their grades online via the secure server at <http://student-info.pitt.edu/>.

TRANSCRIPTS

An academic transcript serves as a permanent record of a student's academic progress. The transcript is a cumulative record of the student's QPA, as well as a record of the department, title, and grade for each course in which the student has enrolled. Students may request an official transcript that bears the seal of the University of Pittsburgh and the signature of the University Registrar at a cost of \$3.00 per copy. Currently enrolled students may also receive one free unofficial copy of their transcript per term for personal use. Upon graduation, the transcript reflects a student's degree and date; major; and, if applicable, honors, area of concentration, and minor.

ACADEMIC HONORS

Schools and programs may recognize academic achievement by students through fellowships, scholarships, and other awards. Students should consult with their individual school and/or program for more information.

PROBATION, SUSPENSION, AND DISMISSAL

Students who fail to make satisfactory progress may be subject to academic probation and/or suspension and dismissal. Students who have completed at least nine quality point credits and whose QPA falls below 3.00 will be placed on academic probation by the dean of their school. After a certain period of time on academic probation (the period is determined by the student's school), a student is subject to academic suspension and restricted from registering for classes in that school. Details of the school's probation system are available through that school.

EFFECT ON FINANCIAL AID AND SCHOLARSHIPS

Conditions for loan eligibility and many scholarships (including those for teaching assistants, teaching fellows, graduate student assistants, and graduate student researchers) usually require students to complete a specified number of credits each year and maintain a specified quality point average (QPA: credits counting toward the degree). Questions about the effect of unsatisfactory academic standing on loans should be directed to the Office of Admissions and Financial Aid in the Masonic Temple (4227 Fifth Avenue) at (412) 624-7488. Questions

about the effect of unsatisfactory academic standing on scholarships, including teaching and research assistantships, should be directed to the particular graduate school.

EDITORIAL ASSISTANCE AND PUBLICATION OF THESES/DISSERTATIONS

All graduate students must follow University regulations regarding editorial assistance and publishing of theses and dissertations as detailed below.

EDITORIAL ASSISTANCE

A student preparing a dissertation or other written work as part of academic requirements may, when appropriate, use the assistance of professional editors, provided that the following rules are observed:

- (1) The student receives the approval of the research advisor or professor of the course in which written work is being submitted.
- (2) The student receives assistance only in use of language and not in the subject matter of the written work.
- (3) The student acknowledges and describes all editorial assistance in the report.

PUBLICATION OF THESES AND DISSERTATIONS

Any thesis or dissertation may be published, either by the University or through an outside agency, provided due credit is given the University. No form of publication, however, will relieve the student of his or her responsibility to supply the proper abstract and the specified number of complete copies of the thesis or dissertation for binding and deposit in the University Library System.

The doctoral candidate is required to execute an agreement with University Microfilms, Inc. for the publication of the dissertation on microfilm (*see Regulations Pertaining to Doctoral Degrees, page 23*).

Advisors should exercise responsibility in approving research topics that will not endanger long-term research projects or the safety or welfare of informants. Dependent upon the circumstances and the research point at which the danger is recognized, the provost's office may authorize a delay in publication of a dissertation for up to a maximum of one calendar year. Similarly, a publication may be withheld for a maximum of six months, if required, for filing a patent application.

REGULATIONS PERTAINING TO MASTER OF ARTS AND MASTER OF SCIENCE DEGREES

The Master of Arts (MA) and Master of Science (MS) degree programs provide an introduction to scholarly activities and research and often serve as preparation for teaching careers. These degrees are awarded for the completion of a coherent program designed to assure the mastery of specified knowledge and skills, rather than a random accumulation of a certain number of courses. The overall form and content of the student's program of study is the responsibility of the faculty of the department. To carry out this responsibility, each student must be assigned a major advisor, who, in consultation with the student, plans a program of study and research in accord with school and departmental guidelines.

MA AND MS REQUIREMENTS

The Master of Arts and Master of Science degrees normally require the satisfactory completion of approximately 30 credits of graduate study approved by the department or school. No Master of Arts or Master of Science degree program may require fewer than 24 course credits. Not more than six credits may be granted toward the completion of the requirements for a master's degree for work completed at another accredited graduate institution or for work previously completed at the University of Pittsburgh. *See Acceptance of Transfer Credits on page 17 for further information.*

At least four courses (12 credits) or one-half the master's degree program, whichever is greater, must be at the graduate-level (the 2000 or 3000 series) and must be completed with an average grade of B (3.00). No course numbered below 1000 may be applied toward graduate degree requirements.

Some master's programs may include approved areas of concentration or minors. Areas of concentration define and describe the student's training and expertise within the broader discipline. Minors represent significant coursework completed in an area related to the student's specialty. Such areas of concentration or minors are added to the transcript upon the granting of the degree.

Master's degrees are conferred only on those students who have completed all courses required for the degree with an average grade of B (i.e., a 3.00 QPA).

The requirement of proficiency in foreign languages is at the discretion of individual departments or schools.

Departments provide students with a copy of school and departmental regulations appropriate for their program. Students are expected to become familiar with these and to satisfy all prescribed degree requirements.

COMPREHENSIVE EXAMINATION

MA or MS degrees are conferred only upon those students who, in one or more comprehensive examinations or the equivalent, show that they have mastered the general field of their graduate study. Each department or similar unit is responsible for specifying the content and procedure for administration of the comprehensive examination and will specify for each candidate the field of his or her examination, which may vary from student to student. When a program substitutes an equivalent requirement for the comprehensive examination, the department should notify the University Council on Graduate Study and describe the substitution.

Students on inactive, special, or provisional status or on probation are not eligible to take a comprehensive examination. These examinations must be taken at least one month prior to the last day of the term in which the degree is to be granted. The results must be reported promptly to the office of the dean but no later than the last day of the term in which the examination is administered. A student who is unable to complete all degree requirements within a two-year period after passing the comprehensive examination may be re-examined at the discretion of the department or school.

THESIS OPTION

The requirement of a thesis or its equivalent is at the discretion of individual departments or schools. If a thesis is submitted, its form must be in accord with specifications stipulated in the *University Style and Form Manual*. Each candidate must provide a suitable number of copies of the thesis for review and use as designated by the thesis examining committee, consisting of at least three members of the faculty recommended by the major advisor and approved by the department chair. The final oral examination in defense of the master's thesis is conducted by the thesis committee, and a report of this examination signed by all members of the committee must be filed in the office of the dean. After the examination, at least one copy of the approved thesis must be deposited with the dean, who forwards it to the appropriate offices for microfilming and deposit in the University Library System. A receipt for the thesis binding/microfilming fees must be submitted with the thesis.

NON-THESIS OPTION

It is usual for a program to require additional course work if a thesis is not required.

For the Master of Arts degree, students must acceptably describe, in writing, one or more substantial intellectual experiences or accomplishments. In programs in which a master's thesis is optional, the student must satisfy this requirement by submitting a paper (or papers), as designated by the major department, and must demonstrate competence in using methods of scholarship.

For the Master of Science degree, a paper or research project is usually required.

REGULATIONS PERTAINING TO PROFESSIONAL MASTER'S DEGREES

The professional master's degree programs are generally similar to those for the MA and MS except that they emphasize instruction in professional affairs and practice and serve as preparation for careers in the professions. The program of study is a coherent program designed to assure the mastery of specified knowledge and skills, rather than a random accumulation of a certain number of courses. The overall form and content of the student's program of study is the responsibility of the student's department or school. To carry out this responsibility, each student must be assigned a major advisor, who, in consultation with the student, plans a program of study and research in accord with school and departmental guidelines.

PROFESSIONAL MASTER'S DEGREE REQUIREMENTS

Professional master's degrees are conferred upon those students who demonstrate comprehensive mastery of their general field of study. The professional master's degrees normally require the satisfactory completion of more than 30 credits of graduate study approved by the department. No professional master's degree program may require fewer than 30 credits. No more than one-third of the total number of required credits may be granted to a student as transfer credit for work done at another accredited graduate institution. (*See Acceptance of Transfer Credits, page 17, for further detail.*) At least one-half of the credits earned in a master's degree program must be at the graduate

level (the 2000 or 3000 series). No courses numbered below 1000 may be applied toward graduate degree requirements. Master's degrees are conferred only on those students who have completed all course requirements with at least a 3.00 QPA.

Most professional master's degree programs provide opportunities for theoretical studies and practical applications. Students are expected to acquire professional skills through course work, projects, internships, practica, and/or research papers as part of demonstrating their comprehensive mastery of their field of study.

Requirements vary from school to school. Departments provide students with a copy of school and departmental regulations appropriate for their programs. Students are expected to become familiar with these and to satisfy all prescribed degree requirements.

Professional master's degrees are conferred upon those students who demonstrate comprehensive mastery of the general field of study. This includes: (a) satisfactory completion of all course requirements and (b) other performances that indicate comprehensive mastery such as examinations, internships, research projects, theses, and practica. These requirements vary from school to school; students should refer to the specific requirements of their program in the Schools, Departments, and Programs section of this bulletin.

REGULATIONS PERTAINING TO DOCTORAL DEGREES

While the regulations governing doctoral study in this section represent university-wide policy, *students should check the Schools, Departments, and Programs section of this bulletin* and with their advisor for any expansions of or exceptions to these rules.

ADMISSION TO DOCTORAL STUDY

In some departments, the requirements for admission to graduate study and for admission to doctoral study are identical, while other departments require the completion of a master's degree or its equivalent as a prerequisite for admission to doctoral study. Admission to doctoral study does not include any implication concerning admission to candidacy for the Doctor of Philosophy degree.

Normally, only one major department of graduate study is permitted for the PhD degree. However, a few formal interdisciplinary programs and, under some circumstances, some independently designed interdisciplinary doctoral programs are available (*see Interdisciplinary Doctoral Programs, page 26*).

PROGRAMS OF STUDY

PhD programs offered at the University of Pittsburgh provide a coherent series of courses, seminars, and discussions designed to develop in the student a mature understanding of the content, methods, theories, and values of a field of knowledge and its relation to other fields. Each program trains the student in the methods of independent research appropriate to the discipline and provides an advisor and a committee to guide the student in an extended investigation of an original and independent research project of significance in the field.

The overall form and content of each student's program is the responsibility of the Graduate Faculty of the department. To carry out this responsibility, the departments must ensure that each student has

a major advisor who, in consultation with the student, plans a program of study and research in accord with school and departmental guidelines. The advisor may prescribe additional courses both within and outside the department that are essential and/or appropriate to the student's program.

Some doctoral programs may include approved areas of concentration used to define and describe the student's training and expertise within the broader discipline. Such an area of concentration is added to the transcript upon the granting of the degree.

Doctoral level courses are numbered in the 3000 series, but courses numbered in the 2000 series may also be appropriate for doctoral study. Normally, courses numbered below 2000 do not meet the minimum requirements for doctoral study, although they may be taken to supplement a doctoral program.

Students must maintain a minimum cumulative QPA of 3.00 in courses to be eligible to take the preliminary and comprehensive examinations as well as to graduate.

The requirement of proficiency in the use of foreign languages or other tools of research is at the discretion of individual departments or schools.

Departments provide students with a copy of school and departmental regulations appropriate for their program and, in turn, students are expected to become familiar with these and to satisfy all prescribed degree requirements.

CREDIT REQUIREMENTS

The minimum credit requirement for the PhD degree is met by six terms of registration as a graduate student for 12 or more credits per term or the equivalent number of credits taken in a reduced load over a longer period of time. If the school requires completion of its master's degree program prior to admission into its doctoral program, at least four terms of registration for 12 or more credits per term or the equivalent number of credits in a reduced load are required as a minimum for the PhD degree. No more than 30 credits may be accepted for a master's degree awarded by another institution to meet the minimum credit requirement; some schools have more stringent requirements, including the **Faculty of Arts and Sciences** and the **Graduate School of Public Health**, both of which will accept only 24 credits for a master's degree awarded by another institution.

In recognition of graduate study beyond the master's degree successfully completed elsewhere, no more than 12 additional credits may be accepted at the time of admission to meet the minimum credit requirement. (*See also Acceptance of Transfer Credits, page 17.*) No more than 30 credits may be accepted for a previously earned PhD degree in recognition of master's degree work, though some schools have more stringent requirements, including the following:

- The **Faculty of Arts and Sciences** accepts only 24 credits from a previously earned PhD in recognition of master's degree work.
- The **Graduate School of Public Health** accepts only six credits from a previously earned PhD degree in recognition of its students' work towards its Master of Science programs. Also, its students working towards the Master of Public Health may use credits from a previously earned PhD to satisfy no more than one-third of the required credits for the MPH.

Graduate students already enrolled may, when approved in advance by their department and the dean, spend a term or more at another graduate institution to obtain training or experience not available at the University of Pittsburgh and transfer those credits toward the requirements for an advanced degree at the University of Pittsburgh. In all cases, at least three terms, or 36 credits, of full-time doctoral study or the equivalent in part-time study must be successfully completed at the University of Pittsburgh.

RESIDENCY REQUIREMENT

Students seeking the PhD degree are required to engage in a minimum of one term of full-time doctoral study, which excludes any other employment except as approved by their departments.

PRELIMINARY EVALUATION

The preliminary evaluation should be designed to assess the breadth of the student's knowledge of the discipline, the student's achievement during the first year of graduate study, and the potential to apply research methods independently. The form and nature of the evaluation should be approved at the school level. It should be conducted at approximately the end of the first year of full-time graduate study. The evaluation is used to identify those students who may be expected to complete a doctoral program successfully and also to reveal areas of weakness in the student's preparation. Evaluation results must be reported promptly to the dean's office, but no later than the last day of the term in which the evaluation occurs. A student on provisional, inactive, or special status or on probation is not eligible to take the preliminary evaluation.

COMPREHENSIVE EXAMINATION

The comprehensive examination should be designed to assess the student's mastery of the general field of doctoral study, the student's acquisition of both depth and breadth in the area of specialization within the general field, and the ability to use the research methods of the discipline. In some programs, the comprehensive examination is combined with the overview or prospectus meeting. It should be administered at approximately the time of the completion of the formal course requirements and should be passed at least eight months before the scheduling of the final oral examination and dissertation defense. In no case may the comprehensive examination be taken in the same term in which the student is to graduate. Examination results must be reported promptly to the dean's office but no later than the last day of the term in which the examination is administered. A student who is unable to complete all degree requirements within a five-year period after passing the comprehensive examination may be re-examined at the discretion of the department or school. A student on provisional, inactive, or special status or on probation is not eligible to take the comprehensive examination.

DOCTORAL COMMITTEE

Before the student is admitted to candidacy for the PhD degree, the student's major advisor proposes, for the approval of the department chair or director of the school's doctoral program and the dean, a committee of four or more persons, including at least one from another department in the University of Pittsburgh or from an appropriate graduate program at another academic institution, to serve as the doctoral committee. The majority of the committee, including the major advisor, must be full or adjunct members of the Graduate Faculty (see <http://www.pitt.edu/~graduate> for most recent Graduate Faculty

roster). This committee must review and approve the proposed research project before the student may be admitted to candidacy.

This doctoral committee has the responsibility to advise the student during the progress of the candidate's research and has the authority to require high quality research and/or the rewriting of any portion or all of the dissertation. It conducts the final oral examination and determines whether the dissertation meets accepted standards.

Meetings of the doctoral candidate and his/her dissertation committee must occur at least annually from the time the student gains admission to doctoral candidacy. During these meetings, the committee should assess the student's progress toward the degree and discuss objectives for the following year and a timetable for completing degree requirements. It is the responsibility of the dean of each school to determine a mechanism for monitoring the occurrence of these annual reviews.

The membership of the doctoral committee may be changed whenever it is appropriate or necessary, subject to the approval of the department chair and the dean.

When a doctoral committee member leaves the University, he or she must be replaced unless the dissertation is almost complete or the member has an essential role on the committee. In the latter case, the dean's approval should be obtained. When the chair of a committee leaves and cannot be conveniently replaced, a co-chair must be appointed from within the department, and the restructured committee requires the approval of the dean and either the department chair or the director of the school's doctoral program. If the defense takes place within a few months of the chair's departure, the requirement of the co-chair is usually waived.

A retired faculty member may remain as a member or chair of a committee if he or she is spending considerable time in Pittsburgh or the vicinity and is still professionally active. Retired faculty who meet these criteria may also be appointed as a member or as a co-chair (but not chair) of a newly formed committee. Retired faculty who leave the Pittsburgh area and/or do not remain professionally active should be replaced on committees and the revised committee approved by the dean and either the department chair or the school's director of doctoral programs.

OVERVIEW OR PROSPECTUS MEETING

Each student must prepare a dissertation proposal for presentation to the doctoral committee at a formal dissertation overview or prospectus meeting. The overview requires the student to carefully formulate a plan and permits the doctoral committee members to provide guidance in shaping the conceptualization and methodology of that plan. The doctoral committee must unanimously approve the dissertation topic and research plan before the student may be admitted to candidacy for the doctoral degree. Approval of the proposal does not imply either the acceptance of a dissertation prepared in accord with the proposal or the restriction of the dissertation to this original proposal. If the research proposed in the overview or prospectus involves human subjects, that proposed research must be approved by the University Institutional Review Board (IRB) before it may be carried out. *For details, see Human Research Subjects: Institutional Review Board under Rights and Responsibilities on page 28, and a description of the Institutional Review Board on page 28.*

ADMISSION TO CANDIDACY FOR THE DOCTOR OF PHILOSOPHY DEGREE

Admission to candidacy for the Doctor of Philosophy degree constitutes a promotion of the student to the most advanced stage of graduate study and provides formal approval to devote essentially exclusive attention to the research and the writing of the dissertation. To qualify for admission to candidacy, students must fulfill the following requirements:

- Be in full graduate status
- Have satisfied the requirement of the preliminary evaluation
- Have completed formal course work with a minimum quality point average of 3.00
- Have passed the comprehensive examination
- Have received approval of the proposed subject and plan of the dissertation from the doctoral committee following an overview or prospectus meeting of the committee

In some schools, admission to candidacy is a prerequisite to registration for dissertation credits. Students are informed of admission to candidacy by written notification from the dean, who also states the approved doctoral committee's composition.

REGISTERING FOR FULL-TIME DISSERTATION STUDY

Doctoral students who have completed all credit requirements for the degree, including any minimum dissertation credit requirements, and are working full-time on their dissertations may register for **Full-Time Dissertation Study**, which carries no credits or letter grade but provides students full-time status. Students so enrolled are assessed a special tuition fee but are still responsible for the full-time computer and network, security/transportation, student health, and activity fees. Students must consult with the dean's office of their school for permission to register for full-time dissertation study.

DISSERTATION AND ABSTRACT

Each student must write a dissertation that presents the results of his or her research project. An appropriate research project involves a substantive piece of original and independent research grounded in an appropriate body of literature. The dissertation must be relevant to an identifiable field as it is currently practiced, present a hypothesis tested by data and analysis, and provide a significant contribution or advancement in that field. It is the responsibility of the student's doctoral committee to evaluate the dissertation in these terms and to recommend the awarding of the doctoral degree only if the dissertation is judged to demonstrate these qualities.

A dissertation should demonstrate the following characteristics:

- The establishment of a historical context for the presentation of an innovative and creative approach to the problem analysis and solution
- A clear understanding of the problem area as revealed by analysis and synthesis of a broad literature base
- A well-defined research design

- Clarity in composition and careful documentation
- Results of sufficient merit to be published in refereed journals or to form the basis of a book or monograph
- Sufficient detail so that other scholars can build on it in subsequent work
- The preparation of the author to assume a position within the profession

If the dissertation is the result of a collaborative research effort, the project should be structured in such a way that the student's dissertation results from one clearly identified piece of work in which the student has unquestionably supplied the major effort. The contributions of the student and the other collaborators must be clearly identified.

Published articles authored by the student and based on research conducted for the dissertation study may be included in the dissertation if the student's department and school have a written policy that this is acceptable. In any case, the published work must be logically connected and integrated into the dissertation in a coherent manner, and sufficient detail must be presented to satisfy the characteristics of a dissertation. The student should be the sole or primary author of the published work. If the published articles were co-authored, the contribution of the student must be clearly delineated in the introduction so the committee can ascertain that the student's own work satisfies the requirements of a dissertation. The Style and Form Manual gives instructions on incorporating articles into the dissertation.

Candidates for the doctoral degree must provide a suitable number of copies of the dissertation, as determined by the doctoral committee and school policy, for review and use during the final oral examination. The general format of the dissertation and the abstract is determined by the Office of the Provost and is set forth in the University's Style and Form Manual. Specific instructions should be available in the office of the dean of the school. After the final oral examination is successfully completed, the candidate must deposit with the dean at least one copy of the approved, completed dissertation and abstract in final form, at least two additional copies of the dissertation abstract, and a receipt for payment of the dissertation binding/microfilm fees. The candidate is also required to execute an agreement with University Microfilms Inc. for the publication of the dissertation on microfilm and for the publication of the abstract of the dissertation in *Dissertation Abstracts*.

LANGUAGE OF THE DOCTORAL DISSERTATION

The language in which doctoral dissertations are written shall normally be English. Exceptions may be granted by the student's dean with the approval of the dissertation advisor and committee, but only for sound reasons of scholarship. Permission shall never be granted on the grounds of the student's inadequate command of English.

FINAL ORAL EXAMINATION

The final oral examination in defense of the doctoral dissertation is conducted by the doctoral committee and need not be confined to materials in and related to the dissertation. Any member of the Graduate Faculty of the University may attend and participate in the examination. The date, place, and time of the examination should be published well in advance in the University Times. Other qualified individuals may

be invited by the committee to participate in the examination. Only members of the doctoral committee may be present during the final deliberations and vote on the passing of the candidate. A report of this examination, signed by all the members of the doctoral committee, must be sent to the dean. If the decision of the committee is not unanimous, the case is referred to the dean for resolution. The chair of the doctoral committee should ensure that the dissertation is in final form before requesting signatures of the members of the committee.

INTERDISCIPLINARY DOCTORAL PROGRAMS

A student may be admitted into one of two types of interdisciplinary doctoral programs, generic and individualized.

GENERIC PROGRAMS

Generic programs are ongoing, formally structured, and approved doctoral programs. Admission to these programs follows the same procedures as those of departmental programs.

INDIVIDUALIZED PROGRAMS

Individualized programs are specially designed to permit an exceptionally able student who has earned a master's degree or the equivalent to pursue an interdisciplinary doctoral program structured to satisfy his or her unique goals. Such students should apply to the dean of the school if the departments involved in the proposed program are organized within one school or to the provost if the departments are organized within more than one school. The student must satisfy the admission requirements of each of the departments or schools involved in the proposed program.

If the request is approved, the dean or the provost, in consultation with the departments concerned, will designate five members from these departments to serve as an advisory committee. After these advisors meet with the student, a chief advisor is selected to assume responsibility for general guidance to the student. These advisors continue their responsibility until the student is admitted to candidacy for the PhD degree and may, if it is appropriate, continue as the doctoral committee for this student.

OTHER DOCTORAL DEGREES

The University of Pittsburgh, through its professional schools, offers the following doctoral degrees in professional fields of study: Doctor of Education and Doctor of Public Health.

These doctoral degree programs are similar to those for the PhD in the degree of rigor required; the minimum total credit requirements and permissible transfer credits; the requirements for the successful completion of a preliminary evaluation and a comprehensive examination; the admission to doctoral candidacy; the nomination of a doctoral committee; the preparation of the dissertation and abstract; the publication of the dissertation; and the successful completion of the final oral examination. Professional doctoral dissertations are usually based on an in-depth empirical research project by the student and are intended to permit the student to apply relevant theory and knowledge as well as to demonstrate skills in analysis of a major problem and to contribute to the improvement of practice in the student's area of specialization.

Such doctoral degree programs may differ from those for the PhD in several ways. They are generally more strongly focused on professional affairs and practice and often serve as preparation for or advancement of careers in the professions.

STATUTE OF LIMITATIONS/LEAVES OF ABSENCE

The purpose of the statute of limitations is to ensure that a graduate degree from the University of Pittsburgh represents mastery of current knowledge in the field of study. Individual schools within the University may adopt policies that are more stringent, but not less, than those stated here.

All requirements for MA and MS degrees must be completed within a period of four consecutive calendar years from the student's initial registration for graduate study; all professional master's degrees, within five years. Dual degrees and joint degrees that require course work in excess of 50 credit hours may be granted a longer statute of limitations by the University Council on Graduate Study.

From the student's initial registration for graduate study, all requirements for the PhD degree must be completed within a period of ten years, or within eight years if the student has received credit for a master's degree appropriate to the field of study. A student who is unable to complete all degree requirements within a five-year period after passing the comprehensive examination may be re-examined at the discretion of the department or school. Programs for professional doctoral degrees, for which the majority of candidates pursue part-time study while working full-time within their chosen disciplines, may be granted a longer statute of limitations by the schools offering the degrees.

Under exceptional circumstances, a candidate for an advanced degree may apply for an extension of the statute of limitations. The request must be approved by the department or departmental committee (master's or doctoral) and submitted to the dean for final action. Requests for an extension of the statute of limitations must be accompanied by a departmental assessment of the work required of the student to complete the degree as well as documented evidence of the extenuating circumstances leading to the requested extension. Students who request an extension of the statute of limitations must demonstrate proper preparation for the completion of all current degree requirements.

Under special conditions, graduate students may be granted one leave of absence. A maximum leave of two years may be granted to doctoral students or one year to master's students. The length and rationale for the leave of absence must be stated in advance, recommended to the dean by the department, and approved by the dean. If approved, the time of the leave shall not count against the total time allowed for the degree being sought by the student. Readmission following an approved leave of absence is a formality.

GRADUATION

REQUIREMENTS FOR GRADUATION

Graduation requirements for MA, MS, professional master's, and doctoral degrees are described earlier in this bulletin under the relevant sections detailing the regulations pertaining to each degree. In order to graduate from the University of Pittsburgh, a graduate student must be an active University of Pittsburgh student registered for at least one credit or full-time dissertation study in the term of graduation. *See specific schools and programs for detailed information on degree and graduation requirements.*

APPLICATION TO GRADUATE

Students must file an application for graduation in the dean's office of their school early in the term in which graduation is expected. Each school establishes its own deadline by which students must apply for graduation. Students should check with their dean's office for the deadline. As noted above, students must be active and registered in the term in which they are to graduate; in exceptional circumstances, students who complete all the degree requirements at the end of a term but graduate in the next term may petition the dean of the school for a waiver of this registration requirement. The requirement that a student be on active status cannot be waived.

Prior to the end of the term in which they graduate, all doctoral candidates must submit to the dean's office a completed Survey of Earned Doctorates.

CERTIFICATION FOR GRADUATION

The Graduate Faculty of the department or program evaluates the performance of the student. If that performance is satisfactory, a report should be submitted to the dean certifying that the candidate has satisfactorily completed all departmental requirements for a graduate degree. The dean, after confirming that the overall school and University requirements have been met, certifies the candidate for graduation.

COMMENCEMENT

Candidates for graduation are encouraged to appear in person at the Annual Commencement Convocation, usually held the Sunday after the Spring Term ends. Although the degree is officially conferred at commencement, diplomas are mailed to graduates several weeks later.

RIGHTS AND RESPONSIBILITIES

The University has a number of official policies affecting students. For complete and current text on all University policies, please see http://www.pitt.edu/HOME/PP/pp_handbooks.html.

The information below summarizes several key University-wide policies affecting graduate students, but students are also responsible for being cognizant of those University, school, and departmental regulations relevant to their programs of study.

ACADEMIC INTEGRITY POLICY

Students have the right to be treated by faculty in a fair and conscientious manner in accordance with the ethical standards generally recognized within the academic community (as well as those recognized within the profession). Students have the responsibility to be honest and to conduct themselves in an ethical manner while pursuing academic studies. Should a student be accused of a breach of academic integrity or have questions regarding faculty responsibilities, procedural safeguards including provisions of due process have been designed to protect student rights. These general procedures may be found in Guidelines on Academic Integrity: Student and Faculty Obligations and Hearing Procedures at <http://www.pitt.edu/~graduate/ail.html>. Individual schools have their own academic integrity policies, and students are encouraged to review these school-specific guidelines, as well.

AFFIRMATIVE ACTION AND NON-DISCRIMINATION POLICY

The University of Pittsburgh, as an educational institution and as an employer, values equality of opportunity, human dignity, and racial/ethnic and cultural diversity. Accordingly, the University prohibits and will not engage in discrimination or harassment on the basis of race, color, religion, national origin, ancestry, sex, age, marital status, familial status, sexual orientation, disability, or status as a disabled veteran or a veteran of the Vietnam era. Further, the University will continue to take affirmative steps to support and advance these values consistent with the University's mission. This policy applies to admissions, employment, and access to and treatment in University programs and activities.

AIDS POLICY

The University of Pittsburgh does not discriminate against individuals who are diagnosed as HIV positive or as having AIDS. The University recognizes that the health condition of individuals is personal and confidential. Reasonable precautions will be taken to protect information regarding the health condition of all members of the University community. Based on medical evidence that indicates that there is no risk of transmitting HIV through casual contact in the classroom or circumstances involving only casual contact with others, the University will impose no undue restrictions on faculty, staff, or students who are infected with HIV.

For complete text on this policy, see <http://www.pitt.edu/HOME/PP/policies/06/06-01-01.html>.

COMPUTING USE POLICY

Every member of the University community has two basic rights regarding computing: privacy and a fair share of resources. It is unethical for another person to violate these rights. All users, in turn, are expected to exercise common sense and decency with regard to the campus computing resources. Please read Ethical Guidelines for Computing, available in campus computing labs or online at <http://www.pitt.edu/~document/ethics/ethics.html>, for details.

Students are subject to the rules and regulations as described in the University of Pittsburgh Student Code of Conduct (*see below*). Students should realize that any misuse of computing resources may result in the suspension of their computing privileges.

COPYRIGHT POLICY

The University of Pittsburgh affirms that, except as specifically exempted by this policy, faculty, staff, and students are entitled to claim copyright ownership, including world-wide rights, in the following works authored by them: books, articles, educational coursework, similar works that are intended to disseminate the results of academic research or scholarly study, popular fiction or nonfiction works, poems, musical compositions, and other works of artistic imagination.

The University has no proprietary interest in copyrightable materials produced by faculty, staff, or students under contract with entities external to the University (in which the faculty, staff, or students have no controlling or majority interest), except as specifically exempted by this policy. For complete text of the policies, including the aforementioned exemptions, see <http://www.pitt.edu/HOME/PP/policies/11/11-02-02.html>.

DRUG-FREE SCHOOL AND WORKPLACE POLICY

The University of Pittsburgh prohibits the unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance on University property or as part of any University activity. Faculty, staff, and students of the University must also comply with the laws of the Commonwealth of Pennsylvania on the possession and consumption of alcohol.

Violation of this policy will result in disciplinary action within 30 days, including, but not limited to, a warning, written reprimand, suspension, dismissal, expulsion, and/or mandatory participation and successful completion of a drug abuse assistance or rehabilitation program approved by an appropriate health or law enforcement agency.

Any University employee paid from federally funded grants or contracts, or any students participating in any federally funded or Guaranteed Student Loan program, must notify the University of any criminal drug statute conviction for a violation occurring at the University or while engaged in University activities.

For complete text on this policy, see <http://www.pitt.edu/HOME/PP/policies/06/06-02-01.html>.

FACULTY-STUDENT RELATIONSHIPS

The University's educational mission is promoted by professional relationships between faculty members and students. Relationships of an intimate nature (that is, sexual and/or romantic) compromise the integrity of a faculty-student relationship whenever the faculty member has a professional responsibility for the student. The University prohibits relationships between a faculty member and a student whose academic work, teaching, or research is being supervised or evaluated by the faculty member.

If an intimate relationship should exist or develop between a faculty member and a student, the University requires the faculty member to remove himself/herself from all supervisory, evaluative, and/or formal advisory roles with respect to the student.

Definition Note: In this policy, the definition of "faculty member" refers to anyone appointed by the University as a teacher, researcher, or academic administrator, including graduate and undergraduate students so appointed. For complete text on this policy, see <http://www.pitt.edu/DOC/94/271/42590/policies/02/02-04-03.html>.

FAMILY EDUCATIONAL RIGHTS AND PRIVACY ACT

In compliance with the Family Educational Rights and Privacy Act of 1974, commonly referred to as the Buckley Amendment, the University guarantees that students have the right to inspect all personally identifiable records maintained by the institution and may challenge the content and accuracy of those records through appropriate institutional procedures. It is further guaranteed by the University that student records containing personally identifiable information will not be released except as permitted by the Family Educational Rights and Privacy Act. See <http://www.pitt.edu/~srfswb/buckley.htm> for more information on FERPA.

GRADUATE STUDENT RESEARCHER POLICY STATEMENT

Graduate Student Researchers (GSRs) at the University of Pittsburgh are graduate students who are receiving financial support from research

funds in return for duties performed to meet the goals for which the funds were awarded. The research performed is also normally an integral part of the student's research practicum experience, thesis, or dissertation. A primary goal of the appointment, from the point of view of both the University and the student, is to provide financial support to the graduate student. For the complete text of the GSR Policy Statement, refer to <http://www.pitt.edu/~graduate/gsr.html>.

HARASSMENT POLICIES

HARASSMENT

No University employee, student, or individual on University property may intentionally harass or abuse a person (physically or verbally) with the purpose or effect of unreasonably interfering with such person's work or academic performance, or of creating an intimidating, hostile, or offensive work or academic environment.

SEXUAL HARASSMENT

The University of Pittsburgh is committed to the maintenance of a community free from all forms of sexual harassment. Sexual harassment violates University policy as well as state, federal, and local laws. It is neither permitted nor condoned.

It is also a violation of the University of Pittsburgh's policy against sexual harassment for any employee or student at the University of Pittsburgh to attempt in any way to retaliate against a person who makes a claim of sexual harassment.

Any individual who, after thorough investigation and an informal or formal hearing, is found to have violated the University's policy against sexual harassment, will be subject to disciplinary action, including, but not limited to, reprimand, suspension, termination, or expulsion. Any disciplinary action taken will depend upon the severity of the offense. For more information, see <http://www.pitt.edu/~provost/har.html>.

HUMAN RESEARCH SUBJECTS: INSTITUTIONAL REVIEW BOARD

The University of Pittsburgh is guided by the ethical principles regarding all research involving humans as subjects, as set forth in the report of the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (entitled: *Ethical Principles and Guidelines for the Protection of Human Subjects for Research [the "Belmont Report"]*).

Most research at the University involving humans as subjects must be reviewed and approved by an Institutional Review Board (IRB) before the research will be allowed to proceed. For complete text of the IRB's policies and practices, see <http://www.irb.pitt.edu/> or contact the IRB at (412) 692-4370.

PATENT POLICY

A University student, during his/her period of enrollment, may be responsible for new discoveries and inventions that could have commercial value and contribute to scientific, technological, social, and cultural progress. Those accomplishments should be patented in the best interest of the student, the University, the public, and the government. The University's policy on patents determines the rights and obligations of the student and the University in any technology the student may invent while enrolled in the University. Details of this University policy are available from the Office of Technology Transfer and Intellectual Property at 200 Gardner Steel Conference Center and at <http://www.pitt.edu/HOME/PP/policies/11/11-02-01.html>.

RESEARCH INTEGRITY

The University of Pittsburgh seeks excellence in the discovery and dissemination of knowledge. Excellence in scholarship requires all members of the University community to adhere strictly to the highest standards of integrity with regard to research, instruction, and evaluation. Research misconduct carries potential for serious harm to the University community, to the integrity of science, and to society as a whole. The University's Research Integrity Policy is available online at <http://www.pitt.edu/DOC/94/271/42590/policies/11/11-01-01.html>.

SMOKING POLICY

Smoking is prohibited in all University-owned and leased facilities, including residence halls and off-campus housing facilities, and in all University vehicles, including motor pool vehicles, campus buses, and vans, with explicit limited exceptions described in University Policy 04-05-03.

STUDENT CODE OF CONDUCT

The Student Code of Conduct is an outline of the non-academic rights and responsibilities of University students. The code defines offenses against students. A student or University official may file a complaint of violation of the Student Code of Contact at the University Student Judicial System Office. For a copy of the code, please contact the

Judicial System Office in 738 William Pitt Union at (412) 648-7918 or see <http://www.pitt.edu/~osaweb/usjs/code.html>.

JUDICIAL SYSTEM

The Office of the University Student Judicial System coordinates the Campus Judicial Board. It also receives, previews, and acts upon complaints of violations of the Student Code of Conduct. Its purpose is to provide due process and fair treatment in disciplinary actions. All complaints should be filed here.

Judicial Affairs also conducts a Student Mediation Program, monitors FERPA (Family Educational Rights and Privacy Act) guidelines on student records, and screens requests for contact of students.

**TEACHING ASSISTANT/TEACHING FELLOW/
GRADUATE STUDENT ASSISTANT POLICY
STATEMENT**

Teaching Assistants (TAs), Teaching Fellows (TFs), and Graduate Student Assistants (GSAs) at the University are graduate students who are receiving support in return for specified duties while gaining teaching and teaching-related experience under the guidance of faculty mentors. Their primary objective, from the standpoint of the University and the individual, is to make steady progress toward an advanced degree. TA/TF/GSA appointment status is dependent upon graduate student status. The complete policy statement for TA/TF/GSAs is available at <http://www.pitt.edu/~graduate/tapolicy.html>.

SPECIAL ACADEMIC OPPORTUNITIES

Special academic opportunities such as certificate programs provide students with ways to augment their education and experience with expanded study programs both on and off campus, in both university and professional settings.

AREA OF CONCENTRATION AND MINORS

Some graduate programs may include approved areas of concentration or minors. Areas of concentration define and describe the student's training and expertise within the broader discipline. Minors represent significant course work completed in an area related to the student's specialty. An area of concentration that is specified for a particular degree program can only be posted to the academic record and the official transcript of those students completing the degree program. A graduate minor offered by the faculty at the Pittsburgh campus is available to any graduate student enrolled in an academic degree program on the campus provided that the school from which the student is graduating recognizes this minor. For each degree, only one minor and one area of concentration can be pursued. Areas of concentration or minors are added to the transcript upon the granting of the degree. *See the Schools, Departments, and Programs section of this bulletin for available areas of concentration and minors.*

CERTIFICATE PROGRAMS

Students may enrich their educational experience by electing to take an academic interdisciplinary certificate program in the areas listed at the start of the Schools, Departments, and Programs section of this bulletin (*see page 31*).

A certificate program at the graduate level is a coherent set of courses and related work in a particular area; the minimum credit requirement is 15 credits, of which 12 credits must be earned at the University of Pittsburgh. The certificate may appear on the transcript as a degree goal and will appear on the final transcript as an awarded certificate.

A student must be formally admitted into a certificate program. The requirements for each certificate vary and students should contact the certificate program director.

CROSS REGISTRATION

Carnegie Mellon University, Duquesne University, the Pittsburgh Theological Seminary, Robert Morris College, and the University of Pittsburgh offer graduate students the opportunity for cross registration

in graduate programs in the five institutions in the Fall and Spring Terms. *See Cross Registration in the Registration section of this bulletin for further details.*

TWO INDEPENDENT DEGREE PROGRAMS SIMULTANEOUSLY

Students may pursue two independent graduate degrees simultaneously in two different schools within the University or two different departments within the same school. Students desiring to enroll in two degree programs must have approval from both program faculties and their respective deans, must be admitted into both programs, and must satisfy the degree requirements of both programs. Students are billed at the tuition rate of the primary academic program. Normally, such students should be enrolled for no more than a total of 15 credits per term.

The same examination, thesis, or dissertation cannot be used to fulfill requirements for two independent degrees, although a maximum of six credits of course work may be used in partial fulfillment of the requirements of both degrees. It is the responsibility of the dean or deans, if two schools are involved, to ensure that this regulation is enforced.

COOPERATIVE-, DUAL-, AND JOINT-DEGREE PROGRAMS

Dual- and joint-degree programs result in two degrees being awarded. Requirements for these programs include all or most of the requirements of two distinct academic degree programs. These programs may result in a student earning two separate master's degrees, a master's and a first-professional degree, or a master's or first-professional degree and a doctoral degree, but never result in a student earning two separate doctoral degrees. Dual programs exist within a single school; joint programs exist between two or more schools; cooperative programs are administered by two or more institutions. The same course, examination, or thesis may be used to fulfill requirements only if so specified in the documents formally establishing the joint- or dual-degree program approved by the University.

Students must be admitted to both academic programs offering the dual or joint degrees being sought and must graduate from both degree programs at the same time. Students are advised to see the individual school for other specific requirements that apply.

SCHOOLS, DEPARTMENTS, AND PROGRAMS

Students who are interested in or accepted to any of the University of Pittsburgh's graduate or professional programs listed below other than those leading to the first-professional degrees offered by the University (MD, JD, LL.M., PharmD, or DMD) will find useful most of the sections of this bulletin. Descriptions of the University, its regulations, and its services are included in the sections prior to the program-specific information in the Schools, Departments, and Programs section of the bulletin, and should be read in conjunction with the specific program information detailed under the relevant school.

Students interested in first-professional programs (MD, JD, LL.M., PharmD, or DMD) can ignore much of the bulletin prior to the First-Professional Programs section, but should familiarize themselves with the general information on the University, as well as the section on Campus Facilities & Student Services, and the University-wide policies detailed in Rights and Responsibilities. The **Schools of Medicine, Law, Dental Medicine, and Pharmacy** appear in the Graduate Programs section for programs leading to the graduate and professional advanced degrees as well as in the First-Professional Programs section since these schools offer both types of programs. Faculty are listed by their department or program at the end of the school.

Students should note that the listings of requirements and procedures for admissions, registration, and other information listed in the sections prior to the more program-specific information provided in the Schools, Departments, and Programs section of this bulletin represent the minimum requirements and basic procedures. Students should consult the information on their specific school, program, and department for detail on additional, stricter, or more specific requirements and procedures.

DEGREE- AND CERTIFICATE-GRANTING PROGRAMS

The University of Pittsburgh offers numerous graduate degrees, first-professional degrees, and certificates in its graduate and professional schools. These degree and certificate programs are listed below.

Program	Degree(s) Offered	Academic Center ¹
Acute Care Nurse Practitioner	MSN	Nursing
Administrative and Policy Studies	MA, MEd, EdD, PhD	Education
Anatomy-Histology	Certificate	Dental Medicine
Anesthesiology	Certificate	Dental Medicine
Anthropology	MA, PhD	FAS
Applied Mathematics	MA, M	FAS
Applied Statistics	MA, MS	FAS
Area Studies	MBA/MA	Business/FAS
Asian Studies	Certificate	UCIS
Astronomy	MS, PhD	FAS
Behavioral and Community Health Sciences	MPH	GSPH
Biochemistry & Molecular Genetics	MS, PhD	Medicine
Bioengineering	MSBeng, PhD	Engineering

Program	Degree(s) Offered	Academic Center ¹
Bioethics	MA	FAS
Biological Sciences	MS, PhD	FAS
Biostatistics	MPH, MS, DrPH, PhD	GSPH
Business Administration	MBA, PhD	Business
Cell Biology and Molecular Physiology	MS, PhD	Medicine
Cellular and Molecular Pathology	MS, PhD	Medicine
Chemical Engineering	MScHE, PhD	Engineering
Chemistry	MS, PhD	FAS
Civil & Environmental Engineering	MSCEE, PhD	Engineering
Civil Litigation	Certificate	Law
Classics	MA, PhD	FAS
Clinical Cardiovascular Engineering	Certificate	Engineering
Clinical Research	MS, Certificate	Medicine
Communication Science and Disorders	MA, MS, PhD	SHRS
Computer Science	MS, PhD	FAS
Cultural Studies	Certificate	FAS
Dental Medicine	DMD	Dental Medicine
East Asian Studies	MA	FAS
Eastern European Studies	Certificate	UCIS
Economics	MA, PhD	FAS
Economic and Social Development	MPIA	GSPHA
Electrical Engineering	MSEE, PhD	Engineering
Employee Assistance Program	Certificate	Social Work
Endodontics	Certificate, MDS	Dental Medicine
English	MA, MFA, PhD	FAS
Environmental and Occupational Health	MS, MPH, PhD	GSPH
Environmental Health Risk Assessment	Certificate	GSPH
Environmental Law, Science, and Policy	Certificate	Law
Epidemiology	MPH, MS, DrPH, PhD	GSPH
Family and Marital Therapy	Certificate	Social Work
Film Studies	Certificate	FAS
French	MA, PhD	FAS
Genetic Counseling	MS	GSPH
Geology and Planetary Science	MS, PhD	FAS
German Languages & Literatures	MA, PhD	FAS
Gerontology	Certificate	Social Work
Global Political Economy	MPIA	GSPHA
Health Administration	MHA	GSPH
Health and Community Systems	MSN	Nursing
Health Law	Certificate	Law

Program	Degree(s) Offered	Academic Center¹	Program	Degree(s) Offered	Academic Center¹
Health, Physical, and Recreation Education	MS, PhD	Education	Nursing	PhD	Nursing
Health Promotion and Development	MSN	Nursing	Occupational Medicine	MPH	GSPH
Health Promotion and Education	MHPE	Education/GSPH	Occupational Therapy	MOT	SHRS
Health and Rehabilitation Sciences	MS	SHRS	Orthodontics	Certificate, MDS	Dental Medicine
Health Services Administration	DrPH	GSPH	Periodontics	MDS	Dental Medicine
Hispanic Languages & Literatures	MA, PhD	FAS	Petroleum Engineering	MSPE	Engineering
History	MA, PhD	FAS	Philosophy	MA, PhD	FAS
History & Philosophy of Science	MA, PhD	FAS	Pharmaceutical Sciences	MS, PhD	Pharmacy
History of Art & Architecture	MA, PhD	FAS	Pharmacy	PharmD	Pharmacy
Human Genetics	MS, PhD	GSPH	Physical Therapy	MPT	SHRS
Immunology	MS, PhD	Medicine	Physics	MS, PhD	FAS
Industrial Engineering	MSIE, PhD	Engineering	Policy Research and Analysis	MPA	GSPIA
Infectious Diseases & Microbiology	MPH, MS, DrPH, PhD	GSPH	Political Science	MA, PhD	FAS
Information Science	Certificate, MSIS, PhD	SIS	Prosthodontics	MDS	Dental Medicine
Instruction and Learning	MA, MAT, MEd, MS, EdD, PhD	Education	Psychology	MS, PhD	FAS
Intelligent Systems	MS, PhD	FAS	Psychology in Education	MA, MEd, PhD	Education
International Business	MBA/MIB	Business	Public and International Affairs	PhD	GSPIA
International and Comparative Law	LLM	Law	Public and Nonprofit Management	MPA	GSPIA
International and Comparative Law	Certificate	Law	Public Policy and Management	MPPM	GSPIA
Italian Languages & Literatures	MA	FAS	Radiation Health	Certificate	GSPH
Latin American Social and Public Policy	Certificate	UCIS	Rehabilitation Engineering	Certificate	Engineering
Latin American Studies	Certificate	UCIS	Rehabilitation Science	PhD	SHRS
Law	JD	Law	Rehabilitation Technology	Certificate	SHRS
Library and Information Science	Certificate, MLIS, PhD	SIS	Religion (Cooperative Program in the study of)	PhD	FAS
Linguistics	MA, PhD	FAS	Religious Studies	MA	FAS
Management of Information Systems	MS	Business	Rhetoric and Communication	MA, PhD	FAS
Management Program for Health Professionals	Certificate	Nursing/GSPH	Russian Studies	Certificate	UCIS
Manufacturing Systems Engineering	MSMfSE	Engineering	Security and Intelligence Studies	MPIA	GSPIA
Materials Science & Engineering	MSMSE, PhD	Engineering	Slavic Languages & Literatures	MA, PhD	FAS
Mathematics	MA, MS, PhD	FAS	Social Work	MSW, PhD	Social Work
Maxillofacial Prosthetics	Certificate	Dental Medicine	Sociology	MA, PhD	FAS
Mechanical Engineering	MSME, PhD	Engineering	Soviet Studies	Certificate	UCIS
Medicine	MD	Medicine	Statistics	MA, MS, PhD	FAS
Medieval and Renaissance Studies	Certificate	FAS	Studies of Law	MSL	Law
Molecular Pharmacology	MS, PhD	Medicine	Teaching English to Speakers of Other Languages	Certificate	FAS
Molecular Virology & Microbiology	MS, PhD	Medicine	Telecommunications	Certificate, MST	SIS
Multidisciplinary MPH	MPH (limited enrollment)	GSPH	Theater Arts	MA, MFA, PhD	FAS
Music	MA, PhD	FAS	Urban and Regional Affairs	MPA	GSPIA
Neurobiology	MS, PhD	Medicine	West European Studies	Certificate	UCIS
Neuroscience	MS, PhD	FAS	Women's Studies	Certificate	FAS
Nurse Anesthesia	MSN	Nursing			

¹ Acronyms for academic centers are as follows:

FAS = Faculty of Arts and Sciences

GSPH = Graduate School of Public Health

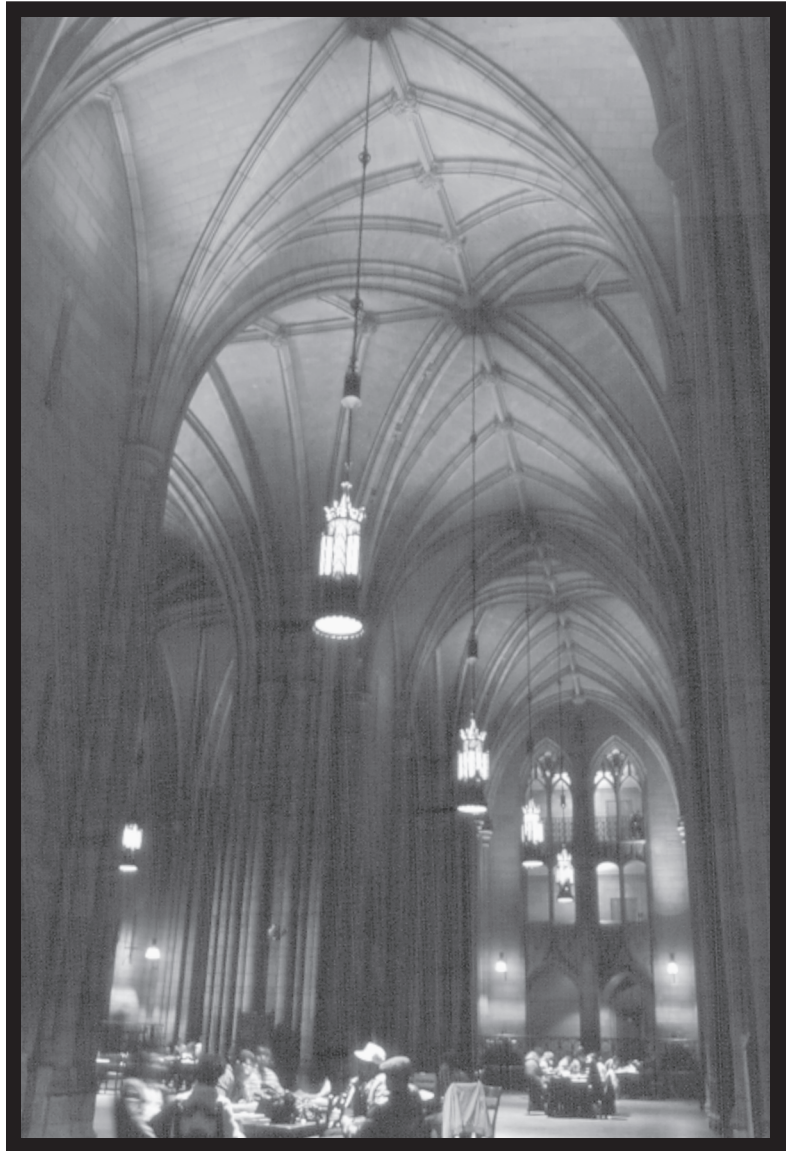
GSPIA = Graduate School of Public and International Affairs

SHRS = School of Health and Rehabilitation Sciences

SIS = School of Information Sciences

UCIS = University Center for International Studies

UNIVERSITY OF PITTSBURGH



GRADUATE PROGRAMS

SCHOOL OF ENGINEERING

The mission of the **School of Engineering** is to produce highly qualified engineers and useful creative research and technology through academic excellence.

The faculty and staff at the University of Pittsburgh **School of Engineering** will be recognized for providing excellent educational programs, for conducting leading edge research, and for creating innovative industrial partnerships.

School of Engineering leaders are committed to:

- Scholarship and creativity
- Collegiality and open-mindedness
- Student satisfaction with their University experience
- Diversity in the school's staff, faculty, and student body
- Accountability for their performance
- Quality in teaching and research
- Academic freedom
- Shared governance and responsibility
- Interdisciplinary collaboration

Graduate study in engineering is designed for those professionals who wish to further develop the ability to apply engineering principles to the solution of the problems of modern society. The programs are flexible and can be used by those interested in industrial production, research, design, management, teaching, and related technical positions in both the public and private sectors.

The University of Pittsburgh **School of Engineering** offers graduate education leading to the Master of Science and Doctor of Philosophy degrees in the following programs: bioengineering, chemical engineering; civil engineering; electrical engineering; industrial engineering; materials science and engineering; and mechanical engineering. Graduate programs leading to Master of Science degrees in manufacturing systems engineering and petroleum engineering are also offered. All **School of Engineering** MS degree programs have two tracks: a professional track and a research track.

The graduate program has been in operation for over 80 years with the first MS and PhD degrees in engineering awarded in 1919 and 1929, respectively. During the 1998-99 academic year, there were over 560 students registered in graduate engineering programs, and a total of 150 MS and 31 PhD degrees were awarded.

CONTACT INFORMATION

The **School of Engineering** is housed in the Michael L. Benedum Hall of Engineering. Inquiries and correspondence concerning graduate study should be addressed to the Graduate Coordinator of the appropriate department or program. Inquiries of a general nature can be sent to:

Associate Dean for Academic Affairs
323 Benedum Engineering Hall

School of Engineering

University of Pittsburgh

Pittsburgh, PA 15261

E-mail: admin@engrng.pitt.edu

Web site: <http://www.engrng.pitt.edu/> for more information.

ADMISSIONS

All applicants will be judged on their own merits. For recent graduates of an ABET-accredited program, admission will be based primarily on the undergraduate academic record. Typically a B average (cumulative quality point average of 3.0 on a 4.0 scale) or better is desired for admission. The Graduate Record Examination (GRE) is required for certain programs. Applicants should check each program's specific requirements.

Applicants from non-ABET accredited programs also are considered on an individual basis with emphasis given to academic achievement, area of study, career orientation, and work experience. Depending on the program, applicants who do not have an engineering degree may have to take certain pre-requisite courses before beginning their graduate engineering degree program. Applicants may be admitted provisionally until specified prerequisites are completed and/or a 3.00 grade point average is achieved.

ADMISSIONS PROCEDURES

(1) U.S. citizens or permanent residents should:

- a. See the **School of Engineering** Web site (<http://www.engrng.pitt.edu/>), or contact a departmental graduate coordinator for the application material.
- b. Return the completed application material with a check or money order for \$40 payable to the University of Pittsburgh. This application fee is not refundable.
- c. Ask the registrars of all undergraduate and graduate schools attended to send transcripts of records to the **School of Engineering** Office of Administration; 253 Benedum Engineering Hall; University of Pittsburgh; Pittsburgh, PA 15261. An official transcript of the undergraduate record is required unless the applicant is a graduate of the University of Pittsburgh.

Once all application material, including the application fee and complete transcripts, are received, the application will be reviewed. The deadline for the fall term is July 1; the spring term deadline is November 1; and the summer term deadline is March 1.

Please see Graduate Admissions of International Students on page 3 of the front section of this bulletin for University regulations on admissions of international students.

- (2) In addition to academic review by the **School of Engineering**, the Admissions Officer, Office of International Services (OIS) will also process international student applications for non-academic qualifications. The document needed to apply for a non-immigrant visa will be issued only after the applicant has been admitted and has provided evidence of adequate financial support and English

language proficiency. The procedure for international applicants is as follows:

- a. Preliminary inquiries concerning graduate programs, research, and financial aid may be directed to the departmental graduate coordinator. Applications for graduate study are available from <http://www.engrng.pitt.edu/>, the graduate coordinator, or the **School of Engineering** Office of Administration; 253 Benedum Hall; Pittsburgh, PA 15261. The non-refundable application fee for international students is \$40.
- b. Following review (and acceptance) by the department based upon the applicant's academic qualifications, the International Student Admissions Officer will review the applicant's financial and language qualifications to determine eligibility for a visa document.

This procedure applies also to international applicants who are already in the United States.

The University reserves the right, even after the arrival and enrollment of a student from another country, to require, at the student's expense, individual curricular adjustments whenever particular deficiencies or needs are found. This may include enrollment without credit in English as a foreign language or other prerequisite courses. New international students are encouraged to use the services of OIS for help in adjusting to the United States and to facilitate their total educational experience.

FINANCIAL AID

The **School of Engineering** provides a considerable amount of financial assistance to highly qualified, full-time graduate students. Applicants interested in being considered for financial assistance including teaching and research assistantships must also complete a graduate assistantship form available at <http://www.engrng.pitt.edu/> and should check with the department of their choice for any additional information concerning applications for assistantships. All applications for financial assistance should be received by February 1 for admission the following Fall Term.

Financial aid includes:

- (1) Fellowships awarded to students of outstanding ability, usually as an unrestricted grant.
- (2) Traineeships awarded to students for training in selected areas.
- (3) Teaching Assistantships and Teaching Fellowships awarded to exceptionally well-prepared students in return for assistance in laboratories, recitation sections, and other teaching duties. Partial or full tuition scholarships are provided with these assistantships.
- (4) Research Assistantships awarded to students for assistance on research programs. Partial or full tuition scholarships are provided as part of the assistantship.

ADVISORS

The following are the three advisors who will be primarily responsible for guiding engineering students through their program:

GRADUATE COORDINATOR

The graduate coordinator is the faculty member responsible for the operation of the department's graduate program. The coordinator supervises the operations of admissions, registration, course

scheduling, assignment of advisors, graduation, and academic disciplinary procedures. The graduate coordinator generally is the best source of information and advice when questions arise or problems are encountered during graduate study.

FACULTY ADVISOR

Each student is assigned a faculty advisor when admitted into a graduate program. The advisor will assist the student in planning a course of study and is responsible for approving the student's registration and all course changes. Once the student begins thesis or dissertation research, the duties of the faculty advisor will be assumed by the student's major (research) advisor.

MAJOR (RESEARCH) ADVISOR(S)

The major (research) advisor (or advisors if joint advisors are designated) is the graduate faculty member who directs the student's research and supervises the preparation of the thesis or dissertation. Generally, the major advisor also serves as the chair of the final oral examination (defense) committee for the student's thesis or dissertation.

RESPONSIBILITY FOR ACADEMIC PROGRESS

It is the student's responsibility to check his or her academic progress by contacting either the departmental graduate coordinator or the student's faculty advisor. The student should also become familiar with the program degree requirements and pertinent academic regulations.

MASTER OF SCIENCE PROGRAMS

All departments in the **School of Engineering**, as well as the Manufacturing Systems Engineering Program, offer MS degree programs that have two tracks: a professional track and a research track. The differences are detailed below.

PROFESSIONAL MSTRACK

The professional track consists of 30 credits (ten courses). The faculty of the degree-granting unit determines the actual course content and requirements. These programs typically have a set of required core courses. Students may have an opportunity for in-depth study in a particular area of interest through a two- or three-course concentration. As a professional degree, there are no thesis or comprehensive examination requirements.

The professional MS programs are oriented towards full-time students seeking a career in industry, and part-time students currently working in industry. Certain programs may be offered off-campus at industrial sites or through distance learning. Depending on the particular MS degree program, students who have an undergraduate degree in a technical area (e.g., mathematics, physics, computer science, or chemistry) may be required to take certain pre-requisite courses. Interested students should contact the appropriate graduate coordinator for specific details.

RESEARCH MSTRACK

The research track is primarily for those students who wish to pursue the PhD. A thesis may be required at the discretion of the responsible department or program. Students in this track will be advised to take those courses best suited for a research degree. The MS research track requires a minimum of 24 course credits, depending on the selected option. The department may also specify credit distribution requirements for courses in the major and related areas. The student should see his or her major department for detailed information. Students working under the MS research option may be required to

present a thesis showing marked attainment in some area of the student's major subject. Acquisition of the methods and techniques of scientific investigation should also be demonstrated. Some programs may permit a project to be completed in replacement for the thesis. The University transcript will include an entry indicating that the student is in the research MS track.

A graduate student may commence MS thesis work after fulfilling all the following requirements:

- (1) Completion of at least 12 graduate credits of course work
- (2) Cumulative quality point average of 3.00 or better
- (3) Full graduate status

A graduate student should initiate preliminary thesis and research work as early as possible. Once research and thesis work has begun, the student must register for thesis credits in each succeeding term until successful completion of the thesis and the final oral examination. Exceptions to this rule can be made only upon the recommendation of the student's major advisor.

Only six credits of MS thesis may be used as partial fulfillment of the requirements for the MS degree. Before completion of the thesis, the student will receive a grade of I (incomplete) at the end of each term. After successful completion of the thesis and the final oral examination, all I grades will be changed to S.

A Style and Form Manual for thesis preparation is available in the Engineering Office of Administration.

■ MS Thesis Oral Examination (Defense)

The purpose of this examination is to evaluate the MS thesis and is part of the MS thesis requirements as specified by the program. *For additional information on the thesis exam, see Thesis Option under Regulations Pertaining to Master of Arts and Master of Science Degrees.*

RESIDENCY AND STATUTE OF LIMITATIONS REQUIREMENTS

A graduate student may complete all requirements for the MS degree on a part-time basis. All degree requirements for the MS degree, however, must be fulfilled within a period of four calendar years after the student's first registration for graduate study.

DOCTOR OF PHILOSOPHY PROGRAMS

The general PhD requirements of the School of Engineering are listed below. Further information concerning departmental requirements and options can be found under each departmental program description.

ENTRANCE TO THE PhD PROGRAM

A graduate student who has received the Master of Science degree in one engineering program area or has equivalent preparation is eligible to enter a doctoral program in that same area. To be accepted for a doctoral program, a graduate student must have achieved a superior scholastic record and shown great promise for conducting independent research. A prospective doctoral student should have a cumulative graduate quality point average of 3.30 or better in graduate course work. Evidence of research aptitude, including favorable recommendations, is required. Exceptionally well-qualified students may be permitted to enter the PhD program without an MS degree according to the established criteria and qualifications set by each

department. Admission to a doctoral program does not include any implication concerning admission to candidacy for the PhD degree.

COURSE AND DISSERTATION CREDIT REQUIREMENTS

An objective of the PhD program is to attain a high degree of competence in the student's chosen field of specialization. Completion of the PhD program requires a total of 72 credits, of which at least 18 must be for dissertation research. The graduate faculty determines the minimum course requirements for each PhD program. Typically each program has a core of well-coordinated courses followed by advanced course work in one or more specialty areas, with the number of course credits varying among programs. Additional course work may be prescribed in accord with the student's specific needs. A student may also partially attain the required degree of competence by other means including independent study under faculty supervision. Regardless of how the required competence is obtained, it must be certified by passing the appropriate series of examinations.

Students who have been formally admitted to PhD candidacy may register for dissertation research. Preliminary dissertation research can be done as part of an appropriate departmental course. The number of dissertation credits for which a student registers should be commensurate with the independent research effort to be undertaken during the term. Minimum registration is three credits per term. Of the minimum of 18 credits of dissertation research for which students must register, at least 12 credits must be for the program's PhD dissertation research course (3999). These may be taken only after admission to candidacy; the other six credits may be in the department's pre-candidacy PhD research course.

Doctoral students who have completed all credit requirements for the degree, including any minimum dissertation credit requirements, and are working full time on their dissertations may register for Full-time Dissertation Study, which carries no credits or letter grade but provides students full-time status. Students so enrolled are assessed a special tuition fee.

Once a student registers for dissertation research (3999), he or she must continue to register for dissertation research in successive terms (not including the summer term) until the final oral examination has been passed. (In special cases this requirement may be waived by written permission of the major advisor.) Upon successful completion of the final oral examination, all I grades will be changed to S grades.

DOCTOR OF PHILOSOPHY EXAMINATIONS

To complete the PhD program, students must pass three exams: the preliminary examination, the comprehensive examination, and the final oral examination.

■ Preliminary Examination (Qualifier)

See Preliminary Evaluation under Regulations Pertaining to Doctoral Study on page 24 for an overview of the purpose of this examination, and then review the school-specific information below. This examination is usually taken within the first two to four terms of graduate study and is a first step towards the student's formal admission to candidacy for the Doctor of Philosophy degree. Each program determines the exact format and content of this examination, which usually consists of written and oral components. Qualifier examinations are usually given once a year at a time specified by the program.

■ Comprehensive Examination

See Comprehensive Examination under Regulations Pertaining to Doctoral Study on page 24 for an overview of the purpose and

regulations regarding this examination, and then review the school-specific information below. The nature and timing of this examination is determined by the department; it may be combined with the student's formal presentation of his/her dissertation proposal.

■ Final Oral Examination (Defense)

See *Final Oral Examination under Regulations Pertaining to Doctoral Study on page 25 for an overview of the purpose and regulations regarding this examination, and then review the school-specific information below.* The final oral examination determines the acceptability of the dissertation and the candidate's ability to comprehend, organize, and contribute to the chosen field of research. One copy of the dissertation must be submitted to each member of the doctoral committee at least two weeks before the date set for the final oral examination.

ADMISSION TO PHD CANDIDACY

See *Admission to Candidacy for the Doctor of Philosophy Degree on page 25 of Regulations Pertaining to Doctoral Degrees for the requirements for admission.* An Application for Admission to Candidacy for the Doctoral Degree must be filed after these requirements have been met.

In order to have the dissertation topic approved, the student must prepare, in consultation with the major advisor, a dissertation proposal. A formal dissertation proposal conference will then be held in which the members of the doctoral committee will review the proposal and either accept, revise, or reject it. Depending on the department's procedure, this conference may be held in conjunction with the comprehensive examination. Approval of the proposal does not imply either the acceptance of a dissertation prepared in accord with the proposal or the restriction of the dissertation to this original proposal.

If the dissertation proposal is accepted by the doctoral committee, the student is formally admitted to Candidacy for the Doctor of Philosophy degree. Such admittance to PhD candidacy must be accomplished at least one term before the student plans to graduate.

DOCTORAL COMMITTEE

See *Doctoral Committee on page 24 of Regulations Pertaining to Doctoral Degrees for an overview of the committee's make up and responsibilities.* In addition, the following school-specific rules apply in the **School of Engineering**:

Faculty who hold a secondary appointment but actively participate in the department will be considered as internal rather than external members of the doctoral committee. Hence, they may serve as the major advisor. Faculty members whose secondary appointment within the department is viewed as a courtesy appointment may be considered as an external committee member, but cannot serve as the student's sole committee chair (major advisor).

If a committee member leaves the University, that member should be replaced unless the dissertation will be completed within the next 12 months.

PHD DISSERTATION

Each student must prepare a dissertation embodying an extended original, independent investigation of a problem of significance in the student's field of specialization. The dissertation must add to the general store of knowledge or understanding of that field. Dissertations must be written in English following the guidelines set down in a Style and Form Manual, available in the Engineering Office of Administration or at <http://www.pitt.edu/~graduate/style.html>.

A dissertation submitted to the **School of Engineering** in partial fulfillment of the requirements for an advanced degree must be free from any restriction, other than the author's copyright, concerning its publication by any agency outside the University. Any publication of a dissertation must be with appropriate acknowledgment to the University of Pittsburgh. After the dissertation has been prepared and approved by the major advisor, the final oral examination shall be held.

After the final oral examination is successfully completed, the candidate must provide at least one copy of the approved completed dissertation in final form to the department chair. One unbound copy of the dissertation, the committee signature sheet, three copies of the title page, one original and three copies of the abstract, and the receipt for the binding fee must be provided to the Engineering Office of Administration. The candidate is also required to execute an agreement with University Microfilms International for the publication of the dissertation on microfilm and for the publication of the abstract of the dissertation in Dissertation Abstracts.

DEPARTMENT OF BIOENGINEERING

Jerome S. Schultz, Chair

Web site: <http://www.engrng.pitt.edu/~wwwbiotc/graduate/>

The Department has an active, interdisciplinary graduate bioengineering program in conjunction with faculty from the **School of Medicine**, the **School of Health and Rehabilitation Sciences**, and the clinical staffs at the University of Pittsburgh Medical Center hospitals.

This graduate program is directed toward engineering and life science education and research, with particular emphasis on the PhD. Its scope is broadly defined to incorporate the application of engineering principles, methods, and technology in two broad areas: scientific inquiries into fundamental biological phenomena; and development of instrumentation, materials, devices, and systems relative to application in the biological sciences and medicine. Thus, the bioengineering faculty is applying various forms of engineering principles, mathematics computation, technology, and methodology to a broad variety of medical and life sciences problems.

Active, externally funded areas of research include: computer processing of biologically derived signals; computer analysis of radiographic, ultrasonic, and nuclear magnetic resonance images; development of prostheses, artificial organs, and implantable sensors; development of medically related instrumentation; mathematical modeling of physiological systems; tissue engineering; environmental control technology using biological and physical chemical techniques; biomaterials; orthopedic biomechanics and sports medicine; vascular mechanics and bioseparations.

CONTACT INFORMATION

Department of Bioengineering

University of Pittsburgh

749 Benedum Hall

Pittsburgh, PA 15261

Web site: <http://www.engrng.pitt.edu/~wwwbiotc/graduate/>

MASTER OF SCIENCE PROGRAMS

The Master of Science in Bioengineering is primarily designed for students with an undergraduate degree in engineering, although students with other backgrounds can be accommodated with specially designed programs. Course work in the program includes both life sciences and engineering. A master's thesis is required for the research MS; course requirements for the research MS are detailed below. In addition, a 30-credit, non-thesis, professional MS degree program is available for those qualified students who are employed in industry. Interested students should contact the Bioengineering Graduate Coordinator, Harvey Borovetz (borovetzhs@msx.upmc.edu).

RESEARCH MS PROGRAM

The Research MS program requires a total of 36 credits, including the following:

- Graduate Engineering Mathematics – three credits
- Statistics for Bioengineers – three credits
- Societal, Political, and Ethical Issues in Bioengineering – three credits
- Life Sciences – six credits
- Three of the following four courses (nine credits):

BIOENG 2064	Biomechanics of Tissues and Organs
BIOENG 2310	Hemodynamics and Biotransport
BIOENG 2510	Biomedical Signal Processing and Analysis
BIOENG 2810	Biomaterials and Biocompatibility

- Graduate Electives – six credits
- MS Thesis – six credits

DOCTOR OF PHILOSOPHY PROGRAM

Students pursuing the PhD degree are required to pass a preliminary examination based on the Bioengineering coursework at the end of their first year of graduate study. Students pursuing the PhD are also required to complete two one-semester TA assignments.

A PhD proposal (comprehensive examination) is presented, generally at the end of the second year. A final, public PhD defense is made by each PhD candidate based on the student's research work.

PHD REQUIREMENTS

The course requirements for the PhD in Bioengineering include the following:

- Graduate Engineering Mathematics – six credits
- Statistics for Bioengineers – six credits
- Societal, Political, and Ethical Issues in Bioengineering – three credits
- Life Sciences – six credits
- Three of the following four classes (nine credits):

BIOENG 2064	Biomechanics of Tissues and Organs
BIOENG 2310	Hemodynamics and Biotransport
BIOENG 2510	Biomedical Signal Processing and Analysis
BIOENG 2810	Biomaterials and Biocompatibility

- Graduate Electives – six credits
- Advanced Biological Science and Engineering – 12 credits
- Doctoral Dissertation Research – 24 credits

BIOENGINEERING GRADUATE COURSES

BIOENG 2023	Bioengineering Seminar Series	1 cr.
BIOENG 2061	Ergonomics and Occupational Biomechanics	3 cr.
BIOENG 2064	Biomechanics of Tissues and Organs	3 cr.
BIOENG 2070	Advanced Tissue Mechanics	3 cr.
BIOENG 2095	M. S. Graduate Projects	1-6 cr.
BIOENG 2220	Cardiovascular Biomaterials	3 cr.
BIOENG 2230	Cardiovascular Organ Replacement	3 cr.
BIOENG 2241	Societal, Political, Ethical Issues In Biotechnology	3 cr.
BIOENG 2250	Cardiovascular Clinical Internships	6 cr.
BIOENG 2310	Hemodynamics And Biotransport	3 cr.
BIOENG 2380	Medical Imaging Systems 1	3 cr.
BIOENG 2382	Medical Imaging Systems 2	3 cr.
BIOENG 2510	Biomedical Signal Processing And Analysis	3 cr.
BIOENG 2530	Biochemistry For Engineers	3 cr.
BIOENG 2531	Fundamentals of Biochemical Engineering	3 cr.
BIOENG 2580	Biomedical Applications Of Signal Processing	3 cr.
BIOENG 2630	Methods in Image Analysis	3 cr.
BIOENG 2670	Topics In Bioimaging	3 cr.
BIOENG 2704	Fundamentals Of Rehabilitation Engineering And Technology I	3 cr.
BIOENG 2708	Physiological And Social Impairment	2 cr.
BIOENG 2709	Rehabilitation Biomechanics	1 cr.
BIOENG 2724	Assistive Technology Funding	1 cr.
BIOENG 2730	Spine Biomechanics	3 cr.
BIOENG 2810	Biomaterials And Biocompatibility	3 cr.
BIOENG 2999	MS Thesis	1-12 cr.
BIOENG 3003	Teaching Practicum	
BIOENG 3095	PhD Graduate Projects	1-6 cr.
BIOENG 3999	PhD Dissertation	1-12 cr.

DEPARTMENT OF CHEMICAL AND PETROLEUM ENGINEERING

Alan J. Russell, PhD, Chair

Web site: <http://www.engrng.pitt.edu/~chewwww/grad.html>

The Master of Science in Chemical Engineering, the Master of Science in Petroleum Engineering, and the Doctor of Philosophy degrees are offered by the Department of Chemical and Petroleum Engineering. Within the chemical engineering curriculum, the student may specialize in transport phenomena, kinetics and catalysis, reactor engineering, control, thermodynamics and phase behavior, solids processing, petroleum reservoir engineering, bioengineering, polymer engineering, multiphase processes, surface phenomena, energy and environmental processes, and computational chemical engineering. The Department's new state-of-the-art Frank Mosier Learning Center, located on the 12th floor of Benedum Hall, provides, through a revised classroom design with PCs carefully integrated into the facility, a forum for improved learning. Departmental laboratory facilities include a multiphase laboratory, catalysis laboratories, solids processing laboratories, thermodynamics laboratories, bioengineering laboratories, and the laboratory for modeling and molecular simulation. Special equipment includes a solid state NMR, image analysis, high-pressure equilibrium view cells, DNA sequencing apparatus, specialized rheometers, gas chromatography, and mass and atomic adsorption spectrometers.

CONTACT INFORMATION

Further information can be obtained by contacting:

Graduate Coordinator
 Chemical and Petroleum Engineering Department
 1249 Benedum Engineering Hall
 University of Pittsburgh
 Pittsburgh, PA 15261
 Phone: (412) 624-9630
 Web site: <http://www.engrng.pitt.edu/~chewww/grad.html>

MASTER OF SCIENCE IN CHEMICAL ENGINEERING (RESEARCH-ORIENTED PROGRAM)

The candidate for the Master of Science degree must demonstrate proficiency in basic chemical engineering subjects by successfully taking the following required three-credit courses:

CHE 2101	Fundamentals of Thermodynamics
CHE 2201	Fundamentals of Reaction Processes
CHE 2302	Fundamentals of Transport Processes
CHE 2410	Mathematical Methods in Chemical Engineering
CHE 2982	Issues in Chemical Engineering

In addition to these 15 credits, the student must satisfactorily complete the following courses:

- At least nine additional credits of graduate-level coursework, at least three of which must be in chemical engineering. Approved courses can be taken outside the department.
- Six credits of thesis must also be taken.
- Three credits for Research Methodology (see below)

A full-time student will normally take 33 credits.

Full-time students are required to register each term for Research Methodology, a one credit course. In Research Methodology, a letter grade will be given each term based upon the student's research performance. Full-time students are also required to attend the graduate seminar during the Fall and Spring terms. It should be emphasized that the preceding course requirements are minimum requirements, and additional work may be necessary for an individual student, especially if the student's undergraduate degree is not in chemical engineering.

A student who does not maintain a B (3.00 QPA) average in all MS-level courses or obtain a B or better in the five required courses is put on academic probation. The graduate faculty of the Department of Chemical and Petroleum Engineering will review all cases of probation each term and determine whether the student will be permitted to continue to pursue graduate study. Should a student receive a C grade or lower in a required MS course, the student will be required to repeat that course and earn a B or better grade before being permitted to graduate.

A student with full-time status should discuss possible thesis topics with at least three members of the departmental faculty and then submit a written request to the faculty for assignment of a thesis advisor. After the faculty assigns an advisor, the student can begin the thesis. The MS thesis oral examination is given at the completion of the thesis.

All full-time master's students must participate in teaching a course during one term as a master's student.

Students wishing to continue into the PhD program after the MS degree should take the oral qualifying examination during their second term of study. Failure to do so will forfeit one of two opportunities to pass this examination.

MASTER OF SCIENCE IN CHEMICAL ENGINEERING (PROFESSIONAL ENGINEER PROGRAM)

Engineers working full-time outside the University who wish to continue advanced study in chemical engineering may apply for admission to the Professional Engineer Program. It differs from the regular MS program in two important respects:

- (1) Admission to the program is limited to engineers working full-time outside the University in chemical engineering or a related area.
- (2) Course work replaces the MS thesis requirement.

A minimum of 30 credit hours of course work is required. These must include the five required courses of the regular program:

CHE 2101	Fundamentals of Thermodynamics
CHE 2201	Fundamentals of Reaction Processes
CHE 2302	Fundamentals of Transport Processes
CHE 2410	Mathematical Methods in Chemical Engineering
CHE 2982	Issues in Chemical Engineering

The remainder of the course work should be selected from graduate offerings in chemical engineering. Up to six credit hours may be elected in approved graduate course offerings outside the department. Students who wish to enter this program should first apply for admission to graduate study in chemical engineering. Once admitted students can then request admission to the Professional Engineering Program.

MASTER OF SCIENCE IN PETROLEUM ENGINEERING

The candidate for the degree of Master of Science in Petroleum Engineering must demonstrate proficiency in petroleum engineering by passing the following courses:

PETE 2201	Recovery of Oil by Waterflooding	3 cr.
PETE 2202	Petroleum Drilling and Production	3 cr.
PETE 2203	Well Testing and Pressure Transient Analysis	3 cr.
PETE 2204	Enhanced Oil Recovery Processes	3 cr.
PETE 2205*	Reservoir Simulation 1	3 cr.
PETE 2207*	Mathematical Modeling in Porous Media	3 cr.
PETE 2210	PVT and Rock Properties	3 cr.
PETE 2214	Advanced Enhanced Oil Recovery	3 cr.
GEOL 1413	Well Logging	3 cr.
Two advanced mathematics courses		

**optional or by appointment.*

In addition to these courses, the student must satisfactorily complete six additional graduate-level credits in engineering or science.

DUAL MASTER'S DEGREE

A program of study is available in which a student may pursue a dual degree between either chemical engineering and petroleum engineering, petroleum engineering and mathematics, or chemical engineering and mathematics. In general, 42 credits are required, including the fundamental courses in the two areas. Both thesis and non-thesis options are possible. The required chemical engineering courses are:

CHE 2101, 2201, 2302, 2410, 2982

and the required petroleum engineering courses are:

PETE 2201, 2202, 2204, 2205*, 2207*, 2210, 2214; GEOL 1413; and two advanced math courses.

**optional or by appointment.*

The required courses in the mathematics area will vary with the student's interest. Courses in the following areas are suggested:

Partial differential equations
Advanced calculus
Numerical analysis
Real analysis
Complex analysis
Matrices and linear operations
Applied math
Ordinary differential equations

The remainder of the courses may be taken from graduate offerings in the various fields. All other departmental regulations listed previously apply to the Master of Science dual-degree program.

DOCTOR OF PHILOSOPHY DEGREE

The following special regulations pertain to the Department of Chemical and Petroleum Engineering. *For additional requirements, review the school-wide information in the Doctor of Philosophy Programs section on page 218 as well as the Regulations Pertaining to Doctoral Degrees on page 23.*

ENTRY TO THE PhD PROGRAM

In order to enter the PhD program, a student must have completed an MS degree and passed the PhD oral qualifying preliminary examination. Especially well-prepared students may petition the department faculty, in writing, for permission to obtain the PhD degree directly without obtaining an MS degree. This eliminates the required completion of the MS thesis. All MS-level course work is still required.

During the second term as a graduate student in the department, the student wishing to continue into the PhD program must take the oral preliminary examination. Failure to take this examination at this time will forfeit one of two opportunities to pass this examination. The structure and content of the PhD oral qualifying examination is subject to change in order to meet the requirements of the faculty and PhD program.

PHD COURSE REQUIREMENTS

A student's course series will be designed by the student and his thesis advisor, approved by the PhD committee, and signed off by the

Graduate Coordinator. This sequence should include courses in the student's research area as well as courses not related to his research area. Forty-two credits beyond the MS degree are required and must include the following courses:

CHE	3301	Advanced Transport Phenomena
CHE	3xxx	CHE Elective
CHE	2/3xxx	CHE Elective
Xx	2/3xxx	Elective
CHE	2982	Issues in Chemical Engineering (if not taken at MS level)
CHE	3990	Advanced Graduate Projects, 6 credits (minimum)
CHE	3999	PhD Dissertation (taken after PhD proposal defense), 12 credits (minimum)

Additional course requirements may include the following, if the student has not previously completed courses in these areas at the master's level:

CHE	2101	Fundamentals of Thermodynamics
CHE	2201	Fundamentals of Reaction Processes
CHE	2301	Fundamentals of Transport Processes
CHE	2410	Mathematical Methods in Chemical Engineering

Students must also register for one credit in PhD Research methodology each term. A minimum of 72 graduate credit hours, including MS courses and thesis credits, are required. All full-time students must fulfill a two-term teaching requirement during their course of study and attend the departmental graduate seminar series during the Fall and Spring semesters.

DISSERTATION REQUIREMENT

A dissertation topic should be selected after passing the PhD oral qualifying examination. This is done by submitting a formal request in writing to the departmental Graduate Faculty for appointment of a faculty advisor (or advisors). Preliminary work can be done on the dissertation by registering for CHE 3990. After being admitted to PhD candidacy, the student should concentrate on the dissertation, registering for CHE 3999. Eighteen credits of these two courses are required with at least 12 of these 18 being in CHE 3999. Most students complete more than 18 credits of these courses.

PHD COMPREHENSIVE EXAMINATION AND PROPOSAL CONFERENCE

This is an oral examination covering chemical engineering at the PhD level and is based upon a written dissertation proposal. If this examination is passed, a doctoral committee will be officially appointed. This exam should be taken at least 18 months before completion of the dissertation and preferably within the first year beyond the MS.

PHD FINAL ORAL EXAMINATION

A final review (defense) of the thesis must be conducted by the dissertation committee in order to determine the acceptability of the dissertation.

OFF-CAMPUS RESEARCH

Occasionally, a research program can be conducted at a government or industrial site. In those situations the student should submit a proposal for such research to the graduate coordinator for approval by the faculty. The faculty advisor must be actively involved in the research.

GRADUATE CHEMICAL ENGINEERING COURSES

All courses numbered 2000 and above are graduate-level courses. Courses with numbers between 2000 and 3000 may be used as technical electives by senior undergraduates.

CHE	2050	Artificial Organs (Cross-listed as BIOENG 2050)	3 cr.	CHE	3050	Selected Topics in Molecular Spectroscopy	3 cr.
CHE	2051	Heat and Mass Transfer in Bio Systems	3 cr.	CHE	3125	Cardiovascular Dynamics	3 cr.
CHE	2101	Fundamentals of Thermodynamics	3 cr.	CHE	3130	Statistical Thermodynamics	3 cr.
CHE	2110	Phase Equilibria	3 cr.	CHE	3149	Advanced Seminar in Thermodynamics	3 cr.
CHE	2118	Colloids and Surfaces	3 cr.	CHE	3229	Advanced Seminar in Kinetics	3 cr.
CHE	2125	Cardiovascular Dynamics (Cross-listed as BIOENG 2022)	3 cr.	CHE	3240	Fundamentals of Heterogeneous Catalysis	3 cr.
CHE	2201	Fundamentals of Reaction Processes	3 cr.	CHE	3245	Advanced Topics in Heterogeneous Catalysis	3 cr.
CHE	2220	Cardiovascular Biomaterials	3 cr.	CHE	3246	Advanced Homogeneous Catalysis	3 cr.
CHE	2230	Introduction to Heterogeneous Catalysis	3 cr.	CHE	3247	Surface Catalyzed Reactions	3 cr.
CHE	2231	Cardio Organ Replacement	3 cr.	CHE	3249	Advanced Seminar in Catalysis	3 cr.
CHE	2246	Advanced Homogeneous Catalysis	3 cr.	CHE	3260	Chemical Reactor Design	3 cr.
CHE	2250	Cardio Clinical Internships	3 cr.	CHE	3261	Three-Phase Reactors	3 cr.
CHE	2301	Fundamental Transport Processes	3 cr.	CHE	3301	Advanced Transport Phenomena	3 cr.
CHE	2310	Particulate Systems	3 cr.	CHE	3325	Advanced Topics in Fluid Dynamics	3 cr.
CHE	2311	Hemodynamics and Biotransport	3 cr.	CHE	3345	Advanced Transport Processes	3 cr.
CHE	2410	Mathematical Methods in Chemical Engineering 1	3 cr.	CHE	3349	Advanced Seminar in Transport Phenomena	3 cr.
CHE	2411	Mathematical Methods in Chemical Engineering 2	3 cr.	CHE	3450	Process Optimization	3 cr.
CHE	2455	Advanced Process Simulation & Pinch Analysis	3 cr.	CHE	3455	Advanced Process Simulation and Pinch Analysis	3 cr.
CHE	2530	Biochemistry for Engineers	3 cr.	CHE	3530	Adv Enzymology: Fundamentals to Applications	3 cr.
CHE	2531	Fundamentals of Biochemical Engineering (Cross-listed as BIOENG 2531)	3 cr.	CHE	3531	Advanced Topics in Biochemical Engineering	3 cr.
CHE	2610	Atmospheric Pollution Control (Cross-listed as CE 2508)	3 cr.	CHE	3749	Advanced Seminar in Polymers	3 cr.
CHE	2620	Industrial Waste Management (Cross-listed as CE 2507)	3 cr.	CHE	3750	Mathematical Modeling in Polymer Processing	3 cr.
CHE	2640	Pollution Prevention	3 cr.	CHE	3760	Theory and Simulation of Polymeric Materials	3 cr.
CHE	2752	Introduction to Polymers	3 cr.	CHE	3820	Advanced Separations	3 cr.
CHE	2753	Introduction to Polymer Processing (Cross-listed as MSE 2081)	3 cr.	CHE	3910	Individual Study	1-3 cr.
CHE	2756	Polymerization Engineering (Cross-listed as MSE 2080)	3 cr.	CHE	3925	Advanced Topics in Fluid/Particle Separations	3 cr.
CHE	2758	Aspects of Polymer Theory (Cross-listed as MSE 2093)	3 cr.	CHE	3930	Selected Topics in Fluid/Particle Processing and Separations	3 cr.
CHE	2781	Structure and Properties of Polymers (Cross-listed as MSE 2085)	3 cr.	CHE	3948	Advanced Separation Processes	3 cr.
CHE	2782	Polymer Crystallization and Morphology (Cross-listed as MSE 2087)	3 cr.	CHE	3980	PhD Research Methodology	1 cr.
CHE	2789	Fundamentals of Polymer Extrusion (Cross-listed as MSE 2090)	3 cr.	CHE	3990	Advanced Graduate Projects	1-15 cr.
CHE	2793	Rheology of Polymers (Cross-listed as MSE 2083)	3 cr.	CHE	3999	PhD Dissertation	1-15 cr.
CHE	2794	Advanced Topics in Polymers	3 cr.	GRADUATE PETROLEUM ENGINEERING COURSES			
CHE	2820	Staged Separations	3 cr.	PETE	2201	Unsteady State Immiscible Displacement and Waterflooding	3 cr.
CHE	2830	Web Based Interactive Tutorial Design	3 cr.	PETE	2202	Petroleum Drilling and Production	3 cr.
CHE	2910	Special Projects	1-12 cr.	PETE	2204	Enhanced Oil Recovery Processes	3 cr.
CHE	2925	Fluid/Particle Separation	3 cr.	PETE	2205	Petroleum Reservoir Numerical Simulation 1	3 cr.
CHE	2930	Selected Topics in Fluid/Particle Processing and Separations	3 cr.	PETE	2206	Petroleum Reservoir Numerical Simulation 2	3 cr.
CHE	2948	Advanced Separation Processes	3 cr.	PETE	2207	Mathematical Modeling of Porous Media	3 cr.
CHE	2980	MS Research Methodology	1 cr.	PETE	2210	PVT and Rock Fluid Properties in Petroleum	3 cr.
CHE	2982	Issues in Chemical Engineering	3 cr.	PETE	2214	Advanced Enhanced Petroleum Recovery	3 cr.
CHE	2999	MS Thesis	1-15 cr.	PETE	2998	Graduate Projects in Petroleum Engineering	1 To 6 cr.
				PETE	2999	MS Thesis	

CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT

Rafael G. Quimpo, PhD, PE, Chair

Web site: <http://www.engrng.pitt.edu/~civwww/graduate/index.html>

The Department of Civil and Environmental Engineering offers graduate study and research leading to the Master of Science and Doctor of Philosophy degrees. The MS in Civil Engineering and PhD in Engineering may be pursued in one of the following five areas:

STRUCTURAL MECHANICS AND STRUCTURAL DESIGN

Behavior and design of concrete structures, steel structures, and composite (steel-concrete) structures; bridge and building structures; wind and earthquake engineering; fatigue and fracture; load and resistance factor design; material characteristics and performance; structural mechanics; structural dynamics; finite element analysis; computer analysis and computer-aided design; structural reliability.

HYDRAULICS AND WATER RESOURCES ENGINEERING

Hydrodynamics, computational fluid mechanics and hydraulics, river mechanics, open channel hydraulics, hydraulic transport of solids, flows through porous media, unsteady flows with movable boundaries, biofluid mechanics, hydraulic engineering, surface and ground water hydrology.

ENVIRONMENTAL ENGINEERING

Fundamentals of environmental science and applications to include aquatic chemistry and microbiology, chemical and biological measurements, water and wastewater treatment technologies, solid and hazardous waste management, environmental modeling, fates of pollutants, and environmental impact assessment.

GEOTECHNICAL ENGINEERING

Engineering geology, site evaluation, physical and chemical properties of soils, theoretical and experimental soil mechanics. Retaining and earth structures, foundation engineering, pavement design. Dynamics of soil systems, seepage and ground water flow, rock mechanics.

TRANSPORTATION AND URBAN SYSTEMS

Traffic analysis, management and control, urban transportation planning, transportation network analysis, analysis and design of urban systems.

The MS in Civil Engineering may also be pursued in construction management. This is a course-based (no thesis) degree. There are no current research activities in this area in the department.

GRADUATE REGULATIONS IN CIVIL ENGINEERING

The general regulations given previously apply to all graduate programs in the **School of Engineering**. Special regulations and options that apply to the Department of Civil and Environmental Engineering are discussed here. A more detailed listing of graduate requirements is available from the academic coordinator of the department.

ADVISING

In all cases the faculty advisor must be in the area of the student's major interest.

MASTER OF SCIENCE IN CIVIL ENGINEERING

The general requirements for the three options for the MS in Civil and Environmental Engineering (thesis, non-thesis, and professional) are detailed below:

Thesis Option: 24 course credits (eight courses) minimum (27 credits or nine courses in the environmental program) and thesis (six credits), with comprehensive and final examinations

Non-Thesis Option: 30 course credits (ten courses) minimum and three-credit project, comprehensive and final examination

Professional Option: 30 course credits (ten courses) minimum

Students supported as graduate research assistants and all students intending to continue for a PhD degree are required to pursue the thesis option. The professional option is not available to students supported as graduate research or teaching assistants. All other students may elect to pursue the appropriate option after consultation with their faculty advisor.

MS EXAMINATION STRUCTURE

As noted above, those students not pursuing the professional MS option must take and pass both the comprehensive examination and the final oral examination.

■ Comprehensive Examination

This examination is given to all students during the last term of the program. It may be either an oral examination or, at the recommendation of the area faculty, a written examination. It is administered by an MS committee made up of the faculty advisor (as chair), plus a minimum of two other faculty members from fields related to the student's interest. If the result of the examination is unsatisfactory, subsequent action is at the discretion of the MS committee.

■ Final Oral Examination

The purpose of this examination is to evaluate the student's MS thesis or project and/or related course work. The examination is administered by the MS committee, chaired by the student's major advisor.

JOINT MASTER'S DEGREE

A student is able to earn the Master of Science degree in Civil and Environmental Engineering and the Master of Science degree in Mathematics at the same time. In general, 42 credits are required, and students must complete the fundamental courses in both areas.

DOCTOR OF PHILOSOPHY DEGREE REQUIREMENTS

Students pursuing the PhD must complete the following minimum credit requirements:

- 30 course credits (ten courses) in major area
- 15 additional course or special investigation credits in major area
- Nine course credits (three courses) in minor area
- 18 credits of dissertation research

The total number of credits above these minimum requirements will depend on the student's background, academic achievement, and dissertation topic. This decision will be made in consultation with the major advisor.

PLAN OF STUDY

The PhD Plan of Study is prepared by the student with the aid of the student's faculty advisor during the student's first two terms of graduate study. It should be approved and signed by the faculty advisor, all other faculty members in the program area, the graduate coordinator, and the department chair. Copies should be made available to the student, faculty advisor, and the academic coordinator. Any change in the Plan of Study must be approved by the faculty advisor and the academic coordinator, and should likewise be recorded.

PHD EXAMINATION STRUCTURE

All PhD candidates must pass the preliminary, comprehensive, and final oral examinations:

■ Preliminary Examination

The purpose of this examination is to determine the student's potential to complete the PhD program. It is organized by the advisor and faculty from the student's program area, before or sometime during the first two terms of the program.

■ Comprehensive Examination

All PhD students must take this examination toward the end of their course work. The examination will be administered by the comprehensive examination committee, and will cover the student's major and minor areas. It is designed to evaluate the student's mastery of the course material needed for independent research. The examination consists of two parts: a written examination lasting several days, and an oral examination of approximately three hours' duration. Portions of the written examination may be waived by the committee. The committee will consist of at least four faculty members as follows: the major advisor as chairman, one full-time faculty member from the student's program area, one additional faculty member from the department, and one member from outside the department representing the non-civil engineering minor area.

■ Final Oral Examination

This is an oral defense of the student's PhD dissertation. The examination will be administered by the doctoral committee. The doctoral committee will consist of the major advisor as chair, at least two faculty members from the student's program area within the Civil and Environmental Engineering Department (if available), and at least one faculty member from outside the Civil and Environmental Engineering Department.

GRADUATE CIVIL ENGINEERING COURSES

CEE	2100	Numerical Methods	3 cr.	CEE	2206	Construction and Cost of Electricity Supply	3 cr.
CEE	2102	Probability, Risk, and Reliability in Civil Engineering	3 cr.	CEE	2207	Construction and Cost of Mechanical Systems	3 cr.
CEE	2105	Advanced Construction Materials	3 cr.	CEE	2208	Environmental Management for Construction	3 cr.
CEE	2112	Decision Analysis in Civil Engineering	3 cr.	CEE	2320	Advanced Mechanics of Materials	3 cr.
CEE	2185	Research Procedures Seminar	1 cr.	CEE	2321	Applied Elasticity	3 cr.
CEE	2200	Construction Management for Non-CEEs	3 cr.	CEE	2322	Fatigue and Fracture of Metal Structures	3 cr.
CEE	2201	Construction Cost Estimating	3 cr.	CEE	2330	Advanced Structural Analysis	3 cr.
CEE	2202	Construction Scheduling	3 cr.	CEE	2331	Computer Methods in Structural Analysis	3 cr.
CEE	2203	Construction Methods and Equipment	3 cr.	CEE	2333	Introduction to Finite Elements	3 cr.
CEE	2204	Construction Law and Risk Management	3 cr.	CEE	2340	Concrete Structures 2	3 cr.
CEE	2205	Construction Finance and Cost Control	3 cr.	CEE	2341	Steel Structures 2	3 cr.
				CEE	2342	LRFD of Steel Structures	3 cr.
				CEE	2343	Prestressed Concrete	3 cr.
				CEE	2360	Dynamics of Structures	3 cr.
				CEE	2400	Hydraulic Engineering	3 cr.
				CEE	2401	Open Channel Hydraulics	3 cr.
				CEE	2402	Hydraulic Transport Processes	3 cr.
				CEE	2403	Hydraulic Analysis and Modeling	3 cr.
				CEE	2404	Surface Hydrology	3 cr.
				CEE	2405	Groundwater Hydrology	3 cr.
				CEE	2407	Hydraulic Transients and Earthquake Hydrodynamics	3 cr.
				CEE	2414	Advanced Hydrology	3 cr.
				CEE	2415	Numerical Methods in Groundwater and Pollutant Transport	3 cr.
				CEE	2500	Environmental Engineering Microbiology	3 cr.
				CEE	2501	Environmental Engineering Chemistry	3 cr.
				CEE	2502	Physical-Chemical Principles in Environmental Engineering	3 cr.
				CEE	2503	Field Methods in Environmental Engineering	3 cr.
				CEE	2504	Modeling of Natural Water Systems 1	3 cr.
				CEE	2505	Water Treatment and Distribution System Design	3 cr.
				CEE	2506	Solid Waste Management	3 cr.
				CEE	2507	Industrial Waste Management (Cross-listed as CHE 2620)	3 cr.
				CEE	2508	Air Pollution and Control (Cross-listed as CHE 2610)	3 cr.
				CEE	2509	Special Topics in Environmental Engineering 1	3 cr.
				CEE	2513	Environmental Impact Assessment	3 cr.
				CEE	2514	Modeling of Natural Water Systems 2	3 cr.
				CEE	2515	Wastewater Collection and Treatment Plant Design	3 cr.
				CEE	2523	Environmental Risk Assessment 2	3 cr.
				CEE	2585	Environmental Engineering Seminar	1 cr.
				CEE	2601	Land Use Planning	3 cr.
				CEE	2602	GIS For Civil and Environmental Engineers	3 cr.
				CEE	2700	Traffic Management and Operations (Cross-listed as PIA 2800)	3 cr.
				CEE	2701	Traffic Flow Theory	3 cr.
				CEE	2702	Computer Methods in Traffic Engineering	3 cr.
				CEE	2710	Transportation Systems Analysis 1	3 cr.
				CEE	2711	Transportation Systems Analysis 2	3 cr.
				CEE	2720	Urban Transportation Planning	3 cr.
				CEE	2721	Travel Demand Analysis	3 cr.
				CEE	2722	Computer Methods in Transportation Planning	3 cr.
				CEE	2730	Highway Engineering	3 cr.

CEE 2800	Engineering Geology	3 cr.	research in the graduate electrical engineering programs are concentrated within the following six focus areas:
CEE 2801	Advanced Soil Mechanics	3 cr.	
CEE 2802	Computer Methods in Geotechnical Engineering	3 cr.	
CEE 2803	Experimental Soil Mechanics	3 cr.	COMPUTER ENGINEERING Graduate course work in this area includes: computer architecture, microprocessor systems, VLSI design, design automation for VLSI, software engineering, computer networks, and automata theory. Faculty/student research includes projects in algorithm development, digital implementation of real-time systems, multiprocessor systems, parallel computer architectures, computer-aided engineering, optical computing, VLSI architectures, computer-aided design for VLSI, microprocessor systems, homogeneous and heterogeneous architectures, parallel performance modeling and analysis, cluster computing, and computer and communication networks. Department laboratories that support this research are the Optical Computing Systems Laboratory, Pittsburgh Integrated Circuits Analysis (PICA) Laboratory, the Pitt Parallel Computer Laboratory, the Network Communications Laboratory, the Jurenko Computer Architecture Laboratory, and the Swanson Embedded Computing and Interfacing Laboratory.
CEE 2804	Applied Plasticity I	3 cr.	
CEE 2814	Slopes and Earth Retaining Structures	3 cr.	
CEE 2815	Pavement Design	3 cr.	
CEE 2818	Advanced Foundation Engineering	3 cr.	
CEE 2996	Special Investigations for MS Students	1-6 cr.	
CEE 2997	MS Research	1-12 cr.	
CEE 2999	MS Thesis	1-12 cr.	
CEE 3320	Continuum Mechanics	3 cr.	
CEE 3321	Applied Plasticity	3 cr.	
CEE 3322	Fracture Mechanics	3 cr.	
CEE 3323	Plastic Design of Steel Structures	3 cr.	
CEE 3330	Structural Stability	3 cr.	
CEE 3331	Plate and Shell Structures	3 cr.	
CEE 3332	Energy Methods in Structural Analysis	3 cr.	
CEE 3333	Advanced Finite Elements	3 cr.	
CEE 3334	Nonlinear Structural Behavior	3 cr.	
CEE 3350	Structural Safety	3 cr.	
CEE 3360	Advanced Dynamics of Structures	3 cr.	
CEE 3361	Structural Wind and Earthquake Engineering	3 cr.	
CEE 3400	Selected Hydraulic Problems	3 cr.	CONTROL Graduate courses offered in this area include linear and nonlinear system theory, optimal control theory, computer control, optimization methods, and optimal stochastic systems. Faculty/student research in this area includes control system theory with emphasis on control of artificial organs, real-time computer control of power systems, and statistical process control.
CEE 3408	Advanced Fluid Mechanics	3 cr.	
CEE 3500	Advanced Environmental Engineering Microbiology	2 cr.	
CEE 3501	Environmental Engineering Processes 1	3 cr.	ELECTRONICS Graduate courses are offered in the following topics: quantum electronics, semiconductor optics and devices, high-speed electronics devices, semiconductor lasers, monolithic integrated circuits, and fundamentals of semiconductor and quantum electronic devices. Current research projects are in microelectronics, semiconductor device modeling, computer-aided design, analog circuit design, linear and nonlinear optical devices, solid state lasers, high speed electro-optic modulators, electro-optical field sensors, phase conjugation, optoelectronic integrated devices, low dimensional structures, resonant tunneling, quantum well infrared detectors, semiconductor materials and devices, optoelectronic devices, integrated optics. Some of this research is supported by the Laser Laboratory and the Opto-electronics Laboratory.
CEE 3502	Environmental Engineering Processes 2	3 cr.	
CEE 3503	Environmental Engineering Process Laboratory	4 cr.	
CEE 3504	Advanced Environmental Analysis	3 cr.	
CEE 3512	Advanced Environmental Engineering Processes	3 cr.	
CEE 3516	Hazardous Waste Management	3 cr.	
CEE 3585	Advanced Environmental Engineering Seminar	1 cr.	
CEE 3700	Analytical Models in Traffic	3 cr.	
CEE 3710	Logistics Management	3 cr.	
CEE 3711	Advanced Topics in Transportation and Logistics	3 cr.	
CEE 3721	Advanced Travel Demand Analysis	3 cr.	
CEE 3804	Dynamics of Soil Systems	3 cr.	
CEE 3805	Rock Mechanics	3 cr.	
CEE 3807	Fracture Mechanics in Geotechnical Engineering	3 cr.	
CEE 3808	Geotechnical Earthquake Engineering	3 cr.	
CEE 3996	Special Investigations for PhD Students	1-6 cr.	IMAGE PROCESSING/COMPUTER VISION Graduate courses are offered in digital image processing, topological algorithms for image processing, pattern recognition, and computer vision. Research is being conducted on the following topics: computer vision, topological algorithms and architectures, digital topology, pattern recognition, biomedical image processing, applications of wavelet transform, magnetic resonance imaging, imagery construction, and computation in medical imaging. Research in this area is supported by the Laboratory for Computer Vision and Pattern Recognition.
CEE 3997	PhD Research	1-12 cr.	
CEE 3999	PhD Dissertation	1-12 cr.	

ELECTRICAL ENGINEERING DEPARTMENT

Joel Falk, PhD, Chair

Web site: <http://ee.pitt.edu/grad/index.htm>

The Department of Electrical Engineering offers a program of graduate study and research for master's and doctoral degree students whose career choice is oriented towards basic or applied research in industry, government, or academic institutions. Course work and faculty/student

POWER

Graduate courses in this area include power systems analysis, power systems transients and high-voltage design, power systems steady state control, power systems control and stability. Current research projects in this area are in electrical transients in power systems, pulse power

components and systems, and real-time computer control of power systems.

SIGNAL PROCESSING/COMMUNICATIONS

Graduate courses are offered in stochastic processes, digital signal processing, statistical signal processing, modern spectral estimation, time-frequency signal analysis, digital speech processing, digital communications, and information theory. Current research projects in this area are in motion analysis to relate body movements to pain, knowledge-based signal processing, statistical signal processing, multidimensional system theory, digital processing of speech signals, spectral estimation, neural networks, stochastic signal processing as applied to communications, image coding, optical processing, nonstationary signal processing, time-frequency distributions, biomedical signal analysis, machine fault monitoring, acquisition and analysis of electrical and magnetic data from the central nervous system, array signal processing, and geophysical applications. The Applied Signal and System Analysis Laboratory supports research in this area.

GRADUATE STUDENT SUPPORT

The Department of Electrical Engineering offers graduate student support in a variety of ways. Many full-time students are supported by graduate research assistantships or teaching assistantships. There are also several fellowships available for highly qualified graduate students.

JOINT ELECTRICAL ENGINEERING-MATHEMATICS MASTER OF SCIENCE PROGRAM

This is a program in which a student earns a Master of Science degree in Electrical Engineering and a Master of Science degree in Mathematics at the same time. Details are available from the graduate program coordinator of electrical engineering.

GRADUATE REGULATIONS IN ELECTRICAL ENGINEERING

In addition to the general regulations of the **School of Engineering**, the electrical engineering department has the following requirements for its degrees.

MASTER OF SCIENCE IN ELECTRICAL ENGINEERING

The Master of Science degree has both research and professional tracks. The research track provides the student the opportunity to work on a thesis (applied or basic in nature) under the close supervision of a faculty advisor. The minimum requirements for the research track are 24 credits of graduate course work and preparation and defense of a thesis on a topic in the student's primary area of interest. For the professional option, the minimum requirement is 30 credits of graduate course work.

Course selection for either the research or the professional tracks is developed by the student in consultation with the student's advisor and following guidelines set by the department. The course plan may include courses in and outside of the Department of Electrical Engineering. A list of courses is available to MS students and can be found on the graduate Web site at <http://ee.pitt.edu/grad/index.htm>.

In addition to the graduate electrical engineering courses shown in the next section, MS students may take at most two of the following electrical engineering senior electives (the content of the 2000-level courses can be found in the undergraduate curriculum section under the corresponding 1000-level number):

EE	2160	Embedded Computer System Design
EE	2185	Computer System Interfacing
EE	2192	Introduction to VLSI Design
EE	2232	Introduction to Lasers and Optical Electronics
EE	2236	Electronic Design with Integrated Circuits
EE	2238	Digital Electronics
EE	2580	Biomedical Applications of Signal Processing
EE	2680	Biomedical Applications of Control
EE	2769	Power Systems Analysis I

DOCTOR OF PHILOSOPHY

A student showing unusual proficiency in graduate course work and independent research will be recommended for doctoral study. The objective of the PhD program is to attain a high degree of competence in one major field, as well as some understanding of a minor or cognate field. A minimum of 72 credits beyond the BS degree is required, including 18 credits of dissertation work. In addition to the general regulations, the department has specific requirements as described below:

PHD PRELIMINARY EXAMINATION

This is an oral and written presentation on a subject mutually agreed upon by the student and the advisor in the field of the student's interest. The examination is to demonstrate the student's initiative and ability to do independent work.

PROGRAM CONFERENCE

During the first term of registration in the PhD program, the student must meet with a faculty committee and present a tentative program of study for its approval. The committee consists of the student's faculty advisor, who chairs the committee, and two other faculty members from the department.

PHD COMPREHENSIVE EXAMINATION

The purpose of this examination is to determine the student's competence in his or her major field of study and in a minor or cognate field. It consists of a six-hour written examination on four courses and is administered on the first Friday in October (Fall term) and on the first Friday in February (Spring term).

PHD PROPOSAL EXAMINATION

In this examination, the student presents and defends a proposal for dissertation work to a doctoral committee consisting of at least five members, four of whom must be graduate faculty, with one from outside the electrical engineering department.

PHD FINAL ORAL EXAMINATION

In this examination administered by the doctoral committee, the student defends the validity of the dissertation and the contributions that are made in the work. Results from the dissertation must be submitted to a refereed journal for publication.

GRADUATE ELECTRICAL ENGINEERING COURSES

EE	2159	Automata Theory	3 cr.	EE	3795	Advanced Topics—Power	3 cr.
EE	2162	Computer Architecture 1	3 cr.	EE	3893	Graduate Seminar	1 cr.
EE	2165	Algorithms for Design Automation	3 cr.	EE	3997	PhD Research	1-12 cr.
EE	2186	Software Engineering	3 cr.	EE	3998	PhD Graduate Project	3 cr.
EE	2193	Advanced VLSI Design	3 cr.	EE	3999	PhD Dissertation	1-12 cr.
EE	2195	Special Topics—Computers	3 cr.				
EE	2231	Fundamentals of Semiconductor and Quantum Electronic Devices	3 cr.				
EE	2235	Monolithic Integrated Circuits	3 cr.				
EE	2250	Power Electronics	3 cr.				
EE	2295	Special Topics—Electronics	3 cr.				
EE	2372	Pattern Recognition	3 cr.				
EE	2373	Artificial Neural Networks	3 cr.				
EE	2390	Introduction to Image Processing	3 cr.				
EE	2391	Projects in Computer Vision	3 cr.				
EE	2395	Special Topics—Image Processing/Computer Vision	3 cr.				
EE	2521	Analysis of Stochastic Processes	3 cr.				
EE	2523	Digital Signal Processing	3 cr.				
EE	2595	Special Topics—Signal Processing/Communications	3 cr.				
EE	2636	Fuzzy Logic and Intelligent Control	3 cr.				
EE	2646	Linear Systems Theory	3 cr.				
EE	2654	Computer Control 1	3 cr.				
EE	2671	Optimization Methods	3 cr.				
EE	2695	Special Topics—Control	3 cr.				
EE	2774	Power Systems Analysis 2	3 cr.				
EE	2777	Power Systems Transients 1	3 cr.				
EE	2795	Special Topics—Power	3 cr.				
EE	2997	MS Research	1-12 cr.				
EE	2998	MS Graduate Project	3 cr.				
EE	2999	MS Thesis	1-12 cr.				
EE	3163	Computer Architecture 2	3 cr.				
EE	3165	Advanced Design Automation for VLSI	3 cr.				
EE	3167	Computer Networks	3 cr.				
EE	3195	Advanced Topics—Computers	3 cr.				
EE	3232	Quantum Electronics	3 cr.				
EE	3233	Advanced Topics in Semiconductor Devices	3 cr.				
EE	3235	Semiconductor Lasers	3 cr.				
EE	3236	Semiconductor Optics and Devices	3 cr.				
EE	3239	High-Speed Electronic Devices	3 cr.				
EE	3295	Advanced Topics—Electronics	3 cr.				
EE	3374	Applications of Wavelet Transforms	3 cr.				
EE	3392	Parallel Image Processing	3 cr.				
EE	3395	Advanced Topics—Image Processing/Computer Vision	3 cr.				
EE	3422	Information Theory	3 cr.				
EE	3524	Digital Speech Processing	3 cr.				
EE	3526	Modern Spectral Estimation	3 cr.				
EE	3528	Time-Frequency Signal Analysis	3 cr.				
EE	3530	Digital Communications	3 cr.				
EE	3557	Statistical Signal Processing	3 cr.				
EE	3595	Advanced Topics—Signal Processing/Communications	3 cr.				
EE	3647	Optimal Stochastic Systems	3 cr.				
EE	3648	Non-Linear Systems Theory	3 cr.				
EE	3650	Optimal Control	3 cr.				
EE	3695	Advanced Topics—Control	3 cr.				
EE	3775	Power Systems Steady State Control	3 cr.				
EE	3776	Power Systems Control and Stability	3 cr.				
EE	3778	Power Systems Transients 2	3 cr.				

INDUSTRIAL ENGINEERING DEPARTMENT

Bopaya Bidanda, PhD, Chair

Web site: <http://ie.pitt.edu/graduate/>

The Industrial Engineering Department offers graduate programs leading to both master's and doctoral degrees. The department provides several choices of concentration areas including:

- Operations Research
- Information Systems Engineering
- Product Realization and Manufacturing Systems
- Engineering Management

The master's program is flexible and students may choose to focus on one of the concentration areas or opt for a more broad-based curriculum with course work spanning all areas. Courses are designed so that students who have a basic foundation in engineering, computers, and basic sciences can develop the capability for more effective technical and management proficiency. All graduates of the program are prepared to assume responsible positions in industry, government, and service organizations; in addition, doctoral graduates are also qualified for academic or research careers.

ADMISSION REQUIREMENTS

Applications are encouraged from candidates who possess an undergraduate or graduate degree from an ABET-accredited program in any engineering discipline, or a degree in a complementary technical discipline, such as mathematics, physics, chemistry, computer science, or information science. An undergraduate knowledge of probability and statistics, calculus, differential equations, linear algebra, and proficiency in computer programming is required. Students who cannot demonstrate these skills upon matriculation will be placed in appropriate undergraduate courses in order to acquire this knowledge. These undergraduate courses do not count towards a graduate degree.

All students should take the GRE, and foreign students also must take the TOEFL examination. It is desirable for PhD applicants to have an interview with a faculty member, although this is not a requirement for admission.

MASTER OF SCIENCE IN INDUSTRIAL ENGINEERING

The Master of Science in Industrial Engineering program requires either 30 credits of graduate study without the thesis option (Professional MS), or 24 credits of graduate study plus a six-credit thesis (Research MS).

Non-thesis option: With this option, the student is required to take IE 2005 and at least two of the five courses in the basic core. The remainder of the student's program can be focused in a concentration area or broad-based in conjunction with the student's interests and the approval of the

advisor. With the permission of the student's advisor, the student may also take two courses from other graduate offerings within the University.

Thesis option: The thesis option also includes IE 2005 and at least two of the five courses in the core. In addition, the student must complete a six-to-eight credit thesis. With this option, all course work must come from departmental offerings and no out-of-department electives are permitted. The master's thesis must show marked attainment in one of the departmental concentration areas. Acquisition of the methods and techniques of scientific investigation must also be demonstrated. A faculty member knowledgeable in the student's area of interest must supervise the thesis.

Concentration Areas: Students may choose to focus on a specific concentration area such as the four listed above. If a student opts to focus on a concentration area, the program must include (in addition to IE 2005) a minimum of five courses from the area. Appropriate core courses may be counted among these five courses.

Normally the program can be completed in 12 months of full-time study or two to three years of part-time study. Many graduate courses are offered in the evening for the convenience of working professionals. Courses also are offered in the summer term.

Students with undergraduate degrees from ABET-accredited Industrial Engineering Programs are encouraged to bypass any or all core courses in which they have a strong background and substitute more advanced elective courses.

DOCTORAL PROGRAM IN INDUSTRIAL ENGINEERING

The doctoral program prepares the student for the rigorous demands of developing and implementing effective operational and management systems. The student is educated at the frontiers of knowledge in technical management, systems design, and decision-making concepts. This work requires a strong background in mathematics, probability theory, optimization techniques, systems management, and behavioral systems. The PhD student is expected to be a full-time student. Although it is possible to seek candidacy as a part-time student, the PhD candidate must spend at least one academic year full-time on campus. The graduate faculty typically works closely with individual doctoral students to create a more flexible program tailored to individual needs.

ENTRANCE TO THE PhD PROGRAM

To be accepted for the doctoral program, a graduate student must have a superior graduate scholastic record and show promise for independent research. To be admitted to the doctoral program, a prospective doctoral student must have a cumulative quality point average of 3.30 or better in graduate course work. A graduate student who has completed the equivalent of a master's degree program, including all of the core courses, is eligible for entrance into the doctoral program. The student must seek faculty approval to take the PhD preliminary examination. This preliminary examination is given once a year and encompasses IE 2005, the five courses in the basic core, and an unstructured problem that the student is required to formulate and solve. The student must pass both the written and oral part of the examination. The examination allows the department to assess the student's academic preparation and creative ability to conduct doctoral-level research. All students must take the examination by January of the second year in which they are in residence, although it is acceptable to take the examination earlier.

DOCTORAL COURSE AND DISSERTATION CREDIT REQUIREMENTS

In addition to the basic core courses, the doctoral student will take any courses that may be required in preparation for the PhD comprehensive examination and the student's dissertation topic. These courses are selected in conjunction with a program approved by the student's advisor. According to University regulations, the PhD requires at least 72 credits beyond the bachelor's degree or 42 credits beyond the master's degree, including 18 credits for dissertation research. Course credits typically include the following:

• IE 2005	3 credits
• Core courses	15 credits
• Additional course work	36 credits
• Dissertation Credits	18 credits

ADDITIONAL DOCTORAL REQUIREMENTS

All full-time students must enroll in and attend IE 3095, the Graduate Seminar, and all full-time students in their second year of study are required to register for IE 2093, Graduate Journal Seminar. The credits for these courses do not count towards the 72-credit requirement.

The comprehensive examination is taken by students after completing the course work in their concentration. The PhD comprehensive exam has a three-fold purpose: (1) test the student's proficiency (knowledge and skills) in his or her major area of interest; (2) identify deficiencies in the student's background and suggest remedial work; and (3) test the student's ability to prepare an acceptable dissertation in the student's area of concentration.

All doctoral students are expected to pursue research by working with individual faculty in areas that can lead to a potential doctoral dissertation. A PhD candidate must demonstrate the ability to conduct research of an original nature by completing a dissertation and preparing a paper of publishable quality. The dissertation topic is selected by the student in some theoretical or applied area of interest in consultation with a faculty advisor. A faculty committee must approve the dissertation proposal before the student embarks on dissertation research.

GRADUATE INDUSTRIAL ENGINEERING COURSES

Required

IE 2005	Probability and Statistics for Engineers	3 cr.
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Basic Core

IE 2001	Operations Research	3 cr.
IE 2003	Systems Management	3 cr.
IE 2004	Information Systems	3 cr.
IE 2006	Introduction to Manufacturing Systems	3 cr.
IE 2007	Statistics for Engineers II	3 cr.

Elective Courses

IE 2018	Engineering Tools for E-commerce	3 cr.
IE 2025	Facility Layout and Material Handling	3 cr.
IE 2030	Behavioral Systems Engineering	3 cr.
IE 2032	Cases in Systems Management	3 cr.
IE 2037	Cost Management for Advanced Manufacturing	3 cr.
IE 2040	Advanced Engineering Economy	3 cr.
IE 2051	Computer Aided Manufacturing	3 cr.
IE 2054	Industrial Robotic Applications	3 cr.
IE 2055	Automation in Manufacturing and Product Design	3 cr.

IE	2057	Manufacturing Information Systems	3 cr.
IE	2061	Ergonomics and Occupational Biomechanics	3 cr.
IE	2073	Design of Experiments	3 cr.
IE	2076	Total Quality Management	3 cr.
IE	2081	Nonlinear Optimization	3 cr.
IE	2082	Linear Optimization	3 cr.
IE	2083	Production and Inventory Control	3 cr.
IE	2084	Stochastic Processes	3 cr.
IE	2086	Decision Models	3 cr.
IE	2087	Simulation Modeling Using Siman/Cinema	3 cr.
IE	2088	Digital Systems Simulation	3 cr.
IE	2089	Rapid Prototyping and Reverse Engineering	3 cr.
IE	2090	MS Project	3 cr.
IE	2093	Graduate Journal Seminar	3 cr.
IE	2997	Research, MS	Var. cr.
IE	2999	MS Thesis	Var. cr.
IE	3030	Advanced Topics in Engineering Management	3 cr.
IE	3031	Project Management	3 cr.
IE	3033	Neural Networks and Industrial Applications	3 cr.
IE	3034	Management of Technological Innovation	3 cr.
IE	3050	Advanced Topics in Manufacturing	3 cr.
IE	3052	Computer Graphics and Machine Vision	3 cr.
IE	3062	Advanced Ergonomics	3 cr.
IE	3082	Mathematical Theory of Scheduling Models	3 cr.
IE	3085	Queuing Theory	3 cr.
IE	3086	Introduction to Integer and Dynamic Programming	3 cr.
IE	3087	Network-Based Optimization	3 cr.
IE	3091	Heuristic Optimization	3 cr.
IE	3095	Graduate Seminar	3 cr.
IE	3997	Research, PhD	Var. cr.
IE	3998	Independent Study	Var. cr.
IE	3999	Dissertation	

MATERIALS SCIENCE AND ENGINEERING DEPARTMENT

Gerald H. Meier, PhD, Interim Chair
Web site: <http://www.engrng.pitt.edu/~msewww/gradcur.html>

The Department of Materials Science and Engineering offers broad-based educational and research programs in metallurgy, materials science and engineering leading to the degrees of Master of Science in Materials Science and Engineering, and Doctor of Philosophy. These programs are oriented toward the transition of results from scientific and engineering disciplines to the solution of materials problems that impede technological progress. They are designed to educate engineers, providing them with the tools to become successful in research, development, production, management, and teaching.

In materials science and engineering, there are programs in structural and electronic ceramics, electromagnetic properties, materials processing and advanced characterization.

Basic courses in the structure, properties, and energetics of materials are taken in common by the students and through advanced and specialty courses the student, working with faculty advisors, tailors the program to suit individual interests and demands of the student's chosen field of specialization.

The range of research programs in the department reflects the broad spectrum of interest of the faculty. However, interest in the structure and properties of materials and their influence on materials processing is a common thread that ties together many of the programs. Research is aimed at building an understanding of basic phenomena that will lead to solutions of materials problems at the forefront of technological and social progress.

Current research programs are centered in several areas of ceramics, metallurgy, and polymers, including: corrosion and oxidation; high-temperature materials; magnetic materials; materials for energy applications; melting and refining; metal-forming processes; phase transformations in metals and ceramics; intermetallic phases; plastic deformation of metals and alloys and composites; strengthening mechanisms, surfaces and interfaces; thermomechanical processing of steels; thermodynamic properties of materials; ceramic processing; sintering science; high-temperature superconductivity; electronic properties of ceramics; ferroelectrics and magnetorheological fluids; nanophases and catalytic materials.

CONTACT INFORMATION

Students wishing more information or application forms for admission or financial aid may write to any member of the Department of Materials Science and Engineering faculty or to:

Graduate Coordinator
Department of Materials Science and Engineering
848 Benedum Hall
School of Engineering
University of Pittsburgh
Pittsburgh, PA 15261
Web site: <http://www.engrng.pitt.edu/~msewww/gradcur.html>

MASTER OF SCIENCE PROGRAM

The department offers a Master of Science degree in Materials Science and Engineering. The major areas of specialization are physical, mechanical, process, and chemical metallurgy and advanced ceramics. MS degrees can be obtained in programs with thesis or non-thesis options. The non-thesis options are available for part-time students only.

In the thesis option, the MS degree requirements include the completion of a minimum of 24 credits of course work and six credits of thesis. The non-thesis research option requires the completion of 30 credits of courses following the recommended distribution in the various areas of specialization.

Details of the requirements and options are given in the pamphlet Guidelines for Students in the MS Program, which is available in the departmental office.

DOCTOR OF PHILOSOPHY PROGRAM

The major requirements for the Doctor of Philosophy degree are:

1. passing the qualifying examination, which is based on a broad body of knowledge defined for each option;
2. passing the comprehensive examination on the area of specialization (thesis area); and
3. completion and successful defense of a PhD dissertation.

The procedures and requirements for the PhD are given in detail in the pamphlet Guidelines for Students in the PhD Program, available in the departmental office.

GRADUATE MATERIALS SCIENCE AND ENGINEERING COURSES

MSE	2001	Advanced Physics of Materials I	3 cr.
MSE	2002	Advanced Physics of Materials II	3 cr.
MSE	2003	Structure of Materials	3 cr.
MSE	2004	Advanced Dislocation Theory	3 cr.
MSE	2005	Point Defects in Crystalline Solids	3 cr.
MSE	2009	Computer Applications in Materials	3 cr.
MSE	2011	Thermodynamics of Materials	3 cr.
MSE	2013	Kinetics in Materials Science	3 cr.
MSE	2014	Phase Transformations	3 cr.
MSE	2015	Electromagnetic Properties of Materials	3 cr.
MSE	2021	Physical Chemistry of Process Metallurgy	3 cr.
MSE	2022	Advanced Physical Metallurgy of Modern Steels	3 cr.
MSE	2030	Mechanical Behavior of Materials	3 cr.
MSE	2031	Metal/Forming Processes	3 cr.
MSE	2032	Failure of Materials	3 cr.
MSE	2041	Advanced Physical Metallurgy 1	3 cr.
MSE	2042	Advanced Physical Metallurgy 2	3 cr.
MSE	2043	Electron Microscopy in Materials Science	3 cr.
MSE	2044	Scanning Electron Microscopy and Microanalysis	3 cr.
MSE	2050	Gas-Metal Reactions	3 cr.
MSE	2055	Principles of Solidification	3 cr.
MSE	2067	Elements of Materials Science and Engineering 1	3 cr.
MSE	2068	Elements of Materials Science and Engineering 2	3 cr.
MSE	2070	Structure of Ceramics	3 cr.
MSE	2071	Properties of Ceramics	3 cr.
MSE	2072	Ceramic Processing	3 cr.
MSE	2074	Colloids and Surfaces (Cross-listed as CHE 2118)	3 cr.
MSE	2076	Surfaces of Materials	3 cr.
MSE	2094	Special Advanced Seminar	1-3 cr.
MSE	2095	Special Topics in Materials Science and Engineering	1-3 cr.
MSE	2997	MS Research	1-12 cr.
MSE	2998	Graduate Projects	1-3 cr.
MSE	2999	MS Thesis	1-12 cr.
MSE	3023	Graduate Seminar	1 cr.
MSE	3024	Graduate Seminar	1 cr.
MSE	3997	PhD Research	1-12 cr.
MSE	3998	Independent Study	1-3 cr.
MSE	3999	PhD Dissertation	1-12 cr.

MECHANICAL ENGINEERING DEPARTMENT

Minking Chyu, PhD, Chair

Web site: <http://www.engrng.pitt.edu/~mewww/>

The Department of Mechanical Engineering at the University of Pittsburgh offers graduate studies in core areas, as well as an opportunity to carry out research in many highly interdisciplinary fields. The curriculum is an integrated program of study with applications to fluid mechanics, solid mechanics, thermal systems, and dynamic systems

and control. The graduate faculty is committed to high-quality research and teaching, and to maintaining sophisticated experimental and computation facilities. Research areas include fluid mechanics (non-Newtonian fluids, rheology, biofluids), heat transfer, applied mechanics (computational mechanics, fracture mechanics, biomechanics, composites), smart materials and structures, acoustics and vibrations, bioengineering, micro-electromechanical systems (MEMs), rehabilitation engineering and strip handling and metals processing.

DEPARTMENTAL REGULATIONS

A detailed and updated list of rules for graduate study in Mechanical Engineering is stated in the department's Graduate Handbook, which is distributed to all graduate students. Students should consult the handbook for current and specific departmental regulations.

ADMISSIONS

An application for either the MS in Mechanical Engineering or PhD program is judged on the student's prior academic record, GRE scores (required for PhD applicants), the accreditation of the prior degree granting school, and the capability of the department to match the applicant's interest with the program. Students with a Bachelor of Science degree in another engineering field, mathematics, or physics will also be considered for the graduate program with the possibility that prerequisite courses may be required.

A part-time program is available for students who are employed in local industries. Part-time students usually carry from three to six credits per term in either day or evening classes.

MASTER OF SCIENCE PROGRAM

Upon entering the MSME program, the student plans a program of study with the aid of the faculty advisor. The course requirements can be met by either the thesis option or non-thesis option as detailed below:

- (1) Thesis option (Research MS): 24 course credits (includes three credits for ME 2997) and six thesis credits (ME 2999); or the
- (2) Non-thesis option (Professional MS): 30 course credits

In either case, students seeking the Master of Science in Mechanical Engineering must take at least one of the mathematics courses, ME 2001 or ME 2002, and must take Mechanical Engineering courses from at least two different subject course lists (see below). Up to nine credits from other engineering, mathematics, or physics departments may be used in fulfilling the remaining course requirements.

SUBJECT COURSE LISTS

MS students must take courses from at least two of the subject course lists in dynamic systems, fluid mechanics, solid mechanics, or thermal systems:

DYNAMIC SYSTEMS

ME	2020	Mechanical Vibrations
ME	2027	Advanced Dynamics
ME	2045	Linear Control Systems
ME	2046	Digital Control Systems

FLUID MECHANICS

ME	2003	Introduction to Continuum Mechanics
ME	2055	Computational Fluid Dynamics and Heat Transfer
ME	2074	Advanced Fluid Mechanics 1
ME	2075	Advanced Fluid Mechanics 2

SOLID MECHANICS AREA

ME	2003	Introduction to Continuum Mechanics
ME	2004	Elasticity
ME	2022	Applied Solid Mechanics
ME	2033	Fracture Mechanics
ME	2047	Finite Element Analysis

THERMAL SYSTEMS

ME	2050	Thermodynamics
ME	2053	Advanced Heat Transfer
ME	2074	Advanced Fluid Mechanics 1

DOCTOR OF PHILOSOPHY PROGRAM

An applicant is officially classified as a PhD student if he or she has been accepted into the PhD program and has satisfied one of the following requirements:

- (1) has received an accredited MS or equivalent degree; or
- (2) has completed eight courses at the MS level in good academic standing and has been granted permission to bypass the additional course work required for the MS degree.

During the first term in the doctoral program the student must submit a program of study for approval by the department. Minimum course requirements (beyond MS or equivalent degree) include:

- 30 credits for the MS degree (or equivalent)
- 18 course credits at an advanced graduate level (approved by the student's advisor and the graduate committee)
- 18 dissertation credits, 12 of which must be for ME 3999
- Six additional credits approved by advisor and graduate committee

= 72 Total Credits

SEMINAR

PhD students are required to give one seminar each year, usually as part of the departmental seminar series. The seminar topic should be chosen in consultation with the student's advisor.

PRELIMINARY EXAMINATION FOR PhD (QUALIFYING EXAM)

The PhD preliminary examination is administered once per year. The purpose of this written and oral examination is to assess students' potential to complete the PhD program.

COMPREHENSIVE EXAMINATION FOR PhD

The comprehensive examination is administered by the student's advisor. This exam is given after the student has passed the preliminary examination and has completed all course requirements for the doctorate with a cumulative QPA of at least 3.30.

PHD DISSERTATION PROPOSAL

In this examination, the student presents and defends a proposal for dissertation research to a doctoral committee consisting of at least four graduate faculty, one of whom must be outside the Mechanical Engineering department. If the dissertation proposal is accepted by the doctoral committee, the student is formally admitted to Candidacy for the Doctor of Philosophy Degree.

PHD DISSERTATION AND FINAL DEFENSE

This is the final examination of the PhD program, conducted by the doctoral committee, in which the student defends the validity of and the contributions made by the dissertation research.

GRADUATE MECHANICAL ENGINEERING COURSES

ME 2001	Differential Equations	3 cr.
ME 2002	Linear and Complex Analysis	3 cr.
ME 2003	Introduction to Continuum Mechanics	3 cr.
ME 2004	Elasticity	3 cr.
ME 2020	Mechanical Vibrations	3 cr.
ME 2022	Applied Solid Mechanics	3 cr.
ME 2027	Advanced Dynamics	3 cr.
ME 2033	Fracture Mechanics for Product Design and Mfg.	3 cr.
ME 2040	Experimentation	3 cr.
ME 2045	Linear Control Systems	3 cr.
ME 2046	Digital Control Systems	3 cr.
ME 2047	Finite Element Analysis	3 cr.
ME 2050	Thermodynamics	3 cr.
ME 2053	Heat and Mass Transfer	3 cr.
ME 2055	Computational Fluid Dynamics and Heat Transfer	3 cr.
ME 2060	Numerical Methods	3 cr.
ME 2067	Musculoskeletal Biomechanics	3 cr.
ME 2074	Advanced Fluid Mechanics 1	3 cr.
ME 2085	Graduate Seminar	0 cr.
ME 2095	Graduate Projects	3 cr.
ME 2997	MS Research	3 cr.
ME 2999	MS Thesis	Var. cr.
ME 3003	Theory of Continuous Media	3 cr.
ME 3004	Advanced Elasticity	3 cr.
ME 3006	Inelasticity	3 cr.
ME 3021	Mechanical Vibrations 2	3 cr.
ME 3023	Composites	3 cr.
ME 3036	Advanced Fracture Mechanics	3 cr.
ME 3047	Advanced Finite Element Analysis	3 cr.
ME 3052	Conduction Heat Transfer	3 cr.
ME 3054	Convection Heat Transfer	3 cr.
ME 3055	Multiphase Flow	3 cr.
ME 3075	Hydrodynamic Stability	3 cr.
ME 3078	Viscous Fluids	3 cr.
ME 3079	Turbulence	3 cr.
ME 3081	Non-Newtonian Fluids	3 cr.
ME 3090	Special Topics in Mechanical Engineering	3 cr.
ME 3095	Graduate Projects	3 cr.
ME 3997	PhD Research	3 cr.
ME 3999	PhD Dissertation	3 cr.

SCHOOL OF ENGINEERING FACULTY

BIOENGINEERING DEPARTMENT

HARVEY S. BOROVIETZ, *Professor, Bioengineering Department/School of Engineering*; PhD, Carnegie Mellon University

RORY A. COOPER, *Professor, Rehabilitation Science and Technology and Professor, Bioengineering Department and Mechanical Engineering Department/School of Engineering*; PhD, University of California, Santa Barbara

RICHARD E. DEBSKI, *Assistant Professor/School of Medicine and Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of Pittsburgh

DANIEL L. FARKAS, *Professor, Bioengineering Department/School of Engineering*; PhD, The Weizmann Institute of Science

KENNETH J. FISCHER, *Assistant Professor, Orthopedic Surgery/School of Medicine and Assistant Professor, Bioengineering Department and Mechanical Engineering Department/School of Engineering*; PhD, Stanford University

JOSEPH M. FURMAN, *Professor, Otolaryngology/School of Medicine and Professor, Bioengineering Department/School of Engineering*; PhD, University of Pennsylvania

PAUL E. KINAHAN, *Assistant Professor of Radiology and Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of Pennsylvania

MARK S. REDFERN, *Associate Professor and Undergraduate Coordinator, Bioengineering Department/School of Engineering*; PhD, University of Michigan

MICHAEL STEVEN SACKS, *Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of Texas at Arlington and University of Texas Southwestern Medical Center

JEROME S. SCHULTZ, *Distinguished Service Professor and Chairman, Bioengineering Department and Director of the Center for Biotechnology and Bioengineering/School of Engineering*; PhD, University of Wisconsin

ROBERT J. SCLABASSI, *Professor, Bioengineering Department/School of Engineering*; PhD, University of Southern California, MD, University of Pittsburgh

SANJEEV G. SHROFF, *Professor and Gerald E. McGinnis Chair, Bioengineering Department/School of Engineering*; PhD, University of Pennsylvania

GEORGE DeWITT STETTEN, *Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of North Carolina

JUN-KYO SUH, *Adjunct Assistant Professor, Bioengineering Department/School of Engineering*; PhD, Rensselaer Polytechnic Institute

DAVID A. VORP, *Assistant Professor, Department of Surgery/School of Medicine and Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of Pittsburgh

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HUICONG WANG, *Assistant Professor, Bioengineering Department/School of Engineering*; PhD, University of Cincinnati

SAVIO L.-Y. WOO, *Professor, Orthopedic Surgery/School of Medicine and Professor, Bioengineering Department/School of Engineering*; PhD, University of Washington

CHEMICAL AND PETROLEUM ENGINEERING DEPARTMENT

MOHAMMAD M. ATAANI, *Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Cornell University

ANNA C. BALAZS, *Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Massachusetts Institute of Technology

ERIC J. BECKMAN, *Associate Dean for Research and Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, University of Massachusetts

JULIE L. d'ITRI, *Associate Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Northwestern University

ROBERT M. ENICK, *Professor and Undergraduate Coordinator, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, University of Pittsburgh

WILLIAM FEDERSPIEL, *Associate Professor, Department of Surgery/School of Medicine and Associate Professor and Graduate Coordinator, Chemical and Petroleum Engineering Department and Associate Professor, Bioengineering Department/School of Engineering*; PhD, University of Rochester

JAMES G. GOODWIN, JR., *Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, University of Michigan

GERALD D. HOLDER, *USX Dean of Engineering and Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, University of Michigan

J. KARL JOHNSON, *Associate Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Cornell University

GEORGE E. KLINZING, *Vice Provost for Research and Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Carnegie Mellon University

J. THOMAS LINDT, *Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Technical University of Delft

JOSEPH J. McCARTHY, *Assistant Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Northwestern University

BADIE I. MORSE, *Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, ScD, Institut National Polytechnique de Lorraine-Ecole Nationale Supérieure des Industries Chimiques

ROBERT S. PARKER, *Assistant Professor, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, University of Delaware

ALAN J. RUSSELL, *Professor and Chairman, Chemical and Petroleum Engineering Department/School of Engineering*; PhD, Imperial College of Science and Technology

CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT

DANIEL D. BUDNY, *Associate Professor, Civil and Environmental Engineering Department and Director, Freshman Engineering Program/School of Engineering*; PhD, Michigan State University

LEONARD W. CASSON, *Associate Professor, Civil and Environmental Engineering Department/School of Engineering*; PhD, University of Texas, Austin

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