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Photo – Chapter 2
PHILOSOPHY

Admission requirements for graduate study at UTSA are designed so that admitted students will have a high probability of success in graduate-level academic work. Graduate study is much more than a continuation of undergraduate work and should be considered only by those students with the capacity for independent thought and investigation. Graduate programs at UTSA use selective entrance requirements in their admission of students. In addition to the University-wide admission requirements listed below, each graduate degree program specifies additional admission requirements, including scores on the Graduate Record Examination (GRE) aptitude test, the Graduate Management Admission Test (GMAT), other standardized examinations, a portfolio, an audition, or other indicators of preparation for graduate study. Information on the GRE and GMAT and test applications may be obtained from the Educational Testing Service, Box 899, Princeton, NJ 08540, or from UTSA Testing Services. The institution code for UTSA is 6919-5 for the GRE and 6919 for the GMAT. Applicants should refer to individual degree descriptions for additional admission requirements.

Consistent with Texas House Bill 1641, any degree program that uses an applicant’s performance on a standardized test, other than scores obtained on the Test of English as a Foreign Language (TOEFL) required of international applicants, to make decisions about admissions or the award of competitive scholarships will only compare the applicant’s test score with those of other applicants from similar socioeconomic backgrounds. If an applicant’s performance on a standardized test is used for that purpose, it will be considered together with other criteria when making an admissions or competitive scholarship decision and will not be used as the sole criterion for consideration of the applicant or as the primary criterion to end consideration of the applicant.

CLASSIFICATIONS AND REQUIREMENTS

Classifications of graduate admission require approval by the Dean of Graduate Studies, the administrative officer responsible for graduate education. The criteria for the various classifications of admission to UTSA are set forth below.

Graduate Degree-Seeking Students

A graduate degree-seeking student is one admitted to a graduate degree program. Admission as a graduate degree-seeking student may be unconditional, conditional, or conditional on academic probation.

Admission without Conditions

In order to be eligible for admission without conditions as a graduate degree-seeking student, an applicant normally must

1. Hold a baccalaureate degree from a regionally accredited college or university in the United States or have proof of equivalent training at a foreign institution.
2. Have a grade point average of at least 3.0 (on a 4.0 scale) in the last 60 semester credit hours of coursework for the baccalaureate degree, as well as in all graduate-level work taken.
3. Have completed at least 18 semester credit hours (12 of which must be at the upper-division level) in the area or areas in which the graduate degree is sought or in related areas as determined by the Graduate Program Committee for the proposed major.
4. Be in good standing at the last institution attended.
5. Be recommended for admission by the Graduate Program Committee in the proposed major. The committee may examine a student on his or her previous preparation before a recommendation is made for the student to be admitted to the program.

Even though admission is based on the last 60 undergraduate hours attempted and all graduate coursework taken, students must list on the application for admission all colleges and universities attended and request that an official transcript from each institution be sent to the Office of Graduate Studies. UTSA graduates only need to order transcripts from any institutions not listed on the UTSA transcript. The Office of Graduate Studies will obtain the UTSA transcript from the Office of the Registrar.
Conditional Admission

An applicant who has insufficient preparation in his or her intended graduate degree program, or who lacks certain supporting documentation required for unconditional admission, may be admitted conditionally to the graduate degree program upon recommendation of the Graduate Program Committee in the proposed major and approval by the Dean of Graduate Studies.

Conditions placed on admission may include

1. Submission of test scores or other indicators of preparation for graduate study that are unavoidably lacking at the time of admission.
2. Completion of additional coursework or other study to remove deficiencies, with such makeup work to be in addition to the regular degree requirements.
3. Completion of a given number of semester credit hours and the achievement of a minimum grade point average, in no case lower than that required for a student to remain in the University as a graduate degree-seeking or special graduate student, if the student's grade point average is less than that specified for unconditional admission. (See the section on Academic Standing in Chapter 3, General Academic Regulations.)

Any conditions placed on the student's admission are included in the notification of admission. If conditions placed on admission are not met within the time specified by the Graduate Program Committee and stated in the admission notice, the Dean will direct the Registrar to withdraw the student from the University. The student may petition for reinstatement under the provisions listed in this catalog. (See Petition for Reinstatement in Chapter 3, General Academic Regulations.)

Admission on Academic Probation

An applicant who fails to meet the requirements for admission without conditions and is admitted on a conditional basis may be admitted on academic probation, upon recommendation of the appropriate graduate program committee and approval by the Dean of Graduate Studies. Such admission requires that coursework taken during the first semester be completed with a grade point average of "B" (3.0 on a 4.0 scale) or better. Failure to earn this average results in academic dismissal.

Denial of Admission as a Graduate Degree-Seeking Student

If an applicant is not eligible for either admission without conditions or conditional admission, the applicant is denied admission as a graduate degree-seeking student. In such cases, the appropriate graduate program committee may recommend the applicant's admission or denial of admission as a special graduate student.

Special Graduate Students

A special graduate student is one admitted to UTSA for the purpose of enrolling in master's-level and/or undergraduate courses without currently entering a degree program. An applicant who elects to enroll as a special graduate student normally must

1. Hold a baccalaureate degree from a regionally accredited college or university in the United States or have proof of an equivalent degree from a foreign institution.
2. Have a grade point average of at least 3.0 (on a 4.0 scale) in the last 30 semester credit hours of coursework for the baccalaureate degree as well as in all graduate-level coursework previously taken.
3. Be in good standing at the last institution attended.
4. Be recommended for admission as a special graduate student by the authorized representative of the discipline offering the graduate course or courses desired. The authorized representative of the discipline offering the course is the discipline graduate program committee acting through its chair or through its graduate advisor of record. If there is no graduate program committee for the discipline, the chair of the department offering the discipline is the authorized representative. If the program is interdisciplinary, the Associate Dean for Graduate Studies and Research of the appropriate college is the authorized representative.
Even though admission is based on the last 30 undergraduate hours attempted for the bachelor's degree and all graduate coursework taken, students must list on the application all colleges and universities attended. Students must request that an official transcript be sent to the Office of Graduate Studies from institutions attended for the last 30 undergraduate hours for the bachelor's degree. Also, official transcripts must be requested from the institution conferring the last degree, plus all the institutions where graduate hours were earned. UTSA graduates only need to order transcripts from any institutions not listed on the UTSA transcript. The Office of Graduate Studies will obtain the UTSA transcript from the Office of the Registrar.

Special graduate students are eligible to take any master's level or undergraduate courses for which they have the necessary prerequisites, provided that space is available, and have the approval of the instructor in which the course is taught. Students who wish to take a graduate course in a discipline other than that for which they have been authorized upon admission must obtain the approval of the authorized representative (as defined above) of the discipline offering the course.

Special graduate students are advised that

1. A maximum of 12 semester credit hours earned as a special graduate student may be applied toward a graduate degree, and then only when the student has been admitted as a graduate degree-seeking student and the credits earned for these courses have been evaluated and approved for this purpose by the appropriate graduate program committee.
2. When teacher certification is involved, approval of the director of the College of Education and Human Development Advising and Certification Center is required before the student enrolls to ensure that credit earned as a special graduate student can be applied to a graduate-level teacher certification program.
3. To continue at UTSA as a special graduate student in a subsequent semester, the student must meet the standards required to remain in UTSA as indicated in the section on Academic Standing.
4. Status as a special graduate student cannot be utilized when admission as a degree-seeking student is denied or when the graduate admissions file is incomplete.

Denial of Admission as a Special Graduate Student

An applicant who is denied admission as both a graduate degree-seeking student and a special graduate student may be eligible for admission as a special undergraduate student if admission requirements for that classification have been met. (See Special Students in Chapter 4, Admissions, UTSA Information.)

Students holding bachelor's degrees who are admitted as special undergraduate students may enroll in undergraduate courses only. If they wish to take courses at the graduate level, they must obtain permission from the course instructor and the department chair on the form provided for this purpose or apply and be admitted as special graduate students. Students may not be enrolled at the graduate and undergraduate levels at the same time.

Non-Degree-Seeking Graduate Students

An applicant who wishes to enroll for courses without pursuing a degree at UTSA should apply for admission as a non-degree-seeking graduate student. In order to qualify as a non-degree-seeking graduate student the applicant must

1. Hold at least a baccalaureate degree from a regionally accredited college or university.
2. Have a grade point average of at least 3.0 (on a 4.0 scale) in the last 30 semester credit hours of coursework for the baccalaureate degree as well as on all graduate-level coursework taken.
3. Be in good standing at the last institution attended.
4. Be recommended for admission as a non-degree-seeking graduate student by the authorized representative of the discipline offering the graduate course or courses desired. The authorized representative of the discipline offering the graduate course is the discipline graduate program committee, acting through its chair or through its graduate advisor of record. If there is no graduate program committee for the discipline, the chair of the department offering the discipline is the authorized representative. If the program is interdisciplinary, the Associate Dean for Graduate Studies and Research of the appropriate college is the authorized representative.

Even though admission is based on the last 30 undergraduate hours attempted for the bachelor's degree and on good standing at the last institution attended, students must list on the application for admission all colleges and universities attended. Students must request that an official transcript be sent to the Office of Graduate Studies only from institutions attended for the
last 30 undergraduate hours for the bachelor's degree. UTSA graduates only need to order transcripts from any institutions not listed on the UTSA transcript. The Office of Graduate Studies will obtain the UTSA transcript from the Office of the Registrar. A statement of good standing is required from the last institution attended.

Non-degree-seeking graduate students may register for any master's level or undergraduate course for which they have the necessary prerequisites, provided that space is available and that they have the approval of the course instructor. Students who wish to take a graduate course in a discipline other than that for which they have been authorized upon admission must obtain the approval of the authorized representative (as defined above) of the discipline offering the course.

Non-degree-seeking graduate students are advised that

1. Credit earned as a non-degree-seeking graduate student will not count toward a degree at UTSA.
2. If the student plans to obtain a graduate degree at UTSA, an application for admission should be made as either a graduate degree-seeking student or a special graduate student.
3. When teacher certification is involved, approval of the director of the College of Education and Human Development Advising and Certification Center is required before the student enrolls to ensure that credit earned as a non-degree-seeking graduate student can be applied to a graduate-level teacher certification program.

International Students

Applications from persons holding nonpermanent visas will be processed as international. This includes applications received from other countries and requests to transfer from a U.S. college or university.

Applicants must

1. Meet the graduate admission requirements for graduate degree-seeking students. Applicants who will be on a student visa may not be admitted other than as graduate degree-seeking students. (An I-20 form is not issued to non-degree-seeking or special graduate students.)
2. Submit scores from the Test of English as a Foreign Language (TOEFL). Students who need to take this test should write to the Educational Testing Service, Box 899, Princeton, NJ 08540, requesting information on taking the TOEFL. The code for UTSA is 6919. A minimum score of 500 (paper version) or 173 (comprehensive version) on the TOEFL is required. TOEFL scores may be waived for international students from countries where English is the primary language of instruction and the principal language spoken in the home; or for noncitizens of the United States earning a bachelor's degree or higher in the United States or other English-speaking countries. Participation in UTSA's English Language Assessment Program (ELAP) before registration is required of students with TOEFL scores below 600 (paper version) or 250 (computerized version). Based on this assessment, students needing additional instruction in English are required to enroll in appropriate English for International Students (EIS) courses.
3. Submit a statement guaranteeing the student's ability to pay all expenses while a student at UTSA, if attendance under the F-1 (student) visa is anticipated. The statement may be sent from a parent or guardian when endorsed by a bank or other reliable institution, or from a U.S. citizen who will accept responsibility for the student's financial needs.
4. Have an application, $75 nonrefundable application fee, and supporting credentials on file in the Office of Graduate Studies by the appropriate application deadline. International students applying for readmission are only required to pay a $75 nonrefundable application fee. The $75 nonrefundable application fee is also charged upon reapplication for admission following academic dismissal. See Application Dates for deadlines.

The above criteria serve as guidelines for admission for international students. The credentials of each applicant are examined on an individual basis by the Office of Graduate Studies and the appropriate graduate program committee, with admission granted only to those who show promise of success in graduate study at UTSA.

Academic Fresh Start

An applicant who has earned a baccalaureate degree under the Academic Fresh Start statute, Texas Education Code § 51.931, will be evaluated on only the grade point average of the coursework completed for that baccalaureate degree and the other criteria stated herein.
Procedures for Teacher Certification or for Certificate Endorsements at the Graduate Level

An applicant who desires to work on teacher certification requirements and holds a bachelor’s degree should apply either as a graduate degree-seeking student or special graduate student (not special undergraduate student) to the Graduate Program Committee for the M.A. in Education for certification and endorsement requirements other than endorsements in Bilingual Education and English as a Second Language. Applicants for these endorsements should apply for admission as either a graduate degree-seeking student or special graduate student to the Graduate Program Committee for the M.A. in Bicultural-Bilingual Studies. A student who is simultaneously seeking a master’s degree in education should apply for admission to the M.A. in Education Program or the M.A. in Bicultural-Bilingual Studies Program.

When admission has been granted, the student should apply to the College of Education and Human Development Advising and Certification Center for an analysis of his or her transcripts and for an official outline of a program that will ensure meeting the requirements to obtain a teacher’s certificate or a certificate endorsement. In some cases it may be possible to meet certification requirements within a degree program; in other cases the student may need to take additional work for the certificate beyond that required for the graduate degree. The completion of degree requirements does not guarantee completion of Texas certification requirements. The student’s program advisor and the College of Education and Human Development Advising and Certification Center will assist the student in planning an appropriate program of study.

Any student seeking a teaching certificate in the state of Texas must pass the Texas Academic Skills Program (TASP) test. For further information on the TASP requirement and exemptions for teachers, a student should contact the College of Education and Human Development Advising and Certification Center.

Recommendations for teacher certification (to the Texas Education Agency) are made by the College of Education and Human Development Advising and Certification Center only after all requirements have been met and the student has officially requested such recommendation.

A brochure summarizing education certificate and endorsement requirements is available from the College of Education and Human Development Advising and Certification Center.

Declaration of Previous College Work Attempted

Students are not at liberty to disregard previous college work attempted. All students transferring to UTSA must list all colleges attended on their UTSA application for admission. Failure to do so may result in the rejection of the application, withdrawal of any offer of acceptance, cancellation of enrollment, permanent dismissal from the University, or other appropriate disciplinary action. Students should consult the admission categories listed above to learn which transcripts they need to have sent to the Office of Graduate Studies.

APPLICATION DATES

Master’s Level

Students applying for admission as master’s degree-seeking, special, or non-degree-seeking students may apply for admission as early as nine months before the beginning of the semester in which they wish to begin graduate study. Because of the time needed to prepare graduate summaries, students are encouraged to have their admission file complete at least one month before the application deadline. Application forms and instructions are available from the Office of Graduate Studies. The completed application form, $40 nonrefundable application fee, and all required supporting documents must be on file with the Office of Graduate Studies by the appropriate application deadline. An additional $5 processing fee will be charged for paper applications.

International students are charged a $75 nonrefundable application fee. The completed application form, $75 nonrefundable application fee, and all required supporting documents must be on file with the Office of Graduate Studies by the appropriate application deadline for international students. An additional $5 processing fee will be charged for paper applications.
The application deadlines for master's-level applicants are

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**Doctoral Level**

The deadline for doctoral applicants are as follows: December 15 for Biology candidates; all other doctoral program on February 1. Students enrolling in cooperative or joint programs between UTSA and other institutions must satisfy admission dates (and procedures) of the other institutions as well as those of UTSA. Failure to meet these admission deadlines will defer admission until a subsequent semester. Doctoral students are admitted during the Fall semester only.

**ADMISSION PROCEDURES**

Each applicant for admission is responsible for ensuring that all required application materials (completed application form, $40 nonrefundable application fee, test results, required transcripts, etc.) are on file in the Office of Graduate Studies by the admission deadlines. Admission is not granted until the applicant's file is complete. Documents submitted in support of an application become the property of UTSA and cannot be returned.

Students who apply for admission to UTSA for any semester and do not register for courses must reapply for admission if they wish to enroll at a later date. Any subsequent application for admission must be in accordance with current admission requirements. New transcripts, test scores, and other supporting documents are required after one year, since files for admitted students who do not register for courses are not retained after that period. (See program descriptions in Chapter 6, Graduate Program Requirements and Course Descriptions, for specific program admission requirements.)

**READMISSION**

UTSA graduate students who have not been in attendance for two full years must file an application for readmission, along with a $40 nonrefundable application fee, by the application deadline. International students pay a $75 nonrefundable application fee.

Former students returning to UTSA who have attended other institutions of higher education since they were last enrolled at UTSA must submit an official transcript from each institution. Eligibility for readmission of any former student depends on the student's academic status at the conclusion of the last UTSA semester of enrollment and performance on any subsequent college or university work attempted. Readmission must be recommended by the appropriate graduate program committee.
## GENERAL ACADEMIC REGULATIONS

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GENERAL ACADEMIC REGULATIONS

REGISTRATION PROCEDURES

Academic Advising

UTSA views sound academic advising as a significant responsibility in educating its students. Academic advisors assist students in developing intellectual potential and exploring educational opportunities and life goals. Many individuals within the UTSA community contribute to the advising process, including faculty and staff academic advisors.

Students are responsible for seeking adequate academic advice, for knowing and meeting degree requirements, and for enrolling in appropriate courses to ensure orderly and timely completion of their degree programs. Frequent advisor contact provides students with current academic information and promotes progress toward educational goals. Students also are encouraged to develop mentoring relationships with faculty for additional information and support.

Registration for Classes

Students who attend classes at UTSA must be officially registered or approved to audit a course. Registration instructions are included in the Schedule of Classes issued each semester. Questions regarding registration should be directed to the Enrollment Services Center or the Office of the Registrar.

UTSA does not guarantee the availability of particular courses or sections, and admission to classes is permitted only until the maximum number of students allowable in any section has been reached. UTSA reserves the right to cancel any course or section in which the number of registrants does not warrant its continuation.

English Language Assessment Procedure (ELAP)

The ELAP is a mandatory UTSA assessment for incoming international students whose Test of English as a Foreign Language (TOEFL) scores are between 500 and 600 (paper version) or 173 and 250 (computerized version). ELAP tests academic language skills in the areas of reading, writing, listening, and speaking. The test is administered during orientation week at no charge to the student. A registration hold is placed on students until the test is successfully completed.

Students who are required to take English for International Students (EIS) classes and do not register for them or drop them before they are successfully completed will be withdrawn from the University and jeopardize their visa status. Once students successfully complete the EIS classes, the registration hold is removed from their record.

Late Registration

Late registration permits students who have been admitted to UTSA to register for classes during an allotted time indicated in the Schedule of Classes, which is issued each semester. Instructions for late registration are included in the Schedule of Classes and are available at the Office of the Registrar. Since many courses will have been closed at capacity, late registrants may need to select their courses from a reduced schedule. Students are not permitted to register after the close of the late registration period.

A late registration fee of $5 is charged from the first day of late registration until the first day of class. Beginning with the first class day, an additional $2.50 per day is assessed. The maximum late registration fee for any one term is $15. This fee may be waived only in extenuating circumstances by the President or his delegate. The late registration fee is not refundable.
Adding Courses

Students who are registered for courses may add courses to their schedules for a limited time prior to and at the beginning of the semester. Adding a course after the add-period requires the approval of the course instructor and the chair of the department offering the course. After the Census Date in any semester, students may not add courses except in extremely rare and extenuating circumstances as approved by the Dean. The Census Date for Fall or Spring Semesters is the 12th class day; for five- and 10-week summer terms, the fourth class day. The University Calendar in the Schedule of Classes, issued each semester, indicates the deadline dates for adding courses.

There is a processing fee for adding courses from the first day of class through the Census Date. See the Schedule of Classes for information on the fee amount and the procedure for adding courses.

Undergraduates seeking to register for or to add a graduate course in any of these time periods must obtain the special approvals specified in the section, Enrollment in Graduate Courses, in the Bachelor’s Degree Regulations chapter of the UTSA Undergraduate Catalog.

Dropping Courses

Students may drop courses from their schedules for a limited time each semester. The University Calendar in the Schedule of Classes, issued each semester, indicates the deadlines for students to drop courses each term.

Courses officially dropped before the Census Date do not appear on a student’s transcript. See the Schedule of Classes each semester for the Census Dates. There is a processing fee for dropping courses from the first day of classes through the Census Date.

Students who drop courses between the Census Date and the Automatic “W” Date have a record of the courses on their transcripts with an automatic grade of “W.” The Automatic “W” Date is the last day of the ninth week of the Fall or Spring Semesters, or of the third week of a five-week term, or of the sixth week of a 10-week term. See the Schedule of Classes for the Automatic “W” date for other shorter terms. The change becomes official after it is processed by the Office of the Registrar. Students dropping courses after the Census Date are not charged the processing fee.

It is the student’s responsibility to drop a course by the appropriate deadline. If a student fails to drop a course, even if the student does not attend the course, he or she will receive a grade of “F” in the class.

Faculty and staff will not drop a student from a course automatically for nonattendance; the student must initiate the process and complete any necessary steps to ensure that the class is dropped.

Under certain circumstances, students may be dropped from courses administratively by college deans. Students who do not meet course prerequisites or who fail to attend a course prior to Census Date may be dropped from courses. If a dean determines that a student should be dropped from a course for these or other documented circumstances, the student will be notified by the college overseeing the course.

After the Automatic “W” date a student may not drop a course except with the approval of the instructor of the course and the Dean of the college in which the course is offered and then only for urgent and substantiated, nonacademic reasons. Students withdrawing from the University should refer to the section Withdrawal from the University in this chapter.

Auditing Courses

UTSA students and nonstudents who wish to audit a course may do so with the approval of the instructor and the chair of the department in which the course is offered, provided there is space in the classroom after all registered students have been accommodated. A course must achieve its minimum size without auditors.

Auditing entitles a student to listen and observe. Participation of an auditor in class is at the discretion of the instructor. No UTSA credit is granted for courses that are audited; no official record is made of enrollment in classes on an audit basis. Due
to the format of studio/laboratory use, auditors are not approved for art courses. Students not enrolled in courses at the University are not allowed to audit courses that require the use of the University computing system.

All auditors must submit an Audit Course Form to the Enrollment Services Center. A UTSA student pays an auditing fee of $25 a course. Auditors who are not registered UTSA students must pay an auditing fee of $50 a course. People over 65 years of age are permitted to audit without paying an auditing fee.

Permission to audit must be obtained and fees paid beginning the first day of class through the Census Date. Students who register for a course and later want to change the course to an audit must officially drop that course before submitting an Audit Course form.

Nonstudent auditors who want library privileges may receive them by filling out a Friends of the UTSA Library application at the circulation desk in the UTSA Library and paying a nonrefundable fee. There are limits on the services offered to the Friends of the UTSA Library cardholders; further details are available from the circulation desk.

Nonstudent auditors who want UTSA parking privileges should go to the University Police Traffic Office with their validated Audit Course Form.

Cancellation of Enrollment

Students who fail to fulfill admission, registration, or financial requirements, or who otherwise fail to adhere to academic regulations may have their enrollment for the semester canceled. Students may apply for readmission for a subsequent semester provided they have resolved the cause of cancellation.

Withdrawal from UTSA

Students who find it necessary to withdraw from UTSA (drop all courses for which they are enrolled during a specific semester) must complete a Withdrawal form at the Enrollment Services Center.

Students may not withdraw from the University later than the Monday preceding final examinations. Students who officially withdraw from the University during the regular drop period receive a grade of “W” in all classes. The Automatic “W” Date is the last day of the ninth week of the fall or spring semesters, or of the third week of a five-week term, or of the sixth week of a 10-week term. See the Schedule of Classes for the Automatic “W” Date for other shorter terms. Students who officially withdraw after the regular drop period receive a grade of “W” for each class they are passing at the time of withdrawal and a grade of “F” for each class they are not passing.

Students who withdraw from all classes are subject to the UTSA’s academic probation and dismissal regulations. Students withdrawing should refer to the regulations on refunds of tuition and fees, readmission policies, and requirements for maintaining registration. Students withdrawing from UTSA, regardless of the date, are not charged the add/drop processing fee.

RECORDS AND CLASSIFICATION OF STUDENTS

Classification Terms

Graduate Degree-Seeking Student. A student who is admitted to a graduate degree program, unconditionally, conditionally, or conditionally on academic probation.

Special Graduate Student. A student who is admitted to UTSA for the purpose of enrolling in graduate and/or undergraduate courses in one or more colleges of the University without entering a degree program.

Non-Degree-Seeking Graduate Student A student who registers for courses but does not intend to work toward a degree at UTSA.
Note: A graduate student who wishes to work on a program to meet the requirements for teacher certification or for a certificate endorsement must be admitted as a graduate degree-seeking student or special graduate student (not a special undergraduate student). He or she must apply to the College of Education and Human Development Advising and Certification Center for an official analysis of the requirements that must be met before he or she can be recommended for certification.

Definition of a Full-Time Graduate Student

A full-time graduate student (degree-seeking, special, or non-degree-seeking) is enrolled in 9 or more semester credit hours of graduate credit during a Fall or Spring Semester or in 5 or more hours of graduate credit during the entire Summer Semester.

Verification of Enrollment and Degree

UTSA student enrollment and degree verifications are reported by the National Student Clearinghouse (NSC). For students on financial aid this means that UTSA electronically submits enrollment verification statuses to the NSC at several key periods during the semester to keep their enrollment status up to date with loan guarantors, services, or lenders. The NSC also provides enrollment status and deferment information to the Department of Education’s National Student Loan Data System. This service provides for more efficient processing of enrollment information for financial aid loans.

The NSC also provides enrollment and degree verification for nonlending institutions, such as travel agencies, healthcare companies, and prospective employers. Students who do not want to have their directory information, such as enrollment and degree status, verified in this manner should contact the Office of the Registrar to request that this information be kept confidential.

Transcripts

Official transcripts of all coursework taken at UTSA are available at the Enrollment Services Center, by fax, or by mail. See the current Schedule of Classes for details on how to request a transcript.

Transcripts from other institutions submitted to UTSA become the property of the University and are not reproduced or mailed to other institutions, agencies, or individuals as an official transcript.

Official transcripts are not issued for students who have a financial obligation or other commitment outstanding to the University until the obligation is cleared.

Release of Academic Records

All official certifications with regard to the academic performance or status of a student or former student of UTSA are made by the Office of the Registrar.

UTSA transcripts and other information from a student’s academic records are released by the Office of the Registrar only upon written request from the student or other person authorized by law under the Family Educational Rights and Privacy Act of 1974. Exceptions may be made in response to a subpoena or court order, under other circumstances as allowed under the Family Educational Rights and Privacy Act of 1974 (FERPA), or as provided in the policy on releasing directory information set forth in Chapter 2 (About UTSA) of UTSA Information.

Catalog of Graduation

Graduate students have six years from the semester of original registration to complete a graduate degree program under the catalog in effect at the time of initial registration at UTSA, provided they are continuously enrolled at UTSA. If a student drops out for one or more long (spring or fall) semesters, he or she has the option of reenrolling under a subsequent catalog. These students will have six years to complete degree requirements under the new catalog. In the event that certain required courses are discontinued, substitutions may be authorized or required by the appropriate graduate program committee.
Change of Major, Degree, or Classification

Students who wish to change their majors, degree objectives, or classifications must obtain the required forms at the Office of Graduate Studies. The change is not official until the student is admitted to the new degree program or certification program. Classification changes (e.g., special graduate to degree-seeking) requested during any semester will not be effective until the following semester.

Change of Name

A student's name on official records at UTSA is the name under which the student applied for admission, unless an Address and Personal Information Change Form has been processed through the Office of the Registrar. The official University transcript will carry the current name and the most immediate previous name, if any. Address and Personal Information Change Forms should be supported by appropriate legal documentation.

Change of Address

Currently enrolled students who have changed their addresses must notify the Office of Graduate Studies on the appropriate form or on the UTSA Web site in ASAP. Official notification of change of address is necessary for proper identification of student records and for accurate mailing of correspondence, and information pertaining to graduation requirements. Students who are applying for graduation should specify on the Application for Graduation if the address change also affects the address to which the diploma is to be mailed.

COURSES

Course Numbering System

All courses are designated by four-digit numbers following a two- or three-letter abbreviation of the subject the course is in. The first digit indicates the level of the course. Courses beginning with “0” are developmental education courses and may not be counted toward a degree. Courses beginning with “1” or “2” are lower-division (freshman and sophomore level). Courses beginning with “3” or “4” are upper-division (junior and senior level). Courses beginning with a “5” or higher are graduate-level courses.

The second and third digits in the course numbers are used within the colleges by each department to distinguish individual courses. The fourth digit indicates the semester-credit-hour value of each course.

The numbers of lecture and laboratory contact hours per week are provided in parentheses in the course description sections immediately following the course number and title. For example, (3-0) indicates three hours of lecture and zero hours of laboratory per week.

Prerequisites

Prerequisites are stated for many courses listed in this catalog. Prerequisites advise students of the background expected of all students in the course. It is the student's responsibility to be sure that all prerequisites are met before enrolling in any course. When a student has not met the specific prerequisites listed, he or she may, under special conditions, obtain permission from the instructor of the course to register.

Extended Education Courses

The Office of Extended Education develops and presents seminars, short courses, conferences, and programs for the general public, professionals, governmental agencies, and businesses. It also provides specialized training to businesses, government agencies, and nonprofit organizations needing customized programs for their employees. These courses are not offered for academic credit. For information, contact the Office of the Vice President for Extended Services.
Correspondence and Distance Learning Courses

UTSA does not offer correspondence courses at this time, but it does participate in the UT TeleCampus. The UT TeleCampus (UTTC) is the centralized support center for online education throughout The University of Texas System. To see a full list of courses and host universities for UTTC programs, access the UT TeleCampus website at www.telecampus.utsystem.edu. This website contains online classrooms, a digital library, free online tutorial services, 24/7 technical support, links to various admissions and registrar offices throughout the UT System and full program descriptions for the online courses and degrees the UT TeleCampus facilitates. Designated contacts at each campus and student services support staff of the UT TeleCampus are available to assist students. Call toll-free: (888) TEXAS-16 or (888) 839-2716 for additional information.

For UTSA policies on transfer and credit limitations on such courses, see the Transfer of Credit and Minimum UTSA Residence Requirements sections of this catalog.

Independent Study Courses

No more than six hours of independent study courses, regardless of discipline, will apply toward a degree.

GRADES

Explanation of Credit, Grading System, and Symbols

Hours Attempted. The number of hours attempted is the total number of semester credit hours for which a student has enrolled and received grades of “A,” “B,” “C,” “D,” or “F,” except as provided for repeated courses.

Hours Earned. The hours earned by a student are the number of semester credit hours in which grades of “A,” “B,” “C,” “D,” or “CR” have been received.

Grade Point Average. The UTSA grade point average (GPA) is determined by dividing the number of grade points earned at UTSA by the number of semester credit hours attempted at UTSA. Credits and grades for work completed at other institutions or credits earned by examination are not included in the UTSA grade point average.

The following table explains UTSA grade symbols.

<table>
<thead>
<tr>
<th>Grade Symbol</th>
<th>Grade Points</th>
<th>Meaning of Grade Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>Outstanding</td>
</tr>
<tr>
<td>B</td>
<td>3</td>
<td>Above Average</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>Average</td>
</tr>
<tr>
<td>D</td>
<td>1</td>
<td>Below Average (see Academic Probation)</td>
</tr>
<tr>
<td>F</td>
<td>0</td>
<td>Failure (see Academic Dismissal)</td>
</tr>
<tr>
<td>CR</td>
<td>0</td>
<td>Credit. Indicates successful credit by examination (see Credit by Examination) or through faculty evaluation of selected internships and practica.</td>
</tr>
<tr>
<td>NC</td>
<td>0</td>
<td>No Credit. Indicates unsatisfactory progress.</td>
</tr>
<tr>
<td>W</td>
<td>0</td>
<td>Withdrawal. Indicates that the student was passing at the time of withdrawal or drop.</td>
</tr>
<tr>
<td>IN</td>
<td>0</td>
<td>Incomplete. Assigned at the discretion of the instructor; see details below. The “EP” grade was replaced by “IN” beginning in fall 2002.</td>
</tr>
</tbody>
</table>
Credit/No-Credit. Students may earn “CR” or “NC” grades only for specific courses listed in the catalog as graded on a credit/no-credit basis.

Incomplete. The grade “IN” is given by an instructor to indicate that some part of the work of a student in a course has, for good reason, not been completed, while the rest of the student’s work in the course was satisfactorily completed. The Incomplete allows a student to complete the course without repeating it. An Incomplete may not be assigned when a definite grade can be given for the work done. The student must have been in attendance at least three-fourths of the term to receive a grade of “IN.”

Whenever a grade of Incomplete is assigned, the instructor is required to file a Requirements for Removal of Incomplete report in the Office of the Dean. The Dean’s office will then submit the report to the Office of the Registrar.

Incomplete work must be made up no later than the end of the final examination period one year from the semester the Incomplete was received and before the student’s graduation. If the work is not completed within this time, the “IN” remains on the student’s record, and credit may be earned only when the student reenrolls in the course and completes the entire course satisfactorily. The time limit does not apply to graduate-level thesis, internship, or dissertation courses, except that an “IN” cannot be removed after a degree is awarded. The time limit does apply to all other graduate courses, including special problems and independent study courses.

IN NO CIRCUMSTANCES WILL GRADES BE CHANGED AFTER ONE CALENDAR YEAR.

Repeating Courses

Courses designated “may be repeated for credit” in the catalog may be repeated with both semester credit hours and grade points earned being counted. Otherwise, students at the graduate level may not elect to repeat courses for the purpose of raising a grade. However, when a course was taken more than six years ago, or upon the recommendation of the appropriate graduate program committee, the course may be repeated; in such cases, both grades in the course appear on the transcript and both are counted in the student’s grade point average. Only semester credit hours for the repeated course may be counted toward the degree.

Administrative Procedures

Reporting of Grades by Faculty

Grades are reported by course instructors every term and are due 48 hours after the final examination. Final grades cannot be withheld nor can reporting of them be deferred. Absence from a final examination should be reported as “IN.”
Grade Reports

The Office of the Registrar compiles final grades after the close of each semester and each summer term. Grades are available in ASAP via UTSA’s Web site, www.utsa.edu, or by calling the automated telephone system at (210) 458-8000. Students who are removed from, placed on, or continued on academic probation and students who are dismissed from UTSA receive written notification. This notification is sent to the permanent address on file in the Office of the Registrar.

Transcripts delineating a student's grades may be withheld from any student who owes tuition and fees to the University.

Change of Grades

Individual faculty members retain primary responsibility for assigning grades and evaluations. The faculty member's judgment is final unless compelling evidence shows discrimination, differential treatment, or factual mistake. Under unusual circumstances, however, grades may be assigned or changed by someone other than the faculty member.

Grades may be changed or assigned through administrative channels in the following procedure:

1. Circumstances when an assigned grade of “A,” “B,” “C,” “D,” or “F” might be changed. In this case, the formal appeals process stated in the catalog must be initiated by the student. Because a grade change of this type is related directly to issues of academic freedom, a committee composed of qualified faculty should be appointed by the appropriate graduate program committee to assess the academic merits of the appeal. The committee report should weigh heavily in the subsequent administrative review by the Department Chair, Dean, and Provost and Vice President for Academic Affairs. Grades may be changed only if compelling evidence demonstrates discrimination, differential treatment, or factual mistake.

2. Circumstances when an assigned grade of “IN” or “NC” might be changed. Under unusual circumstances, a faculty member of record may be unable to assign grades in a timely manner. Examples include death or incapacitation of a faculty member; a faculty member who permanently leaves the University and refuses or fails to respond; and a faculty member who is on leave and cannot be reached.

IN NO CIRCUMSTANCES WILL GRADES BE CHANGED AFTER ONE CALENDAR YEAR.

Class Participation Policy

Students are expected to regularly attend and participate in all meetings of courses for which they are registered. The instructor is responsible for communicating the participation requirements for each course to students. With the exception of UTSA policies on class absences related to observance of the religious holy days, the instructor determines classroom participation requirements and policies on making up work missed during an absence.

Students who expect to be absent from class for observance of a holy day must notify the instructor of the course(s) no later than the 15th day of classes. The notification must be in writing and must be delivered by the student either personally to the instructor of each class, or by certified mail, return receipt requested, addressed to the instructor of each class. A religious holy day is a day observed by a religion whose places of worship are exempt from property taxation under § 11.20, Tax Code. Instructors shall allow a student who is absent from classes for the observance of a religious holy day to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence.

If students have to miss class excessively due to illness or other unforeseen circumstances, it is their responsibility to notify the instructor as soon as possible. Students who enroll in a course and do not attend are considered absent from class until they officially drop the course. A student who does not attend class and fails to drop the course by the specified deadline listed in the Schedule of Classes will receive a grade of “F.”

Grade Grievance Procedure

In resolving any student grievance regarding grades or evaluations, the student must first make a serious effort to resolve the matter with the faculty member with whom the grievance originated. Individual faculty members retain primary responsibility for assigning grades and evaluations. The faculty member's judgment is final unless compelling evidence shows discrimination, differential treatment, factual mistake, or violation of a relevant University policy. If the matter is not resolved,
the student may file a formal grade grievance with the Department Chair. The student must file the grievance with the Department Chair within 90 calendar days from the end of the term in which the grade was assigned.

The Department Chair will communicate his or her decision to the student and forward a copy to the Dean of the College. The student may appeal the decision to the Associate Dean for Graduate Studies and Research of the college and then to the Dean of Graduate Studies.

IN NO CIRCUMSTANCES WILL GRADES BE CHANGED AFTER ONE CALENDAR YEAR.

ACADEMIC STANDING

A student's academic standing, whether the student is a graduate degree-seeking student, a special graduate student, or a non-degree-seeking graduate student, is defined as either good standing, academic probation, or academic dismissal.

Good Standing

Good standing is the absence of any contingency that would result in the student's being on academic probation or academic dismissal.

Academic Probation

A student who fails to achieve a grade point average in any term at UTSA of 3.0 or higher, irrespective of level of courses taken.

1. A student who received a grade of “D” in any course in a term.

2. A student who does not meet all requirements for unconditional or regular admission and who, by special action, is admitted on academic probation.

3. A student who has been reinstated following academic dismissal.

4. The student must be in good standing at the close of the semester in which the degree is to be received.

Academic dismissal is cleared only when none of the above criteria apply and when the student achieves an overall grade point average of 3.0 as a graduate student at UTSA. Students on academic probation are encouraged to discuss their status with their academic advisors.

Academic Dismissal

A student who has been dismissed academically may petition for reinstatement. Normally, such reinstatement is requested after a student has remained out of school one long semester; however, under exceptional circumstances, a petition may be considered earlier. A letter containing all explanations, recommendations, or doctors' statements in support of the student's request for reinstatement should be submitted to the Dean of Graduate Studies on or before June 15 for Fall Semesters, October 15 for Spring Semesters, or March 15 for Summer Semesters.

The appropriate graduate program committee will review the petitioner's letter and academic record and make a recommendation concerning reinstatement to the Dean of Graduate Studies. If the Petition for Reinstatement is disapproved, the student may not file another petition until the following semester.
ACADEMIC HONESTY

The University can best function and accomplish its objectives in an atmosphere of high ethical standards. All students are expected and encouraged to contribute to such an atmosphere in every way possible, especially by observing all accepted principles of academic honesty. It is recognized, however, that a large university will include a few students who do not understand, appreciate, or practice these principles. Consequently, alleged cases of academic dishonesty involving UTSA students will inevitably occur.

Academic or scholastic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts. A academic dishonesty is a violation of the Student Code of Conduct and is addressed below.

SCHOLASTIC DISHONESTY

The integrity of a university degree depends on the integrity of the work done for that degree by each student. The University expects a student to maintain a high standard of individual honor in all scholastic work (Rules and Regulations of the Board of Regents, Chapter VI, 3.(17)).

If a student is accused of academic dishonesty, the faculty member may initiate disciplinary proceedings through the Department Chair, the Dean of the college, and the Student Judicial Affairs Coordinator.

(a) The dean or a faculty member may initiate disciplinary proceedings under Section 203 and 303, Student Code of Conduct, against a student accused of scholastic dishonesty.

(b) “Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor, providing false or misleading information in an effort to receive a postponement or an extension on a test, quiz, or other assignment), or the attempt to commit such an act.

(c) “Cheating” includes, but is not limited to

1. copying from another student’s test paper;
2. using during a test materials not authorized by the person giving the test;
3. failing to comply with instructions given by the person administering the test;
4. possession during a test of materials which are not authorized by the person giving the test, such as class notes or specifically designed "crib notes." The presence of textbooks constitutes a violation only if they have been specifically prohibited by the person administering the test;
5. using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program;
6. collaborating with or seeking aid from another student during a test or other assignment without authority;
7. discussing the contents of an examination with another student who will take the examination;
8. divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned to or kept by the student;
9. substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course-related assignment;
10. paying or offering money or other valuable thing to, or coercing another person to obtain an unadministered test, test key, homework solution, or computer program, or information about an unadministered test, test key, homework solution, or computer program;
11. falsifying research data, laboratory reports, and/or other academic work offered for credit;
12. taking, keeping, misplacing, or damaging the property of the University, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct; and
13. misrepresenting facts, including providing false grades or résumés, for the purpose of obtaining an academic or financial benefit or injuring another student academically or financially.
(d) “Plagiarism” includes, but is not limited to, the appropriation, buying, receiving as a gift, or obtaining by any means another’s work and the submission of it as one’s own academic work offered for credit.
(e) “Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.
(f) “Falsifying academic records” includes, but is not limited to, altering or assisting in the altering of any official record of the University or The University of Texas System, the submission of false information or the omission of requested information that is required for or related to any academic record of the University or The University of Texas System. Academic records include, but are not limited to, applications for admission, the awarding of a degree, grade reports, test papers, registration materials, grade change forms, and reporting forms used by the Office of the Registrar. A former student who engages in such conduct is subject to a bar against readmission, revocation of a degree, and withdrawal of a diploma.
Photo – Chapter 4
DEGREE REQUIREMENTS

University-wide Requirements

In order to receive a master's degree from UTSA, the following minimum requirements must be met:

1. The student must be admitted as a graduate degree-seeking student for the degree sought.
2. The student must remove all conditions of admission, if any were assigned at the time of admission.
3. Subject to the six-year time limitation, the student must complete satisfactorily all coursework as specified in his or her discipline's program of study, and, if Option I is selected, must complete satisfactorily the thesis as outlined in the Options for Master's Degrees section of this chapter.
4. The student must formally apply for the degree and pay the required fee in the Office of the Registrar no later than the deadline for the semester in which he or she intends to graduate (deadlines are published in the Schedule of Classes).
5. The student must complete satisfactorily the comprehensive examination, except as provided by the M.B.A. degree.
6. The student must meet the grade point average requirement of 3.0 or higher (on a 4.0 scale) in all work counted as part of the degree program.
7. No courses in which grades of less than “C” (below 2.0 on a 4.0 scale) were earned may be applied to a graduate degree, nor may courses for which the grade of “CR” was earned by examination be applied to minimum degree requirements. Credit for selected internships and practica in which a grade of “CR” was earned may be applied to minimum degree requirements upon approval of the Graduate Program Committee.
8. The student must be in good standing at the close of the semester in which the degree is to be received.

Detailed descriptions of each of the above requirements are included in this catalog.

Comprehensive Examination

A candidate for a master's degree (other than candidates for the M.B.A. degree, who are required to complete MGT 5903 with a grade of “B” or better) must, in addition to other requirements, pass a comprehensive examination which may be oral, written, or both. Students must be registered during any semester or term in which they are taking required examinations. Comprehensive examinations are given only to those students who have complied with the following requirements:

1. completion of all conditions of admission, if any were assigned at the time of admission
2. completion of all special admission requirements for the degree program, if any
3. be in good standing
4. an acceptable program of study in the discipline in which the degree is sought
5. if a thesis is to be written, selection of supervising professor and thesis committee and acceptance of thesis topic
6. enrollment in 6961 Comprehensive Examination in the semester the comprehensive examination is taken, if registered for no other courses that semester.

Options for Master's Degrees

Two options are available for most master's degree programs. Refer to specific program requirements in Chapter 6, Graduate Program Requirements and Course Descriptions, to determine whether a program offers both options.

Thesis Option (Option I)

The candidate for a Master of Arts, Master of Science, Master of Business Administration, or Master of Science in Accounting degree is required to complete the required number of semester credit hours in coursework approved by the appropriate graduate program committee, including 6 semester credit hours for a thesis. The thesis is subject to approval by the student's program advisor, thesis committee, graduate advisor, and the Dean of Graduate Studies.
Students receiving advice and assistance from a faculty member in the preparation of a thesis must enroll in the appropriate thesis course (if necessary, for multiple semesters) until final approval of the completed thesis has been given and three copies have been filed with the Dean of Graduate Studies.

**Requirements for Thesis.** The following steps for completing a thesis as part of a master's degree are the responsibility of each degree candidate selecting Option I:

1. Secure the approval of the supervising professor, who is also Chair of the Thesis Committee. The Thesis Committee consists of the Thesis Chair and two additional members of the graduate faculty appointed by the College Dean. The student is expected to work closely with the Thesis Chair in selecting the thesis topic and in completing other details of his or her study.

2. Submit a preliminary draft for approval by the Thesis Chair no later than 45 calendar days before final examinations of the semester in which the degree is to be awarded. The first draft copy should be corrected, legible, and typewritten. The format of the thesis must follow University regulations. The detailed requirements are available from the Office of Graduate Studies.

3. Secure approval of the draft by the Thesis Committee. This step is intended to ensure that the thesis meets the required standards for content, expression, format, spelling, and accuracy. Candidates are responsible for meeting the standards of those reading and approving the thesis.

4. Submit the approved draft to a typist. The approved draft of the thesis is then to be typed in acceptable form.

5. Submit the final copy of the thesis to the supervising professor and Thesis Committee no later than 20 calendar days before final examinations of the semester in which the degree is to be awarded. This copy of the thesis must be the original and, if acceptable, must be signed by the Thesis Chair and members of the Thesis Committee. Before submission of the thesis to the Office of Graduate Studies through the Dean of the College for final acceptance, the Office of Graduate Studies must certify that it conforms to the format prescribed in the Guide for the Preparation of a Master's Thesis and approve the method of duplication.

6. File three unbound copies, including the original, of the approved thesis with the Office of Graduate Studies at least 10 days before the last day of classes of the semester in which the degree is to be awarded. The copies are transmitted by the Office of Graduate Studies to the library, where they are bound. Two copies will be filed in the Library and one copy will be sent to the student's program office. The student will be notified by the library when personal copies are available for pickup. (A fee of $10 per copy will be charged for binding the official copies of the thesis.)

7. It is customary that copies of the thesis be presented to the Thesis Chair and members of the Thesis Committee. Arrangements and expenses for binding of copies are the responsibility of the student. Copyright is optional and may be arranged by the student and will be at his or her expense.

8. Copies of theses and dissertations are available to the general public through the UTSA Library.

**Nonthesis Option (Option II)**

For a master's degree under Option II, a student can meet requirements without writing a thesis. Instead, the student is required to complete a program of coursework, as indicated by specific program requirements in Chapter 6, Graduate Program Requirements and Course Descriptions, approved by the Graduate Program Committee.

At the beginning of the student's master's degree program, he or she should, in consultation with his or her program advisor, select the option most suitable to his or her needs. Should a student elect to change options, he or she should consult with the program advisor.

**Limitation on Repeating Courses for Credit**

Many independent study, thesis, special problems, special topics, directed research, seminar, dissertation, and other similar courses may be repeated for credit; however, limitations exist on the number of semester credit hours that may be applied toward a degree. Refer to the individual course descriptions for specific details on these limitations and consult the appropriate graduate advisor.
Catalog of Graduation

Graduate students have six years from the semester of original registration to complete a graduate degree program under the catalog in effect at the time of initial registration at UTSA, provided they are continuously enrolled at UTSA. If a student drops out for one or more long (spring or fall) semesters, he or she has the option of reenrolling under a subsequent catalog. These students will have six years to complete degree requirements under the new catalog. In the event that certain required courses are discontinued, substitutions may be authorized or required by the appropriate graduate program committee.

Additional Master's Degrees

A student who holds a master's or higher degree may pursue an additional master's degree at UTSA only under the following conditions:

1. The additional master's degree opens up an additional area, field, or concentration.
2. The proposed second master's degree is approved by the appropriate graduate program committee and the Dean of Graduate Studies.

It should be further understood that

1. The same courses cannot be applied toward two different degrees.
2. Credit applied to a previous degree at another institution which duplicates a portion of the program required under the second degree being sought at UTSA does not reduce the number of semester credit hours required for that second degree. (The only exception is the M.F.A. degree. See Courses Counted for Another Degree under Course Types and Acceptability in the Transfer of Credit section of this chapter.) Courses already taken would not be required. Rather, additional coursework would be substituted for previously completed courses.

TRANSFER OF CREDIT

Limitations

Quantity

Ordinarily all work for the master's degree must be done at UTSA. Transfer credit of usually not more than 6 semester credit hours may be allowed for graduate coursework completed at another accredited institution upon the approval of the appropriate graduate program committee in which the major area is located. Upon petition by the student, recommendation of the appropriate graduate program committee, and approval by the Dean of Graduate Studies, a maximum of one-third of the semester credit hours of coursework (exclusive of thesis) required for a degree at UTSA may be accepted as transfer credit for the degree.

Time Limitation

All credit applied to a master's degree must be earned within the six years immediately preceding the date the degree is awarded. Outdated UTSA credits may be accepted upon approval of the appropriate graduate program committee and the Dean of Graduate Studies. An examination may be required as a condition for validating this credit.

Evaluation of Courses

The Office of Admissions evaluates transcripts and designates which graduate courses are acceptable under the above provisions for transfer toward a master's degree at UTSA. Whether or not a course is transferable as graduate coursework is determined by the course number assigned by the institution awarding the credit. To be transferable to UTSA, courses must be defined as graduate courses at the institution where credit was earned. Courses that are defined as undergraduate upper-division by their course numbers, but that can be applied to a graduate degree at the institution awarding the credit, are not accepted for transfer toward a master's degree at UTSA. All work submitted for transfer credit must have been completed with grades of “A” or “B” and must have been completed no more than six years before the degree was awarded.
Transfers within The University of Texas System

It is the policy of The University of Texas System that all academic institutions within the System may accept graduate credit from each other, and the regular requirements for residency are adjusted accordingly. The applicability of specific courses from other University of Texas institutions to a student's graduate degree program at UTSA, however, must be approved by the appropriate graduate program committee.

Course Types and Acceptability

Accepted on a Limited Basis

UTSA Undergraduate Courses. With the approval of the appropriate graduate program committee, the department chair, and the dean of the college in which the student expects to earn his or her degree, a candidate for the master's degree may apply a maximum of 6 semester hours of unduplicated credit for undergraduate upper-division (junior or senior) courses completed at UTSA with the grades of "A" or "B" to a master's degree; no course below the upper-division level or with other grades may be applied to the degree.

Not Accepted

Correspondence and Extension Courses. Courses completed by correspondence or extension may not be applied to a graduate degree program.

Courses Counted for Another Degree. No courses counted toward another degree may be applied to a graduate degree, either directly or by substitution. The only exception is that candidates holding a Master of Arts degree in Art from another institution seeking admission to the Master of Fine Arts degree program may have up to 24 semester credit hours applied toward the M.F.A. degree exclusive of the thesis and/or degree project, upon recommendation of the department graduate program committee and approval of the Dean of Graduate Studies. Work done for the master's degree may be included in the work for the doctoral degree, when it is offered, provided it is acceptable to the candidate's supervising committee, the appropriate graduate program committee, and the Dean of Graduate Studies.

Credit by Examination. Credit by examination at UTSA is intended to enable undergraduate students to receive credit for courses leading to a bachelor's degree in which they may already have achieved the objectives. Credit cannot be earned by CEEB examination or by UT Challenge Examination for any courses used to meet minimum requirements for a graduate degree or graduate teacher certification program. Graduate degree-seeking students in the College of Business may challenge by examination any UTSA graduate-level "professional" or "background" course that is required in addition to minimum degree requirements. (See the UTSA Credit by Examination brochure.)

GRADUATION

Graduation Dates

Degrees are conferred at the end of each long semester and at the end of the Summer Semester. Public commencement ceremonies are held at the conclusion of the Fall, Spring, and Summer Semesters. Information on the procedures to be followed is available in the Office of the Registrar.

Students may not participate in ceremonies before their actual date of graduation.

Application for the Degree

It is the student's responsibility to apply officially for his or her degree at the Office of the Registrar no later than October 1 for the Fall Semester, February 1 for the Spring Semester, or June 1 for the Summer Semester. The application of any student applying for graduation after the established deadlines for that semester will be processed for graduation for the following
semester. A student who has completed all degree requirements but has failed to apply for the degree may obtain a Letter of Completion from the Office of the Registrar after the close of the semester in which all degree requirements were met.

Students who apply for the degree in a given semester but who do not fulfill all requirements must file a new degree application (on or before the appropriate deadlines) for the next semester in which they intend to graduate. An additional application fee is required for the second and all subsequent degree applications.
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DEGREE REQUIREMENTS

Residence Requirement
A student must spend at least two consecutive semesters (Fall and Spring, Summer Terms I and II and Fall, or Spring and Summer Terms I and II) in residence as a full-time student taking a minimum of 9 semester credit hours each residence semester.

Grade Point Average
A grade point average of “B” (3.0 on a 4.0 scale) must be maintained in each of the following:

1. all coursework completed at UTSA
2. graduate courses in the student’s major
3. graduate courses in the student’s support field.

In computing grade point averages, grades from other institutions are not used.

Course Requirements
No specific number of semester credit hours of coursework has been established for doctoral programs at UTSA, although advanced coursework is an essential part of a doctoral candidate’s preparation. Individual doctoral programs may set minimum semester-credit-hour requirements for the attainment of the degree.

Support Work
In addition to courses and research in a field of specialization within the major, supporting coursework will be taken to broaden or supplement the student’s preparation.

Support work may consist of coursework in one area or several; it may be in conference, laboratory, or problems courses; it may be a supervised activity off campus relevant to the major interest. Some portion, not necessarily all, of the support work is normally outside the major area unless that area is of a multidisciplinary nature. At least three courses, or the equivalent, from outside the area of specialization are generally required.

Language Proficiency
Students are required to possess a competent command of English. Proficiency in a foreign language is a matter of degree option. Students should refer to individual degree descriptions for English and foreign language proficiency requirements.

TRANSFER OF CREDIT

Students are expected to complete all coursework at UTSA. Exceptions require approval of the appropriate graduate program committee and the Office of Graduate Studies, the administrative office responsible for graduate education.

Limited Acceptability

UTSA Undergraduate Courses
Credit earned in undergraduate-level courses may not normally be applied to a doctoral degree program. Such courses may be taken to meet background or support requirements, if necessary.
Not Accepted

Correspondence and Extension Courses

Courses completed by correspondence or extension may not be applied to a doctoral degree program.

ADMISSION TO CANDIDACY

Students seeking a doctoral degree at UTSA must be admitted to candidacy. In order to be admitted to candidacy, the student must comply with the following requirements:

1. Fulfill the requirements for unconditional admission as a graduate degree-seeking student, which entails the removal of any conditions assigned at the time of admission.
2. Satisfy any special admission requirements established for the degree program.
3. Be in good standing.
4. Have passed a qualifying examination (written, oral, or both) prepared by the Graduate Program Committee program and have met any other requirements specified by the Graduate Program Committee for the specific degree program.
5. Submit a proposed program of study.
6. Having satisfied the above requirements, be recommended for admission to candidacy by the appropriate Graduate Program Committee, which in the case of interdisciplinary programs is a committee appointed by the Office of Graduate Studies, consisting of no fewer than five members of the graduate faculty, with at least one representative from each of the disciplines included in the program.
7. Having satisfied the above requirements, be approved for admission to candidacy by the Dean of Graduate Studies.

INTERIM MASTER’S DEGREE

Students who are admitted to doctoral programs directly from the bachelor’s-degree level (without the requirement of a master’s degree) and who want to take the master’s degree as part of the program for the doctorate must meet the following requirements:

1. Complete the appropriate set of 36 semester credit hours of coursework, matching, to the satisfaction of the appropriate Graduate Program Committee, the 36 hours required for regular master’s degrees at UTSA in the specified area.
2. Pass a qualifying examination related to the above 36-semester-credit-hour program, administered under the standard UTSA regulations. (If the doctoral Qualifying Examination has been administered and passed, this requirement has been met.)
3. Apply for award of the master’s degree at the time and in the manner prescribed for regular master’s degrees at UTSA.
4. Present to the Office of Graduate Studies, through the Office of the Dean of the appropriate college
   a. an approved program of study for the master’s degree
   b. certification of having passed the Qualifying Examination
   c. a transcript (or certification from the Office of the Registrar) showing a grade point average of 3.0 or better and current good standing
   d. certification of removal of any conditions imposed on admission.

Courses counted as indicated above toward the master’s degree may also be included in the overall requirements for the doctorate.

UTSA 2003-2005 Graduate Catalog
COMPLETING THE DEGREE

Program of Study

Before admission to candidacy, the student's proposed program of study is under the direction of the Graduate Program Committee in the major program area through an appropriate program advisor, if designated, and the Graduate Advisor of Record. Upon admission to candidacy and the formation of the student's dissertation committee, the program of study comes under the purview of the Dissertation Committee, which reviews the proposed program of study and recommends to the Graduate Program Committee any additional course requirements. The final program of study, as approved by the Graduate Program Committee, is then recommended to the Office of Graduate Studies for approval. Approval of the final program of study by the Office of Graduate Studies is a degree requirement. All completed coursework included in the final program of study must have been taken within the preceding eight years. No course for which a grade of less than “C” was earned can be applied to the doctoral degree.

Qualifying Examination

All students seeking a doctoral degree must pass a qualifying examination. The Qualifying Examination for the doctoral degree is taken upon completion of coursework in the final approved program of study. This examination consists of questions to test the candidate's knowledge and command of the major field. A examination covering support work is not a University-wide requirement, but it may be required at the discretion of the Graduate Program Committee or the Dissertation Committee.

Registration during Examination Semester(s)

Students must be registered during any semester or term in which they are taking required examinations.

Dissertation Committee

Upon admission to candidacy and in consultation with the Graduate Advisor of Record, the student selects his or her supervising professor with that professor's consent. The supervising professor, who chairs the Dissertation Committee, must be a member of the UTSA graduate faculty. Additional members of the Dissertation Committee are recommended by the supervising professor, in consultation with the student, to the Graduate Program Committee. Upon recommendation of the Graduate Program Committee, the Office of Graduate Studies appoints the Dissertation Committee. The committee must consist of at least four members, including the supervising professor, who consults with other members of the committee as work proceeds.

In addition to recommending the student's final program of study to the Graduate Program Committee and supervising the research and writing of the dissertation, the Dissertation Committee certifies to the Office of Graduate Studies that all degree requirements have been fulfilled.

Progress Review

If the doctoral degree is not completed within three years from the date of passing the Qualifying Examination, the Graduate Program Committee will review the student's progress at the end of the three-year period and annually thereafter. The committee may recommend that the student meet new requirements that have been adopted in the interim or take additional courses; it may also recommend that the student's candidacy be extended one or two semesters, or that it be terminated. Recommendations of the Graduate Program Committee are forwarded to the Office of Graduate Studies.

Doctoral Dissertation

A dissertation is required of every candidate and must be an original contribution to scholarship, based on independent investigation in the major area. It must be approved by the Dissertation Committee. Registration for the dissertation must be for a period of more than one semester. During each semester or term that a student receives advice and/or assistance from a faculty member or supervision by the Dissertation Committee or uses University resources, he or she is required to enroll in the appropriate dissertation course.
**Final Oral Examination (Defense of Dissertation)**

A satisfactory final oral examination is required for the approval of a dissertation. After the Dissertation Committee makes a decision, which must be unanimous, to accept a dissertation for examination, the supervising professor notifies the Office of Graduate Studies at least two weeks in advance of the date of the final oral examination.

The examination covers the dissertation and the general field of the dissertation, and other parts of the student's program as determined by the committee. All members of the Dissertation Committee must be satisfied that the student has

1. completed the work assigned by the committee.
2. passed all examinations required by the program's Graduate Program Committee, including the final oral examination.
3. completed a dissertation that is an independent investigation in the major field, and that itself constitutes a contribution to knowledge.
4. submitted an abstract for publication in *Dissertation Abstracts International* that meets with the approval of the committee.

Once this is complete, the Dissertation Committee members sign the approval sheets for the doctoral dissertation and make an official recommendation to the Office of Graduate Studies that the doctoral degree be awarded. Approval must be unanimous.

**Submission and Publication of Dissertation**

When the student has successfully defended the dissertation, he or she must arrange for its publication, usually by microfilm reproduction of the complete dissertation. Three unbound copies, including the original of the dissertation, must be forwarded to the Office of Graduate Studies. The copies are transmitted to the library and sent to UMI for reproduction and binding. The student is required to pay $55 publishing and $10 (per copy) binding fees. Other forms of publication of the dissertation may be accepted to fulfill the publication requirement. A proposal for an alternative to microfilm reproduction must be approved by the Office of Graduate Studies.

Publication by microfilm does not preclude subsequent publication of the dissertation, in whole or in part, as a monograph or in a journal. Registration of copyright at the author's expense may be arranged, if desired and appropriate, by completing a form available from the Office of Graduate Studies. In order to protect patent or other rights, the student or supervising professor may request that the Office of Graduate Studies delay publication for one year. This request must be supported by a written recommendation by the student's supervising professor.
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  Molecular Neurobiology Concentration
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Ph.D. in Biology

Department of Chemistry

M.S. in Chemistry

Department of Computer Science

M.S. in Computer Science
Ph.D. in Computer Science

Department of Earth and Environmental Science

M.S. in Environmental Science
M.S. in Geology
  Water Resources (Hydrogeology) Emphasis
  Environmental Geology Emphasis
  Applied Geology Emphasis

Department of Mathematics

M.S. in Mathematics
  Mathematics Concentration
  Mathematics Education Concentration

Department of Physics and Astronomy

School of Architecture

M.Arch.
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COLLEGE OF BUSINESS

Vision Statement
To be a globally respected community of scholars, dedicated to advancing the intellectual understanding of business and positioning San Antonio and South Texas as an international entrepreneurial center of commerce and technology.

Mission Statement
The mission of the UTSA College of Business is life-long learning. We provide an excellent business education at the undergraduate, graduate, and executive levels and promote world-class research, addressing relevant business issues. Using the most current and effective teaching methods and technologies, we serve student-scholars from across the nation and around the world by introducing them to an environment of active learning and a culture of high achievement in a setting that is increasingly entrepreneurial and reliant on technology. For this mission, we rely on talented, diverse, and dedicated faculty, staff, and administrators working in concert with industry and community leaders, to provide significant contributions to the educational, economic, and cultural development of South Texas and beyond.

Master of Business Administration Degree
The Master of Business Administration (M.B.A.) degree is accredited by AACSB International – The Association to Advance Collegiate Schools of Business, and conforms to its recommended guidelines.

The Master of Business Administration degree is designed to offer the opportunity for intensive education to qualified graduate students and is available to individuals with undergraduate degrees in the business administration areas, as well as to those with specializations outside the business field.

Students whose previous training has been in nonbusiness fields may be admitted to the M.B.A. program but are required as a condition of admission to complete (in total or in part, depending upon the background of each student) the M.B.A. core courses. Students whose background is in business but who have completed the M.B.A. core courses seven or more years before entering the program may be required by the Admissions Subcommittee of the Graduate Program Committee to successfully complete or test out of the M.B.A. core courses. These courses are open only to graduate students and are in addition to degree requirements of the M.B.A.

Students who enter the M.B.A. degree program should have a familiarity with computer programs commonly used for spreadsheets and word processing. Special not-for-credit courses may be offered to address this need.

Program Admission Requirements. For admission to the M.B.A. program, applicants must meet University-wide graduate admission requirements. Applicants are further considered on the basis of demonstrated potential for success in graduate study in business administration as indicated by a combination of prior academic achievement, Graduate Management Admission Test (GMAT) scores, personal statement, résumé (optional), and references (optional).

The M.B.A. Program Committee evaluates each applicant individually based on the complete package of submitted materials.

A complete application package will include:

- a completed application form
- transcripts from all universities attended
- official Graduate Management Admission Test (GMAT) scores
- personal statement
- current résumé with employment or other experience (optional)
- letters of reference (optional).
M.B.A. Core Courses. The following courses constitute the M.B.A. core and are required for students who do not have credit for equivalent undergraduate courses. However, no credit for these courses may count toward M.B.A. degree requirements.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 5003</td>
<td>Financial Accounting Concepts</td>
</tr>
<tr>
<td>BLW 5003</td>
<td>Legal Environment of Business</td>
</tr>
<tr>
<td>ECO 5003</td>
<td>Economic Theory and Policy</td>
</tr>
<tr>
<td>FIN 5003</td>
<td>Business Finance</td>
</tr>
<tr>
<td>IS 5003</td>
<td>Introduction to Information Systems</td>
</tr>
<tr>
<td>MGT 5003</td>
<td>Conceptual Foundations of Management</td>
</tr>
<tr>
<td>MKT 5003</td>
<td>Introduction to Marketing</td>
</tr>
<tr>
<td>MS 5003</td>
<td>Quantitative Methods for Business Analysis</td>
</tr>
</tbody>
</table>

Degree Requirements. The M.B.A. program requires 33 semester credit hours of work beyond any hours acquired in the M.B.A. core courses.

Candidates for the M.B.A. degree are required to successfully complete the foundations of knowledge, which are included in the following 21 semester credit hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 5023</td>
<td>Accounting Analysis for Decision Making</td>
</tr>
<tr>
<td>ECO 5023</td>
<td>Managerial Economics</td>
</tr>
<tr>
<td>FIN 5023</td>
<td>Financial Management</td>
</tr>
<tr>
<td>MGT 5043</td>
<td>Management and Behavior in Organizations</td>
</tr>
<tr>
<td>MGT 5903</td>
<td>Strategic Management and Policy</td>
</tr>
</tbody>
</table>

Students who earn a grade of “B” or better in this course will satisfy the comprehensive examination requirement. A student who receives a grade of “C” may still satisfy the requirement by successfully passing a comprehensive examination as set out in this catalog.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKT 5023</td>
<td>Marketing Management</td>
</tr>
<tr>
<td>MS 5023</td>
<td>Decision Analysis and Production Management</td>
</tr>
</tbody>
</table>

Students seeking the M.B.A. degree may elect one of three options to complete the required 33 semester credit hours.

Option 1: General M.B.A. Nonthesis Option. Under Option 1 students are required to complete the 21 semester credit hours listed above and 12 semester credit hours of electives. These electives may be taken either in the College of Business (Departments of Accounting, Economics, Finance, Information Systems, Management, Management Science and Statistics, or Marketing) and include courses listed in the M.B.A. concentrations, or in areas outside of the college as approved by the Graduate Program Committee.

Option 2: General M.B.A. Thesis Option. Under Option 2 students are required to complete the 21 semester credit hours listed above, 6 semester credit hours of electives as approved by the Graduate Program Committee, and 6 semester credit hours of Master's Thesis. See the University’s requirements for a thesis in Options for Master's Degrees in Chapter 4.


Specific requirements for each concentration are discussed under the departments of the College of Business.

Executive Master of Business Administration

The Executive Master of Business Administration (E.M.B.A.) is a version of the Master of Business Administration (M.B.A.) degree program structured specifically for executives, professionals, and entrepreneurs who have significant managerial experience. This five-semester plan of study features cohort classes, lock-step weekend class scheduling, and an emphasis on strategic leadership. The E.M.B.A. is accredited by the AACSB International – The Association to Advance Collegiate Schools of Business, and conforms to its recommended guidelines.
E.M.B.A. Program Admission Requirements. Because of the special focus of the E.M.B.A. program, the application process is separate from and independent of the regular M.B.A. program. Admission decisions are not reciprocal; class size is limited; and admission decisions are made on a rolling basis until all available class positions are filled.

For admission to the E.M.B.A. program, applicants must meet University-wide graduate admissions requirements and the following College of Business requirements:

- In general, applicants are expected to meet M.B.A. program admission requirements with special additional consideration given to work experience, life accomplishments, and leadership potential.
- Applicants are expected to have approximately 10 years of work experience with increasing managerial responsibility. Less experienced applicants will be considered if they can demonstrate exceptional accomplishment.
- Applicants must submit three letters of professional reference attesting to leadership potential.
- Applicants are required to participate in a personal interview with the E.M.B.A. Admissions Subcommittee of the Graduate Program Committee.

Applicants who fail to meet these requirements can be admitted conditionally upon recommendation of the E.M.B.A. Admission Subcommittee of the Executive Programs Committee and approval of the Dean of Graduate Studies.

Students are expected to enter the E.M.B.A. program with basic computer skills, specifically in the use of Microsoft Word, Power Point, and Excel. Special not-for-credit courses may be offered to address this need. Because of the lock-step nature of the E.M.B.A., students must complete all required courses without exception. There will be no course waivers. In addition, students who leave the program before completion for any reason are not eligible to rejoin the same class in a subsequent semester. Admission to future E.M.B.A. classes is dependent upon successful reapplication. Acceptance in a future program is not guaranteed.

Master of Business Administration Degree in International Business

In response to the geographical and commercial environments of UTSA, the College of Business offers the Master of Business Administration degree in International Business. This program is designed to offer students from the United States or foreign countries the opportunity to study business administration while developing special expertise in its international aspects. Specific international content courses have been developed in the disciplines of management, marketing, economics, business law, accounting, and finance. There may be opportunities to study outside the United States and to apply the credit earned to the degree program at UTSA.

Students pursuing this degree must either demonstrate proficiency in one of the modern languages or take 6 semester credit hours of culture courses approved by the graduate advisor. The proficiency in language may be demonstrated either by completion of 6 hours of courses in the same language or by an examination measuring proficiency at the 6-hour level.

Students who are not United States citizens and whose native language is not English will be assumed to have completed the language requirement.

Program Admission Requirements. Applicants for admission to the M.B.A. program in International Business are required to meet the same general program admission requirements set out for the M.B.A. degree.

Degree Requirements. The M.B.A. program in International Business requires 33 semester credit hours of work beyond any hours acquired in the M.B.A. core courses.

A. Candidates for the M.B.A. degree in International Business are required to successfully complete the following 18 semester credit hours:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 5023</td>
<td>Accounting Analysis for Decision Making</td>
</tr>
<tr>
<td>ECO 5023</td>
<td>Managerial Economics</td>
</tr>
<tr>
<td>FIN 5023</td>
<td>Financial Management</td>
</tr>
</tbody>
</table>
MGT 5903 Strategic Management and Policy (Students who earn a grade of “B” or better in this course will satisfy the comprehensive examination requirement. A student who receives a grade of “C” may still satisfy the requirement by successfully passing a comprehensive examination as set out in this catalog.)

MKT 5023 Marketing Management
MS 5023 Decision Analysis and Production Management

B. In addition, students must complete the following 15 semester hours of courses:

Required courses (9 semester hours):

- MGT 5183 Global and Comparative Management
- MKT 5673 International Marketing
- FIN 5833 International Financial Management

International content elective courses (6 hours from the following):

- ACC 6203 Seminar in International Accounting
- BLW 5173 Legal Environment of International Business
- ECO 5303 International Trade and Finance
- MGT 5233 International Business Analysis
- MGT 5243 International Business Strategy
- MGT 6973 Special International Business Topics
- MKT 6973 Special International Business Topics
- GBA 5193 Doing Business under NAFTA

C. Special permission is required for

- FIN 5963 International Business Internship
- MKT 5963 International Business Internship
- FIN 5983 International Business Essay
- MKT 5983 International Business Essay

D. Foreign coursework. Students choose either a program of 15 semester credit hours in international content courses as listed above or a combination of elective international content courses and foreign study as approved by the Graduate Program Committee. Normally the foreign study is taken at a cooperating foreign institution. Foreign study is encouraged, and efforts are made to assist interested students in completing a portion of their work outside the United States.

MBA Online

The MBA Online program is a Web-based, asynchronous degree program offered by a consortium of eight University of Texas universities through the University of Texas TeleCampus. Courses taken in this program do not count toward the traditional UTSA M.B.A. degree. Students who cannot commute regularly to the UTSA campus because of distance or time constraints are encouraged to consider the MBA Online program. While all UTSA students participating in the MBA Online Program will follow UTSA admission procedures, registration procedures and tuition and fees may differ. Students should consult the UT TeleCampus Web site at http://www.telecampus.utsystem.edu for current information on the MBA Online program and its courses.
Doctor of Philosophy Degree in Business Administration

The College of Business offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Business Administration. The degree program offers four areas of emphasis: Accounting, Finance, Information Technology, and Organization and Management Studies. The Ph.D. in Business Administration is awarded to candidates who have displayed an in-depth understanding of the subject matter and demonstrated the ability to make an original contribution to knowledge in their field of specialty.

The regulations for this degree comply with the general University regulations (refer to Chapter 3, General Academic Regulations, and Chapter 5, Doctoral Degree Regulations).

Admission Requirements. Applicants must have a Bachelor’s degree from an accredited university. The Doctoral Studies Committee in the major areas will evaluate applicants to the Ph.D. program on several factors, including academic achievement, standardized test scores, a personal statement, letters of recommendation, and possibly, an interview. Normally a student should hold a Master’s degree in business or a related discipline before being granted admission to the Doctor of Philosophy in Business Administration degree program. Applicants who do not possess a graduate degree in a business-related discipline will be required to satisfy foundations of knowledge requirements for the M.B.A. program.

All applicants must submit the following material for evaluation:

- official transcripts of all undergraduate and graduate course work completed
- Graduate Management Admission Test (GMAT) scores or Graduate Records Examination (GRE) scores from a recent (no more than five years) administration of the examination
- three letters of recommendation from academic or professional sources familiar with the applicant’s background
- a résumé or curriculum vitae and a statement of academic interests and goals
- international students must also submit a score of at least 550 on the Test of English as a Foreign Language (TOEFL). TOEFL scores may not be more than two years old.

Admission normally requires appointment to a teaching assistantship, research assistantship, or research fellowship. The Doctoral Studies Committee, comprised of members selected from the graduate faculty, is responsible for advising students.

Degree Requirements. The degree requires a minimum of 69 semester credit hours beyond the Master’s degree. If a student does not have a Master’s degree in a business-related discipline, up to 15 hours of foundation of knowledge coursework might be required. All students will be required to take 18 hours of Statistics and Research Support courses. Students will be required to take 19 hours of Ph.D.-level courses in the student’s major area of studies, as directed by the Doctoral Studies Committee. Students will take 9 semester credit hours of free electives. A minimum of 23 semester credit hours in doctoral research, including 1 hour for comprehensive examination and 12 hours for the doctoral dissertation, must be completed. Any grade lower than “B” in a graduate course or in remediating coursework at the undergraduate level will not count toward the 69 hours.

Program of Study

A. Foundation Courses

This requirement may be met by a Master’s Degree in Business or business-related discipline. If a student does not have the appropriate graduate degree, at least 15 credit hours must be taken from the following list:

<table>
<thead>
<tr>
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<tbody>
<tr>
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<tr>
<td>ECO</td>
<td>Managerial Economics</td>
</tr>
<tr>
<td>FIN</td>
<td>Financial Management</td>
</tr>
<tr>
<td>MGT</td>
<td>Management and Behavior in Organizations</td>
</tr>
<tr>
<td>MGT</td>
<td>Strategic Management and Policy</td>
</tr>
<tr>
<td>MKT</td>
<td>Marketing Management</td>
</tr>
<tr>
<td>MS</td>
<td>Decision Analysis and Production Management</td>
</tr>
</tbody>
</table>
B. Statistics and Research Methodology (18 semester credit hours)

1. Courses required of all students:

   STA  7013  Advanced Applied Business Statistical Methods
   STA  7023  Applied Linear Statistical Models

2. 12 hours from the following as approved by the Doctoral Studies Committee:

   GBA  7013  Research Methods I
   GBA  7023  Research Methods II
   ECO  7013  Seminar in Microeconomic Theory
   ECO  7053  Quantitative Methods for Business and Economics
   ECO  7063  Econometrics
   STA  7033  Multivariate Statistical Analysis
   MS   7033  Applications in Causal Structural Modeling
   STA  7043  Time Series Analysis

C. Major Area Coursework

1. Four Ph.D.-level courses in major area; colloquium (13 credit hours)
2. Two directed electives approved by the Doctoral Studies Committee from among graduate-level courses in major area. (6 credit hours)

D. Free Electives (9 credit hours)

Three courses to be approved by the Doctoral Studies Committee. If courses are in the College of Business, two are expected to be at the Ph.D. level. Courses from outside the College of Business must be at the graduate level and approved by the Committee.

E. Doctoral Research and Comprehensive Examination (11 credit hours)

1. Up to 10 hours of doctoral research study in preparation for the comprehensive examination
2. One semester credit hour for the comprehensive examination.

F. Dissertation Research (minimum 12 credit hours)

The initial Program of Study must be approved by the Doctoral Studies committee and must be submitted to the Dean for final approval.

**Advancement to Candidacy.** Advancement to candidacy requires a student to complete University and program requirements and to pass written qualifying examination following completion of course requirements. The examination is administered by the Doctoral Studies Committee. No more than two attempts to pass qualifying examinations are allowed. Results of the written and oral examinations must be reported to the Doctoral Studies Committee, the Dean, and the campus Dean of Graduate Studies. Admission into the doctoral program does not guarantee advancement to candidacy.

**Dissertation.** Candidates must demonstrate ability to conduct independent research by completing and defending an original dissertation. The research topic is determined by the student in consultation with his or her supervising professor. A dissertation committee, selected by the student and supervising professor, guides and critiques the candidate’s research. The completed dissertation must be formally presented to and approved by the Dissertation Committee.
Following an open presentation of the dissertation findings, the Dissertation Committee conducts a closed meeting to determine the adequacy of the research and any further requirements for completion of the dissertation. Results of the meeting must be reported to the Dean and to the campus Dean of Graduate Studies.

Awarding of the degree is based on the approval of the Dissertation Committee, approved by the Dean. The UTSA Dean of Graduate Studies certifies the completion of all University-wide requirements.

COURSE DESCRIPTIONS
GENERAL BUSINESS ADMINISTRATION (GBA)

5193 Doing Business under NAFTA
(3-0) 3 hours credit. Prerequisite: Permission of International Coordinator required.
A study of business practices in the United States, Canada, and Mexico under NAFTA. Course may require travel and/or field study in the three countries.

7013 Research Methods I
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An introduction to the research process. The course examines the scientific method, issues in the philosophy of science, ethical issues in research, and an introduction to basic experimental and quasi-experimental design principles and threats to validity. Course also examines the elements of scientific paper writing.

7023 Research Methods II
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An advanced study of contemporary research design and data collection techniques including interviewing, survey construction, use of archival data, and qualitative approaches to data collection.
DEPARTMENT OF ACCOUNTING

Mission Statement

The mission of the accounting programs in the Department of Accounting is to offer graduate and undergraduate accounting programs of high quality, which meet the needs for students for professional careers in the field. This mission includes providing a broad-based education and education in general business and accounting. The department is responsive to the needs of employers and other constituents of its programs. The department is also alert to the current issues in the local, regional, and national environment and plans and implements changes in the educational process to respond to those issues when needed. The faculty of the accounting program assist in accomplishing this mission through a planned integration of their teaching, intellectual, and service contribution.

The Master of Science in Accounting has been separately accredited by AACSB International – The Association to Advance Collegiate Schools of Business.

Five-Year (150-Hour) Professional Accounting Program

The Five-Year Professional Accounting Program is a 3/2 degree program. Undergraduate accounting majors should apply for admission to the program during the second semester of their junior year. Once admitted, these students would be allowed to take graduate courses while, technically, undergraduate students. In this program, the degree plan for the Bachelor of Business Administration (B.B.A.) in Accounting is combined with that of the Master of Science in Accounting (M.S.A.). The advantage of the program is that it allows accounting majors to spread the graduate courses required for the M.S.A. degree over the fourth and fifth years of the 150-hour program. Upon successful completion of the 150-hour program, students will be simultaneously awarded the B.B.A. in Accounting and the M.S. in Accounting degrees.

Admission Criteria: To be admitted to the Five-Year (150-Hour) Professional Accounting Program, students must meet the following criteria:

1. be a declared accounting major
2. have an overall grade point average (GPA) of 3.0, a GPA of 3.0 in accounting courses taken, and an acceptable score on the Graduate Management Admission Test (GMAT)
3. have completed a minimum of 6 hours of upper-level undergraduate accounting courses including ACC 3023, Intermediate Financial Accounting I.

In addition, the student must have completed at least 12 hours of upper-level undergraduate accounting courses by the end of the first semester following admission into the program.

Master of Science in Accounting Degree

The Master of Science in Accounting (M.S.A.) degree is designed to accommodate applicants with a degree in any field. Applicants must complete the equivalent of a B.B.A. degree in accounting from an accredited institution or must enroll in the M.S.A. core courses plus certain accounting courses set out by the Coordinator of Graduate Programs in Accounting. Students whose background is in business but who have completed M.S.A. core courses or their equivalents seven, or more, years before entering the program may be required by the M.S.A. Admissions Committee to successfully complete or test out of the M.S.A. core courses. M.S.A. core courses may be taken simultaneously with the M.S.A. requirements, subject to course prerequisites and approval of the Coordinator of Graduate Programs in Accounting.

Program Admission Requirements. In order to be unconditionally admitted to the M.S.A. program, applicants must meet University-wide graduate admission requirements. In addition, applicants are considered on the basis of demonstrated
potential for success in graduate study in accounting and/or taxation as indicated by a combination of prior academic achievement, Graduate Management Admission Test (GMAT) scores, a personal statement, and other relevant factors.

A completed set of application material will include the following:

- a completed application form
- transcripts from all universities attended
- official Graduate Management Admission Test (GMAT) scores
- a personal statement
- a current résumé with data regarding employment and other relevant experience (optional)
- letters of reference (optional).

Applicants are evaluated by the M.S.A. Admissions Committee based on the above set of application materials. Those who do not meet the requirements for unconditional admission may be considered for admission on a conditional basis. Admission deficiencies, which do not count toward degree requirements, must be removed before enrolling for the last semester before graduation.

The following M.S.A. core courses or their equivalents are required for students with undergraduate curriculum deficiencies; however, no credit for these courses will count toward the M.S.A. degree requirements:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 5003</td>
<td>Financial Accounting Concepts</td>
</tr>
<tr>
<td>ACC 5023</td>
<td>Accounting Analysis for Decision Making</td>
</tr>
<tr>
<td>ACC 3023</td>
<td>Intermediate Accounting I</td>
</tr>
<tr>
<td>ACC 3033</td>
<td>Intermediate Accounting II</td>
</tr>
<tr>
<td>ACC 3043</td>
<td>Federal Income Taxation I</td>
</tr>
<tr>
<td>ACC 3113</td>
<td>Accounting Information Systems I</td>
</tr>
<tr>
<td>ACC 4013</td>
<td>Principles of Auditing</td>
</tr>
<tr>
<td>BLW 5003</td>
<td>Legal Environment of Business</td>
</tr>
<tr>
<td>ECO 5003</td>
<td>Economic Theory and Policy</td>
</tr>
<tr>
<td>FIN 5003</td>
<td>Business Finance</td>
</tr>
<tr>
<td>IS 5003</td>
<td>Introduction to Information Systems</td>
</tr>
<tr>
<td>MGT 5003</td>
<td>Conceptual Foundations of Management</td>
</tr>
<tr>
<td>MKT 5003</td>
<td>Introduction to Marketing</td>
</tr>
<tr>
<td>MS 5003</td>
<td>Quantitative Methods for Business Analysis</td>
</tr>
</tbody>
</table>

**Degree Requirements.** The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 30 hours.

**Master of Science in Accounting Degree – Accounting Track**

All candidates must complete the following:

A. 9 semester credit hours of required graduate accounting courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC 5863</td>
<td>Advanced Financial Accounting</td>
</tr>
<tr>
<td>ACC 6013</td>
<td>Financial Accounting Theory</td>
</tr>
<tr>
<td>ACC 6003</td>
<td>Managerial Accounting Theory</td>
</tr>
</tbody>
</table>

B. 12 semester credit hours of graduate electives in accounting or taxation, approved by the Coordinator of Graduate Programs in Accounting

C. 9 semester credit hours of graduate nonaccounting electives, approved by the Coordinator of Graduate Programs in Accounting
Master of Science in Accounting Degree – Taxation Track

All candidates must complete the following:

A. 12 semester credit hours of required graduate tax courses:
   
   ACC 6043  Tax Research
   ACC 6073  Advanced Corporate Taxation
   ACC 6083  Special Topics in Tax Practice
   ACC 6113  Flow Through Entities

B. 9 semester credit hours of graduate taxation or accounting electives, approved by the Coordinator of Graduate Programs in Accounting

C. 9 semester credit hours of graduate business electives outside the areas of taxation and accounting, approved by the Coordinator of Graduate Programs in Accounting

Master of Business Administration Degree – Management Accounting Concentration

This concentration is designed to provide added preparation in management accounting subjects for graduate business students who do not have extensive coursework in accounting.

Students choosing to concentrate in management accounting must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours as follows:

   ACC 5803  Controllership
   ACC 5823  Nonprofit and Governmental Accounting
   ACC 5833  Cost Management and Control
   ACC 5873  Budgeting and Forecasting

Master of Business Administration Degree – Taxation Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration while developing special expertise in taxation. To achieve this end, students can focus their elective courses on developing an understanding of tax problems and opportunities in business planning.

Students choosing to concentrate in taxation must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours as follows:

   ACC 6043  Tax Research

   and 9 hours from the following:

   ACC 6053  Estate, Trust, and Gift Taxation
   ACC 6073  Advanced Corporate Taxation
   ACC 6083  Special Topics in Tax Practice
   ACC 6113  Flow Through Entities
Doctor of Philosophy Degree in Business Administration with an Emphasis in Accounting

The College of Business offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Business Administration with an emphasis in Accounting. See page 75 of this catalog for a detailed description of the general requirements for the Ph.D. degree. The Doctoral Studies Committee of the Department of Accounting will advise students admitted to the program who pursue a Ph.D. in Business Administration with an emphasis in Accounting.

To satisfy the Major Area Coursework for the accounting emphasis, a student must complete:

1. ACC 6013 Financial Accounting Theory
   ACC 6003 Managerial Accounting Theory
   ACC 7013 Seminar in Empirical Research in Accounting
   ACC 7023 Seminar in Behavioral Research in Accounting
   ACC 7201-3 Accounting Research Colloquium

2. Two directed electives:
   ACC 7113 Seminar in Advanced Accounting Topics I
   ACC 7123 Seminar in Advanced Accounting Topics II

COURSE DESCRIPTIONS
ACCOUNTING
(ACC)

5003 Financial Accounting Concepts
(3-0) 3 hours credit.
An intensive study of accounting as a tool to communicate financial information for planning, analyzing, and controlling business enterprises directed toward decision making.

5023 Accounting Analysis for Decision Making
(3-0) 3 hours credit. Prerequisite: ACC 5003 or an equivalent.
The study of accounting and its uses by management in the decision-making process.

5803 Controllership
(3-0) 3 hours credit. Prerequisite: ACC 5023 or an equivalent.
A study of the accounting executive’s role in the management of a business enterprise; case studies of the use of accounting information to management. (Formerly ACC 5033. Credit cannot be earned for both ACC 5803 and ACC 5033.)

5813 Advanced Auditing
(3-0) 3 hours credit. Prerequisite: ACC 4013 or an equivalent.
A study of specialized areas of auditing. Topics may vary depending upon current professional controversies. (Formerly ACC 5043. Credit cannot be earned for both ACC 5813 and ACC 5043.)

5823 Nonprofit and Governmental Accounting
(3-0) 3 hours credit. Prerequisite: ACC 5023 or an equivalent.
A study of accounting principles and practices of not-for-profit organizations, including federal, state, and local governments. (Formerly ACC 5053. Credit cannot be earned for both ACC 5823 and ACC 5053.)
5833  **Cost Management and Control**  
(3-0) 3 hours credit. Prerequisite: ACC 5023 or an equivalent.  
Study of contemporary issues, cost concepts, and procedures in managerial accounting, to include analysis and application of techniques in the generation of data for management information systems. (Formerly ACC 5073. Credit cannot be earned for both ACC 5833 and ACC 5073.)

5843  **Seminar in Current Auditing Issues**  
(3-0) 3 hours credit. Prerequisite: ACC 4013 or an equivalent.  
A study of the current and emerging issues of internal, operational, and financial auditing. (Formerly ACC 5083. Credit cannot be earned for both ACC 5843 and ACC 5083.)

5863  **Advanced Financial Accounting**  
(3-0) 3 hours credit. Prerequisite: ACC 3033 or an equivalent.  
A study of specialized areas of financial accounting. Topics may vary depending upon current professional controversies. (Formerly ACC 5133. Credit cannot be earned for both ACC 5863 and ACC 5133.)

5873  **Budgeting and Forecasting**  
(3-0) 3 hours credit. Prerequisite: ACC 5023 or an equivalent.  
Examines the accountant's role in budgeting and forecasting. Study of advanced forecasting techniques and applications of microcomputers and forecasting. (Formerly ACC 5143. Credit cannot be earned for both ACC 5873 and ACC 5143.)

5893  **Consulting**  
(3-0) 3 hours credit. Prerequisite: 15 semester hours of graduate accounting courses above ACC 5443 or an equivalent.  
A study of project management. An applied approach using teams with appropriate cumulative expertise will address the various issues encountered by consultants.

6003  **Managerial Accounting Theory**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A study of the accumulation, analysis, and interpretation of accounting data relevant to purposes of managerial decision-making, profit planning, and control. Emphasis is placed on familiarizing students with the theories underlying cost/managerial accounting research, the nature of the research questions commonly addressed in cost/managerial accounting research, and the methods used to address those questions. A number of paradigms employed by researchers to study the use of accounting data within organizations will be discussed, including the application of mathematics and statistics to accounting analysis.

6013  **Financial Accounting Theory**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
This course focuses on accounting information reported to user groups outside the firm and is designed to introduce students to a number of substantive topics in empirical accounting research. Emphasis is placed on familiarizing students with the theories underlying financial accounting research, the nature of the research questions commonly addressed in empirical research, and the methods used to address those research questions. Topics include the earnings-return relation, financial reporting standard setting, information content of accounting disclosures, use of accounting information in contracting, and the relation between accounting information and firm value.

6043  **Tax Research**  
(3-0) 3 hours credit. Prerequisite: ACC 3043 or an equivalent.  
An in-depth study of how to find answers to tax questions. Students will become acquainted with various tax materials in the library and their use, including tax services, case reports, and IRS publications.

6053  **Estate, Trust, and Gift Taxation**  
(3-0) 3 hours credit. Prerequisite: ACC 4153 or an equivalent.  
Emphasis on estate and gift planning and income taxation of trusts and estates. Taxation of gratuitous transfers under the Federal Estate and Gift Tax Codes including inter vivos gifts, marital deduction, powers of appointment, retained interest, the concept of distributable net income, fiduciary taxation, and the concept of an estate.
6073 Advanced Corporate Taxation  
(3-0) 3 hours credit. Prerequisite: ACC 4153 or an equivalent.  
A study of federal income taxation of corporation and shareholders, which includes formation, distributions, penalty taxes, reorganization, and consolidations.

6083 Special Topics in Tax Practice  
(3-0) 3 hours credit. Prerequisite: ACC 4153 or an equivalent.  
Advanced case studies of tax audits, administrative appeals, settlement technique, appellate jurisdiction, choosing forums, ruling and technical requests, civil litigation, collection process, offers in compromise, interest and civil penalties, indirect methods of proof, and criminal penalties.

6113 Flow Through Entities  
(3-0) 3 hours credit. Prerequisite: ACC 4153 or an equivalent.  
A study of the special tax attributes of partnerships, S-corporations, limited liability companies, and limited liability partnerships including formation, operation, distributions, and dissolution.

6203 Seminar in International Accounting  
(3-0) 3 hours credit. Prerequisite: 9 semester credit hours of accounting.  
An analysis of the issues involved in accounting for multinational corporations, including environmental influences, foreign currency translation, management accounting, and international accounting standard setting. A brief study of accounting history is included in the course. (Formerly ACC 6133. Credit cannot be earned for both ACC 6203 and ACC 6133.)

6943 Accounting Internship  
3 hours credit. Prerequisites: Graduate standing; 15 semester credit hours of upper-division accounting or an equivalent.  
Internship must be approved in advance by the Internship Coordinator and the Graduate Advisor of Record. Supervised full- or part-time off-campus training in public accounting, industry, or government. Individual conferences and written reports required. May not be repeated for credit.

6951-3 Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and written permission of the instructor and the student's Graduate Advisor of Record (forms available from the department office).  
Independent reading, research, discussion, and/or writing under the direction of a graduate faculty member. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961 Comprehensive Examination  
1 hour credit. Prerequisite: Approval of the appropriate committee on graduate studies to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Committee on Graduate Studies. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to a Master's degree.
6983  **Master’s Thesis**  
3 hours credit. Prerequisite: Permission of the Graduate Advisor of Record and thesis director (form available). 
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7013  **Seminar in Empirical Research in Accounting**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and admission to the Ph.D. program. 
An exploration of accounting research that employs observational, data-analytical methodology as means for theory development and validation, with emphasis on positive, empirical studies related to auditing, financial markets, and international accounting issues.

7023  **Seminar in Behavioral Research in Accounting**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and admission to the Ph.D. program. 
The behavioral research in accounting seminar is a dichotomous class aimed at providing students with a framework for understanding the behavioral implications of the development, dissemination, and use of accounting information through an understanding of behavioral theories and methodologies.

7113  **Seminar in Advanced Accounting Topics I**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and admission to the Ph.D. program. 
Advanced study of academic disciplines of auditing and accounting information systems through a survey and critical analysis of research in these areas. Designed to identify theoretical foundations, research methodologies, and current issues of interest to the academic community.

7123  **Seminar in Advanced Accounting Topics II**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and admission to the Ph.D. program. 
An analytical course investigating the concept of information from a theoretical perspective. Includes review and critical analysis of research capturing the costs, benefits, and the role of accounting information inside and outside organizations,

7201-3  **Accounting Research Colloquium**  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisites: Consent of instructor and admission to the Ph.D. program. 
Presentation and analysis of literature in a selected area of research. May be repeated.

7211-3  **Doctoral Research**  
1 to 3 hours credit. Corequisite: Concurrent enrollment in ACC 6961. 
May be repeated for credit, but no more than 24 hours may be applied to the doctoral degree.

7311-3  **Doctoral Dissertation**  
1 to 3 hours credit. Prerequisite: Admission to candidacy for Doctoral degree in Business Administration. 
May be repeated for credit, but no more than 12 hours may be applied toward the Ph.D. degree requirements.
Master of Business Administration Degree – Business Economics Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration at the graduate level with particular emphasis in business economics. It assists students in preparing for economics-related careers in the business environment and government or for graduate study in economics at the doctoral level.

Students choosing to concentrate in business economics must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours as follows:

- ECO 5033 Macroeconomic Issues
- ECO 6103 Econometrics and Business Forecasting
- 6 semester credit hours of graduate economics elective courses

Master of Arts Degree in Economics

The Master of Arts degree in Economics (M.A.E.) blends the traditional social sciences–oriented Master's program in economics with modern applied and analytical tools. It is designed to prepare students for careers in a wide range of professional fields or further graduate study in economics. Students may choose a thesis or nonthesis option. The program and admissions are supervised by the Economics Graduate Program Committee, which includes the Economics Graduate Advisor. General requirements for completion of the program consist of required courses, electives, and a comprehensive examination.

Program Admission Requirements. For admission to the M.A.E. program, applicants must meet University-wide graduate admission requirements. Applicants are further considered on the basis of potential for success in graduate study in economics as indicated by a combination of records in the applicant’s application package, including:

- a completed application form
- transcripts from all universities attended
- official Graduate Record Examination (GRE) or Graduate Management Admission Test (GMAT) scores
- letters of reference (optional)
- statement of purpose (optional).

The Economics Graduate Admissions Committee evaluates each applicant individually based on the stated records. Accepted students are required to have completed an undergraduate degree before the start of the Master's program. Also, students with noneconomics undergraduate degrees may be required to take some undergraduate or graduate courses in addition to degree requirements.

Degree Requirements. Students must complete 33 semester credit hours and a comprehensive examination.

A. Required courses. 12 semester credit hours of economics graduate courses:
- ECO 5023 Managerial Economics
- ECO 5033 Macroeconomic Issues
- ECO 5303 International Trade and Finance
- ECO 6103 Econometrics and Business Forecasting

B. 21 semester credit hours of elective graduate work, 12 of which may be noneconomics courses, contingent upon approval by the Economics Graduate Advisor. With approval of the advisor, students with graduate credits in a noneconomics field may apply up to 12 hours of graduate work to fulfill the noneconomics elective requirements. In the case of students who have not had similar courses in their undergraduate program and upon the Graduate Advisor's approval, all College of
Business 5003 courses qualify as electives. Such electives may be desirable for those with a prospect of entering the Ph.D. program in Business Administration at UTSA. Students pursuing the thesis option may fulfill up to 6 credit hours of the elective work with a thesis. Economics elective courses are economics graduate courses not in the student’s required courses sequence, including:

- ECO 5603 Public Finance and Fiscal Policy
- ECO 5913 Antitrust: Legal and Economic Analysis
- ECO 6203 Government and Business
- ECO 6313 Managerial Labor Economics
- ECO 6543 Health Care Economics and Policy
- ECO 6553 Urban and Regional Economics
- ECO 6973 Special Problems

C. Comprehensive examination. Students must pass a comprehensive examination administered by their graduate committee. This examination is normally taken in the semester before or during the semester in which degree requirements are completed. During the first month of the appropriate semester, the student informs the Economics Graduate Advisor of the intent to take the examination and requests the formation of the committee. The committee consists of the Economics Graduate Advisor and two other faculty members, who may be recommended by the student. One may be a noneconomics faculty member. If the thesis option is adopted, the thesis supervisor is a member of the committee.

### COURSE DESCRIPTIONS

#### ECONOMICS (ECO)

5003 **Economic Theory and Policy**
(3-0) 3 hours credit.  
The opportunity for intensive study of micro- and macroeconomic concepts; the price system as it functions under competition, monopoly, and partial monopoly; national income measurement and determination; business cycles; money and banking; monetary policy; and fiscal policy and economic stabilization.

5023 **Managerial Economics**
(3-0) 3 hours credit. Prerequisites: ECO 5003 and MS 5003, or their equivalents.  
Application of price theory to economic decisions of the firm. A problem-oriented approach emphasizing demand, production, and profit-maximizing conditions, and their implications for output and pricing strategies under various market structures and types of organization.

5033 **Macroeconomic Issues**  
(3-0) 3 hours credit. Prerequisite: ECO 5003 or an equivalent.  
Introduction to advanced macroeconomic theory and policy. Topics include indicators of overall economic activity, various models of the economy and stabilization policies, economic growth, inflation and unemployment, models of consumption, investment, and trade and their impact on policy effectiveness.

5303 **International Trade and Finance**  
(3-0) 3 hours credit. Prerequisite: ECO 5003, an equivalent, or consent of instructor.  

5603 **Public Finance and Fiscal Policy**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Theoretical rationale for collective action; incidence, equity, and efficiency of taxation methods; externalities and property rights; and fiscal management and debt financing.
5913 **Antitrust: Legal and Economic Analysis**  
(3-0) 3 hours credit. Prerequisite: ECO 5003 or an equivalent.  
An analysis of promoting and protecting competition through law. Antitrust implications of the managerial process are examined.

6103 **Econometrics and Business Forecasting**  
(3-0) 3 hours credit. Prerequisite: ECO 5003, an equivalent, or consent of instructor.  
Estimation and interpretation of econometric models. Classical and advanced forecasting methodologies, including regression analysis of multivariate time series, smoothing procedures, autoregressive integrated moving average (ARIMA) models, and vector autoregression. Application of computer-assisted forecasting methods to business and economic problems.

6203 **Government and Business**  
(3-0) 3 hours credit. Prerequisite: ECO 5003 or an equivalent.  

6313 **Managerial Labor Economics**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Survey of wage theory; wage determination and structure of labor markets; employment opportunities, economic security, leisure, and technological change; and labor organizations and collective bargaining.

6543 **Health Care Economics and Policy**  
(3-0) 3 hours credit. Prerequisite: ECO 5003 or an equivalent.  
The application of economic principles and modeling to the health care marketplace. Students will be given the opportunity to apply theoretical and empirical economic analysis to business and public policy issues in the health care industry.

6553 **Urban and Regional Economics**  
(3-0) 3 hours credit. Prerequisite: ECO 5003, an equivalent, or consent of instructor.  
Economic aspects of regions and their cities, including growth and development processes; data sources and analytical methods; and analysis of urban issues such as transportation, land use, pollution, and public sector service delivery.

6943 **Economics Internship**  
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor. Internship must be approved in advance by the Internship Coordinator and the student's Graduate Advisor of Record. Cannot count as an economics elective toward an M.B.A. with a concentration in Business Economics. Supervised full- or part-time off-campus work experience and training in economics. Individual conferences and written reports required.

6951-3 **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to a Master's degree.
6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to a Master’s degree.

6983 Master’s Thesis
3 hours credit. Prerequisite: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to a Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7013 Seminar in Microeconomic Theory
(3-0) 3 hours credit. Prerequisite: ECO 3013 or ECO 3033 or consent of instructor.
Decision problems faced by the household and firm; theories of consumer choice; theory of production, cost, markets, and pricing decisions in deterministic and stochastic settings.

7023 Seminar in Macroeconomic Theory
(3-0) 3 hours credit. Prerequisite: ECO 3053 or consent of instructor.
Macroeconomic models and their implications for forecasting and policy; determination of the interest rate, price level, wage rate, employment, and output; dynamic models of consumption, investment, and expectations; introduction to monetary economics and growth models.

7053 Quantitative Methods for Business and Economics
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A review of mathematical tools and their application in modeling and solving business and economic problems. Topics include linear algebra; linear systems and solution methods; special and multivariate functions; differential and integral calculus; constrained optimization and Lagrange method; and optimal control and dynamic programming.

7063 Econometrics
(3-0) 3 hours credit. Prerequisites: MS 1013, MAT 1033, STA 7013, and STA 7023 or equivalents, or consent of instructor.
A study of fundamental econometric techniques and applications. Topics include single equation models, least squares, and maximum likelihood estimation, properties of estimators, generalized least squares, general linear hypothesis, model selection techniques, simultaneous equations identification and estimation methods, distributed lag models, forecasting and time-series models.

7073 Topics in Economic Research
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Seminar on special topics in a particular area of research. These topics may include financial economics; econometrics; international economics; industrial organization; public economics; resources and energy; and government and business. May be repeated for credit when topics vary.
Master of Business Administration Degree – Finance Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration at the graduate level with an emphasis in finance. It particularly assists students in preparing for finance-related careers in the business environment or for graduate study in finance at the doctoral level.

Students choosing to concentrate in finance must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours as follows:

- FIN 5633 Investment Theory and Problems
- 9 semester credit hours of graduate finance elective courses

Master of Science Degree in Finance

The Master of Science degree in Finance (M.S.F.) provides an intensive education in various aspects of finance, including markets and institutions, corporate finance, international finance, financial modeling, and investments including derivative securities. Emphasis is on theoretical aspects of finance, developments in financial instruments and markets, and practical application tools and techniques. The program is designed to train students to be financial managers and analysts in corporations, banks, and investment institutions. It also provides the opportunity for students to prepare to undertake specialized certification examinations and doctoral studies in finance. The program, including admission, is supervised by the Graduate Program Committee in Finance, which includes the Graduate Advisor in Finance. General requirements for completion of the program consist of nonfinance foundations of knowledge requirements, required finance courses, elective work, and a comprehensive examination.

Program Admission Requirements. For admission to the Master of Science degree in Finance program, applicants must meet University-wide graduate admission requirements. Applicants are further considered on the basis of demonstrated potential for success in graduate study in finance as indicated by a combination of prior academic achievement, Graduate Management Admission Test (GMAT) scores, personal statement, résumé (optional), and references (optional).

The M.S.F. Graduate Program Committee evaluates each applicant individually based on the complete package of submitted materials.

A complete application package will include:

- a completed application form
- transcripts from all universities attended
- official Graduate Management Admission Test (GMAT) scores
- personal statement
- current résumé with employment or other experience (optional)
- letters of reference (optional).

Students with nonfinance undergraduate degrees may be required to take additional undergraduate and graduate courses for removal of deficiencies, as determined by the Graduate Program Committee in Finance. Such courses do not apply toward the degree.
**Degree Requirements.** Students must complete 33 semester credit hours and a comprehensive examination.

A. Foundations of knowledge courses:
   - ACC 5023  Accounting Analysis for Decision Making
   - ECO 5023  Managerial Economics
   - MS 5023   Decision Analysis and Production Management

B. Finance courses:
   - FIN 5023  Financial Management
   - FIN 5633  Investment Theory and Problems
   - FIN 6313  Modeling of Financial Decision Making (must be taken at least one semester before graduation)

C. 15 semester credit hours of electives, at least 12 of which must be in finance. The Graduate Advisor in Finance must approve nonfinance electives. Finance electives include:
   - FIN 5033  Cases in Financial Management
   - FIN 5713  Financial Markets
   - FIN 5733  Banking and the Financial Services Industry
   - FIN 5813  Corporate Valuation
   - FIN 5833  International Financial Management
   - FIN 5853  Entrepreneurial Business Finance
   - FIN 5913  Portfolio Theory and Efficient Capital Markets
   - FIN 6213  Speculative Markets and Securities
   - FIN 6943  Finance Internship
   - FIN 6953  Independent Study
   - FIN 6973  Special Problems

D. Comprehensive examination. All candidates must pass a comprehensive examination administered by the Graduate Program Committee in Finance.

**Doctor of Philosophy Degree in Business Administration with an Emphasis in Finance**

The College of Business offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Business Administration with an emphasis in Finance. See page 75 of this catalog for a detailed description of the general requirements for the Ph.D. degree. The Doctoral Studies Committee of the Department of Finance will advise students admitted to the program who pursue a Ph.D. in Business Administration with an emphasis in Finance.

To satisfy the Major Area Coursework for the finance emphasis, a student must complete:

1. FIN 7013  Financial Theory
   - FIN 7023  Corporate Finance
   - FIN 7033  Valuation
   - FIN 7043  Empirical Finance
   - FIN 7201-3 Finance Research Colloquium

2. Two directed electives:
   - FIN 7053  Topics in Financial Research
   - FIN elective
COURSE DESCRIPTIONS

FINANCE
(FIN)

5003 Business Finance
(3-0) 3 hours credit. Prerequisite: ACC 5003 or an equivalent.
The framework, tools, and basic concepts of financial management. Areas of inquiry include taxation, forecasting, working capital management, external financing, capital budgeting, and dividend policy.

5023 Financial Management
(3-0) 3 hours credit. Prerequisites: ECO 5003, FIN 5003, and ACC 5003, or their equivalents. Completion of or concurrent enrollment in ACC 5023 is recommended.
The study of concepts related to the financial management of the firm. Topics include asset and liability management, capital investment analysis and valuation, risk and uncertainty, sources and costs of financial alternatives, and corporate financial policy. (Credit cannot be earned for both FIN 5023 and FIN 5043.)

5033 Cases in Financial Management
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
A case approach will be used to illustrate the applications of financial management to business situations and to integrate topical areas. Primary areas of focus include planning, current asset management, capital budgeting, mergers and acquisitions, and financing alternatives.

5633 Investment Theory and Problems
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
A study of investment analysis and decision making with regard to financial instruments traded in organized markets. Topics include descriptions and functions of markets; impact of market structure on market efficiency and security pricing; valuation of stocks, bonds, and options; analysis of risk and return characteristics of investment alternatives; and selection and management of bond and stock portfolios.

5713 Financial Markets
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
An examination of major financial markets with emphasis on current trends and developments. Topics include markets used for risk management, such as financial futures, listed options, and SWAPS.

5733 Banking and the Financial Services Industry
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
The study of management practices applicable to banks and other firms operating in the financial services industry. Bank management practices using an asset/liability management approach are emphasized. Topics include major trends and developments having an impact on the financial services industry.

5813 Corporate Valuation
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
The techniques and issues involved in making long-term capital investment decisions. Topics include the concepts of the cost of capital and financial structure and how they relate to the capital budgeting decision, dividend policy, risk assessment and management, forecasting, and cash flow analysis.

5833 International Financial Management
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.
The theory of business finance as applied to the operations of multinational firms. The determinants of exchange rates and the management of exchange rate risk are analyzed in terms of their impact on how a multinational corporation functions in the international setting. Topics include the financial analysis and control of foreign investment decisions, management of working capital, participation in the international capital markets, financing of international trade, and management of corporate risk.
5853  **Entrepreneurial Business Finance**  
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.  
The course focuses on the financial needs and conditions unique to the small firm that arise as it progresses from the development stage through the start-up, expansion, and harvesting stages. Topics include comparison of operating and managerial characteristics, valuation issues, and financial alternatives.

5913  **Portfolio Theory and Efficient Capital Markets**  
(3-0) 3 hours credit. Prerequisite: FIN 5633 or an equivalent.  
A comprehensive survey of the classical and contemporary theories of optimum portfolio construction; a study of the determinants of risk-return trade-offs in the selection of securities; and emphasis on the theory and evidence of efficient markets and its implications on the analysis of securities and portfolio management.

5963  **International Business Internship**  
3 hours credit. Prerequisites: Consent of instructor and the Graduate Advisor of Record.  
Opportunity for work experience in international business or a public agency.

5983  **International Business Essay**  
3 hours credit. Prerequisites: Consent of instructor and the Graduate Advisor of Record.  
Original research report on an international management topic.

6213  **Speculative Markets and Securities**  
(3-0) 3 hours credit. Prerequisite: FIN 5633 or an equivalent.  
An examination of derivative financial instruments such as options and futures and their potential role in controlling portfolio risk. Valuation and the risk and return characteristics of these instruments, as well as trading and portfolio strategies, will be developed.

6313  **Modeling of Financial Decision Making**  
(3-0) 3 hours credit. Prerequisite: FIN 5023 or an equivalent.  
Computer models of financial problems commonly used in industry are developed. Topics include financial statement analysis, financial planning and forecasting, capital investment analysis, and financing decisions. Applications to investment analysis include security and options valuations, performance analysis, and portfolio management. Decision making under uncertainty is examined through various techniques, including simulation.

6943  **Finance Internship**  
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor. Internship must be approved in advance by the Internship Coordinator and the student's Graduate Advisor of Record. Cannot count as a finance elective toward the M.B.A. with a concentration in Finance. Supervised full- or part-time off-campus work experience and training in finance. Individual conferences and written reports required.

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to a Master's degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive
Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to a Master’s degree.

6983 Master’s Thesis
3 hours credit. Prerequisite: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to a Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7013 Financial Theory
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
The course covers financial theory, including considerations of financial decision making in an uncertain environment, introduction to utility theory; state-preference theory; and mean-variance choice theories. Considerations of market equilibrium, introduction to financial derivatives, and international finance will be covered, as well as empirical findings in finance.

7023 Corporate Finance
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
The theory of financial management of the firm, including Miller and Modigliani propositions and their extensions; imperfect information and agency problems; and asymmetric information and signaling, will be considered. Corporate finance issues such as capital structure, dividend policy, corporate governance, and bankruptcy topics will be covered. Empirical research in corporate financial decisions will also be covered.

7033 Valuation
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
The concepts of valuation are developed through such topics as asset pricing models and arbitrage methods. Development of concepts of value additivity, stochastic dominance, and state preference will be undertaken. Stochastic processes and stochastic calculus are developed for the pricing of options in continuous time. Other discrete time processes and valuation methods will also be covered.

7043 Empirical Finance
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Methodologies and techniques for testing hypotheses regarding asset pricing models, option pricing models, volatility, and market efficiency will be developed. Market structure issues using event studies and time series applications are explored and developed.

7053 Topics in Financial Research
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
This is a research seminar course where the topics may vary. Topics envisaged include the following: advanced international financial management topics, the theory and management practices in financial intermediaries, and advanced topics in real estate finance. The course may be repeated for credit when topics vary.

7201-3 Finance Research Colloquium
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
Presentation and analysis of literature in a selected area of research. May be repeated.
7211-3  **Doctoral Research**
1 to 3 hours credit. Corequisite: Concurrent enrollment in FIN 6961.
May be repeated for credit, but no more than 24 hours may be applied to the doctoral degree.

7311-3  **Doctoral Dissertation**
1 to 3 hours credit. Prerequisite: Admission to Candidacy for the Doctoral degree in Business Administration. May be repeated for credit, but no more than 12 hours may be applied to the doctoral degree.
DEPARTMENT OF INFORMATION SYSTEMS

Master of Business Administration Degree – Information Systems Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration while developing special expertise in information systems. To achieve this end, students can focus their elective courses on developing general managerial knowledge in the design and implementation of information systems, management of communications technologies, and principles of database management systems. Some of the course offerings require previous academic credit or professional experience in information systems.

Students choosing to concentrate in information systems must complete the 21 semester credit hours of courses containing the foundation of knowledge and 12 semester credit hours of graduate information systems courses other than IS 5003.

Master of Science Degree in Information Technology

The Master of Science degree in Information Technology (M.S.I.T.) provides information systems and computer science professionals with the opportunity to acquire technical knowledge in a variety of specialized information technology fields and the management skills to create, plan, organize, lead, and control the information technology in their organizations. The program is designed for students with a technical background and preferably an undergraduate or graduate degree in information systems or computer science.

Program Admission Requirements. For admission to the M.S.I.T. program, applicants must meet University-wide graduate admission requirements. Applicants are further considered on the basis of demonstrated potential for success in graduate study in information technology as indicated by a combination of prior academic achievement, Graduate Management Admission Test (GMAT) scores, personal statement, résumé (optional), and references (optional).

The M.S.I.T. Program Committee evaluates each applicant individually based on the complete package of submitted materials. A complete application package will include:

- a completed application form
- transcripts from all universities attended
- official Graduate Management Admission Test (GMAT) scores
- a personal statement
- a current résumé with employment or other experience (optional)
- letters of reference (optional).

Degree requirements. Candidates for the degree of Master of Science in Information Technology (M.S.I.T.) must complete the following:

A. 12 semester credit hours of required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>IS 5143</td>
<td>Information Technology</td>
</tr>
<tr>
<td>IS 5203</td>
<td>Telecommunication Systems</td>
</tr>
<tr>
<td>MGT 5043</td>
<td>Management and Behavior in Organizations</td>
</tr>
<tr>
<td>MOT 5203</td>
<td>Strategic Management of Technology</td>
</tr>
<tr>
<td>or IS 6813</td>
<td>Strategic Management of Information Technology</td>
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</tbody>
</table>

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B. All candidates for the degree must complete an additional 21 semester credit hours of elective courses.

1. Five courses from the following:

- CS 5103 Software Engineering
- CS 5443 Database Management Systems
- CS 6543 Networks
- CS 6553 Performance Evaluation
- IS 5193 Software Engineering Management
- IS 5563 International Telecommunications Policy
- IS 6103 Information Systems Design and Implementation
- IS 6303 Introduction to Voice and Data Security
- IS 6323 Security Risk Analysis
- IS 6353 Security Incident Response
- IS 6503 Principles of Database Management
- IS 6703 Advanced Business Information Systems
- IS 6953 Independent Study

2. Two courses from the following:

- MGT 5093 Leadership
- MGT 5133 Organizational Decision Making
- Any of the graduate courses from Management of Technology (MOT) other than MOT 5013 and MOT 5203.

Master of Science Degree in Information Technology – Infrastructure Assurance Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study information technology while developing the special expertise in infrastructure assurance. To achieve this end, students can focus their elective courses on developing the specialized knowledge requirements for the computer and information security area while at the same time completing the requirements for the Master of Science (M.S.) degree.

Students choosing to concentrate in infrastructure assurance must complete the following 12 semester credit hours. These classes are part of the requirements for the M.S. degree.

- IS 5203 Telecommunication Systems
- IS 6303 Introduction to Voice and Data Security
- IS 6323 Security Risk Analysis
- IS 6353 Security Incident Response

Doctor of Philosophy Degree in Business Administration with an Emphasis in Information Technology

The College of Business offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Business Administration with an emphasis in Information Technology. See page 75 of this catalog for a detailed description of the general requirements for the Ph.D. degree. The Doctoral Studies Committee of the Department of Information Systems will advise students admitted to the program who pursue a Ph.D. in Business Administration with an emphasis in Information Technology.
To satisfy the Major Area Coursework for the information technology emphasis, a student must complete:

1. IS 7013 Foundations of Information Systems Research
   IS 7023 Behavioral and Organizational Information Systems Research
   IS 7033 Topics in Information Systems Technology Research
   IS 7043 Seminar in Software Development
   IS 7201-3 Information Technology Research Colloquium

2. Two directed electives (6 semester credit hours) as approved by the Doctoral Studies Committee

### COURSE DESCRIPTIONS

#### INFORMATION SYSTEMS

**5003 Introduction to Information Systems**

(3-0) 3 hours credit.

A conceptual study of information systems in organizations. A survey of information systems concepts will be presented, including a historical perspective of information systems, the structure of the information systems function, an introduction to information systems technologies (hardware and software), application planning, system development, end user computing, decision support systems, and the management of information systems resources. Small cases and application problems which illustrate the concepts studied will be assigned. (Credit for this course may not be counted toward the M.B.A. concentration in Information Systems.)

**5013 Database Management for Business**

(3-0) 3 hours credit. Prerequisite: Consent of instructor.

The use of databases in a contemporary business environment will be discussed. The course includes an in-depth analysis of topics associated with the definition, creation, and use of databases for business-oriented applications. Topics include current applications in the field of database management systems with hands-on experience with a database or data-warehousing software package.

**5023 Software Development**

(3-0) 3 hours credit. Prerequisite: IS 5003 or an equivalent.

Modern approaches to program design. Emphasis in this course is on programming logic, object-oriented programming and program design. JAVA will be used to illustrate the concepts of the class. Class projects using JAVA will give the students some experience in developing software.

**5043 Analysis and Design of Information Systems**

(3-0) 3 hours credit. Prerequisite: IS 5003 or an equivalent.

This course concentrates on the procedures for conducting the analysis and design of an information system. The techniques necessary to determine the requirements of a large scale information system will be the focal point of the class. Translating the user requirements to system specifications will also be one of the main objectives of the course.

**5103 Computer Support of Groups**

(3-0) 3 hours credit. Prerequisite: IS 5003 or an equivalent.

A study of the ways computers can be used to support the communication, coordination, and decision-making needs of groups. Problems encountered by face-to-face and distributed groups will be examined. Technology for addressing the problems will be studied.

**5113 Electronic Commerce**

(3-0) 3 hours credit. Prerequisite: IS 5003 or an equivalent.

Addresses the technological aspects of doing business on the Internet, including the technology underlying the Internet, common services required for all electronic commerce such as authentication and electronic payment systems, and the problems associated with some electronic commerce applications.
5143  **Information Technology**  
(3-0) 3 hours credit. Prerequisite: Undergraduate degree in information systems or computer science, or consent of instructor.  
Broad coverage of technology concepts underlying modern computing and information management. Topics include computer architecture and operating systems, information retrieval techniques, graphical user interfaces, networks, groupware, computer performance evaluation, efficiency of algorithms, and cryptography. Hands-on exposure to Internet services, SQL database language, PowerBuilder graphical interface language, and Lotus Notes.

5193  **Software Engineering Management**  
(3-0) 3 hours credit. Prerequisite: Undergraduate degree in information systems or computer science, or consent of instructor.  
Focuses on managing and improving the delivery of software in organizations, especially projects that include the development of large, multidisciplined systems. Students are exposed to the tools and techniques used on commercial systems, and will present research on how best to manage information technology projects. Emphasis on measurement tools for effective managerial planning and control.

5203  **Telecommunication Systems**  
(3-0) 3 hours credit. Prerequisite: Undergraduate degree in information systems or computer science, or consent of instructor.  
Examines current, future, and basic technical concepts and related telecommunications operations; explores critical issues of communications and connectivity among information systems from strategic, organizational, and technical perspectives. An in-depth examination of basic telecommunication terminology and concepts. Topics include signaling, modulation, multiplexing, frequency bands and propagation characteristics, spectral analysis of signals, digital coding, switching systems, OSI models, and traffic analysis.

5313  **Web Site Design and Development**  
(3-0) 3 hours credit. Prerequisite: IS 5113 or consent of instructor  
This course examines the principles of designing Web sites to meet business requirements. The course includes a technical look at Web site architecture, and database integration in support of e-commerce utilizing popular commercial software. Hands-on team projects involving actual development utilizing principles from the course will be a major element of the course.

5563  **International Telecommunications Policy**  
(3-0) 3 hours credit. Prerequisite: Undergraduate degree in information systems or computer science, or consent of instructor.  
The ultimate use of technology depends on a number of variables. Political factors as well as technical ones must be considered. All levels of government regulate telecommunications, from the city that controls the placement of telephone wires to the nation and/or state that issues licenses to broadcast. Because of the nature of telecommunications and the importance of the information it carries, international policies are also involved. This seminar investigates the institutions that affect the use of telecommunications, including the Department of State, the Department of Commerce, and the Federal Communications Commission.

6103  **Information Systems Design and Implementation**  
(3-0) 3 hours credit. Prerequisite: IS 4053 or consent of instructor.  
Integrates the areas of computer technology, systems analysis, and systems design in designing large-scale application or decision support systems. A strong introduction to the formalization of the information systems design process is provided. The course explores state-of-the-art systems design and specification techniques and stresses the frontiers of knowledge in the specification, design, implementation, and testing of information systems.

6203  **Data Communication and Network Management**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Emphasis is on the impact of communications technology on information systems and the firm. Major topics include communication concepts, network architectures, data communications software and hardware, distributed information systems, and communication services. Network management and managing the new technologies are also emphasized.
6303 Introduction to Voice and Data Security
(3-0) 3 hours credit. Prerequisite: IS 5203 or consent of instructor.
A study of security in both the voice and data networks and an examination of the security issues associated with the movement toward a convergence of the two infrastructures. Topics to be covered include voice and data network connectivity, modem security, VOIP security, wireless security, cryptography, intrusion detection systems, voice and data firewalls, malicious software, information operations and warfare, and denial of service attacks.

6323 Security Risk Analysis
(3-0) 3 hours credit. Prerequisites: IS 5203 and IS 6303 or consent of instructor.
Addresses the tools, techniques and methodologies in performing computer system and network security risk analyses. Computer system and network vulnerabilities will be examined as well as tools designed to discover or exploit them. Security Best Practices and audit requirements for specific environments will be studied. Topics to be covered include internal and external penetration tests, wardialing, wireless security technology, risk analysis methodology, and security audits.

6353 Security Incident Response
(3-0) 3 hours credit. Prerequisite: IS 6303.
Addresses the Detection and Response portion of the security operational model. Takes an in-depth look at intrusion detection methodologies and tools and the approaches to handling intrusions when they occur. Examines the laws that address cybercrime and intellectual property issues. Includes a study of proper computer and network forensics procedures to aid in the identification and tracking of intruders and in the potential prosecution of criminal activity.

6403 Information Resource Management
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
Study of the problems and techniques associated with managing information resources. Topics include information systems project planning and control, staffing, and costing alternatives. The role of the information systems function in relation to the business firm is also studied.

6503 Principles of Database Management
(3-0) 3 hours credit. Prerequisite: IS 3063 or consent of instructor.
Discussion and in-depth analysis of topics associated with the definition, creation, and management of databases for business-oriented applications. Topics include current developments in the field of database management systems. Design and implementation of a database system will be done as a major project in the course.

6603 Seminar in Computer Security and Internal Control
(3-0) 3 hours credit. Prerequisite: IS 5003 or consent of instructor.
In-depth analysis of topics related to control and security during system development and operation of information systems. Emphasis is on techniques associated with control and security requirements in information systems.

6703 Advanced Business Information Systems
(3-0) 3 hours credit. Prerequisite: IS 3073 or consent of instructor.
Study of computer-based technologies for facilitating the analysis and evaluation of complex problems. A review of decision analysis and a discussion of representations and the modeling process. General concepts of artificial intelligence are examined as the foundation for designing computer-based information systems that support strategic planning and managerial control. Methods and principles of knowledge engineering are explored.

6813 Strategic Management of Information Technology
(3-0) 3 hours credit. Prerequisite: Semester of graduation or consent of Graduate Advisor of Record.
This course develops a conceptual framework for strategy, its definition, elements, and relationships to the basic business functions of management of information technology. Considers the impact of technology and environmental forces on strategic management of organizations. Examines the role of information technology in business process reengineering, product life cycles and new business models. (Credit cannot be earned for both IS 6813 and MOT 5203.)
6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate committee on graduate studies to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Committee on Graduate Studies. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3  **Special Problems**  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6983  **Master’s Thesis**  
3 hours credit. Prerequisite: Permission of the Graduate Advisor of Record and thesis director (form available).  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7013  **Foundations of Information Systems Research**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A survey of the foundations of information systems (IS) research. Students gain an understanding of both the foundations and the current research directions in a variety of IS topic areas. The course addresses frameworks, research concepts, and exemplary Management Information Systems (MIS) research. Students develop the ability to critically evaluate MIS journal articles and are exposed to a diversity of topics, research methodologies, and journals.

7023  **Behavioral and Organizational Information Systems Research**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
This course focuses on one or more areas of emerging IS behavioral research. Topics may include individual, group, or organizational decision making, issues for e-commerce, knowledge management, management of information, and human factors. May be repeated once for credit when topics vary.

7033  **Topics in Information Systems Technology Research**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
This research seminar focuses on issues and methods in one or more areas having to do with the technology of information systems. Topics may include communication systems, infrastructure assurance, and data management. May be repeated once for credit when topics vary.

7043  **Seminar in Software Development**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
In this course, theories and models applicable to the analysis of systems structure and the processes of systems analysis and design are studied in relation to software engineering concepts. Emerging or advanced topics in the development of information system applications, such as socio-technical or soft-system methods, methodology engineering, or workflow system design, are included.
7201-3 Information Technology Research Colloquium
1 to 3 hours credit. Prerequisite: Consent of instructor.
This course will primarily be a presentation and analysis of research in information technology with particular emphasis on the students’ areas of specialization.

7211-3 Doctoral Research
1 to 3 hours credit. Corequisite: Concurrent enrollment in IS 6961.
May be repeated for credit, but no more than 24 hours may be applied to the doctoral degree.

7311-3 Doctoral Dissertation
1 to 3 hours credit. Prerequisite: Admission to Candidacy for the Doctoral degree in Business Administration.
May be repeated for credit, but no more than 12 hours may be applied to the doctoral degree.
DEPARTMENT OF MANAGEMENT

Master of Business Administration Degree – Health Care Management Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration at the graduate level with particular emphasis in health care management. It will assist students who enter with differing work experience in their quest for managerial roles within a variety of types of health care organizations.

Students choosing to concentrate in health care management must complete the 21 semester credit hours of foundations of knowledge courses.

In addition, students choosing this concentration must complete 12 semester hours as follows:

- MGT 6123 Health Care Management
- MGT 6133 Organizational and Managerial Issues in Health Care Delivery
- BLW 6553 Legal, Ethical, and Social Issues of Health Care Management
- 3 semester credit hours of graduate business elective, as approved by the Graduate Advisor of Record

Doctor of Philosophy Degree in Business Administration with an Emphasis in Organization and Management Studies

The College of Business offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Business Administration with an emphasis in Organization and Management Studies. See page 75 of this catalog for a detailed description of the general requirements for the Ph.D. degree. The Doctoral Studies Committee of the Department of Management will advise students admitted to the program who pursue a Ph.D. in Business Administration with an emphasis in Organization and Management Studies.

To satisfy the Major Area Coursework for the organization and management studies emphasis, a student must complete:

1. MGT 7013 Seminar in Organizational Behavior
   MGT 7023 Seminar in Organization Theory
   MGT 7033 Seminar in Strategic Human Resources
   MGT 7043 Foundations of Strategy
   MGT 7201-3 Organization and Management Studies Research Colloquium

2. Two directed electives:
   - MGT 7053 Empirical Approaches to Strategy
   - MGT 7073 Seminar in Organization and Management Studies

Master of Business Administration Degree – Management of Technology Concentration

This concentration is designed to offer the opportunity for qualified graduate students, primarily with a nontechnical background, to study business administration while developing special expertise in the management of technology. To achieve this end, students can focus their elective courses on developing general managerial skills applicable to technology-based organizations, leading professional and technical employees, and integrating the various functions of an organization in today’s rapidly changing technological environment.
Students choosing to concentrate in the management of technology must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours as follows:

A. Required courses (6 hours):

- MOT 5163 Management of Technology
- MOT 5223 Management of Professional Personnel

B. Elective courses (6 hours):

Students must complete an additional 6 semester credit hours of graduate courses from management of technology (other than MOT 5013 and 5023), information systems (other than IS 5003), management science (other than MS 5003), and/or statistics.

**Master of Business Administration – Project Management Concentration**

This concentration is designed to offer qualified graduate students the opportunity to study business administration while developing special expertise in project management. To achieve this end, students will complete courses that will enable them to manage projects successfully. Additionally, students will focus their elective choices to improve their understanding of the business environment in which contemporary projects are managed.

A. Required Courses (6 hours):

- MOT 5243 Essentials of Project and Program Management
- MOT 5233 Advanced Topics in Project Management

B. Elective Courses (6 hours):

Students are required to take 6 semester credit hours of graduate elective courses. Students are encouraged to elect courses which will develop their knowledge of a specific project management domain such as e-commerce, health care management, information systems, or technology management. Accordingly, the faculty coordinating this concentration must approve the 6 elective hours.

**Master of Science Degree in Management of Technology**

The Master of Science in Management of Technology (M.S. MOT) differs significantly from both the M.B.A. and the M.B.A. with a concentration in Management of Technology. The M.S. MOT has a different set of required Common Body of Knowledge (CBK) courses and focuses on management issues and skills required to help bring into the marketplace and manage advances in technology in the form of ideas, goods, and services. Courses are from both the College of Business and the College of Engineering. Courses may be available through distance learning.

**Program Admission Requirements.** For admission to the M.S. MOT program, the ideal applicant should have an undergraduate or graduate degree in a scientific, engineering, mathematical, or other technology-based discipline from an accredited university or college and meets University-wide graduate admission requirements. In addition, the M.S. MOT Program Committee evaluates each applicant individually, based on a combination of:

- prior academic achievement
- Graduate Management Admission Test (GMAT) or Graduate Record Examination (GRE)
- at least two letters of recommendation
- current résumé with employment or other experience
- personal statement.
The following courses constitute the M.S. MOT core and are required for students with limited exposure to business academe or work experience; however, their necessity is determined on a case-by-case basis depending on the student's background. Credit for these courses may not be applied toward degree requirements for the Master of Science in Management of Technology:

- MOT 5013 Global Foundations of Management of Technology
- MOT 5023 Technological Foundations of Management of Technology
- or
- EGR 5633 Technological Foundation of Management of Technology

**Degree Requirements.** Students must successfully complete 33 semester credit hours and a comprehensive examination.

A. Candidates are required to successfully complete the following 15 semester credit hours:

- EGR 5613 New and Emerging Technologies
- MOT 5053 Building Enterprise Equity
- MOT 5163 Management of Technology
- MOT 5223 Management of Professional Personnel
- MOT 5243 Essentials of Project and Program Management

B. Candidates must complete an additional 12 semester credit hours of electives as approved by the M.S. MOT Candidacy and Program of Study Committee.

C. Candidates are required to complete the following 6 semester credit hours leading to a capstone experience in the management of technology. The capstone experience, under the guidance of a graduate faculty advisor, is a synthesizing effort that may be a project, a thesis, or a paper prepared either for publication or for presentation at an appropriate conference.

- MOT 6923 Directed Research in Management of Technology
- MOT 6933 Management of Technology Capstone

D. Candidates must pass a comprehensive examination administered by the M.S. MOT Candidacy and Program of Study Committee.

### COURSE DESCRIPTIONS

#### MANAGEMENT (MGT)

**5003 Conceptual Foundations of Management**

(3-0) 3 hours credit.
This course examines the evolution and development of conceptual frameworks for understanding managerial work and organizational processes within the context of changing environments. An integrated strategic management perspective is emphasized.

**5043 Management and Behavior in Organizations**

(3-0) 3 hours credit. Prerequisite: MGT 5003 or an equivalent.
This course examines the processes and techniques used to get work done through others in an organization. These processes include a study of individual differences, motivation, leadership, group behavior, interpersonal communication, decision making, and change. Cross-cultural applications are considered.
5053 Organizational Communication
(3-0) 3 hours credit. Prerequisite: MGT 5043.
A survey of theoretical and functional aspects of organizational communication, stressing interpersonal, intra- and interorganizational, and intercultural communication.

5093 Leadership
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
An advanced course in organizational behavior that examines traditional and contemporary perspectives on leadership and the group process toward which leadership is directed. The course includes applications of leadership theory to contemporary organizational problems.

5133 Organizational Decision Making
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
An advanced course in organizational behavior focusing on the behavioral elements of the decision-making process. Drawing on theory and research in several disciplines, the course examines individual, group, and organizational decision-making models. Emphasis on prescriptive models for effective decision making.

5153 Social Issues in Business
(3-0) 3 hours credit. Prerequisite: MGT 5043.
Focuses on the forces surrounding the secularly oriented, technologically energized, and scientifically administered business sector of Western society. Develops an understanding of the underlying and basic forces that have fostered and shaped business. Emergence of the social responsibility ethic is examined.

5183 Global and Comparative Management
(3-0) 3 hours credit. Prerequisite: MGT 5003 or consent of instructor.
Examination of management challenges facing multinational and international business. Includes the study of organization options, political risk and strategy, staffing, communication, multicultural negotiations, and cross-cultural behavior and management. Emphasis on different countries’ approaches to competing, notably East Asia, Mexico, and Europe.

5233 International Business Analysis
(3-0) 3 hours credit. Prerequisite: MGT 5003 or an equivalent, or consent of instructor.
The opportunity to develop strategic opportunities in international business through the analysis of international trade and other international statistics. Extensive use of the Internet and international databases to find, evaluate, analyze, and develop international business opportunities. Emphasis is on developing export and import trade and transportation opportunities.

5243 International Business Strategy
(3-0) 3 hours credit. Prerequisite: MGT 5003 or an equivalent, or consent of instructor.
Emphasis on how firms create global bases of sustainable competitive advantage. Examines strategic problems unique to global business competition, including dimensions of perceived environment uncertainty, international entry-mode choices, global sourcing, and creating entry barriers to defendable product markets.

5623 Employee Relations/Negotiations
(3-0) 3 hours credit. Prerequisite: MGT 5003 or consent of instructor.
An analysis of various employee relations systems in organizations. Emphasis on various formal and informal discipline, grievance, and appeal systems in private and public organizations, as well as group and individual negotiation and dispute resolution processes.

5643 Management of Personnel and Human Resources
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
Management’s approach to and the techniques for handling the human resources in an organization. An examination of the primary management activities involved in the procurement, development, utilization, and maintenance of its human resources. Course focuses on behavioral and social science findings as they relate to the policy and practice of managing the employment relationship.
5723 Labor Relations in the Public Sector
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
An analysis of the unique role of labor relations at the federal, state, and local levels. Consideration is given to relevant legislation and how and why public employees organize for collective bargaining. Emphasis is on the practical aspects of bargaining and contract administration and how they relate to the public in general.

5733 Employment Law and Legislation
(3-0) 3 hours credit. Prerequisite: MGT 5043 or consent of instructor.
An analysis of the various laws and administrative rulings having an impact on the employment process of organizations. Focus is on the law as it affects various administrative decisions in recruiting, selection, training, promoting, and other employment areas, including benefits and labor relations.

5813 Strategic Human Resources Management
(3-0) 3 hours credit. Prerequisite: MGT 5643 or consent of instructor.
An examination of the overall role and functions of human resource management in relation to an organization’s strategic planning process. Emphasis is on human resource issues of strategic importance to an organization’s top management. Course focuses on the broader issues of human resource management policy, practice, and trends.

5903 Strategic Management and Policy
(3-0) 3 hours credit. Prerequisite: Completion of the foundations of knowledge courses or consent of instructor.
A course intended to integrate material taken in the M.B.A. program, as well as to broaden the horizons of the student beyond the focus on the firm. The macroeconomic aspects of the economy and contemporary problems and trends of business are covered. Students who earn a grade of “B” or better in this course will satisfy the comprehensive examination requirement. A student who receives a grade of “C” may still satisfy this requirement by successfully passing a comprehensive examination as set out in this catalog.

6123 Health Care Management
(3-0) 3 hours credit. Prerequisite: MGT 5003 or an equivalent.
Introduction to the health care industry, health care management and policy issues, managing in a regulated industry, and health care research issues. Students will have the opportunity to analyze several aspects of the health care industry using organizational and managerial frameworks.

6133 Organizational and Managerial Issues in Health Care Delivery
(3-0) 3 hours credit. Prerequisite: MGT 5003 or an equivalent.
An analysis of the organizational and managerial implications of clinical issues in the delivery of health care. Students have the opportunity to examine quality of care issues and concerns related to patient care that affect how health care organizations are managed.

6943 Management Internship
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor. Internship must be approved in advance by the Internship Coordinator and the student’s Graduate Advisor of Record. Supervised full- or part-time off-campus work experience and training in management. Individual conferences and written reports required.

6951-3 Independent Study
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.
6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to a Master’s degree.

6983 Master’s Thesis
3 hours credit. Prerequisite: Permission of the Graduate Advisor and thesis director.
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7013 Seminar in Organizational Behavior
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Critical examination of the theory and research pertaining to individual and group behavior within the context of a larger work organization system.

7023 Seminar in Organization Theory
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Critical examination of the theory and research pertaining to the relationships of organization structure and processes to complex environmental conditions. Multiple theoretical paradigms will be examined.

7033 Seminar in Strategic Human Resources
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A critical examination of research linking the management of human resource policies, practices and deployments in the context of internal and external environments with the performance of the organization.

7043 Foundations of Strategy
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A critical examination of the theoretical foundations of corporate strategy, especially the relationship between strategy and organizational performance.

7053 Empirical Approaches to Strategy
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A critical examination of the empirical foundations of corporate strategy. Emphasis will be placed on the design of empirical studies of strategy.

7073 Seminar in Organization and Management Studies
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Organized course offering the opportunity for specialized study not normally available as part of regular course offerings. This seminar may be repeated for credit when topics vary, but not more than 6 hours will apply to doctoral degree. Topics can include: The Learning Organization, Complex Adaptive Systems, and Special Issues in the Management of Technology.
7201-3 Organization and Management Studies Research Colloquium
1 to 3 hours credit. Prerequisite: Consent of instructor.
During their first year in the program, doctoral students will make a formal paper presentation to the faculty. Students will also be expected to participate in all research presentations in the College of Business during the two long semesters preceding their own presentation. The grade report for this class is either “CR” (satisfactory participation) or “NC” (unsatisfactory participation).

7211-3 Doctoral Research
1 to 3 hours credit. Corequisite: Concurrent enrollment in MGT 6961.
May be repeated for credit, but no more than 24 hours may be applied to the doctoral degree.

7311-3 Doctoral Dissertation
1 to 3 hours credit. Prerequisite: Admission to Candidacy for the doctoral degree in business.
May be repeated for credit, but no more than 12 hours may be applied to the doctoral degree.

COURSE DESCRIPTIONS
MANAGEMENT OF TECHNOLOGY
(MOT)

5013 Global Foundations of Management of Technology
(3-0) 3 hours credit. Prerequisites: Admission to M.S. MOT program and consent of instructor.
This course includes an overview of the contemporary business context: leadership of change; legal issues; science and technology policy; and global economic transformation. Elements of decision support systems are introduced, including accounting, finance, and information systems. Strategic paradigms of management of technology are used to integrate the content and give voice to emerging perspectives.

5023 Technological Foundations of Management of Technology
(3-0) 3 hours credit. Prerequisites: Admission to M.S. MOT program and consent of instructor.
This course examines the activities used to transform viable products and processes. Consideration is given to “green design” within a system’s context. Design is used as the rubric to integrate the activities. (Equivalent to EGR 5633. Credit cannot be earned for both MOT 5023 and EGR 5633).

5053 Building Enterprise Equity
(3-0) 3 hours credit. Prerequisite: MKT 5023 or consent of instructor.
An analysis of the role of technology and innovation in modern business practice. Emphasis is on managing technological change to develop business opportunities and competitive advantage. The concepts and tools covered aim to make the task of innovation and product portfolio management more understandable and controllable.

5163 Management of Technology
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Examines a broad range of topics and issues involved in the management of technology, including the international research and development environment and infrastructure; government, industry, and university roles in technology development; managing the research and development function; technology forecasting and assessment; and new product development.

5173 Technology Transfer: The Theory and Practice of Knowledge Utilization
(3-0) 3 hours of credit. Prerequisite: Consent of instructor.
Technology transfer or diffusion may be defined as the utilization or application of knowledge. The course examines the organizational, behavioral, and communication challenges involved in transferring technology from the research laboratory to the marketplace.
5183 Design of Experiments for Technology Managers
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An applied approach to design of experiments in engineering and scientific settings. Randomized block designs, factorials, two- and three-level factorial and fractional factorial designs, nested and split-plot designs, response surface methods, and robust design methods are studied. Computer statistical packages, including JMP, are used. A project and presentation based on designing an industrial experiment is required.

5203 Strategic Management of Technology
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Development of a conceptual framework for strategy, its definition, elements, and relationships to the basic functions of management of technology. Considers the impact of technology and environmental forces on strategic management of the organization.

5213 Organizational Systems for Management of Technology
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Focuses on organizational systems commonly found in modern organizations dealing with technology, innovation, and creativity. Considers alternative organizing concepts, interfacing and integrating considerations, and decision-making and control systems.

5223 Management of Professional Personnel
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
The study of behavior in professional and technical organizations. Focuses on the characteristics of professional and technical personnel, status and role systems within the professional organization, and communication and conflict within and among professional groups.

5233 Advanced Topics in Project Management
(3-0) 3 hours credit. Prerequisite: MOT 5243 or consent of instructor.
An advanced course that examines contemporary issues in project management. Includes topics such as: the value of project management; organizational project management maturity; project selection models; enterprise project management; and project office implementation. Synthesis and evaluation are emphasized. A basic understanding of project management is required.

5243 Essentials of Project and Program Management
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
This course addresses concepts and techniques for the management of business and technology projects. Includes topics such as: the project life cycle; project planning; project scheduling; project cost estimating; project risk analysis; project control techniques; earned value management; project organizations and functions; project manager responsibilities; and team building.

5253 Starting the High-Tech Firm
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A review of the steps and processes involved in starting a technology-based economic endeavor. The focus is built around the steps of identifying a problem area, identifying potential technological solutions to the identified need, and developing a proposed business entity to commercialize the technology solution.

6923 Directed Research in Management of Technology
(3-0) 3 hours credit. Prerequisites: Permission of the Graduate Advisor and the faculty advisor/director.
A directed research course to prepare students for MOT 6933 Management of Technology Capstone. The course emphasizes the understanding of scientific research problem solving, including research problems in management of technology, the design and methodology of research solutions to those problems, and the relations between problem and design. Presentation of assigned project is required.
Management of Technology Capstone
3 hours credit. Prerequisites: Permission of the Graduate Advisor and the faculty advisor/director. Research and preparation of an in-depth study of a complex problem in management of technology. Credit is awarded upon completion of the project, thesis, conference paper, or publishable article.

Management of Technology Internship
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor. Internship must be approved in advance by the Internship Coordinator and the student's Graduate Advisor of Record. Supervised full- or part-time off-campus work experience and training in management of technology. Individual conferences and written reports are required.

Independent Study
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to a Master's degree.

COURSE DESCRIPTIONS
BUSINESS LAW
(BLW)

Legal Environment of Business
(3-0) 3 hours credit. A legal analysis of the ethical and legal environment of business. Includes topics such as the common law, court systems, business torts and crimes, contracts and related areas of the Uniform Commercial Code, agency formation, forms of business organizations, administrative law, employment law, and real and personal property law.

Commercial Law
(3-0) 3 hours credit. Thorough study of the Uniform Commercial Code and related business transactions, including Bankruptcy and Federal Securities Regulations.

Legal Environment of International Business
(3-0) 3 hours credit. Prerequisite: BLW 5003 or consent of instructor. Survey of the legal environment of international business and the laws of international commerce. Includes comparative law, treaties and international agreements and contracts, international organizations, the Foreign Corrupt Practice Act, international letters of credit, exports and imports, tariffs, antidumping, the GATT, NAFTA, European Union, foreign investments, international patent laws, and related international legal topics.
6553  **Legal, Ethical, and Social Issues of Health Care Management**
(3-0) 3 hours credit. Prerequisite: BLW 5003, an equivalent, or consent of instructor.
Introduction to problems, issues, and trends in organized health care delivery with a particular focus on related legal
and ethical issues.

6943  **Business Law Internship**
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor.
Internship must be approved in advance by the Internship Coordinator and the student’s Graduate Advisor of Record.
Supervised full- or part-time off-campus work experience and training in business law. Individual conferences and
written reports required.

6951-3  **Independent Study**
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and
the student’s Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated
for credit, but no more than 6 hours, regardless of discipline, will apply to a Master’s degree.

6971-3  **Special Problems**
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the
regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than
6 hours, regardless of discipline, will apply to a Master's degree.
DEPARTMENT OF MANAGEMENT SCIENCE AND STATISTICS

Master of Business Administration Degree – Management Science Concentration

This concentration is designed to offer the opportunity for qualified graduate students to study business administration while developing special expertise in management science and to synthesize the theory and fundamentals of decision analysis with a study of current applicable technology. To achieve this end, students can focus their elective courses on the use of modern methodologies and techniques in the analysis and support of managerial decision-making activities, including the application of computer hardware and software.

Students choosing to concentrate in management science must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 semester credit hours of electives from the following:

- MS 5303 Decision Support Systems
- MS 5323 Statistical Methods for Business Analysis
- MS 5363 Computer Graphics/Multimedia for Management
- MS 5373 Simulation Analysis of Business Systems
- MS 5393 Production Operations Management
- MS 5453 Management and Control of Quality
- MS 6943 Management Science Internship
- MS 6953 Independent Study
- MS 6973 Special Problems

Additionally, a student may request the management science coordinator or chair to substitute other appropriate College of Business graduate electives for one or two of the above courses.

Master of Science Degree in Statistics

The Master of Science (M.S.) Degree in Statistics includes instruction in a broad range of statistical methods and computational tools to equip students to pursue careers as government, industrial, or academic statisticians, or to continue to doctoral study in statistics.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, a B.A. or B.S. in Mathematics, Statistics, or a closely related field is highly recommended as preparation. In particular, the completion of MAT 4213 and STA 3523 or their equivalents is required for unconditional admission. Those students who do not qualify for unconditional admission should anticipate that additional undergraduate and/or graduate coursework may be required to complete the degree. All applicants are required to submit scores from the Graduate Record Examination (GRE) aptitude test.

Degree Requirements

Candidates for this degree are required to successfully complete 36 semester credit hours as specified below:

A. All candidates for the Master of Science in Statistics must complete the following 18 semester credit hours of coursework:

- MAT 5203 Theory of Functions of a Real Variable I
- MAT 5283 Linear Algebra and Matrix Theory
- STA 5133 Data Analysis with Statistical Software
- STA 5503 Mathematical Statistics I
- STA 5513 Mathematical Statistics II
- STA 5713 Foundation of Linear Models
B. A candidate for the Master of Science degree in Statistics must complete 6 semester credit hours of coursework chosen from eligible graduate courses in Statistics within the Department of Management Science and Statistics.

C. A candidate for the Master of Science degree in Statistics must complete 6 semester credit hours of coursework chosen from eligible graduate courses in either Mathematics or Statistics.

D. Each student in the Master’s program is required either to write a Master’s thesis or complete 6 semester credit hours of graduate level courses in Mathematics, Statistics, or other disciplines as approved by the Graduate Advisor of Record.

E. Each candidate for the degree is required to pass an advanced comprehensive examination in Statistics or successfully defend his or her thesis research results.

**COURSE DESCRIPTIONS**

**MANAGEMENT SCIENCE**

**(MS)**

5003  **Quantitative Methods for Business Analysis**  
(3-0) 3 hours credit. Prerequisites: MAT 1033 and MS 1013, their equivalents, or consent of instructor.  
Introduction to managerial decision analysis using quantitative and statistical tools. Topics include a general framework for decision analysis, decision tables and trees, simulation, linear programming and related techniques, classical optimization, forecasting, and statistical techniques. Uses applicable decision support software. (Formerly MGT 5013. Credit cannot be earned for both MS 5003 and MGT 5013.)

5023  **Decision Analysis and Production Management**  
(3-0) 3 hours credit. Prerequisite: MS 5003 or an equivalent.  
Study of applications of quantitative approaches (such as probabilistic, programming, and simulation) to business decision analysis. Emphasis is given to production management applications (such as resource allocation, scheduling, inventory control, capital budgeting) and the use of computerized decision support systems. (Formerly MGT 5023. Credit cannot be earned for both MS 5023 and MGT 5023.)

5303  **Decision Support Systems**  
(3-0) 3 hours credit. Prerequisite: MS 5023.  
Study of systems for supporting managerial and personal/professional decision processes. Topics include review of sample decision support systems, methodologies for identifying decision needs, exploration of analysis tools and related computer technologies and software, survey of expert systems and artificial intelligence applications, and hands-on building of systems. (Formerly MGT 5033. Credit cannot be earned for both MS 5303 and MGT 5033.)

5323  **Statistical Methods for Business Analysis**  
(3-0) 3 hours of credit. Prerequisite: MS 5003.  
Introduction to multivariate statistical analysis. Topics include multiple regression, analysis of variance, discriminant analysis, conjoint analysis, and factor analysis. Emphasizes the use of computer statistical packages. (Formerly MGT 5323. Credit cannot be earned for both MS 5323 and MGT 5323.)

5363  **Computer Graphics/Multimedia for Management**  
(3-0) 3 hours credit. Prerequisite: MS 5023.  
Survey of the state of the art in multimedia applications in business and industry. Study of the processes by which multimedia objects (graphic, audio, video, and animation) are created, captured, edited, and inserted into documents, presentations, and computer-based learning environments. Emphasis is given to managerial applications delivered via networks, the Internet, and CD-ROM technologies. (Formerly MGT 5363. Credit cannot be earned for both MS 5363 and MGT 5363.)
5373 Simulation Analysis of Business Systems  
(3-0) 3 hours credit. Prerequisite: MS 5023.  
Study of computer simulation techniques in the analysis of business decision situations. Currently available tools,  
including general purpose simulation languages, spreadsheets, and graphics programs, are explored. Applications  
from a wide spectrum of areas are discussed. (Formerly MGT 5373. Credit cannot be earned for both MS 5373 and  
MGT 5373.)

5393 Production Operations Management  
(3-0) 3 hours credit. Prerequisite: MS 5023.  
Survey of the body of knowledge concerning the management of operations. Considers manufacturing and service  
principles. The course reviews a variety of topics necessary in the field of production and inventory management,  
including logistics and distribution process. The unique nature of service operations is stressed.

5453 Management and Control of Quality  
(3-0) 3 hours credit. Prerequisite: MS 5023.  
An examination of the fundamental nature of quality assurance, its strategic importance in business and industry, and  
the economic impact of quality. Theoretical and management issues relating to quality problem solving are  
emphasized. The contribution of the leaders in modern quality management are discussed. (Formerly MGT 5453.  
Credit cannot be earned for both MS 5453 and MGT 5453.)

6943 Management Science Internship  
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor.  
Internship must be approved in advance by the Internship Coordinator and the student's Graduate Advisor of Record.  
Supervised full- or part-time off-campus work experience and training in management science. Individual  
conferences and written reports required.

6951-3 Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and  
the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students  
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated  
for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6971-3 Special Problems  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the  
regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than  
6 hours, regardless of discipline, will apply to the Master's degree.

6983 Master's Thesis  
3 hours credit. Prerequisite: Permission of the Graduate Advisor and thesis director.  
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master's  
degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is  
in progress.

7033 Applications in Causal Structural Modeling  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An advanced treatment of causal modeling, including reviews of path analysis, covariance algebra, creating path  
diagrams, and structural equations, LISREL notation and syntax, confirmatory factor analysis and its extensions.
COURSE DESCRIPTIONS
STATISTICS
(STA)

5073  Methods of Statistics I
(3-0) 3 hours credit. Prerequisite: STA 1053.
Emphasis on methods and applications of statistics. Measure of location, variability, and association. Interpretation of
categorical data. Hypothesis testing, use of SAS programs and applications. May not be applied to a Master of
Science degree in Mathematics or Statistics.

5083  Methods of Statistics II
(3-0) 3 hours credit. Prerequisite: STA 5073.
A continuation of STA 5073, with emphasis on linear statistical models. Use of SAS programs and applications.
Topics in applied statistics may include maximum likelihood estimation and its properties; likelihood ratio tests.
Procedures in regression and model fitting, transformations of data, analysis of variance, and others. May not be
applied to a Master of Science degree in Mathematics or Statistics.

5103  Applied Statistical Methods
(3-0) 3 hours credit. Prerequisite: STA 3523 or an equivalent.
Topics include graphical method; estimation and hypothesis testing; regression and model fitting; transformations of
data; and analysis of variance. Applications in science, biostatistics, engineering, and industry.

5133  Data Analysis with Statistical Software
(3-0) 3 hours credit. Prerequisites: CS 1713 and STA 3523, or their equivalents.
Statistical analysis of data sets using SAS, JMP, S-Plus, and other popular statistical software. Manipulation of data
sets and production of reports and graphs. Emphasis is on linear models and basic multivariate procedures.
Introduction to programming in the S-Plus language.

5213  Advanced Statistical Quality Control
(3-0) 3 hours credit. Prerequisite: EGR 5103 or consent of instructor.
Methods and techniques for process control, process and gage capability analyses, inspection plans, American
National Standards, and recent advanced techniques. Use of statistical software including JMP. Tour of
manufacturing industry. Case studies in process control outgoing quality and costs. A required project, assigned by a
manufacturing company, must be presented. This course is designed for technology managers and engineers and may
not be applied to a Master of Science degree in Mathematics or Statistics.

5233  Product and Manufacturing Reliability
(3-0) 3 hours credit. Prerequisite: EGR 5103 or consent of instructor.
Topics include product and manufacturing reliability from managerial, engineering, and statistical perspectives.
Emphasis on component and system reliability estimation, testing, and demonstration. Advanced topics such as
accelerated life tests, Bayesian procedures, system availability, system maintainability, and compliance with
international standards are addressed. Methods and theory are supported through data analytic packages such as JMP,
SAS, and S-Plus. This course is designed for technology managers and engineers and may not be applied to a Master
Science degree in Mathematics or Statistics.

5253  Applied Time Series Analysis
(3-0) 3 hours credit. Prerequisite: STA 5103 or consent of instructor.
Modern techniques for time series analysis and their applications. Principles of model building. Regression methods,
moving averages, and autoregressive integrated moving average models. Practical examples drawn from various
application environments. Use of software such as MINITAB, SAS, and S-Plus in time series analysis.
5313  **Theory of Sample Surveys with Applications**  
(3-0) 3 hours credit. Prerequisite: STA 3523.  
Basic sampling techniques and their comparisons for finite populations. Topics include simple random sampling; stratified sampling; ratio and regression estimates; systematic sampling; cluster sampling; multistage and double sampling; and bootstrap and other sampling plans.

5413  **Nonparametric Statistics**  
(3-0) 3 hours credit. Prerequisite: STA 5103 or consent of instructor.  
Order statistics, test of goodness of fit, rank-order statistics, linear rank statistics for problems involving location and scale, association in multiple classifications, and asymptotic relative efficiency.

5503  **Mathematical Statistics I**  
(3-0) 3 hours credit. Prerequisites: MAT 4213 and STA 3513.  
Axioms of probability, random variables and probability distributions, sampling distributions, and stochastic convergence.

5513  **Mathematical Statistics II**  
(3-0) 3 hours credit. Prerequisite: STA 5503.  
Sufficient statistics, unbiased estimation, likelihood ratio test, sequential probability ratio test, and decision theory.

5643  **Stochastic Processes**  
(3-0) 3 hours credit. Prerequisite: STA 5503 or consent of instructor.  
Poisson processes, renewal theory, Markov chains, and Markov processes, including branching processes, ruin problems, birth and death processes, and Brownian motion. Applications in queueing theory, analysis of algorithms, and molecular genetics may be discussed.

5713  **Foundation of Linear Models**  
(3-0) 3 hours credit. Prerequisites: MAT 2233 and either STA 5103 or consent of instructor.  
G-inverses, multivariate normal, and distribution of quadratic forms; least squares estimation and the Gauss-Markov theorem; likelihood ratio tests for full-rank and less-than-full-rank models, including regression and analysis of variance models.

5723  **Theory and Application of Linear Models**  
(3-0) 3 hours credit. Prerequisite: STA 5713.  
Analysis of covariance, random effects, and mixed effects models; analysis of repeated measures. Emphasis on applications and use of statistical packages.

5803  **Process Control and Acceptance Sampling**  
(3-0) 3 hours credit. Prerequisite: STA 3523 or STA 5103 or consent of instructor.  
Introduction to statistical process control and product inspection plans. Topics include control charts by attributes and variables, special control charts, specification limits, process capability, and acceptance sampling plans by attributes and variables. Use of statistical software.

5813  **Applied Multivariate Statistics**  
(3-0) 3 hours credit. Prerequisites: MAT 2233 and either STA 5103 or consent of instructor.  
Principal components, factor analysis, cluster analysis, multidimensional scaling, discriminant analysis, multivariate normal distribution, estimation of mean vector and covariance matrix, Hotelling's $T^2$, and tests concerning covariance matrices.

5833  **Design and Analysis of Experiments**  
(3-0) 3 hours credit. Prerequisite: STA 3523, STA 5103, STA 5513, or consent of instructor.  
Introduction to experimental design and data analysis in scientific and engineering settings. Topics include one-factor experiments, randomized block designs, factorials, two- and three-level factorial and fractional factorial designs, nested and split-plot designs, response surface methods and Taguchi methods. Use of statistical software.
5853  **Analysis of Categorical Data**  
(3-0) 3 hours credit. Prerequisite: STA 5103 or STA 5503.  
Analysis of multifactor contingency tables: linear and log-linear models, inference in complete and incomplete tables, 
model selection and assessing goodness of fit, other methods of estimation such as information theoretic approach,  
minimum chi-square and logit chi-square, and measures of association. Models of discrete data.

5903  **Survival Analysis**  
(3-0) 3 hours credit. Prerequisite: STA 5513, STA 5103, or consent of instructor.  
This course covers topics in survival measures and lifetime distributions. A primary approach focuses on estimation  
and hypothesis testing regarding the parameters in these models. Advanced topics, such as Cox regression models  
and competing risk models, are presented from epidemiological and biomedical databases. Methods and theory are  
supported through analytic software such as SAS and S-Plus.

5973  **Directed Research**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the  
student's Graduate Advisor of Record.  
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but  
not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the  
student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students  
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated  
for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive  
Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times  
as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive  
Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR”  
(satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the  
Comprehensive Examination).

6971-3  **Special Problems**  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the  
regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6  
hours, regardless of discipline, will apply to the Master’s degree. (Same as former STA 5993. Not more than 6 hours  
of STA 5993 and Special Problems courses, regardless of discipline, will apply to the Master’s degree).

6983  **Master's Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree.  
Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is  
in progress.

7013  **Advanced Applied Business Statistical Methods**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Methods and applications of statistics. Topics include basic probability theory, probability distributions of both  
discrete and continuous random variables, expectations, moments, distributions of functions of random variables,  
sampling distributions, estimations of population parameters and hypothesis testing. Nonparametric statistical  
techniques and their applications to business research will also be covered in the course. Statistical computer software  
such as SAS or SPSS will be used in the course for data analysis.
7023  **Applied Linear Statistical Models**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An in-depth study of regression and analysis of variance models. Topics include multiple regression and model building, multiple and partial correlation, analysis of residuals, analysis of variance, multivariate analysis of variance, analysis of variance as regression analysis, generalized linear model, and applications of statistical models to problems in business. Computer software packages such as SAS, SPSS, or BMDP will be used for data analysis.

7033  **Multivariate Statistical Analysis**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An advanced treatment of multivariate statistical techniques. Topics include multivariate normal distribution, multivariate tests of hypotheses, confidence regions, principal component analysis, factor analysis, discrimination and classification analysis, and clustering. Computer software packages such as SAS or SPSS will be used for data analysis.

7043  **Time Series Analysis**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Univariate and multivariate time series analysis of economic and financial data, autoregressive integrated moving average (ARIMA) models and vector autoregression, out-of-sample forecasting using computer software. Unit roots, cointegration and error correction, ARCH models.
DEPARTMENT OF MARKETING

Master of Business Administration Degree – Marketing Management Concentration

This concentration is designed to offer qualified graduate students the opportunity to study business administration while developing special expertise in marketing management. To achieve these ends, students focus their elective courses in the area of marketing.

Students choosing to concentrate in marketing management must complete the 21 semester credit hours of courses containing the foundations of knowledge and 12 hours of graduate marketing courses as follows:

- MKT 5063 Marketing Research Design and Application
- 9 semester credit hours of graduate marketing elective courses beyond MKT 5023

COURSE DESCRIPTIONS

MARKETING

(MKT)

5003 Introduction to Marketing (3-0) 3 hours credit.
Examination of marketing in society and the firm. Functions, institutions, processes, methods, and issues will be examined. Emphasis is on marketing decision making.

5023 Marketing Management (3-0) 3 hours credit. Prerequisites: ACC 5003, ECO 5003, FIN 5003, and MKT 5003, or their equivalents. Completion of or concurrent enrollment in ACC 5023 is recommended. An analysis of marketing management processes within organizations. Focus is on the use of strategic planning and market analysis to design marketing programs in competitive environments.

5043 Consumer Behavior in Marketing Strategy (3-0) 3 hours credit. Prerequisite: MKT 5023 or an equivalent. The study of consumer behavior as the basis for marketing opportunities. Analyzes and evaluates contemporary models of consumer behavior as a guide to organizational decision making.

5063 Marketing Research Design and Application (3-0) 3 hours credit. Prerequisite: MKT 5023 or an equivalent. Reviews the methodology essential to marketing’s role of guiding the firm’s production, distribution, pricing, and communication efforts through marketing research, including designing and conducting customer research and analyzing and communicating research results.

5073 Services Marketing (3-0) 3 hours credit. Prerequisite: MKT 5023 or an equivalent. This course entails an in-depth investigation of the nature of services marketing and the special features that distinguish successful marketing for services and tangible goods. Attention is given to promoting and making services tangible, blueprinting services, the design of service operations, pricing services, the critical aspects of service delivery, the measurement of service quality, and other topics.

5083 Advertising and Promotion Management (3-0) 3 hours credit. Prerequisite: MKT 5023 or an equivalent. Use of communication processes and programs to attain promotional goals; examination of mass and interpersonal forms of communication; and the uses of sales promotion tools.
5123  **Sales Management**  
(3-0) 3 hours credit. Prerequisite: MKT 5023. 
Examination of current and relevant issues regarding the role of selling in the firm; discussion of communication concepts and managerial processes in goal selection and attainment for sales activities.

5673  **International Marketing**  
(3-0) 3 hours credit. Prerequisite: MKT 5023 or an equivalent. 
Analysis of global marketing strategies, including an examination of the cultural, economic, and political dimensions. Focus is on developing alternative market entry strategies and managing longer term competitive marketing adjustments.

5963  **International Business Internship**  
3 hours credit. Prerequisites: Consent of instructor and the student's Graduate Advisor of Record.  
Work experience in international business or a public agency.

5983  **International Business Essay**  
3 hours credit. Prerequisites: Consent of instructor and the student's Graduate Advisor of Record.  
Original research report on an international management topic.

6943  **Marketing Internship**  
3 hours credit. Prerequisites: Graduate standing, 15 semester credit hours of graduate work, and consent of instructor.  
Internship must be approved in advance by the Internship Coordinator and the student's Graduate Advisor of Record. Supervised full- or part-time off-campus work experience and training in marketing. Individual conferences and written reports required.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6971-3  **Special Problems**  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6983  **Master’s Thesis**  
3 hours credit. Prerequisite: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
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COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT

The College of Education and Human Development offers the following degrees: Master of Arts Degree in Adult and Higher Education (page 138), Master of Arts Degree in Bicultural-Bilingual Studies (page 125), Master of Arts Degree in Counseling (page 140), Master of Arts Degree in Education (see below), Doctor of Philosophy Degree in Culture, Literacy, and Language (page 128), and Doctor of Education Degree in Educational Leadership (page 149).

Master of Arts Degree in Education

The Master of Arts (M.A.) degree in Education offers the opportunity for advanced study and professional development programs in seven fields of concentration in the following departments:

Department of Educational Leadership and Policy Studies
Educational Leadership Concentration

Department of Health and Kinesiology
Kinesiology and Health Promotion Concentration

Department of Interdisciplinary Studies and Curriculum and Instruction
Curriculum and Instruction Concentration
Early Childhood and Elementary Education Concentration
Special Education Concentration
Instructional Technology Concentration
Reading and Literacy Concentration

Education concentrations provide specialized degree plans in one or more areas of program emphasis so that students may choose a plan suitable to their needs and objectives. Degree plans are designed to offer the opportunity to gain advanced levels of knowledge and professional competency for students engaged in or concerned about educational activity in schools, colleges, and other public or private institutions and agencies. Credit toward graduate-level certificates and certificate endorsements may be earned in conjunction with work toward the Master's degree in most programs. Programs with a thesis option emphasize the development of research competencies critical to continued graduate-level study.

Program Admission Requirements. Applicants without adequate preparation in education may be required to complete preparatory courses as a condition of admission. Individuals who do not meet the University-wide graduate admission grade point average standard may be required to submit Graduate Record Examination (GRE) scores for consideration in admission decisions. Some concentrations may also require GRE scores because of licensing regulations. Contact the Graduate Advisor of Record for the M.A. in Education for more information.

Degree Requirements. Education degrees have four required components: a core of common courses, a program emphasis, support work, and a comprehensive examination.

A. Core courses common to all concentrations:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU 5003</td>
<td>Research Methods</td>
<td>EDU</td>
</tr>
</tbody>
</table>
B. Program emphasis. The program emphasis must consist of at least 12 semester credit hours in one of the fields of concentration. Some concentrations offer more than one program emphasis. A program emphasis may require up to 24 semester credit hours. Courses outside the specific concentration may be used to meet this requirement with advance approval of the student’s supervisory committee and the Graduate Advisor of Record. See individual concentration listings or contact the Graduate Advisor of Record for the M.A. in Education for more information.

C. Support work. Each student is required to select additional courses, with the approval of the program advisor and the Graduate Advisor of Record, to complete the degree requirements of 33 semester credit hours (with thesis) or 36 hours (without thesis). Nine semester credit hours must support the concentration. Three additional hours must be taken with the approval of the Graduate Advisor of Record. In some degree programs support work may consist of additional courses in the area of concentration.

Students in some programs may take support courses in their teaching fields. Students in teacher certification programs may take their support work courses in areas that meet certification requirements. It is recommended that thesis students take EDU 5053, Inferential Educational Statistics, as part of the support work.

D. Comprehensive examination. The student’s supervisory committee is responsible for administering this examination. The examination may be repeated, but a student who has failed the examination two times must have the permission of his or her supervisory committee in order to take the examination additional times. Ordinarily, failure to pass the examination should be followed by additional coursework or other work to remedy deficiencies or areas of weakness before the examination is retaken.

Summary of Degree Options

Option I. Thesis option (33 semester credit hours):

A. Core. 12 semester credit hours required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU 5003</td>
<td>Research Methods</td>
</tr>
<tr>
<td>EDU 5103</td>
<td>Contemporary Educational Philosophy</td>
</tr>
<tr>
<td>EDP 5003</td>
<td>Psychological Learning Theories</td>
</tr>
<tr>
<td>C&amp;I 5003</td>
<td>Theory and Dynamics of Curriculum and Instruction</td>
</tr>
</tbody>
</table>

B. Concentration. 12 semester credit hours of coursework to form a program emphasis in a single concentration

C. Support work. 9 semester credit hours as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU 5053</td>
<td>Inferential Educational Statistics (or approved substitution)</td>
</tr>
<tr>
<td>EDU 6983</td>
<td>Master’s Thesis (taken twice for a total of 6 hours)</td>
</tr>
</tbody>
</table>

Option II. Nonthesis option (36 semester credit hours):

A. Core. 12 semester credit hours required:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDU 5003</td>
<td>Research Methods</td>
</tr>
<tr>
<td>EDU 5103</td>
<td>Contemporary Educational Philosophy</td>
</tr>
<tr>
<td>EDP 5003</td>
<td>Psychological Learning Theories</td>
</tr>
<tr>
<td>C&amp;I 5003</td>
<td>Theory and Dynamics of Curriculum and Instruction</td>
</tr>
</tbody>
</table>

B. Concentration. At least 12 semester credit hours of coursework to form a program emphasis in a single concentration

C. Support work. No more than 12 semester credit hours as follows:

<table>
<thead>
<tr>
<th>Credit Hours</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Support courses</td>
</tr>
<tr>
<td>3</td>
<td>Approved electives</td>
</tr>
</tbody>
</table>
DIVISION OF BICULTURAL-BILINGUAL STUDIES

Master of Arts Degree in Bicultural-Bilingual Studies

The Master of Arts degree in Bicultural-Bilingual Studies is designed to respond to a variety of societal needs through advanced multidisciplinary study in language, culture, and related disciplines. It has concentrations in Bicultural-Bilingual Education, Bicultural Studies, and English as a Second Language.

Program Admission Requirements. The Division of Bicultural-Bilingual Studies offers an interdisciplinary program that encourages applicants from a wide range of disciplines. Applicants who do not meet University-wide requirements for unconditional admission may be admitted conditionally if scores from the Graduate Record Examination (GRE), letters of recommendation, and/or previous work in the field provide evidence of academic potential. Information on the GRE and applications for the test may be obtained from the UTSA Testing Center or from the Educational Testing Service, Princeton, New Jersey 08540. The institution code for the University of Texas at San Antonio is 6919-5 for the GRE.

Degree Requirements. Degree candidates are required to successfully complete a 36-semester-credit-hour program. Upon completion of at least 30 semester credit hours of coursework, the candidate is required to pass a written and oral comprehensive examination.

Candidates for the concentration in Bicultural-Bilingual Education must demonstrate proficiency in a second language.

Candidates for the concentrations in Bicultural Studies and English as a Second Language are required to give evidence of second language learning experiences acceptable to the division's Graduate Program Committee.

Bicultural-Bilingual Education Concentration

This concentration is offered for students interested in advanced study in the design and implementation of bicultural-bilingual education programs. This interdisciplinary course of study presents systematic instruction in bilingualism, cultural dynamics, and applied linguistics. It also includes an examination of theory and research related to effective bilingual education. The Master's degree is offered under two options: thesis and nonthesis.

Degree Requirements. Degree candidates must complete the following:

A. Required coursework. 30 semester credit hours of coursework from six major areas as follows:

1. Sociocultural Studies (6 hours from the following):
   - BBL 5003 Foundations for Bicultural Studies
   - BBL 5013 Multicultural Groups in the United States
   - BBL 5023 Cultural Adaptation in Bilingual Societies
   - BBL 5073 Psychosocial Processes in Bicultural-Bilingual Environments
   - BBL 5123 Sociolinguistics and Education
   - BBL 5133 Latino Biculturalism in the United States

2. Bilingual Education Theory (3 hours):
   - BBL 5113 Theoretical Foundations of Bicultural-Bilingual Education

3. Linguistics and Second Language Studies (3 hours from the following):
   - ESL 5003 Linguistics for Second Language and Bilingual Specialists
   - ESL 5013 Foundations of Second Language Acquisition
Teaching Methodology: Content and Language (6 hours from the following):

BBL 5033 Bilingual Content Instruction
BBL 5063 Biliteracy in Bilingual Classrooms
BBL 5143 Communication in Bilingual Classrooms
BBL 5193 Multicultural Literature for Children

Research and Assessment (6 hours):

BBL 5053 Assessment in Bilingual and Second Language Studies

3 hours from the following:

BBL 6043 Bilingual Education Research
BBL 6063 Research Methods in Bilingual and Second Language Studies

English as a Second Language (6 hours from the following):

ESL 5053 Approaches to Second Language Instruction
ESL 5063 Language and Content-Area Instruction
ESL 6063 Advanced Second Language Literacy

B. **Option I.** 6 semester credit hours of Master's Thesis

or

**Option II.** 6 semester credit hours of graduate elective coursework in Bicultural-Bilingual Studies, English as a Second Language, or in approved related areas

**Bicultural Studies Concentration**

This program concentration offers students the opportunity to pursue interdisciplinary study of cultural diversity and sociocultural dynamics in multicultural societies. Emphasis is on the study of biculturalism in the United States. Courses are designed for students with professional, policy, and research interests in intercultural relations within the various institutional settings of society, including business, education, government, health, social services, and cultural organizations. The curriculum complements a wide range of academic backgrounds including the humanities, social sciences, public policy, and business. At least 21 semester credit hours must be courses with a BBL designation. The Master's degree is offered under two options: thesis and nonthesis.

**Degree requirements.** Degree candidates must complete the following:

A. Required coursework. 30 semester credit hours of coursework from four major areas as follows:

Sociocultural Foundations (12 hours):

BBL 5003 Foundations for Bicultural Studies

9 additional semester credit hours, selected from the following:

BBL 5013 Multicultural Groups in the United States
BBL 5023 Cultural Adaptation in Bilingual Societies
BBL 5073 Psychosocial Processes in Bicultural-Bilingual Environments
BBL 5133 Latino Biculturalism in the United States
BBL 6033 Topics in Bicultural Studies (Consult the graduate advisor)
Historical Foundations (3 hours from the following):

HIS 5263  The Spanish Borderlands 1521–1821
HIS 5303  Twentieth-Century Texas
HIS 5313  South Texas: Rural and Urban
HIS 5423  Colonial Mexico
HIS 5433  Modern Mexico
HIS 6173  Latina/os in the United States

Expressive Culture and Language Diversity (9 hours from the following):

AHC 5823  Topics in Mesoamerican Pre-Columbian Art
AHC 5843  Topics in Latin American Colonial Art
AHC 5853  Topics in Contemporary Latin American Art
BBL 5043  Ethnography of Communication
BBL 5093  Multicultural Art and Folklore in the United States
BBL 5123  Sociolinguistics and Education
BBL 5193  Multicultural Literature for Children
ESL 5003  Linguistics for Second Language and Bilingual Specialists
SPN 5473  Latin American Civilization
SPN 5483  Studies in Hispanic Culture
SPN 5803  Mexican American Literature
SPN 5853  Spanish of the Southwest

Research Foundations (6 hours from the following):

BBL 6073  Ethnographic Research Methods in Bicultural-Bilingual Studies
BBL 6053  Assessment in Bicultural-Bilingual Communities
or
BBL 6063  Research Methods in Bilingual and Second Language Studies

B. Option I. 6 semester credit hours of Master’s Thesis

or

Option II. 6 semester credit hours of graduate elective coursework in Bicultural-Bilingual studies, English as a Second Language, or approved related areas

**English as a Second Language Concentration**

This program of study is designed for students interested in teaching English as a Second Language (ESL) to children or adults in schools and programs in the United States or in international settings. It is an interdisciplinary program that presents systematic instruction in applied linguistics, second language acquisition theory, and ESL program implementation. Students must take at least 24 semester credit hours of English as a Second Language courses and 9 hours of Bicultural-Bilingual studies courses. The Master’s degree is offered under two options: thesis and nonthesis.

**Degree requirements.** Degree candidates must complete the following:

A. Required coursework. 30 semester credit hours of coursework from four major areas as follows:

   Language Theory and Language Use (9 hours):
ESL 5003 Linguistics for Second Language and Bilingual Specialists
ESL 5013 Foundations of Second Language Acquisition
and
ESL 5023 Language Analysis for Second Language Specialists
or
BBL 5123 Sociolinguistics and Education

Classroom Practice and Program Designs (12 hours from the following):

ESL 5053 Approaches to Second Language Instruction
BBL 5053 Assessment in Bilingual and Second Language Studies

and 6 hours from the following:

ESL 5033 Second Language Reading and Writing
ESL 5043 Listening and Speaking in Second Language Programs
ESL 5063 Language and Content-Area Instruction
ESL 6043 Family and Adult Literacy in Language Minority Communities
ESL 6053 Program and Syllabus Design
ESL 6063 Advanced Second Language Literacy

Research (6 hours from the following):

ESL 6013 Second Language Acquisition Research
and
BBL 6063 Research Methods in Bilingual and Second Language Studies
or
BBL 6073 Ethnographic Research Methods in Bicultural Bilingual Studies

Sociocultural Studies (3 hours from the following):

BBL 5003 Foundations for Bicultural Studies
BBL 5013 Multicultural Groups in the United States
BBL 5023 Cultural Adaptation in Bilingual Societies
BBL 5043 Ethnography of Communication

B. Option I. 6 semester credit hours of Master’s Thesis

or

Option II. 6 semester credit hours of graduate elective coursework in Bicultural-Bilingual studies, English as a Second Language, or approved related areas, 3 of which must carry an ESL prefix.

Doctor of Philosophy Degree in Culture, Literacy and Language

The Division of Bicultural-Bilingual Studies offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Culture, Literacy and Language. The program focuses on the consequences of cultural and linguistic diversity for literacy and language acquisition. Successful Ph.D. candidates must demonstrate in-depth interdisciplinary knowledge in culture, literacy, and language, and must deliver an original contribution to the field.

The regulations for this degree comply with the general University regulations (refer to Chapter 3, General Academic Regulations, and Chapter 5, Doctoral Degree Regulations).
Program Admission Requirements. In addition to the University-wide admission requirements, the minimum requirements for admission to the doctoral degree program in Culture, Literacy and Language are as follows:

1. A Master's degree in an area such as the following: anthropology, applied linguistics, bicultural-bilingual studies, foreign language education, history, international business, linguistics, psychology, sociology, and teaching English as a Second Language. Masters' degrees in other fields may be accepted, subject to the approval of the Doctoral Studies Committee.

2. A portfolio consisting of the following items will be evaluated by the Doctoral Studies Committee, comprised of members selected from the graduate faculty of the Division of Bicultural-Bilingual Studies:
   • A master's degree transcript documenting a grade point average of 3.5 or better in an approved master's degree program.
   • Graduate Record Examination (GRE) scores.
   • Advanced proficiency in a language other than English to be demonstrated by examination or approved coursework.
   • For students whose Master's degree is from a non-English speaking university, submission of Test of English as a Foreign Language (TOEFL) scores of no less than 550.
   • Three letters of recommendation attesting to the student's academic and personal attributes for success in the program and potential for contributing substantially to a field of study related to the degree; and
   • A sample of academic writing in the form of an essay describing research interests and purpose for pursuing the Ph.D. in Culture, Literacy and Language.

Applicants are evaluated based on the above criteria.

Degree Requirements. The doctoral degree requires a minimum of 60 semester credit hours beyond the Master's degree. The core curriculum consists of 24 semester credit hours of required courses. A minimum of 12 hours in research methods and 15 hours in doctoral research must be completed.

Program of Study

A. Foundation Course (3 semester credit hours required)
   
   BBL  7003  Proseminar in Culture, Literacy and Language (CLL)

B. Research Methods Courses (12 semester credit hours required)
   
   BBL  7013  Research Design and Statistics for Culture, Literacy and Language
   BBL  7023  Qualitative Research Methods for Culture, Literacy and Language
   BBL  7033  Research in the Speech Community

   An additional 3 hours chosen from the following:

   EDU  7113  Educational Research Statistics: Descriptive and Comparative
   EDU  7123  Educational Research Statistics: Relational and Nonparametric

C. Core Courses (9 semester credit hours required)

   BBL  7113  Cultural Studies Research
   BBL  7123  Sociocultural Contexts of Literacy
   BBL  7133  Bilingualism and Second Language Acquisition

D. Designated Electives (12 semester credit hours required). Students, in consultation with their academic advisor and the Graduate Advisor of Record, will select 12 semester credit hours for an emphasis in a coherent interdisciplinary area. As part of these 12 hours, students will be required to take a minimum of 6 semester credit hours of advanced Doctoral seminars.
Advanced Doctoral Seminars

BBL 7203 Seminar in Latino Biculturalism
BBL 7213 Seminar in Ethnological Theory
BBL 7223 Seminar in Biliteracy and Second Language Literacy
BBL 7233 Seminar in Second Language Acquisition and Bilingualism
BBL 7243 Seminar in Language and Language Use

Other Designated Electives

BBL 5043 Ethnography of Communication
BBL 5173 Sociocultural Issues and the Teaching of Reading
BBL 6053 Assessment in Bicultural-Bilingual Communities
BBL 6223 Anthropology and Education in Multicultural Contexts
BBL 6233 Advanced Topics in Language Policy
BBL 6243 Evaluation Research for Bilingual and Second Language Programs
ESL 5023 Language Analysis for Second Language Specialists

E. Free Electives (9 semester credit hours required)

Students, in consultation with their academic advisor and the Doctoral Program Coordinator (Graduate Advisor of Record), will select additional graduate level courses from other departments in the University in order to complete a coherent emphasis area. Selection of this coursework will be driven by two primary factors: the discipline in which a student has completed the Master's degree and the research goals for that student.

F. Doctoral Research (15 semester credit hours minimum)

BBL 7303 Directed Doctoral Research (3 hours minimum)
BBL 7313 Doctoral Dissertation (12 hours minimum)

The entire program of study must be approved by the student's dissertation advisor, dissertation committee, and Doctoral Studies Committee and must be submitted to the Dean of Graduate Studies through the Dean of the College for final approval.

Advancement to Candidacy. Advancement to candidacy will require a student to complete all University and program requirements and to pass written and oral qualifying examinations. The written examination will be constructed, administered, and evaluated by the Doctoral Studies Committee. The written portion of the examination will cover the areas of the graduate core and emphasis courses and must be taken after completion of core and emphasis courses or after the completion of 42 semester credit hours. In order to pass this examination, the student must demonstrate a broad knowledge of culture, literacy, and language. The oral examination will be conducted by a faculty committee, nominated by the Doctoral Studies Committee and approved by the Office of Graduate Studies. The oral portion of the examination will be given to a doctoral student before he/she starts the chosen dissertation research. The purposes of this examination are to ensure that: (1) the student has sufficient grasp of the theoretical and methodological fundamentals of the chosen dissertation area; (2) the student has selected an original and acceptable research topic; and (3) the student has the ability to exchange ideas and information with the collaborating research faculty members. No more than two attempts to pass qualifying examinations will be allowed.

Dissertation and Final Oral Examination. Candidates must demonstrate their ability to conduct independent research by completing and defending an original dissertation. The dissertation may employ quantitative or qualitative research methods as applicable to the selected emphasis for the degree. The doctoral dissertation must make a substantial contribution to a field within Culture, Literacy and Language. The research topic will be determined by the student in consultation with his/her supervising professor. A dissertation committee selected by the student and supervising professor and approved by the Office of Graduate Studies will guide and critique the candidate's research. The Dissertation Committee must unanimously approve the completed dissertation. The dissertation shall then be defended publicly before the student's committee and interested members of the University community. Following an open presentation of the dissertation findings, a final oral examination covering the dissertation and the general field of the dissertation will be administered and evaluated by the student's dissertation committee.
### COURSE DESCRIPTIONS

#### BICULTURAL-BILINGUAL STUDIES (BBL)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5003</td>
<td>Foundations for Bicultural Studies</td>
<td>(3-0) 3 hours</td>
<td>The study of concepts, theories, and approaches used in the examination of culture and society, with emphasis on the analysis of bicultural and transcultural praxis.</td>
</tr>
<tr>
<td>5013</td>
<td>Multicultural Groups in the United States</td>
<td>(3-0) 3 hours</td>
<td>A study of sociocultural diversity, culture maintenance and change, culture revitalization, and other aspects of ethnicity in the past, present, and future of the United States.</td>
</tr>
<tr>
<td>5023</td>
<td>Cultural Adaptation in Bilingual Societies</td>
<td>(3-0) 3 hours</td>
<td>The study of the dynamic relations between culture, language, and the social environment. Explanations for the range of cultural, historical, psychological, and political-economic adaptations in diverse systems.</td>
</tr>
<tr>
<td>5033</td>
<td>Bilingual Content Instruction</td>
<td>(3-0) 3 hours</td>
<td>Examines curriculum development, materials, and pedagogy applicable to the integrated teaching of mathematics and the social and natural sciences in bilingual classrooms. Emphasizes research-based methods that use the learner’s first language as a vehicle for content instruction. Offered in Spanish and English.</td>
</tr>
<tr>
<td>5043</td>
<td>Ethnography of Communication</td>
<td>(3-0) 3 hours</td>
<td>Examines the theoretical perspectives for the study of communication in varying cultural contexts. Topics may include intercultural and intracultural communication patterns, the effect of cultural differences on interactions, culture concepts, nonverbal behavior, and increasing intercultural effectiveness.</td>
</tr>
<tr>
<td>5053</td>
<td>Assessment in Bilingual and Second Language Studies</td>
<td>(3-0) 3 hours</td>
<td>Study and evaluation of means of assessing language proficiency in bilingual and English as a Second Language programs. Critical review of standardized tests of language proficiency, as well as alternative and informal language assessment techniques; consideration of relationship between second language proficiency and academic achievement; and sociocultural dimensions of testing and assessment.</td>
</tr>
<tr>
<td>5063</td>
<td>Biliteracy in Bilingual Classrooms</td>
<td>(3-0) 3 hours</td>
<td>Examines research and instructional practices supporting the acquisition of biliteracy through reading, writing, speaking, and listening. Preparation and adaptation of holistic, thematically based materials and activities. Critical evaluation of existing materials in Spanish. Offered in Spanish and English.</td>
</tr>
<tr>
<td>5073</td>
<td>Psychosocial Processes in Bicultural-Bilingual Environments</td>
<td>(3-0) 3 hours</td>
<td>The study of the social and cognitive psychological factors facing populations in bicultural-bilingual environments.</td>
</tr>
<tr>
<td>5093</td>
<td>Multicultural Art and Folklore in the United States</td>
<td>(3-0) 3 hours</td>
<td>A study of the visual arts and the folklore of representative culture groups creating a significant contribution to contemporary society. The course emphasizes Latino/a contributions to mural and street art, regional and religious art, as well as folk, popular, and other arts.</td>
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</tbody>
</table>

UTSA 2003–2005 Graduate Catalog
5113 Theoretical Foundations of Bicultural-Bilingual Education  
(3-0) 3 hours credit.  
A critical analysis of the rationale for bicultural-bilingual education focusing on history, philosophy, and theory. The study and analysis of bicultural-bilingual program designs, research perspectives on effective implementation, and adaptation to community needs.

5123 Sociolinguistics and Education  
(3-0) 3 hours credit.  
Study of sociolinguistic theory and methodology, with special emphasis on their applicability to linguistically diverse educational contexts and communities. Topics include sociolinguistic approaches to bilingualism and second language learning, dialect diversity, and minority language maintenance and shift.

5133 Latino Biculturalism in the United States  
(3-0) 3 hours credit.  
A study of Mexican American, Puerto Rican, Cuban, and other Latino communities in the United States in the twentieth century. Topics may include economic labor force participation, cultural revitalization and self-determination patterns, school achievement and performance, political participation, and integration.

5143 Communication in Bilingual Classrooms  
(3-0) 3 hours credit.  
Emphasis on oral and written communicative strategies for achieving full interaction among students in bilingual classrooms. Review of specialized teaching-related vocabularies needed to conduct instruction in two languages. Offered in Spanish.

5173 Sociocultural Issues and the Teaching of Reading  
(3-0) 3 hours credit.  
Study of how social, cultural, and linguistic factors affect the reading and writing practices of students and how school reading curriculum, instruction, and assessment can be designed to support students from differing sociocultural backgrounds. Special attention is given to the role that social class, dialect, gender, second language learning, and ethnicity play in literacy learning and teaching.

5193 Multicultural Literature for Children  
(3-0) 3 hours credit.  
A study of representative children’s literature for, and about, the many culture groups in the Americas, with emphasis on Latinos and Latinas.

6033 Topics in Bicultural Studies  
(3-0) 3 hours credit.  
Examines topics of interest in bicultural studies and bilingual education. Possible topics include, but are not limited to, contemporary Chicano arts, Chicanas, Mexican American folklore, cultural factors in human resources development, and bilingual-multicultural school communities. May be repeated for credit when topics vary.

6043 Bilingual Education Research  
(3-0) 3 hours credit.  
Examines qualitative and quantitative methods and models applied to the field of bilingual education. Evaluation of community and school-based research that influences instructional policies and practices in bilingual programs.

6053 Assessment in Bicultural-Bilingual Communities  
(3-0) 3 hours credit.  
Critical review of research in the areas of testing of ethnic minority populations, sociocultural dimensions of testing and assessment, standardized testing, academic achievement, and cognitive assessment issues. Research projects in appropriate assessment of language and cognitive abilities for minority group members.
6063  **Research Methods in Bilingual and Second Language Studies**  
(3-0) 3 hours credit.  
Research design for the study of linguistic, social, and psychological variables in bilingual, second language, and dialectally diverse populations; emphasis on designing and carrying out a research project.

6073  **Ethnographic Research Methods in Bicultural-Bilingual Studies**  
(3-0) 3 hours credit. Prerequisite: Completion of 15 semester hours of degree program.  
Explores ethnographic approaches and their translation into bicultural-bilingual studies from a multidisciplinary perspective. Emphasis on designing and writing a research proposal; practicing participant observation, interviewing, journal writing; document searching; engaging strategies for qualitative analysis and interpretation; and examining writing styles of research reports.

6223  **Anthropology and Education in Multicultural Contexts**  
(3-0) 3 hours credit. Prerequisite: BBL 5003.  
The application of anthropological theory and methods to the study of education in bicultural and bilingual contexts. Theoretical and methodological approaches range from macrosystem studies to microclassroom studies.

6233  **Advanced Topics in Language Policy**  
(3-0) 3 hours credit. Prerequisite: ESL 5003 or equivalent.  
Study of language policies, discourses, and practices. Topics may include: theory and implementation of bilingual policies in the United States, cases of official language decisions, instructional medium choices, literacy initiatives, gender-neutral language reforms, or other language-related decisions and policies.

6243  **Evaluation Research for Bilingual and Second Language Programs**  
(3-0) 3 hours credit.  
The study of evaluation foundations for bilingual programs. Topics include design, pilot testing, implementation, coordination, and assessment of effectiveness of evaluation processes.

6941-3  **Internship in Bicultural/Multicultural Settings**  
1 to 3 hours credit.  
A supervised experience, relevant to the student's program of study, within selected community organizations. Must be taken on a credit/no credit basis, but no more than 3 hours will apply to a Master's degree.

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's program advisor and Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.
6983 Master’s Thesis
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director. Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7003 Proseminar in Culture, Literacy and Language
(3-0) 3 hours credit.
This course is intended to provide first-year doctoral students with an opportunity to explore the main theories and areas of research in culture, literacy, and language, with emphasis on language minority communities. Readings include foundational and recent work in interdisciplinary study of culture, literacy, and language, with emphasis on implications for human development, social organization, and education. Students will also become familiar with areas of research of doctoral program faculty.

7013 Research Design and Statistics for Culture, Literacy and Language
(3-0) 3 hours credit. Prerequisite: An introductory course in statistics. Research design for quantitative studies in culture, literacy, and language. Topics include formulating testable hypotheses, collecting data on linguistic and cultural variables, selecting appropriate statistical models, and interpreting results. Special attention to the procedures commonly used in studies of language development and language variation, including parametric and nonparametric models, to specialized computer programs and databases used in the study of language development and bilingualism, e.g., the CHAT and CLAN programs developed by the Child Language Data Exchange System (CHILDES) at Carnegie Mellon University.

7023 Qualitative Research Methods for Culture, Literacy and Language
(3-0) 3 hours credit. Multimethod research involving an interpretive, naturalistic approach to its subject matter. Examines the use and collection of case studies, personal experience, introspective/retrospective accounts, life story, interview, observational, historical, interactional, and visual texts as data sources. Special attention to software packages commonly used in the study of qualitative data on culture, language, and literacy, e.g. Ethnography, QSR Non-numerical Unstructured Data Indexing, Searching, and Theorizing.

7033 Research in the Speech Community
(3-0) 3 hours credit. Prerequisites: BBL 5123 or equivalent, BBL 7013, BBL 7023. Sociolinguistic field research methods in linguistically diverse communities, with attention to both quantitative and qualitative approaches. Emphasis on collection, reduction, and analysis of language data. Special attention to procedures and analytic techniques commonly used to examine language data from minority speech communities. Introduction to software packages used in the study of minority speech communities, e.g. GoldVarb, VARBRUL. Consideration of ethical issues in research in minority communities.

7113 Cultural Studies Research
(3-0) 3 hours credit. Prerequisite: BBL 5003 or equivalent. Interdisciplinary study of anthropological and humanistic conceptions of all forms of cultural production in relation to social and historical structures. Examines a range of society’s arts, beliefs, institutions, and communicative practices in relation to social and historical structures.

7123 Sociocultural Contexts of Literacy
(3-0) 3 hours credit. Prerequisite: BBL 5043 or equivalent. Theories and research in language and literacy that examine the complex interactions among social, cultural, psychological, and political factors in literacy learning in multicultural and multilingual contexts.

7133 Bilingualism and Second Language Acquisition
(3-0) 3 hours credit. Prerequisite: BBL 5003 or ESL 5003 or ESL 6013 or equivalent. Theories and research in bilingualism, multilingualism, and second language acquisition. Emphasis on the linguistic, cognitive, and motivational factors in the study of language acquisition.
7203 Seminar in Latino Biculturalism
(3-0) 3 hours credit. Prerequisite: BBL 7113 or consent of instructor.
Study of Mexican American, Central American, Cuban, and Puerto Rican ethnic self-determination patterns in the context of mainstream cultural diversity in the United States. Suggested topics include: Latino cultural expression, Latino labor market participation, Latino political participation, Latino educational participation and achievement. May be repeated for credit when topics vary.

7213 Seminar in Ethnological Theory
(3-0) 3 hours credit. Prerequisite: BBL 7113 or consent of instructor.
Study of the relations of theory and ethnography in sociocultural anthropology. Suggested topics include: culture, ethnography, comparison, history, and the current controversies that illustrate various theoretical perspectives.

7223 Seminar in Biliteracy and Second Language Literacy
(3-0) 3 hours credit. Prerequisite: BBL 7123 or consent of instructor.
Exploration of literacy development from social and cognitive perspectives. Topics may include: simultaneous acquisition of first and second language literacy; emerging literacy in second language; adult literacy; reading and writing in a second language; the relationship of biliteracy and second language literacy to language maintenance and shift. May be repeated for credit when topics vary.

7233 Seminar in Second Language Acquisition and Bilingualism
(3-0) 3 hours credit. Prerequisite: BBL 7133 or consent of instructor.
Study of the research in second language acquisition and bilingualism. Topics may include: age and second language acquisition; universal grammar and second language acquisition; interlanguage variation; bilingual groups in the Americas, Asia, and Europe; cultural and linguistic interaction norms; cognitive development in the bilingual child. May be repeated for credit when topics vary.

7243 Seminar in Language and Language Use
(3-0) 3 hours credit. Prerequisite: BBL 7133 or consent of instructor.
Topics in linguistic theory and their relationships to second language acquisition and bilingualism. Topics may include: phonological theory, syntactic models, discourse analysis, and pragmatics, language contact; language maintenance and shift, sociolinguistics and literacy, and language variation. May be repeated for credit when topics vary.

7303 Directed Doctoral Research
3 hours credit. Prerequisite: Permission of instructor.
Supervised research on a topic in culture, literacy, and language. May be repeated for credit, but no more than 6 hours may be applied to the doctoral degree.

7311-3 Doctoral Dissertation
1 to 3 hours credit. Prerequisite: Admission to candidacy for the doctoral degree.
May be repeated for credit, but no more than 12 hours may be applied to the doctoral degree requirements. Credit will be awarded upon completion of the dissertation.

COURSE DESCRIPTIONS
ENGLISH AS A SECOND LANGUAGE
(ESL)

5003 Linguistics for Second Language and Bilingual Specialists
(3-0) 3 hours credit.
Concepts in linguistics directed toward a broad understanding of human language, with particular attention to second-language and bilingual contexts.
5013 Foundations of Second Language Acquisition
(3-0) 3 hours credit.
Study of principles, theories, and issues in second language acquisition and bilingualism, with implications for language teaching.

5023 Language Analysis for Second Language Specialists
(3-0) 3 hours credit.
Study of English grammar from descriptive and discourse perspectives, with consideration of cross-linguistic contrasts and of applications for teaching English as a Second Language.

5033 Second Language Reading and Writing
(3-0) 3 hours credit.
Current approaches to the teaching and learning of reading and writing in English as a Second Language. The relationship of second language reading and writing to language learning including oral development. A critical evaluation of existing literacy materials available for second language learners.

5043 Listening and Speaking in Second Language Programs
(3-0) 3 hours credit.
Development, presentation, and evaluation of materials and strategies for teaching listening, speaking, and pronunciation to second language learners. Emphasizes current theories and development of oral proficiency.

5053 Approaches to Second Language Instruction
(3-0) 3 hours credit.
Study of instructional strategies and materials, including available community resources for teaching linguistically diverse students. Attention will range from early stages of second language acquisition through more advanced stages of language development.

5063 Language and Content-Area Instruction
(3-0) 3 hours credit.
Theoretical and practical approaches to integration of language teaching with subject matter areas. Emphasis on oral language and literacy for academic purposes. Emphasis on school settings.

6013 Second Language Acquisition Research
(3-0) 3 hours credit. Prerequisite: 15 hours completed in degree program.
Investigation of second language acquisition from multiple perspectives through data-based studies.

6033 Topics in Second Language Acquisition and Teaching
(3-0) 3 hours credit.
Suggested topics include, but are not limited to, discourse analysis and second language acquisition, technology and second language learning and instruction, and Universal Grammar and second language acquisition. May be repeated for credit when topics vary.

6043 Family and Adult Literacy in Language Minority Communities
(3-0) 3 hours credit.
Theoretical and practical aspects of family and adult literacy development in language minority communities. Topics may include relationships between oral and written language; second language literacy, and relationships between literacy and social, economic, and political factors. Implications for program development and implementation.

6053 Program and Syllabus Design
(3-0) 3 hours credit.
Theoretical and practical concerns in developing instructional programs to meet the objectives of second language learners, including English for Specific Purposes.
6063  Advanced Second Language Literacy  
(3-0) 3 hours credit. Prerequisite: ESL 5033 or consent of instructor.  
Current approaches and theories of second language literacy, with a focus on the integration of reading and writing.  
Review of research on second language reading and second language writing. Theory-based practice in literacy  
development in a second language

6941-3  Internship in English as a Second Language  
1 to 3 hours credit. Prerequisite: 15 semester hours of coursework in ESL and consent of instructor.  
Supervised experience in teaching English as a Second Language. Must be taken on a credit/no credit basis. 1-3 hours  
credit, but no more than 3 hours will apply to a Master’s degree.

6951-3  Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and  
the division’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students  
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated  
for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6973  Special Problems  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the  
regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than  
6 hours, regardless of discipline, will apply to the Master’s degree.

6983  Master’s Thesis  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s  
degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is  
in progress.
Department of Counseling, Educational Psychology, and Adult and Higher Education

Master of Arts Degree in Adult and Higher Education

The Adult and Higher Education Program serves a diverse group of students with unique professional developmental needs. The program offers opportunities for advanced study in four specialties: continuing education, social/community agency, college teaching, and higher education administration. Following is an overview of each specialty.

Continuing Education

Intended for persons who desire instructional and administrative positions in continuing education and continuing professional education settings. Course offerings include instructional methods, program planning, adult learning, adult development, multicultural issues, and program assessment.

Social/Community Agency

Intended for persons who desire instructional and administrative positions in diverse community and social service settings. Course offerings include community development, adult literacy, instructional methods, program planning, multicultural issues, and program assessment.

College Teaching

Intended for persons who desire instructional positions in higher education, particularly community colleges. Students must have a Bachelor’s degree in the subject which they intend to teach; additional Master’s level courses may be required also. Course offerings include college student development, effective teaching, higher education curricula, multicultural issues, and an overview of higher education in the United States.

Higher Education Administration

Intended for persons who desire middle and senior administrative management positions in higher education in academic and student personnel services. Course offerings include governance, finance, legal issues, program assessment, multicultural issues, enrollment management, college student personnel, and student personnel administration.

Degree Requirements. The course of study consists of a core of required courses and an area of specialization. Additionally students select research hours in combination with a thesis or hours in a designated support area for the nonthesis option.

A. Core courses:

   Foundations course (select one):

   AHE  5013  Foundations of Adult Education
   AHE  5003  The Development of Higher Education in the United States

B. Common core courses (all three required):

   AHE  5343  Theory and Practice of Adult Learning
   AHE  5633  Multicultural Issues in Adult and Higher Education
   EDU  5003  Research Methods in Education (or equivalent)
C. Field Experience (select one):

- AHE 6943 Internship in Adult and Higher Education
  Advisor-approved Adult and Higher Education course (Independent Study or Service Learning)

D. 12 semester credit hours in the specialty:

**Continuing Professional Education (select 4)**

- AHE 5403 Adult Development
- AHE 5603 Development & Organization of Adult and Continuing Education
- AHE 5613 Instructional Procedures in Adult and Continuing Education
- AHE 5623 Adult and Continuing Education Management Systems
- AHE 6123 Effective Teaching in Higher Education II

**Social/Community Agency (select 4)**

- AHE 5813 Adult Literacy
- AHE 5643 Adult Education for Community Development
- AHE 5403 Adult Development
- AHE 5613 Instructional Procedures in Adult and Continuing Education
- AHE 6123 Effective Teaching in Higher Education II

**College Teaching (select 4)**

- AHE 5203 The American College Student
- AHE 6203 The Professorate
- AHE 6103 Effective Teaching in Higher Education I
- AHE 6123 Effective Teaching in Higher Education II
- AHE 6003 The Community College
- C&I 5903 Higher Education Curricula

**Higher Education Administration (select 4)**

- AHE 5103 Contemporary Thought in Higher Education
- AHE 5313 Seminar in Governance of Higher Education
- AHE 5323 Financing Higher Education
- AHE 5333 Legal Issues in Higher Education
- AHE 6003 The Community College

**Support:** Support work may be taken in educational technology, nonprofit management, or teaching. Other areas of support may be developed with advisor supervision.

**Summary of Degree Options**

*Option I. Thesis option* (36 hours):

A. Core: 15 hours
B. Specialty: 12 hours
C. Research: 9 hours
  a. Thesis: AHE 6983 (6 hours)
  b. Advanced Research Course
Option II. Non-Thesis option (36 hours):

A. Core: 15 hours  
B. Specialty: 12 hours  
C. Support: 9 hours

Master of Arts Degree in Counseling

The Master of Arts (M.A.) degree in Counseling offers the opportunity for advanced study and professional development in the fields of Community and School counseling. Students may earn credit toward a state-level counseling license to practice in community settings (Licensed Professional Counselor). Credit may also be earned toward a School Counselor endorsement on a Teacher's certificate (or, with additional courses, a Special Education Counselor endorsement.) A thesis option emphasizes the development of research competencies critical to continued graduate-level study.

Program Admission Requirements. Applicants without adequate background for counseling may be required to complete preparatory courses as a condition of admission. Individuals who do not meet the University-wide graduate admission grade point average requirement may be required to submit Graduate Record Examination (GRE) scores for consideration in admission decisions. Letters of recommendation, a written statement of goals, and a personal interview may be required. Contact the Graduate Advisor of Record for the M.A. in Counseling for more information. The number of students admitted to this program may be limited.

Degree Requirements. Candidates for the Master of Arts degree in Counseling must earn a minimum of 48 semester credit hours. Students must pass a comprehensive written examination toward the end of their formal coursework. The comprehensive examination may be repeated, but students who fail the examination two times must have permission from their supervisory committee to take the examination additional times. Students who fail to pass the examination should take coursework or other work to remedy deficiencies before they retake the examination.

A. 36 hours of required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>COU 5203</td>
<td>Introduction to Community Counseling (for students specializing in Community Counseling)</td>
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<tr>
<td>or</td>
<td></td>
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<tr>
<td>COU 5103</td>
<td>Introduction to School Counseling (for students specializing in School Counseling)</td>
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<tr>
<td>COU 5213</td>
<td>Counseling Theories</td>
</tr>
<tr>
<td>COU 5223</td>
<td>Psychological Assessment for Counselors</td>
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<tr>
<td>COU 5233</td>
<td>Group Theory and Process</td>
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<tr>
<td>COU 5243</td>
<td>Counseling Individuals with Behavioral and Emotional Disorders</td>
</tr>
<tr>
<td>COU 5263</td>
<td>Child and Family Counseling (for students specializing in School Counseling)</td>
</tr>
<tr>
<td>COU 5283</td>
<td>Counseling in Multicultural Settings</td>
</tr>
<tr>
<td>COU 5393</td>
<td>Development of Counseling Skills</td>
</tr>
<tr>
<td>COU 5683</td>
<td>Practicum in Counseling</td>
</tr>
<tr>
<td>COU 5693</td>
<td>Field-Based Internship (for students specializing in Community Counseling)</td>
</tr>
<tr>
<td>COU 6153</td>
<td>Career Development and Choice</td>
</tr>
<tr>
<td>EDP 5033</td>
<td>Human Development Across the Life Span</td>
</tr>
<tr>
<td>EDU 5003</td>
<td>Research Methods in Education</td>
</tr>
</tbody>
</table>

B. 12 hours of elective courses:

Option 1. Thesis Option: 6 hours of thesis, a 3-hour elective, plus a 3-hour research methods or statistics course to be approved by Thesis Committee Chair (Total of 48 semester credit hours)

Option 2. Non-Thesis Option: 12 hours of electives (Total of 48 semester credit hours)
Standards and Procedures

In order to complete counselor preparation programs and to be eligible to take certification or licensing examinations, students must:

- maintain scholastic performance meeting or exceeding department standards
- demonstrate the acquisition of and ability to apply counseling skills necessary to work effectively with persons having diverse needs, as generally accepted by practitioners in counseling
- demonstrate emotional and mental fitness in their interactions with others, and
- conform with the codes of ethics of professional associations in counseling and of the State of Texas. (Texas Administrative Code, Title 19, Part 7, Chapter 247, Code of Ethics and Standard Practices for Texas Educators).

It is the duty of faculty members in the counseling program to evaluate all students according to these standards in all settings in which faculty members and students interact, in classes, in advising and counseling settings, in personal conversations, etc.

It is expected that students will respond to evaluations, formal or informal, in appropriate ways; in all cases, attempting to conform to standards as explained to them. Conformance with standards must be demonstrated by students throughout the period of time spent in the program; events of nonconformance must be followed by faculty judgments that satisfactory adjustments have been made.

Admission to the program does not guarantee fitness to remain in the program to completion. Only those students who meet program standards will be allowed to continue in the program. If and when a student is judged not to meet program standards sufficiently to be allowed to engage in counseling others, that student will be removed from continuation in the program. Please refer to the Graduate Counseling Handbook for a detailed outline of the due process procedures related to this policy.

Only two courses with the grade of “C” will be accepted toward this degree. A minimum of a 3.0 grade point average will be required for graduation. Those who obtain more than two grades of “C” will be put on probation and may be required to do appropriate remedial work.

COURSE DESCRIPTIONS
ADULT AND HIGHER EDUCATION
(AHE)

5003 The Development of Higher Education in the United States
(3-0) 3 hours credit.
A study of the transition from patterns of European institutions of higher learning to the development of uniquely American institutions. Relates the development of human and physical resources to the changing role of higher education in American society.

5013 Foundations of Adult Education
(3-0) 3 hours credit.
Overview of the historical development of adult education as a field of practice, particularly in the United States. Includes an overview of current philosophies and approaches to adult education.

5103 Contemporary Thought in Higher Education
(3-0) 3 hours credit.
A study of current thought as it relates to the management of institutions of higher education.

5203 The American College Student
(3-0) 3 hours credit.
The college student’s role in contemporary society; characteristics, human diversity, basic values, peer group influence, campus culture, needs, and pressures. Particular attention is devoted to the identification of student developmental needs and relevant counseling issues. (Same as COU 5603. Credit cannot be earned for both AHE 5203 and COU 5603.)
5313 Seminar in Governance of Higher Education  
(3-0) 3 hours credit.  
Analysis of current practices and issues in the governance of higher education that affect students, faculty, and administration; study of the scope and role of colleges and universities. (Same as EDL 5313. Credit cannot be earned for both AHE 5313 and EDL 5313.)

5323 Financing Higher Education  
(3-0) 3 hours credit.  
Examination of representative methods of state funding of public colleges and universities; elements of funding formulas; rationales for funding patterns; and policy implications of various funding methods for colleges and universities.

5333 Legal Issues in Higher Education  
(3-0) 3 hours credit.  
An overview of historic and contemporary influences of the U.S. and state constitutions, federal and state statutes, case law, and agency regulations that affect higher-education institutions and their administrators, faculties, and students.

5343 Theory and Practice of Adult Learning  
(3-0) 3 hours credit.  
Overview of the theories and practices of adult learning. Particular attention is given to the concepts of andragogy, self-directed learning, situated learning, and transformational learning. The course also explores situational and cultural factors that influence adult learning, as well as effective methods of instruction in various contexts.

5403 Adult Development  
(3-0) 3 hours credit.  
Theories of adult development and implication for adults. The course explores diverse theories of cognitive, intellectual, and epistemological adult development. Topics include the nature of adult development; psychological and sociocultural aspects of adult development; and implication for instruction or counseling of adults. (Same as COU 5403. Credit cannot be earned for both AHE 5403 and COU 5403.)

5603 Development and Organization of Adult and Continuing Education  
(3-0) 3 hours credit.  
Exploration of forms of continuing and adult education conducted by business and industry, the armed forces, educational institutions, and private foundations, including federal and state programs of support; external and alternative degree programs; the open university concept and self-study programs; general treatment of historical development.

5613 Instructional Procedures in Continuing Education  
(3-0) 3 hours credit.  
Examination of instructional procedures appropriate in adult basic education, GED, community service and recreation courses, professional continuing education courses, initial training courses in corporate settings, and other noncredit offerings.

5623 Adult and Continuing Education Management Systems  
(3-0) 3 hours credit.  
Organization for adult and continuing education within a college or university and its relationship to the entire institution; staffing, training, directing, and controlling the continuing education effort; planning, programming, and budgeting; marketing and public relations; methods of determining the market; evaluation of administrative and academic performance. (Same as EDL 5623. Credit cannot be earned for both AHE 5623 and EDL 5623.)

5633 Multicultural Issues  
(3-0) 3 hours credit.  
Overview of cultural diversity in the adult educational context. Topics include cultural self-awareness, perspectives of multicultural education in counseling, adult and continuing education settings, and strategies for implementing
diversity. Various psychosocial developmental factors of diverse cultural and ethnic groups, and the influence of these variables on the helping relationship will be explored. (Same as COU 5633. Credit cannot be earned for both AHE 5633 and COU 5633.)

5643 **Adult Education for Community Development**  
(3-0) 3 hours credit.  
Theories and practices of community learning and action processes. Topics include the history of community development endeavors, current issues and perspectives of community development, participatory models of change development, effective instructional methods in community settings, and application in social, community, and mental health contexts. (Same as COU 5643. Credit cannot be earned for both AHE 5643 and COU 5643.)

5813 **Adult Literacy**  
(3-0) 3 hours credit.  
Examination of the acquisition and development of reading and writing in adult populations. Reviews research and issues relevant to the teaching of reading and writing to adults. (Formerly AHE 5803. Credit cannot be earned for more than one of the following: AHE 5813, AHE 5803, or C&I 5813.)

6003 **The Community College**  
(3-0) 3 hours credit.  
The historical and philosophical foundations for the community junior college movement in the United States are analyzed and utilized as a basis for understanding contemporary trends and problems of community junior colleges.

6053 **Qualitative Research Design**  
(3-0) 3 hours credit.  
Introduction to the design and implementation of qualitative research projects. Particular attention is given to the development of research to improve practice, emphasizing action research and case study methods. Students will conduct a pilot study relevant to their program of study. (Same as COU 6053. Credit cannot be earned for both AHE 6053 and COU 6053.)

6063 **Research in Adult and Higher Education**  
(3-0) 3 hours credit. Prerequisite: EDU 5003.  
Consideration of the major research problem areas in adult and higher education, identification of problems in need of research, examination of research literature in selected areas, and study of research procedures unique to or especially useful in adult and higher education.

6073 **Research Colloquium**  
(3-0) 3 hours credit. Prerequisites: EDU 5003 and AHE 6063.  
Guided discussion of research in planning stages, in process, and recently completed by participants; opportunity for the organization of research teams and effective interpersonal collaboration in planning and conducting research; and opportunity for students engaged in research to obtain assistance in planning, data collection, data analysis, and preparation of reports. (Same as COU 6073. Credit cannot be earned for both AHE 6073 and COU 6073.)

6103 **Effective Teaching in Higher Education I**  
(3-0) 3 hours credit.  
This seminar focuses on the image of the college professor and reviews the current research on the teaching and learning process at the college or university level. Includes a review of educational psychology of the late adolescent and adult, an investigation of new and effective instructional methods, and an appraisal of evaluation procedures.

6123 **Effective Teaching in Higher Education II**  
(3-0) 3 hours credit. Prerequisites: AHE 5613 or AHE 6103 and consent of instructor.  
An examination of traditional and innovative instructional strategies for use in college teaching. Special emphasis will be placed on the integration of classroom theory and practice.
6203 The Professorate
(3-0) 3 hours credit.
An examination of the vital issues and trends affecting college faculty personnel, with emphasis on institutional practices and policies.

6943 Internship in Adult and Higher Education
3 hours credit. Prerequisites: Consent of instructor and Graduate Advisor of Record.
Individually supervised field experience in adult or higher education setting.

6953 Independent Study
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, may be counted toward the Master's degree.

6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, may be counted toward the Master's degree.

6983 Master's Thesis
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

COURSE DESCRIPTIONS
COUNSELING
(COU)

5103 Introduction to School Counseling
(3-0) 3 hours credit.
Orientation to the role and profession of school counseling. Investigation of institutional constraints, documentation, and the legal and ethical aspects of school counseling. Examines program planning for students, teachers, administrators, parents, and the community; as well as program evaluation, and facilitating internal and external collaborative efforts. Also examines TEA knowledge, skills and abilities for school counselors. (Formerly EDP 5253. Credit cannot be earned for COU 5103 and EDP 5253.)

5113 Ethical and Legal Issues in Counseling
(3-0) 3 hours credit.
Explores philosophical precepts on which counseling interventions are based. Examines ethical and legal standards related to professional practice and the impact of personal values on the counseling process. (Formerly EDP 5113. Credit can be earned for only one of COU 5113, EDP 5113, and EDU 5113.)
5203  **Introduction to Community Counseling**  
(3-0) 3 hours credit.  
Introductory course that provides an overview of the counseling profession. Explores ethical and diversity issues of school and community counselors. Provides an orientation to the counseling program, information about professional credentials, and job roles. Requires observational experience. (Formerly EDP 5233. Credit cannot be earned for COU 5203 and EDP 5203.)

5213  **Counseling Theories**  
(3-0) 3 hours credit.  
Major counseling theories and techniques are presented. Students investigate affective, behavioral, and cognitive psychotherapeutic strategies. (Formerly EDP 5213. Credit cannot be earned for COU 5213 and EDP 5213.)

5223  **Psychological Assessment for Counselors**  
(3-0) 3 hours credit. Prerequisites: EDU 5003 and COU 5243.  
Introduction to measurement theory, assessment strategies, and individual- and group-administered techniques, including standardized tests. Emphasis on analysis and interpretation of assessment results for treatment planning. Casework is required. (Formerly EDP 5223. Credit cannot be earned for COU 5223 and EDP 5223.)

5233  **Group Theory and Process**  
(3-0) 3 hours credit. Prerequisites: COU 5103 or COU 5203 and COU 5213.  
A study of small group theory, research, and procedures. Explores group membership and leadership behavior. Participation in group counseling is required. (Formerly EDP 5233. Credit cannot be earned for COU 5233 and EDP 5233.)

5243  **Counseling Individuals with Behavioral and Emotional Disorders**  
(3-0) 3 hours credit. Prerequisites: COU 5103 or COU 5203 and COU 5213.  
Counseling interventions with behavioral and emotional disorders; symptomatology for psychoses, emotional disorders, and maladaptive behavior patterns. (Formerly EDP 5243. Credit cannot be earned for COU 5243 and EDP 5243.)

5263  **Child and Family Counseling**  
(3-0) 3 hours credit.  
The emotional and behavioral experiences of childhood and adolescence are discussed. Family systems theory and strategies for counseling children and families are presented. Requires casework. (Formerly EDP 5263. Credit cannot be earned for COU 5263 and EDP 5263.)

5283  **Counseling in a Multicultural Setting**  
(3-0) 3 hours credit. Prerequisite: COU 5103 or COU 5203.  
A study of major issues of cross-cultural counseling. The impact of diversity (within and between group differences) is examined. (Formerly EDP 5283. Credit cannot be earned for COU 5283 and EDP 5283.)

5323  **Advanced Psychological Assessment**  
(3-0) 3 hours credit. Prerequisite: COU 5223.  
Theory and application of specific instruments and techniques, including administration and scoring. Emphasis on analysis, interpretation, and integration of ability, achievement, and personality assessment results for diagnostics as well as treatment planning. Casework is required. (Formerly EDP 5323. Credit cannot be earned for COU 5323 and EDP 5323.)

5393  **Development of Counseling Skills**  
(3-0) 3 hours credit. Prerequisites: COU 5223, COU 5233, plus 3 hours  
Focus on sequential learning of counseling skills and their practical application. Counseling sessions are recorded and evaluated. (Formerly EDP 5393. Credit cannot be earned for COU 5393 and EDP 5393.)
5403 Adult Development  
(3-0) 3 hours credit.  
Theories of adult development and implication for adults. The course explores diverse theories of cognitive, intellectual, and epistemological adult development. Topics include the nature of adult development, psychological and sociocultural aspects of adult development, and implication for instruction or counseling of adults. (Same as AHE 5403. Credit cannot be earned for both AHE 5403 and COU 5403.)

5603 The American College Student  
(3-0) 3 hours credit.  
The college student's role in contemporary society; characteristics, human diversity, basic values, peer group influence, campus culture, needs, and pressures. Particular attention is devoted to the identification of student developmental needs and relevant counseling issues. (Same as AHE 5203. Credit cannot be earned for both AHE 5203 and COU 5603.)

5613 Substance Abuse & Chemical Dependency Counseling  
(3-0) 3 hours credit.  
This course uses cognitive-behavioral and systems-based strategies for treatment and relapse prevention in substance abuse and chemical dependence. Examines dual diagnosis with other Axis I disorders and comorbidity with Axis II disorders. Introduction to the ICRC/AODA 12 core functions and global criteria for substance abuse counselors. (Formerly EDP 5613. Credit cannot be earned for both COU 5613 and EDP 5613.)

5633 Multicultural Issues  
(3-0) 3 hours credit.  
Overview of cultural diversity in the adult educational context. Topics include cultural self-awareness, perspectives of multicultural education in counseling, adult and continuing education settings, and strategies for implementing diversity. Various psychosocial developmental factors of diverse cultural and ethnic groups, and the influence of these variables on the helping relationship will be explored. (Same as AHE 5633. Credit cannot be earned for both COU 5633 and AHE 5633.)

5643 Adult Education for Community Development  
(3-0) 3 hours credit.  
Theories and practices of community learning and action processes. Topics include the history of community development endeavors, current issues and perspectives of community development, participatory models of change development, effective instructional methods in community settings, and application in social, community, and mental health contexts. (Same as AHE 5643. Credit cannot be earned for both AHE 5643 and COU 5643.)

5683 Practicum in Counseling  
3 hours credit. Prerequisite: COU 5393. Students must apply for permission to enroll one semester in advance by completing the appropriate form and supplying evidence of readiness and fitness to practice counseling. (Thesis students may omit one prerequisite course as agreed upon by the supervisory committee.) Offers the opportunity for supervised field work in a counseling setting. May be repeated for credit to a maximum of 6 hours. (Formerly EDP 5693. Credit cannot be earned for COU 5683 and EDP 5693.)

5693 Field-Based Internship  
3 hours credit. Prerequisite: COU 5683  
Extensive supervised field work in a UTSA approved counseling setting. May be repeated for credit for a maximum of 6 hours. Students apply to enroll one semester in advance.

6003 Consultation Skills and Practices in School and Community Settings  
(3-0) 3 hours credit. Prerequisite: COU 5213  
This course provides a framework for understanding and practicing consultation in a school and/or community setting. Students examine the historical development, major models, and ethical and legal issues related to consultation. Students develop a personal model of consultation and apply theoretical material to case presentations.
6053 **Qualitative Research Design**  
(3-0) 3 hours credit.  
Introduction to the design and implementation of qualitative research projects. Particular attention is given to the development of research to improve practice, emphasizing action research and case study methods. Students will conduct a pilot study relevant to their program of study. (Same as AHE 6053. Credit cannot be earned for both COU 6053 and AHE 6053.)

6073 **Research Colloquium**  
(3-0) 3 hours credit. Prerequisites: EDU 5003 and AHE 6063.  
Guided discussion of research in planning stages, in process, and recently completed by participants; opportunity for the organization of research teams and effective interpersonal collaboration in planning and conducting research; and opportunity for students engaged in research to obtain assistance in planning, data collection, data analysis, and preparation of reports. (Same as AHE 6073. Credit cannot be earned for both AHE 6073 and COU 6073.)

6113 **Supervision of Counseling**  
(3-0) 3 hours credit. Prerequisite: COU 5693  
This course introduces supervisors-in-training to knowledge and skills identified by the profession as basic to effective tutoring and mentoring skill development of counselors-in-training and practicing counselors. Students will be required to engage in supervision experiences to demonstrate competency in skill acquisition. This course is designed for students who have completed their Master’s degree.

6153 **Career Development and Choice**  
(3-0) 3 hours credit.  
A study of theories of occupational choice and career development and their application to the guidance and counseling process. Identification and utilization of various types of occupational information and resources in counseling interviews and guidance programs. (Formerly EDP 6153. Credit can be earned for only one of COU 6153, EDP 6153, or C&I 6153.)

6953 **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961 **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973 **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, may be counted toward the Master’s degree.

6983 **Master’s Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
EDUCATIONAL PSYCHOLOGY (EDP)

5003 Psychological Learning Theories
(3-0) 3 hours credit.
A comprehensive analysis of human learning through an examination of major concepts and results of research on how learning occurs; also, the mental processes involved in learning and the application of these principles.

5033 Human Development Across the Life Span
(3-0) 3 hours credit.
A study of major theories and issues related to developmental change across the life span, including implications for education and counseling.

5043 Classroom Management and Motivation
(3-0) 3 hours credit.
A detailed investigation of various theories and models of classroom management and motivation. Topics include behavior modification, assertive discipline, control theory, and the concept of the democratic classroom. (Credit can be earned for only one of C&I 5023, C&I 5043, and EDP 5043.)

5303 Principles and Techniques of Evaluation
(3-0) 3 hours credit.
Introduction to program evaluation and the development and analysis of instruments, including implications for education and counseling.

5603 Psychology of Human Motivation
(3-0) 3 hours credit. Prerequisite: Graduate standing or permission of the instructor.
This course is designed to explore Human Motivation in a biopsychosocial context. Some of the goals of the course are to understand the evolution of various theories of motivation and to understand the influence of factors such as culture, race, emotion, etc. on human motivation. This course will synthesize research on motivation to provide an in-depth psychological inquiry into human motivation to facilitate the understanding of what motivates people to do what they do. Appropriate for students in Adult and Higher Education, Counseling and Educational Psychology, and Educational Leadership.

6953 Independent Study
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.
Master of Arts Degree in Education — Educational Leadership Concentration

Students seeking to apply for administrative careers in public or private schools and school systems should follow programs in this concentration. The unique problems, processes, and expertise associated with effective personnel, instruction, and instructional leadership are explored, developed, and tested in simulations with an emphasis on applied research and human relations methodologies. The degree program and 9 specified semester credit hours are designed to meet principalship certification requirements. In addition, a superintendency/central office program of 15 semester hours is available for practicing school administrators. Successful completion of the program and passing the ExCET results in principalship and superintendency certification.

Program Admission Requirements. See page 123 for general admission requirements for the Master’s degree in Education.

Degree Requirements

A. Core. 12 semester credit hours required:
   - EDU 5003 Research Methods
   - EDU 5103 Contemporary Educational Philosophy
   - EDP 5003 Psychological Learning Theories
   - C&I 5003 Theory and Dynamics of Curriculum and Instruction

B. Concentration. No fewer than 12 semester credit hours of EDL courses.

C. Support work. No more than 12 semester credit hours; support work may consist of additional EDL courses.

D. Comprehensive Examination: A comprehensive examination is required as indicated on page 124.

Doctor of Education Degree in Educational Leadership

The primary objective of the doctoral degree program is to provide advanced academic training in educational leadership, particularly in the area of administrative and instructional leadership. Graduates should gain an advanced understanding of theories of education and learning; extensive theoretical background and experiences in emerging paradigms of organizational leadership; high-level research skills for developing, analyzing, and evaluating educational programs; and in-depth training for the increasing cultural and linguistic diversity of contemporary education. Students may pursue an emphasis in administrative leadership or instructional leadership. Administrative leadership focuses on managerial skills for improving educational effectiveness. Instructional leadership focuses on innovative programs to help solve critical literacy, technological, and sociocultural educational issues.

Program Admission Requirements. Applications are screened by the doctoral program faculty or a representative selection committee thereof. Applicants must meet or, as applicable, submit the following criteria to be considered for admission:

- a Bachelor’s degree from an accredited institution
- a Master’s degree in education or other appropriate field
- a grade point average of 3.5 or better out of a possible 4.0 in a Master’s degree program
- submission of an official score on any of the following three graduate admissions examinations: (a) Graduate Record Examination (GRE) (verbal and quantitative sections required, analytical section recommended), (b) Graduate Management Admission Test (GMAT), or (c) Miller Analogies Test (MAT);
- for applicants whose native language is not English, a score of at least 550 on the Test of English as a Foreign Language (TOEFL);
• demonstrated experience in a work environment where education is the primary professional emphasis (teaching, administration, curriculum development in elementary, secondary, postsecondary, governmental, or private industry settings)

• three letters of recommendation from professionals who can discuss the applicant’s potential administrative or instructional leadership capabilities; and

• a statement of purpose outlining, at a minimum, (1) the applicant’s reasons for pursuing a doctorate in educational leadership, (2) a biographical sketch of the applicant’s experiences relevant to the field of education, (3) career plans, (4) scholarly interests, and (5) views on and roles in current and future educational reform efforts.

Applicants who meet initial screening requirements will be interviewed using a standardized format to determine their qualifications as prospective leaders in administration or instruction. Interviews are conducted by the Doctoral Program Committee. Those who pass the second-level screening requirements will be admitted to begin the coursework portion of their program. The number of students admitted to this program may be limited.

Degree Requirements. Degree candidates must complete 36 semester credit hours of core courses:

A. Culture (9 hours). The social, cultural, and linguistic dynamics of current and future school populations; historical and cultural contexts of schooling in Texas and the Southwest; issues related to language and linguistic policies and education; and issues related to leadership within culturally diverse communities.

B. Methodology (12 hours). Research design; qualitative and quantitative research methods; uses of technology for data collection and analysis; and the role of research in school change.

C. Leadership (15 hours). Procedures and techniques of inquiry-based organizational development and leadership; effective leadership of culturally diverse school personnel; issues related to leadership of majority-minority schools; the ethics of leadership; and a doctoral internship.

After completing the core requirements, students take an additional 15 semester credit hours of courses toward fulfilling the administrative leadership or instructional leadership emphasis and cognate requirements:

A. Area of emphasis (9 hours). Development of knowledge and skills in administrative leadership or instructional leadership.

B. Cognate support (6 hours). Students select a cognate area of support to enhance their emphases and the research for their dissertations. Courses are selected from graduate offerings throughout the University, and students must meet prerequisites for enrollment.

Dissertation Requirement. Upon completion of the required 51 semester credit hours, students must pass a written and oral qualifying examination. They must also take 9 semester credit hours of Dissertation. The dissertation must meet these objectives:

1. The dissertation format creates strong ties between the University and the selected educational setting.

2. The dissertation’s research team consists of a doctoral student and faculty member who work in collaboration with an educational institution to focus on a single issue.

3. Dissertation topics are linked to the goal of improving program effectiveness.

4. The dissertation demonstrates the scholarly capabilities of the student working with his or her committee.

In addition, each student must:

1. Pass an oral defense of his or her doctoral proposal, conducted by the Dissertation Committee, that addresses the dissertation’s potential for scholarly research as specified by University-wide requirements.

2. Maintain a grade point average of 3.0 or higher (on a 4.0 scale) each semester for the entire doctoral program, as specified by University-wide requirements.

3. Complete an on-campus residency as a full-time student for two consecutive long semesters, or two full summer terms and one long semester (consecutively), or three full summers. No transfer students will be admitted to the program. However, up to 6 hours of transfer credit toward the degree may be accepted, provided that the graduate courses were taken at an accredited institution within the past three years and were not part of a program that culminated in the award of a degree.
5003  **Research Methods**  
(3-0) 3 hours credit. Prerequisite: Admission to graduate program or consent of instructor.  
Basic concepts of research design; strategies of experimental, historical, and descriptive research; and basic statistical  
procedures are introduced. Participants use these concepts to read, interpret, and evaluate educational and counseling  
research and to plan such research.

5103  **Contemporary Educational Philosophy**  
(3-0) 3 hours credit.  
Philosophical analysis of issues in American education. Consideration is given to ethical and epistemological  
implications of issues with an emphasis on the evaluation of arguments for the adoption of educational policy.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the  
student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction  
of a faculty member. For students needing specialized work not normally or not often available as part of the regular  
course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the  
Master's degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate Graduate Program Committee to take the Comprehensive  
Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times  
as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive  
Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR”  
(satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the  
Comprehensive Examination).

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the  
regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than  
6 hours, regardless of discipline, will apply to the Master's degree.

6983  **Master's Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s  
degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is  
in progress.

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**COURSE DESCRIPTIONS**  
**EDUCATIONAL LEADERSHIP**  
(EDL)

5003  **Introduction to School Administration**  
(3-0) 3 hours credit. Prerequisite: One year of teaching experience or consent of instructor.  
Introduction to the roles, tasks, and problems of positions in educational administration and their relationship to local,  
state, and federal government agencies.
5103 **Introduction to School Finance**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Introduction and survey of current designs in educational finance of public school districts, review of general concepts, and practices of the appropriate local, state, and federal government agencies.

5203 **School and Community Relations in Education**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Introduction to the strategies and design models for informing local business taxpayers and clientele about educational activities; study of models for participation and analysis of interaction models.

5303 **Human Relations in Educational Administration**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Analysis and identification of group processes and individual behaviors that tend to enhance democratic interaction in the achievement of educational goals. Consideration of supportive roles requisite to the supervision of professionals in the educative process.

5403 **The Principalship: Educational Unit and Site Administration**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Analysis of the principal's or comparable position's role and the requisite interaction with various referent groups. Emphasis is on administration of academic programs. Applicable to all levels of common school.

5503 **Administration and Function of Special Programs**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Identification and analysis of models and designs for the administration, development, supervision, and support programming of special education, guidance, vocational and technical education, and other alternative and support functions in education.

5603 **Applied Research Seminar in Educational Leadership**  
(3-0) 3 hours credit. Prerequisites: EDU 5003, EDL 5003, and consent of instructor.  
Introduction to identification, analysis, and design formulation of applied research problems in educational leadership. Practice in conducting searches, elementary analysis, and deriving appropriate conclusions from applied studies. Students are required to complete and articulate an approved applied research design in prescribed form.

5703 **Legal Foundations in Education**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Survey of current legal basis and practices in the policy administration of education and review of significant court decisions pertaining to educational operations. Emphasis on rights and responsibilities of teachers and students and legislation related to multicultural institutional operations.

6003 **Supervision: Theoretical Basis**  
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.  
An application of theories of curriculum development, educational planning, learning, and human relations to instructional supervision; an examination of the role of the supervisor. (Credit cannot be earned for both EDL 6003 and C&I 6003.)

6013 **Supervision: Teaching-Learning Process**  
(3-0) 3 hours credit. Prerequisite: EDL 6003, C&I 6003 or consent of instructor.  
The analysis and application of models of the teaching and learning process to instructional supervision; the study and application of content, interaction, and climate analysis techniques. (Credit cannot be earned for both EDL 6013 and C&I 6013.)

6023 **Supervision: Tools and Techniques**  
(3-0) 3 hours credit. Prerequisite: EDL 6003, C&I 6003 or consent of instructor.  
A study of impact strategies in instructional supervision and the development of communication and interpersonal skills needed for working with teachers. (Credit cannot be earned for both EDL 6023 and C&I 6023.)
6203 **Educational Facilities and Capital Funds Administration**  
(3-0) 3 hours credit. Prerequisite: EDL 5003 or consent of instructor.  
Survey of models, policies, and procedures for the effective development, planning, use, and management of educational facilities and capital funds. Emphasis is on meeting curricular program needs.

6503 **Superintendent's Seminar**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A field-based course designed for students preparing for educational leadership at the school district level. Enrollment is required each semester a student desires to fulfill a requirement for Texas school superintendent certification. Students develop an independent field-based study component in four certification areas: personnel administration, educational funds and facilities management, survey of organization and administration theory in education, and organizational systems analysis. Students are required to participate in 100 hours of clinical experience related to the certification area they seek to fulfill. May be repeated four times for credit.

6943 **Internship in Educational Administration**  
3 hours credit. Prerequisites: EDL 5003, EDL 5103, EDL 5203 or EDL 5303, EDL 5403, EDL 5503, EDL 5603, EDL 5703, and consent of instructor.  
Individually supervised field experience with unit-level or institutional-level educational administrators with related applied research activity. Must be taken for both principalship and superintendency certification. May be repeated for a total of 6 semester hours.

6953 **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6973 **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

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**COURSE DESCRIPTIONS-DOCTORAL LEVEL**  
**EDUCATION (EDU)**

7053 **Inferential Statistics**  
(3-0) 3 hours credit.  
The logic of inference in research with special emphasis on statistical techniques and the appropriate types of inference related to each. Computer programs will be used to analyze simulated data.

7103 **Qualitative Research**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Definition of and rationale for qualitative research. Delineation of procedures used in qualitative research: problems, hypotheses, data collection and analysis, conclusions, and significance of findings.

7113 **Educational Research Statistics: Descriptive and Comparative**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Review of descriptive statistics, study of comparative statistics including t-tests and ANOVA, reporting and plotting functions, and Chi-square applications.
7133  **The Role of Research in Educational Environments**  
(3-0) 3 hours credit. Prerequisites: EDU 7053 or EDU 7113 and EDU 7123.  
Application of research techniques in school-based settings. Students design research proposals using qualitative and quantitative perspectives and ‘pilot test’ them in an educational environment.

7213  **School Reform**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Examination of the historical and philosophical roots of school reform during the last 100 years. The course will focus on different perspectives on analysis and evaluation of school reform efforts for culturally diverse populations.

7223  **Learning in a Culturally and Linguistically Diverse Society: Infancy through Adulthood**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Examination of development changes throughout the lifespan from a variety of theoretical perspectives. Emphasis on psychological, anthropological, and sociolinguistic principles and their application to learning and teaching in a culturally and linguistically diverse society.

7403  **Education, Cultural Differences, and Acculturation**  
(3-0) 3 hours credit.  
Advanced level consideration of the impact of cultural differences upon the education process. Interactions of schooling and social life with the process of acculturation. Study of procedures and techniques for identifying and ameliorating educational problems related to cultural differences.

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**COURSE DESCRIPTIONS-DOCTORAL LEVEL**

**EDUCATIONAL LEADERSHIP (EDL)**

7103  **Administration of Urban/Multicultural Institutions**  
(3-0) 3 hours credit.  
Provides practicing and potential urban educational leaders with knowledge of contemporary conditions and positive models for effective educational administrative designs, including alternative educational delivery systems.

7133  **Topics in Administration**  
(3-0) 3 hours credit.  
Study and analysis of contemporary issues related to administration, including educational facilities and capital fund administration, school finance, strategic and operational planning, personnel management, and program evaluation. May be repeated for credit when topics vary.

7273  **Examining School Populations, Structures, and Culture**  
(3-0) 3 hours credit. Prerequisite: EDU 7223 or consent of instructor.  
Development of an analytical framework for intervening in political and organizational systems to accomplish educational missions and establish a sense of community in school culture.

7343  **The Politics of Educational Change**  
(3-0) 3 hours credit.  
Examination of the political structure and processes through which many of the major issues in education are treated, analysis of the power structure and its influence on educational policy making, exploration of the evolving roles of state and federal agencies, the courts, private organizations, and interest groups in shaping the policymaking process in education. (Formerly EDL 6333. Credit cannot be earned for both EDL 7343 and EDL 6333.)

7563  **Research in Leadership Laboratory: Change Theory, Innovation, and Application**  
(3-0) 3 hours credit. Prerequisite: EDU 7133 or consent of instructor.  
Inquiry into the research of leadership and organizational change processes in field-based settings. Examination of cases involving organizational and leadership change agents.
7663 Technology in Educational Environments
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
Examination of current models for use and application of technology, including computer-based, multimedia, and distance learning in educational settings.

7773 Independent Study
3 hours credit. Prerequisites: Doctoral standing and permission in writing (form available) of the instructor and student's Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work as part of the regular course offerings. May be repeated for credit, but no more than 6 hours will apply to the doctoral degree.

7783 Special Problems
(3-0) 3 hours credit. Prerequisites: Doctoral standing and consent of instructor.
An organized course offering the opportunity for specialized study not normally or often part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours will apply to the doctoral degree.

7893 Doctoral Research
3 hours credit. Prerequisite: Admission to candidacy for the doctoral degree.
May be repeated for credit, but no more than 6 hours may be applied to the doctoral degree.

COURSE DESCRIPTIONS-DOCTORAL LEVEL
LEADERSHIP
(LDR)

7003 Proseminar in Educational Leadership
(3-0) 3 hours credit.
This course is intended to acclimate and provide first-year doctoral students with an opportunity to explore the main theories and areas of research in educational leadership. Readings include seminal work in organizational theory, educational administration, and related areas. Students will become familiar with areas of research of doctoral program faculty and will learn prerequisite material to successful doctoral work such as, APA writing style, how to conduct literature reviews, and insights into the dissertation process.

7133 Majority-Minority Settings: Creating a Community of Leaders
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
This course focuses on organizational relationships and the tension between power and equality. A model of leadership in which organizational members are given shared visions to accomplish goals is presented.

7153 Reflective Leadership: The Personal Dimension
(3-0) 3 hours credit. Prerequisite: LDR 7133.
An in-depth study of the character and nature of leadership, including an examination of social ethics, educational policy issues, and the link of theory and practice. Students are required to clarify, critique, and develop personal perspectives on the public responsibility of leaders.

7183 Emerging Paradigms in Leadership
(3-0) 3 hours credit. Prerequisites: LDR 7133 and LDR 7153.
An overview of major leadership theories and an exploration of significant shifts in perspectives that affect the exercise of authority and power. A reexamination of traditional views of leadership and an analysis of views emerging from corporate, international, and transcultural perspectives.
7303  **Organizational Theory**  
(3-0) 3 hours credit.  
The purpose of this course is to advance student understanding of organizations by exploring a variety of theoretical frameworks and applying these perspectives to aspects of public and private institutions. Each framework draws attention to significant aspects of the organizing process and provides a distinctive means of understanding and managing organizational situations.

7343  **Principles of Ethical Leadership**  
(3-0) 3 hours credit. Prerequisites: LDR 7133, LDR 7153, and LDR 7183.  
This course will expose doctoral students to multiple frameworks involved with ethical dilemmas. Using theoretical principles of ethics in the context of democratic values, students will examine and interpret educational policies from an ethical leadership perspective. Analysis of complex policy cases that raise ethical issues will be investigated.

7413  **Sponsored Internship in Educational Leadership**  
(1-16) 3 hours credit. Prerequisites: LDR 7133, LDR 7153, LDR 7183, LDR 7343, and assessment and screening process administered by UTSA and cooperating sponsors (application available).  
Individually designed internships in educational leadership in school systems, adult and higher education, human service institutions, government, and private industry. Jointly supervised by University faculty and field administrators from cooperating agencies. May be repeated for credit but no more than 6 hours may be applied to a degree program.

7991,3,6  **Dissertation**  
1, 3 or 6 hours credit. Prerequisites: Admission to candidacy for the doctoral degree and consent of student’s Graduate Advisor of Record.  
May be repeated for credit, but no more than 9 hours may be applied toward the Ed.D. degree requirements. Credit will be awarded upon completion of the dissertation.
DEPARTMENT OF HEALTH AND KINESIOLOGY

Master of Arts Degree in Education — Kinesiology and Health Promotion Concentration

The program is designed for students seeking advanced preparation for teaching physical and health education in school and community settings and pursuing careers in an area related to kinesiology or health. It is intended to offer students the opportunity to expand content knowledge and to apply such information to become more effective teachers and leaders. Graduates of this program proceed or continue their careers as teachers, coaches, supervisors, health workers, and administrators in public education and health or private sectors.

Degree Requirements

Core:

EDU 5003 Research Methods
EDU 5103 Contemporary Educational Philosophy
EDP 5003 Psychological Learning Theories
C&I 5003 Theory and Dynamics of Curriculum and Instruction

Concentration:

Twelve semester credit hours consisting of

KAH 5003 Current Trends in Physical and Health Education
KAH 5093 Statistics and Research in Health and Kinesiology
Two additional KAH courses selected after consultation with Program Advisor or the Graduate Advisor of Record.

Support Work:

No more than 12 semester credit hours; support work may consist of additional KAH courses, and must be selected after consultation with the Program Advisor or the Graduate Advisor of Record.

As a partner in a University of Texas System collaborative program, the University of Texas at San Antonio offers graduate courses over the Internet. A complete list of the kinesiology courses and descriptions are located at www.telecampus.utsystem.edu. Students interested in Internet courses should contact the Program Advisor prior to enrollment.

COURSE DESCRIPTIONS
KINESIOLOGY AND HEALTH PROMOTION (KAH)

5003 Current Trends in Physical and Health Education
(3-0) 3 hours credit.
Students have the opportunity to examine current development in theories and practices of physical education. Recent research and literature are examined for causes and consequences of today’s issues, trends, and problems.

5013 The Role of Sport in Society
(3-0) 3 hours credit.
Examination of sport and physical activity, sport’s impact on society, and the affective roles sport takes as part of our social structure and the institution of education.
5023 Management of Kinesiology and Health Programs
(3-0) 3 hours credit.
An examination of the various functions involved in the management of a sport-, health-, or recreation-related organization. Topics include budgeting, facilities, scheduling, promotion, and liability.

5033 Sport and Exercise Psychology
(3-0) 3 hours credit.
A study of cognition and behaviors related to participation in sport and physical activity. Survey of contemporary research in motivation in sport, sport psychology, performance enhancement, psychological effects of exercise, and exercise adherence. For teachers and counselors, as well as kinesiology and health professionals.

5043 Child and Adolescent Health Promotion
(3-0) 3 hours credit.
Examines the multifaceted determinants of health for children and adolescents (environmental, behavioral, developmental, biological, and social) with special emphasis on the roles of the family, school, and community. Models and theories of health behavior, risk-taking, and challenges to health care delivery for these populations will be investigated.

5053 Principles of Exercise Physiology
(3-0) 3 hours credit.
A survey of exercise physiology, examining muscular, metabolic and cardiorespiratory adaptations to acute and chronic exercise.

5063 Health Behaviors
(3-0) 3 hours credit.
A study of the determinants of human behavior as they relate to current health issues. Health behavior models and underlying rationales for prevention and intervention strategies will be examined. For teachers and counselors, as well as kinesiology and health professionals.

5073 Health and Wellness/Health Promotion
(3-0) 3 hours credit.
The purpose of this class is to introduce students to the field of health promotion and to show how epidemiology, social and behavioral science theory, organization change, administration, and evaluation are related to the design and implementation of health education programs. This course serves as a foundation for other courses in health education and provides an overview of the field to the student from related areas.

5083 Epidemiology
(3-0) 3 hours credit.
The overall goal of this course is to increase health professional’s ability to analyze problems and make decisions based on applications of epidemiologic concepts and methods in a variety of settings, with a particular focus on applications from studies in health promotion. Social, psychological, and biological determinants of disease will be examined. Epidemiologic tools to be presented include use of vital statistics and rates, descriptive studies, observational studies, and experimental studies.

5093 Statistics and Research in Health and Kinesiology
(3-0) 3 hours credit.
This course is designed to provide students with knowledge of experimental designs and the statistical tools necessary for analyzing research data in the fields of Health and Kinesiology.

5103 Biomechanics
(3-0) 3 hours credit.
A survey of principles and procedures related to mechanical analysis of human motion, with emphases on both kinematic and kinetic analysis.
5203  **Motor Learning and Control**  
(3-0) 3 hours credit.  
Study of the individual processes of skill acquisition, including the involvement of transfer, timing, feedback, practice, retention as well as the processes of central and peripheral mechanisms involved in implementing physical and perceptual skills.

5303  **Community Health**  
(3-0) 3 hours credit.  
Study of community health problems, the function of public, private, and voluntary health agencies, and administration and supervision of health programs in the community, school, business, or industry setting.

5403  **Cardiovascular Fitness**  
(3-0) 3 hours credit. Prerequisite: Exercise Physiology, Exercise Prescription, or Human Physiology
This course covers the physiology underlying the methods used for obtaining, maintaining, and rehabilitating the health of the cardiovascular system. Recent research findings in the areas of exercise and nutrition, related cardiovascular disease prevention and rehabilitation, weight control, and blood lipids are emphasized.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6983  **Master's Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
Master of Arts Degree in Education

The course of study for the Master of Arts degree in Education consists of:

a. Core courses required of all Master of Arts in Education degree seeking students (12 semester hours)
   b. Concentration courses (12 to 24 hours)
   c. Support courses (0 to 12 semester hours)

A comprehensive examination is required.

Applicants for the Master of Arts Degree in Education may choose a thesis or non-thesis option.

Master of Arts Degree in Education — Curriculum and Instruction Concentration

The program emphases are focused on the theoretical and practical aspects of curriculum planning, development, implementation, and evaluation in all subject fields and at all educational levels. The concepts of curricular innovation and teaching excellence are stressed in conjunction with expanded knowledge of content fields and applied research. Students who want to specialize in a teaching field may do so by taking courses in that field to support the concentration in Curriculum and Instruction. Within this concentration, a student may specialize in the supervision of instruction, or an initial teacher's certificate may be earned in specified areas of public school programs.

Curriculum and Instruction Concentration emphases:

Curriculum Specialist
Teaching (MAECIT)

Master of Arts Degree in Education — Early Childhood and Elementary Education Concentration

The concentration in Early Childhood and Elementary Education focuses on the broad spectrum of development and learning in children from infancy through preadolescence. Emphasis is on translating related research and theory into curriculum development and instruction, with the intent of helping children realize the best development possible in a multicultural society. This concentration is designed primarily for experienced classroom teachers at the early childhood and elementary levels, but it is also suitable for personnel in human services and other allied fields.

Master of Arts Degree in Education — Instructional Technology Concentration

The Instructional Technology concentration focuses on the uses and applications of technology in instructional environments. Emphasis is placed on the development, function, and utilization of a variety of technologies within educational settings. This concentration is designed for students seeking to expand their knowledge of instructional technology as well as those seeking leadership roles in this area. Courses required for this concentration are:

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>IST</td>
<td>5303 Technology in Curriculum and Instruction</td>
</tr>
<tr>
<td>IST</td>
<td>6353 Multimedia Production</td>
</tr>
<tr>
<td>IST</td>
<td>6503 Advanced Topics in Instructional Technology</td>
</tr>
<tr>
<td>IST</td>
<td>5703 Technology and Learning Cultures</td>
</tr>
</tbody>
</table>
Master of Arts Degree in Education — Reading and Literacy Concentration

This concentration is designed to provide theory, research, knowledge, and field experiences for students who plan to teach reading and writing. Reading is presented as a linguistic, cognitive, and sociocultural process in relation to other language arts processes such as listening and speaking, with particular emphasis on writing and the writing process. Students select one of two program emphases: instruction or research. The instruction emphasis is designed for teachers and can lead to completion of the requirements for certification as a reading specialist. The research emphasis is designed for students who want to pursue research in reading and writing; students in this emphasis normally pursue the thesis option.

Master of Arts Degree in Education – Special Education Concentration

The Master of Arts Degree in Education with a concentration in Special Education is designed for individuals seeking initial, additional or advanced preparation as educators, counselors, and other professionals in serving individuals with disabilities in a variety of settings. The program is intended to offer students the opportunity to acquire theoretical understanding and classroom/clinical experiences in order to develop and apply effective instructional, habilitation skills and therapeutic practices for working with individuals with disabilities and their families. Graduates of the program go on to, or continue their careers in serving children, youth, and adults with intellectual, scholastic, social, and behavioral disabilities as teachers, supervisors, and administrators in public and private education and service agencies. Applicants who hold a valid Texas teaching certificate may obtain a teaching certificate endorsement in Special Education as a part of their program of study.

COURSE DESCRIPTIONS

CURRICULUM AND INSTRUCTION (C&I)

5003 Theory and Dynamics of Curriculum and Instruction
(3-0) 3 hours credit.
An examination of theoretical structures underlying curriculum considerations and the implications of these for the work of responsible curriculum decision-makers at all levels, including administrators, instructional supervisors, and classroom teachers.

5013 Classroom Instruction and Evaluation
(3-0) 3 hours credit.
Examination of different pedagogical approaches to the teaching and learning process in elementary school, with emphasis on the development of curriculum for classroom instruction, evaluation, organization, and management.

5043 Classroom Management and Motivation
(3-0) 3 hours credit. Prerequisite: Graduate standing.
A detailed investigation of various theories and models of classroom management and motivation. Topics include behavior modification, assertive discipline, control theory, and the concept of the democratic classroom. (Credit can be earned for only one of C&I 5023, C&I 5043, and EDP 5043.)

5403 Instructional Design and Development
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.
The design of instruction. Special attention is given to theory and method of design based on congruence between identified needs and approaches to curriculum development.

5503 Curricula for Preschool and Primary Children
(3-0) 3 hours credit.
A systematic analysis of curricula for preschool and primary-grade children, including a critical study of related objectives, organizational schemes, content teaching strategies, and materials. (Credit cannot be earned for both C&I 5503 and ECE 5503.)
5523  **Metacognitive Thinking and Learning Strategic Across Instructional Domains**  
(3-0) 3 hours credit.  
An analysis of the basis for curriculum planning in early childhood and elementary content areas; consideration of developmental levels, domains of learning, and taxonomies of objectives, with special attention to the role of the teacher and the student, the uses of materials, the classroom environment, and special student populations. (Credit cannot be earned for both ECE 5523 and C&I 5523.)

5603  **Curricula for Elementary School Children**  
(3-0) 3 hours credit.  
A systematic analysis of elementary school curricula. A critical study of the objectives, methods of curricular organization, and content used with elementary school children grades 1-8. (Credit cannot be earned for both C&I 5603 and ECE 5603.)

5673  **Critical Issues in Elementary School Teaching**  
(3-0) 3 hours credit.  
Study of critical issues in the elementary school. Investigation of research, practices, and positions related to special education, bilingual and multicultural education, early childhood education, and other current broad-based social issues.

5703  **Secondary School Curricula**  
(3-0) 3 hours credit.  

5723  **Integrating Reading and the Language Arts**  
(3-0) 3 hours credit.  
Study of reading processes and instructional practices and examination of ways reading can be related to writing, speaking, and listening. Emphasizes development of integrated language arts curriculum and instruction from primary through secondary school.

5743  **Reading in Secondary School**  
(3-0) 3 hours credit.  
Principles and techniques for teaching higher-level reading and comprehension skills to adolescents. Attention to developing reading programs and to literacy learning in various academic subjects in middle and high schools. Strategies for meeting the needs of the wide range of ability levels found in secondary schools.

5753  **Literature for Children**  
(3-0) 3 hours credit.  
Examines the selection and uses of children’s literature in the classroom. Emphasizes literary response and ways to integrate literature into the elementary and secondary school curriculum.

5763  **Diagnosis and Practicum in Reading**  
(3-0) 3 hours credit. Prerequisite: C&I 5723  
Multidisciplinary approach to diagnosis and remediation of reading problems, with special attention to cognitive, sociolinguistic, and emotional factors that may impede learning. Application of diagnostic and remedial procedures with individual children through a guided field-based practicum.

5783  **Survey of Reading Research**  
(3-0) 3 hours credit. Prerequisite: EDU 5003, C&I 5723, C&I 5763.  
A review of past and current literature and research concerning the reading process, curricula, and instructional practice. Opportunity for students to acquire critical analysis skills in evaluating research.
5793 Seminar in Reading Supervision
(3-0) 3 hours credit.
Organization of developmental and remedial reading and writing programs. Selection of appropriate materials. Techniques and procedures for maintaining quality programs, including staff selection and in-service training. The role of research in improving the teaching of reading and writing.

5813 Adult Literacy
(3-0) 3 hours credit.
Examination of the acquisition and development of reading and writing in adult populations. Reviews research and issues relevant to the teaching of reading and writing to adults. (Credit cannot be earned for both C&I 5813 and AHE 5813.)

5823 Reading and Writing Development in Early Childhood
(3-0) 3 hours credit.
Study of the literacy development of young children from birth to the point of acquisition of conventional reading and writing ability. Examines young children's emergent literacy concepts and behaviors and considers ways that early childhood educators can develop appropriate approaches to teaching reading and writing in classroom settings.

5833 Assessment Issues and Practices in Reading
(3-0) 3 hours credit.
Examination of techniques to assess student reading and writing. Considers strengths and weaknesses of assessment tools such as standardized tests, informal observations, and portfolios, and ways educators may best use the results from these approaches to provide appropriate instruction for all students.

5843 Young Adult Literature
(3-0) 3 hours credit.
This course is designed to provide opportunities for students to become familiar with young adult literature and to examine current issues, practices, and perspectives about this field of study.

5853 Study Strategies and Cognitive Processes in Reading
(3-0) 3 hours credit.
Reviews research that examines study strategies and cognitive processes for reading and learning in schools. Focuses on upper elementary-through-college study practices and higher-level reading and thinking. Field experience may be required. (Formerly C&I 5583. Credit cannot be earned for both C&I 5853 and C&I 5583)

5863 Russian Contributions to Literacy, Psychology and Learning
(3-0) 3 hours credit.
Examines the contributions of Russian psychologists to reading and writing, social and cultural development, and special needs of learners. Focuses on contributions of Lev Vygotsky; application of his thinking to contemporary educational, psychological, and social-bicultural issues.

5903 Higher Education Curricula
(3-0) 3 hours credit.
A systematic analysis of higher education curricula. A critical study of objectives, methods of organization, content, methods, and learning materials used with college students. (Credit cannot be earned for both C&I 5903 and C&I 5803.)

6003 Supervision: Theoretical Basis
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.
An application of leadership theory, curriculum development theory, educational planning theory, general learning theory, and theories of adult learning to instructional supervision; an examination of the role of the supervisor. (Credit cannot be earned for both EDL 5003 and C&I 6003.)
6013 Supervision: Teaching-Learning Process
(3-0) 3 hours credit. Prerequisite: C&I 6003 or consent of instructor.
The analysis and application of theories related to the teaching and learning process; study of the principles and practices in the professional development of teachers. (Credit cannot be earned for both C&I 6013 and EDL 6013.)

6023 Supervision: Tools and Techniques
(3-0) 3 hours credit. Prerequisite: C&I 6003 or consent of instructor.
A study of impact strategies in instructional supervision and the development of communication and interpersonal skills needed for working with teachers. (Credit cannot be earned for both C&I 6023 and EDL 6023.)

6303 Advanced Methods in Subject-Matter Fields
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.
Course sections are designed to offer students the opportunity to develop skill in instructional methodology specifically related to and derived from the characteristics of the discipline taught.
• Science
• Mathematics
• Social Studies
• Language Arts
• Foreign Languages
• Physical and Health Education
• Integrated Math/Science
May be repeated for credit when disciplines vary.

6943 Instructional Internship
3 hours credit. Prerequisite: Approval of the Graduate Advisor of Record
Individually supervised full-time field experience in assigned classrooms for one semester. May be repeated for credit.

6953 Independent Study
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

COURSE DESCRIPTIONS
EARLY CHILDHOOD AND ELEMENTARY EDUCATION (ECE)

5123 Seminar in Development in Early Childhood and Infancy
(3-0) 3 hours credit. Prerequisite: EDP 5013 or consent of instructor.
Studies of the results of stimulating sensory equipment in the early years and investigation of insufficient psychological and physiological nourishment. Includes relevant research-suggested practices that may enable future generations to avoid developmental disruptions and alleviate existing developmental handicaps.
<table>
<thead>
<tr>
<th>Course Number</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5133</td>
<td>Language and Discourse Development in Preschool-Primary Children</td>
<td>3</td>
<td>Study of early acquisition and development of language skills. Emphasis on identifying the sequence of normal expressive and receptive language development in terms of the child's related abilities and learning experiences. Language acquisition and discourse in linguistically and culturally diverse children. Identification of atypical patterns of language development.</td>
</tr>
<tr>
<td>5503</td>
<td>Curricula for Preschool and Primary Children</td>
<td>3</td>
<td>Opportunity is provided for a systematic analysis of curricula for preschool and primary grade children, including a critical study of related objectives, organizational schemes, content teaching strategies, and materials. (Same as C&amp;I 5503. Credit cannot be earned for both ECE 5503 and C&amp;I 5503.)</td>
</tr>
<tr>
<td>5513</td>
<td>Materials, Methods, and Techniques in Teaching Early Childhood Education</td>
<td>3</td>
<td>A study of the methodologies and techniques effective in teaching preschool and elementary school children. Participants construct and use materials for teaching at the level of student ability.</td>
</tr>
<tr>
<td>5523</td>
<td>Metacognitive Thinking and Learning Strategies Across Instructional Domains</td>
<td>3</td>
<td>An analysis of the basis for curriculum planning in early childhood and elementary content areas; consideration of developmental levels, domains of learning, and taxonomies of objectives, with special attention to the role of the teacher and the student, the uses of materials, the classroom environment, and special student populations. (Same as C&amp;I 5523. Credit cannot be earned for both ECE 5523 and C&amp;I 5523.)</td>
</tr>
<tr>
<td>6123</td>
<td>Administration of Early Childhood Programs</td>
<td>3</td>
<td>A study of the organization, structure, and operation of early childhood care and education in various contexts, including community child care and public school settings. Investigation of the roles, tasks, and problems related to administration of early childhood programs. Emphasis on national guidelines and recommendations for curriculum and effective practice in inclusive education and other types of early childhood programs.</td>
</tr>
<tr>
<td>6163</td>
<td>Biological Basis of Child Development</td>
<td>3</td>
<td>Analysis of biological and psychological perspectives on child growth and development. Emphasis on theoretical aspects of biopsychological and social factors influencing cognitive and learning functions.</td>
</tr>
<tr>
<td>6183</td>
<td>Seminar in Early Childhood Education in Cross-Cultural Perspective</td>
<td>3</td>
<td>An examination of contrasting strategies of socialization employed by societies around the world, past and present; limit of and alternatives to formal early childhood education in the current Western sense. Readings are drawn from ethnographic and theoretical sources in anthropology, psychology, and education.</td>
</tr>
</tbody>
</table>
6213  **Current Issues in Early Childhood and Elementary Education**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Studies of current issues and problems in preschools and elementary schools and other educational settings.  
Investigation of research, practices, and positions related to the issues studied. Exploration of available models for  
possible solutions or resolution of issues, as well as factors that may have an impact on desired outcomes.

6303  **Advanced Methods in Early Childhood and Elementary Education**  
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.  
Specialized studies in early childhood and elementary education are offered through course section in these areas:  
• Science  
• Mathematics  
• Social Studies  
• Language Arts  
• Fine and Performing Arts  
• Play and Play Environments  
• Nutrition and Health  
• Educational Technology  
May be repeated for credit when curriculum areas vary.

6373  **Specialized Instruction in Early Childhood and Elementary Education**  
(3-0) 3 hours credit. Prerequisite: C&I 5503, ECE 5503, or consent of instructor.  
Identification and description of specialized instruction related to needs of learners, characteristics of subject matter,  
and demands of the learning environment. Analysis and evaluation of specialized instruction designed for specific  
educational settings and individual learners. Emphasis on inclusive education programs using a variety of strategies  
to differentiating instruction for individual children. (Formerly ECE 5473. Credit cannot be earned for both ECE  
6373 and ECE 5473.)

6453  **Assessment and Evaluation in Early Childhood and Elementary Education**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Evaluation and research on student development and learning, educational programs, processes, products,  
instructional objectives, and alternative approaches to attain objectives. A disciplined inquiry into trends and issues in  
assessment and evaluation in early childhood and elementary education.

6473  **Seminar in Elementary Education**  
(3-0) 3 hours credit.  
Examination of the discipline of the subject-field selected (e.g., science, social studies, music), including an intensive  
study of research findings, publications of related professional organizations, and advanced experimentation related  
to teaching and learning situations.

6513  **Advanced Approaches to Interdisciplinary Teaching**  
(3-0) 3 hours credit.  
Review of theory and practice in interdisciplinary teaching and learning in elementary education. Emphasis on  
understanding the conceptual interrelationships of the fields of study in the elementary curriculum.

6523  **Social Policy for Families and Children**  
(3-0) 3 hours credit.  
Examination of social policy and its implications for communities, families and children. Students analyze national,  
state, and local policy for educational settings and investigate local and regional resources for the teaching and  
learning process.

6643  **The Teacher as Researcher**  
(3-0) 3 hours credit. Prerequisite: EDU 5003.  
Application of research concepts and skills to classroom field studies. Participants conduct directed research on  
classroom practice in early childhood and elementary school settings.
6723  **Integrating Technology Across the Early Childhood and Elementary Curriculum**  
(3-0) 3 hours credit.  
An investigation into the design and use of innovative technological tools and instructional techniques across the early childhood and elementary education curriculum. Opportunities for design and use of educational experiences for children incorporating technological innovations. Includes use of technology to customize instruction to meet the individual learning needs of children.

6943  **Instructional Internship**  
3 hours credit. Prerequisite: Approval of the Graduate Advisor of Record.  
Individually supervised full-time field experience in assigned classrooms for one semester. May be repeated for credit.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

### COURSE DESCRIPTIONS

#### INSTRUCTIONAL TECHNOLOGY (IST)

5303  **Technology in Curriculum and Instruction**  
(3-0) 3 hours credit.  
A study of emerging instructional technologies and innovative curriculum resources. Focus is on the design, application, and evaluation of resources as they can be applied to educational settings. (Formerly C&I 5303. Credit cannot be earned for both IST 5303 and C&I 5303.)

5313  **New Media Design**  
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.  
An overview of assessment and measurement techniques, tools, and philosophies as they apply to current and developing applications of technology in learning environments. (Formerly C&I 5313. Credit cannot be earned for both IST 5313 and C&I 5313.)

5343  **Instructional Design Theory**  
(3-0) 3 hours credit. Prerequisite: C&I 5003 or consent of instructor.  
An investigation of theories, principles, and processes of instructional design including their application to instructional product development. (Formerly C&I 5343. Credit cannot be earned for both IST 5343 and C&I 5343.)

5353  **Instructional Technology and Learning**  
(3-0) 3 hours credit.  
Investigation of how theories of knowing and learning are reflected in and supported by technology. Focus on current learning and detaching theories and how these relate to applications in technology delivered and supported learning environments.
5363 Distance Learning
(3-0) 3 hours credit.
Examination of the application of tools, resources, and strategies to support, deliver, and enhance technology-supported curriculum. Students actively engage in online activities as they identify and plan a curriculum.

5383 Technology Training and Management in Educational Systems
(3-0) 3 hours credit.
The dynamic nature of technology development and innovation requires strategies to ensure service populations are informed and skilled. This course will review models of technology, professional development, issues of change and technology adoption, and policy issues.

5703 Technology and Learning Cultures
(3-0) 3 hours credit.
An overview of historical developments in technology and how their influences have affected the way that technology has been used for teaching and learning. Particular attention will be paid to issues regarding culture, gender, and diversity. (Formerly EDU 5703. Credit cannot be earned for both IST 5703 and EDU 5703).

6353 Multimedia Production
(3-0) 3 hours credit.
The design and development of new media instructional applications/programs. Includes an overview of both design and development principles and processes used to produce multimedia/new media prototypes. Can be taken in addition to MUS 6353. (Formerly C&I 6353. Credit cannot be earned for both IST 6353 and C&I 6353.)

6373 Evaluation of Educational Technology Trends
(3-0) 3 hours credit.
An overview of evaluation approaches, techniques, tools, and philosophies as they apply to current and future applications of technology in educational environments.

6503 Advanced Topics in Instructional Technology
(3-0) 3 hours credit. Prerequisite: IST 5303 or consent of instructor.
Course develops skills in instructional technology related to and derived from the characteristics of the topics.
• Action Research
• Technology Systems in Education
• Distance Learning
• Leadership, Project Management and Assessment
May be repeated for credit when topics vary. (Formerly C&I 6503. Credit cannot be earned for both IST 6503 and C&I 6503.)

6953 Independent Study
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course that offers graduate students the opportunity to engage in specialized study not normally or not often available as part of the program’s regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours regardless of discipline, will apply to the Master’s degree.
COURSE DESCRIPTIONS
SPECIAL EDUCATION
(SPE)

5403 Exceptional Children and Youth in the Schools
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An introduction to and survey of the field of special education for general and special education teachers and students in related fields of study. The course focuses on characteristics, etiology, definition, and prevalence of exceptional children; description of available services; field experiences. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5413 Children and Youth with Mental Retardation
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.
This course presents the opportunity for special education teachers, counselors and students in related fields of study to acquire knowledge and skills associated with contemporary theories and practices used in the assessment, diagnosis, and treatment of individuals with mild-to-profound mental retardation in school and community settings. Trends and research in education of students with mental retardation are studied. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5433 Children and Youth with Behavior Disorders
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.
Presents opportunities for general and special education teachers, counselors, and students in related fields of study to obtain an understanding of various theories and practices used in the identification, treatment, and education of behavior disorders. Research on the education of children and adolescents with behavior disorders, as well as practical implications for the classroom teacher and school counselor are emphasized. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5443 Conference and Consultative Skills in Special Education
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.
This course presents the opportunity for general and special education teachers, counselors, and students in related fields of study to acquire knowledge and skill working with parents, teachers, and other professionals to optimize the educational and therapeutic experiences of exceptional children and youth. Students plan, implement, and evaluate a series of parent conferences, staff development, and consultative activities. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5453 Children and Youth with Learning Disabilities
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.
This course presents a study of the incidence, prevalence, etiology, and characteristics of the student with learning disabilities (LD) for general and special education teachers, counselors and students in related fields. This relationship between LD, child development, school environment, and academic performance are studied. Emphasis is on a critical analysis of instruction and assessment techniques used with this population. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5503 Applied Behavior Analysis for Classroom Teachers and Counselors
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.
This course presents principles and procedures of applied behavior analysis and classroom management for teachers, counselors, and students in related fields of study to facilitate the acquisition and improvement of social, academic, and life skills of children and youth with disabilities. Requires an applied project. (Formerly EDP 5423. Credit may not be earned for both EDP 5423 and SPE 5503.)
5513  **Curriculum and Instructional Applications for Children and Youth in Special Education**  
(3-0) 3 hours credit. Prerequisite: SPE 5403, SPE 5533, or consent of instructor.  
Provides the opportunity for general and special education teachers, counselors, and students in related fields to engage in the analysis of curriculum planning and implementation of a variety of instructional methods, procedures, and strategies appropriate for the implementation of mandated Individual Family Service Plans, Individual Education Programs, and Individual Transition Plans for children and youth with disabilities. (Formerly EDP 6203. Credit may not be earned for both SPE 5513 and EDP 6203.)

5523  **Language Development and Cognitive Intervention for Individuals with Disabilities**  
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.  
This course provides an opportunity for general and special education teachers, counselors, and students in related fields of study to acquire knowledge and skills for assisting individuals identified as mildly to moderately disabled to achieve communicative competence through language acquisition and remedial and corrective interventions. Emphasis is on addressing the language and literacy development needs (listening, speaking, reading, writing, mathematics) of individuals with learning and behavior disabilities. (Formerly EDP 5463. Credit may not be earned for both SPE 5523 and EDP 5463.)

5533  **Assessment and Evaluation of Children and Youth with Disabilities**  
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.  
Offers students in education, special education, counseling, and related fields of study the opportunity to develop knowledge and skills in selection, administration, and interpretation of instruments and procedures to evaluate individuals with disabilities. Emphasis is on assessment techniques, instruments, and procedures relevant to the education of disabled children and youth. (Formerly EDP 5553. Credit may not be earned for both SPE 5533 and EDP 5553.)

5573  **Behavior Analysis and Intervention for Children and Youth with Severe/Profound Disabilities**  
(3-0) 3 hours credit. Prerequisite: SPE 5403 or consent of instructor.  
This course presents general and special education teachers, counselors, and students in other related fields, the opportunity to learn and apply principles and procedures of behavior analysis and intervention for the acquisition and improvement of skills by children and youth with severe and profound disabilities. An applied behavior analysis project is required. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

5793  **Practicum in Special Education: Children and Youth with Mild/Moderate Disabilities**  
(3-0) 3 hours credit. Prerequisites: SPE 5403 and consent of instructor.  
This course focuses on the application of theoretical principles to field settings. Students are required to develop, implement, and evaluate educational programs for children and youth with mild-to-moderate disabilities. (Formerly EDP 5563 and EDP 5793. Credit may not be earned for both SPE 5793 and EDP 5563 or EDP 5793.)

5893  **Practicum in Special Education: Behavior Disorders**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
This course focuses on the application of theoretical principles to field settings. The student works in educational settings to plan, implement, and evaluate appropriate experiences with children and youth exhibiting emotional and/or behavior disorders. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction a faculty member. The course is intended for students needing specialized work not normally, or not often available as part of the program's regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of the discipline, will apply to the Master's degree.
6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course that offers graduate students the opportunity to engage in specialized study not normally or not often available as part of the program's regular course offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours regardless of discipline, will apply to the Master's degree. (Credit cannot be earned for both a SPE course and an EDP course with the same number in an earlier catalog.)

COURSE DESCRIPTIONS  
SECONDARY EDUCATION  
(SED)

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, may be counted toward the Master's degree.

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but no more than 6 hours, regardless of discipline, may be counted toward the Master's degree.

COURSE DESCRIPTIONS-DOCTORAL LEVEL  
CURRICULUM AND INSTRUCTION  
(C&I)

7003  **Technology in Curriculum and Instruction**  
(3-0) 3 hours credit.  
Advanced study of modern instructional technologies with special emphasis on their use in educational settings. Consideration of distance-learning procedures and their implications for curriculum planning and supervision.

7013  **Advanced Methods in Subject-Matter Fields**  
(3-0) 3 hours credit.  
Advanced investigation of teaching procedures and the relationship of supervisors, administrators, and curriculum designers with instructors. Course may be offered as a general course or subject area sections may be offered as listed.  
•Science  
•Mathematics  
•Social Studies  
•Language Arts  
•Foreign Languages  
•Physical and Health Education  
May be repeated for credit when disciplines vary.
COURSE DESCRIPTIONS-DOCTORAL LEVEL
INSTRUCTIONAL LEADERSHIP
(ILR)

7113 Paradigms in Instructional Leadership
(3-0) 3 hours credit. Prerequisite: LDR 7133.
Pluralistic alternatives and advanced approaches in instructional leadership, including research related to models of
instruction and student achievement, frameworks for identifying and analyzing models of teaching, and decision
making.

7123 Cases in Instructional Development and Reform
(3-0) 3 hours credit. Prerequisite: LDR 7183.
Examines historical developments in instruction and schooling and the results. Focuses on social, achievement, and
cultural criteria for evaluating curricular effects and factors in positive curriculum developments.

7203 Leadership in Curriculum Development
(3-0) 3 hours credit.
An examination of processes related to the facilitation and management of curricular innovation and delivery systems
in varied educational settings including school systems, higher education, and other human service institutions.

7643 Advanced Research on Instruction
(3-0) 3 hours credit. Prerequisite: ILR 7123 or consent of instructor.
Design and development of advanced research studies on classroom instruction. Participants conduct directed
research into critical issues of classroom practice.

7773 Independent Study
3 hours credit. Prerequisites: Doctoral standing and permission in writing (form available) of the instructor and the
student's Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students
needing specialized work as part of the regular course offerings. May be repeated for credit, but no more than 6 hours
will apply to the doctoral degree.

7783 Special Problems
(3-0) 3 hours credit. Prerequisites: Doctoral standing and consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often part of the regular course
offerings. Special Problems courses may be repeated for credit when topics vary, but no more than 6 hours will apply
to the doctoral degree.

7893 Doctoral Research
3 hours credit. Prerequisite: Admission to candidacy for the Doctoral degree.
May be repeated for credit, but no more than 6 hours may be applied to the doctoral degree.
Photo - College of Engineering
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COLLEGE OF ENGINEERING

Graduate programs in engineering include the Master of Science in Civil Engineering, the Master of Science in Electrical Engineering, the Master of Science in Mechanical Engineering, and the Doctor of Philosophy in Electrical Engineering. These programs offer opportunities for advanced study and research designed to prepare students for leadership roles in engineering careers with industry, government, or educational institutions. A thesis option is recommended for students who are planning a career in research or who contemplate pursuing a doctorate in one of the engineering disciplines. A nonthesis option is also available for students who desire a practical industrial applications-oriented degree.

Civil engineering includes programs of study in structures, environmental sciences, systems, solid mechanics, and materials. Electrical engineering includes programs of study in signal processing, digital systems, communications, instrumentation, and control systems. Mechanical engineering includes programs of study in thermal and fluid systems, mechanical systems and design, solid mechanics, materials, biomechanics, and biomaterials.

A Doctor of Philosophy Degree in Electrical Engineering offers an in-depth and integrated study focused in one of the following areas: communications, signal and image processing, digital systems, and control.

The implementation of a Doctor of Philosophy Degree in Biomedical Engineering is targeted for Fall 2003 pending Coordinating Board approval. Updates will be posted on the Graduate Studies website (www.utsa.edu/graduate). Student inquiries should be directed to Dr. C. Mauli Agrawal, College of Engineering Dean's Office.

A limited number of assistantships and fellowships are available to qualified students. Financial assistance is awarded on a competitive basis.

COURSE DESCRIPTIONS

ENGINEERING

(EGR)

5013 Analytic Techniques in Engineering Analysis
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering or consent of instructor. Advanced methods of applied mathematics, including linear algebra, vector differential calculus, integral theorems, differential equations, and calculus of variations.

5023 Numerical Techniques in Engineering Analysis
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering or consent of instructor. Advanced methods of applied mathematics, including numerical linear algebra, initial value problems, stability, convergence, partial differential equations, and optimization.

5093 Special Topics in Engineering Analysis
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering or consent of instructor. A comprehensive treatment of advanced methods of applied mathematics needed for the study of advanced courses in engineering. May be repeated for credit as topics vary.

5113 Advanced Engineering Economic Analysis
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering. Examination of the factors required to transform technological innovations into products. Elements of business planning are examined through a case-study approach.
5213 **Topics in Systems Modeling**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering.  
Systems analysis approach to formulating and solving engineering problems. Topics include operational research,  
mathematical modeling, optimization, linear and dynamic programming, decision analysis, and statistical quality  
control.  
Topic 1: Applied Operations Research. Application of operations research methods to practical engineering  
problems.  
Topic 2: Engineering Systems Modeling. Modeling of modern engineering systems for operational and management  
control.  
May be repeated for credit as topics vary.

5233 **Advanced Quality Control**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering or consent of instructor.  
Methods and techniques for process control, process and gage capabilities, inspection plans, American National  
Standard, and recent advanced techniques. Tour of manufacturing industry. Case studies in process control, outgoing  
quality, and costs. A project, assigned by a manufacturing company, is required, along with a final presentation of the  
project.

5613 **New and Emerging Technologies**  
(3-0) 3 hours credit.  
Examines entrepreneurial and managerial perspectives on the process of technology innovation. Design is the  
organizing concept used to study the continuum from idea to sale of products and services that are spawned by  
innovators using new and emerging technologies. Seminar format, case-study preparation, presentation, and  
cooperative learning are defining characteristics of this course.

5623 **Issues in Engineering Management**  
(3-0) 3 hours credit.  
Examines issues facing managers of technology in terms of their implications for people. The context is the cycle  
from conception to use/disposal of products and services. The framework for analysis and synthesis is ecological,  
historical, and institutional. Seminar format, issue paper preparation and presentation, and cooperative learning are  
defining characteristics of this course.

5633 **Technological Foundations of Management of Technology**  
(3-0) 3 hours credit.  
This course examines the activities used to transform viable products and processes. Project planning and  
management, incorporating fundamentals of engineering economic analysis, are examined via case analysis. Explicit  
consideration is given to “green design” within a systems context. Design is used as the rubric to integrate the  
activities.
DEPARTMENT OF CIVIL ENGINEERING

Master of Science Degree in Civil Engineering

The Master of Science degree in Civil Engineering is designed to provide civil engineering professionals with the opportunity to prepare for careers concerned with the critical problems of a multifaceted society. Civil engineering education and research activities focus on projects that are typically large and costly, with potentially profound environmental, social, and financial impacts.

Both a thesis and a nonthesis option are available.

Program Admission Requirements. In addition to the University-wide graduate admission requirements for unconditional admission, applicants must satisfy the following:

- a satisfactory score, as specified by the Graduate Program Committee for Civil Engineering, on the Graduate Record Examination (GRE)
- an undergraduate degree in civil engineering or a closely related field from an accredited institution of higher education, or proof of equivalent training at a foreign institution
- a favorable recommendation by the Master of Science in Civil Engineering Admissions Committee.

A student who does not qualify for unconditional admission may be admitted on a conditional basis as determined by the Master of Science in Civil Engineering Admissions Committee.

Degree Requirements. The minimum number of semester credit hours required for the degree, in addition to any conditional course requirements, is 33 semester credit hours for the nonthesis option and 30 semester credit hours for the thesis option. At least 24 semester credit hours must be taken at UTSA. Each candidate is required to pass a comprehensive examination and/or a thesis defense administered by his or her advisory committee, which is chaired by a full-time graduate faculty member.

Degree requirements:

<table>
<thead>
<tr>
<th>Thesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree Core Courses (Substitutions must be approved by the student’s advisory committee)</td>
<td>6</td>
</tr>
<tr>
<td>CE 5413 Topic 3: Advanced Civil Engineering Design</td>
<td></td>
</tr>
<tr>
<td>CE 5813 Risk and Decision Analysis in Civil Engineering</td>
<td></td>
</tr>
<tr>
<td>Electives chosen from courses offered by the College of Engineering</td>
<td>18</td>
</tr>
<tr>
<td>Thesis</td>
<td>6</td>
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<tr>
<td>Total semester credit hours required</td>
<td>30</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Nonthesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree Core Courses (Substitutions must be approved by the student’s advisory committee)</td>
<td>6</td>
</tr>
<tr>
<td>CE 5413 Topic 3: Advanced Civil Engineering Design</td>
<td></td>
</tr>
<tr>
<td>CE 5813 Risk and Decision Analysis in Civil Engineering</td>
<td></td>
</tr>
<tr>
<td>Electives chosen from courses offered by the College of Engineering</td>
<td>24</td>
</tr>
<tr>
<td>CE 5973 Special Project</td>
<td>3</td>
</tr>
<tr>
<td>Total semester credit hours required</td>
<td>33</td>
</tr>
</tbody>
</table>
COURSE DESCRIPTIONS
CIVIL ENGINEERING
(CE)

5113  Advanced Structural Analysis
(3-0) 3 hours credit. Prerequisite: CE 3113 or an equivalent.
Moment distribution, force-deformation relations, stiffness matrix method, prismatic and nonprismatic members,
flexibility method, beam column, frame stability, and inelastic effects.

5123  Advanced Structural Design
(3-0) 3 hours credit. Prerequisite: CE 3113, 3213, 3233, or an equivalent.
Structural behavior, design of trusses, funicular structures; cables and arches; members in bending and compression;
continuous structures; plate and grid structures; membrane and pneumatic structures; structural systems; and
constructional approaches.

5213  Industrial Waste Treatment
(3-0) 3 hours credit. Prerequisite: CE 3633 or consent of instructor.
Survey of industrial wastewater characteristics, biological, chemical and physical treatment processes, selection of
appropriate processes, and design principles.

5223  Solid Waste Engineering
(3-0) 3 hours credit. Prerequisite: CE 3633 or consent of instructor.
Basic concepts in planning, designing, and operating solid waste systems, with emphasis placed on state-of-the-art
technology and the interrelationship of economic, environmental, and institutional aspects.

5233  Topics in Water Quality Control
(3-0) 3 hours credit. Prerequisite: CE 3633 or an equivalent.
Topic 1: Physical and Chemical Treatment Operations. Physical and chemical unit operations for water and
wastewater treatment, with emphasis on treatment process combinations for drinking water supply.
Topic 2: Biological Treatment Operations. Application of principles of biological processes, fluid dynamics, and
process engineering to define and solve water and wastewater treatment problems.
Topic 3: Stream Sanitation. Biological impact of pollution on the ecosystems of rivers and streams.
Topic 4: Groundwater Pollution Control. Control approach and transport mechanisms of pollutants in different types
of aquifers.
May be repeated for credit as topics vary.

5243  Topics in Environmental Monitoring and Analysis
(2-3) 3 hours credit. Prerequisites: CHE 1303 and CE 3633.
Topic 1: Methods of Environmental Monitoring and Measurement. Functions, terminology, method development,
and QA/QC for drinking, ground, and wastewater analysis; soil analysis; and air sampling and analysis, including
EPA methods and industrial application.
Topic 2: Unit Process for Water Quality Control. Laboratory and pilot plant studies of physical, chemical, and
biological processes for the treatment of wastewaters and sludges.
May be repeated for credit as topics vary.

5273  Hazardous Material Control
(3-0) 3 hours credit. Prerequisite: CE 3663 or consent of instructor.
Analysis of advanced or specialized hazardous waste treatment methods. Emphasis on physical, chemical, and
biological processes in treatment of hazardous wastes and processing of treatment residuals. Definitions of problems
and objectives and evaluation of alternatives for special cases. Development of concepts for preliminary process
design. Design-oriented class project and field trips.
5313  **Topics in Water Resource Engineering**  
(3-0) 3 hours credit. Prerequisite: CE 3713 or an equivalent.  
Topic 1: Water Resources Systems Engineering. Applications of engineering systems and analysis techniques to the design of water systems.  
Topic 2: Application of water quantity and water quality modeling in water resources planning.  
Topic 3: Advanced Surface Water Hydrology. Statistical analysis of hydrologic data, frequency analysis of extreme events, maximum probable precipitation and floods, watershed hydrology, and hydrologic time series.  
Topic 4: Advanced Hydraulic Engineering. Open-channel flow, sediment transport, and hydraulics for special structures.  
Topic 5: Special Topics in Water Resources. Irrigation engineering, coastal engineering, conjunctive use, regime theories, universal soil loss equation, and other selected topics.  
May be repeated for credit as topics vary.

5323  **Topics in Construction Management**  
(3-0) 3 hours credit. Prerequisite: Graduate standing.  
Topic 1: Large Project Management. Large engineering project implementation and optimization of manpower, schedule, and material.  
Topic 2: Urban Project Management. Application of engineering fundamentals and analysis to urban construction activities.  
Topic 3: Site Cleanup and Remediation. Methods of cleanup and remediation of industrial and hazardous waste sites.  
Topic 4: Forensic Engineering. Construction responsibilities, risks, and quality control.  
May be repeated for credit as topics vary.

5333  **Topics in Dynamics of Structures**  
(3-0) 3 hours credit. Prerequisites: Graduate standing and consent of instructor.  
Topic 1: Dynamics of Structures. Fundamentals of structural dynamics; single- and multiple-degrees-of-freedom structural systems; lumped and distributed parameters systems; undamped and damped motions; and response to general dynamic loading.  
Topic 3: Design of Structures for Dynamic Loads. Static equivalent load design vs. dynamic load design, design of structures for general dynamic loading, seismic design of reinforced concrete and masonry buildings, and base isolation design.  
Topic 4: Stability of Structures. Concepts of stability of structures; buckling of columns, beams, beam-columns, rigid frames, and plates; flexural-torsional buckling of columns and beams; design for buckling; and energy and numerical methods.  
May be repeated for credit as topics vary.

5343  **Topics in Structures**  
(3-0) 3 hours credit. Prerequisites: Graduate standing and consent of instructor.  
Topic 1: Earthquake Engineering. Earthquake characteristics, seismic loads, elastic and inelastic response, analysis and design of buildings for earthquakes.  
Topic 3: Prestressed Concrete. Theory, advantages, and limitations; various systems of prestressing.  
Topic 4: Advanced Steel Design. Analysis and design of bolted and welded connections under eccentric and combined loads, stiffened and unstiffened connections, continuous beam-to-column connections, and design of steel buildings.  
Topic 5: Design of Shell Structures. Analysis and design of cables, arches, plates, folded plates, domes, shell roofs, and shell walls.  
Topic 6: Masonry Design. Material properties; masonry block properties; design of masonry beams, columns, walls, joints, retaining walls, and highrise buildings; construction techniques.


May be repeated for credit as topics vary.

5353 Topics in Geotechnical Engineering
(3-0) 3 hours credit. Prerequisites: CE 3413, graduate standing, and consent of instructor.

Topic 1: Advanced Soil Mechanics. A study of soil constitutive behavior and testing, including nonlinear elastic hyperbolic models, incremental plasticity, soil chemistry, shear strength, and consolidation theory. Soil testing includes triaxial tests, the direct shear test, and consolidation tests.

Topic 2: Advanced Foundation Engineering. A study of foundation engineering design, including excavation slopes and retaining walls, cofferdams, sheetpile walls, caissons, drilled shafts, piles, settlement control methods, engineered fills, and foundations on expansive soils.

Topic 3: Soil and Site Improvement. A study of techniques available to improve poor soils and marginal construction sites, including lime stabilization, stone columns, deep dynamic compaction, geogrid reinforcement, geotextiles, slurry walls, grouting, construction dewatering, wick drains, and HDPE liners.

Topic 4: Soil Dynamics and Foundation Vibrations. A study of single- and multiple-degree-of-freedom systems, foundation analogs, dynamic soil testing and field measurements, vibration isolation, foundation design, and liquefaction site assessment.

May be repeated for credit as topics vary.

5413 Topics in Civil Engineering
(3-0) 3 hours credit. Prerequisites: Graduate standing and consent of instructor.

Topic 1: Civil Engineering Project Analysis. Planning, implementation, control, and evaluation methods for special civil engineering projects.

Topic 2: Advanced Civil Engineering Technology Transfer. Civil engineering technology development and transfer for real-world problems.

Topic 3: Advanced Civil Engineering Design. Project-oriented design course involving advanced civil engineering knowledge and other engineering expertise.

Topic 4: Topics in Geotechnical Engineering. Advanced soil mechanics, advanced geotechnical engineering, soil mechanics theory, advanced soil testing, soil dynamics, and earthquake engineering.

May be repeated for credit as topics vary.

5513 Topics in Transportation Engineering
(3-0) 3 hours credit. Prerequisite: Graduate standing.

Topic 1: Transportation Systems Design. Multimode transportation networks and systems design methods.

Topic 2: Urban Transit. Planning and implementation of mass transit systems, airports, streets, and highways to satisfy the needs of urban residents and urban-based businesses.

Topic 3: Urban Transportation Engineering. Traffic studies, scheduling and routing, design and construction; economic and environmental impacts.


Topic 5: Pavement Design. Design and analysis of pavement structural systems.


May be repeated for credit as topics vary.

5813 Risk and Decision Analysis in Civil Engineering
(3-0) 3 hours credit. Prerequisite: EGR 3713 or equivalent.

Perspective of risk assessments, risk estimation, event tree analysis, fault tree analysis, risk classifications, risk acceptability, probabilistic modeling, anatomy of risks with revealed preference method, decisions under uncertainties, utility theory, multiattribute utility functions, and case studies.
5923  **Topics in Air Pollution Control**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor. 
Topic 1: Air Quality Monitoring and Analysis. Measurement and monitoring methods, including various laboratory and process development procedures. 
Topic 2: Air Pollution Control Design. Design principles for pollution control equipment for both gaseous and particulate emissions. 
Topic 3: Air Resources. Various types and characteristics of industrial air emissions; survey and control approach. May be repeated for credit as topics vary. 

5973  **Special Project**  
3 hours credit. Prerequisite: Permission in writing (form available) from the instructor and the student’s Graduate Advisor of Record. 
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree. 

5991  **Graduate Seminar**  
(1-0) 1 hour credit. Prerequisites: Graduate standing and consent of instructor. 
May be repeated for credit up to a limit of 2 credit hours. 

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record. 
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree. 

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the Civil Engineering Graduate Program Committee to take the Comprehensive Examination. 
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated for credit as many times as approved by the Civil Engineering Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination). 

6971-3  **Special Problems**  
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor. 
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, may be applied to the Master’s degree. 

6983  **Master’s Thesis**  
3 hours credit. Prerequisite: Consent of the Graduate Advisor of Record and thesis director. 
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
Master of Science Degree in Electrical Engineering

The Master of Science degree in Electrical Engineering is designed to offer students the opportunity to prepare for leadership roles in careers with industry, government, or educational institutions. A thesis option is offered for students who want the opportunity to obtain some expertise in research. A nonthesis option is available for students who want a practical industrial applications-oriented degree.

Program Admission Requirements. In addition to the University-wide graduate admission requirements, admission decisions will be based on a combination of the following:

1. a satisfactory score, as specified by the Electrical Engineering Graduate Studies Committee, on the Graduate Record Examination (GRE)
2. a bachelor’s degree in Electrical Engineering from an ABET-accredited institution of higher education or related field
3. a minimum grade point average of 3.0 in the last 60 hours

A student who does not qualify for unconditional admission may be admitted on a conditional basis as determined by the Electrical Engineering Graduate Studies Committee. Applicants with an electrical engineering background who wish to continue their education but do not intend to pursue the Master of Science degree in Electrical Engineering are encouraged to seek admission as special graduate students.

Degree Requirements. The degree requirements for different options are as follows:

A. The following five core courses form the basis for the program:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 5123</td>
<td>Computer Architecture</td>
</tr>
<tr>
<td>EE 5143</td>
<td>Linear Systems and Control</td>
</tr>
<tr>
<td>EE 5153</td>
<td>Random Signals and Noise</td>
</tr>
<tr>
<td>EE 5163</td>
<td>Digital Signal Processing</td>
</tr>
<tr>
<td>EE 5183</td>
<td>Foundations of Communication Theory</td>
</tr>
</tbody>
</table>

B. The requirements for each option, with minimum semester-credit-hour requirements and their distribution, are as follows:

<table>
<thead>
<tr>
<th>Thesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses (any three)</td>
<td>9</td>
</tr>
<tr>
<td>Additional graduate electrical engineering courses*</td>
<td>9</td>
</tr>
<tr>
<td>Electives (may be courses from outside electrical engineering)*</td>
<td>6</td>
</tr>
<tr>
<td>EE 6983 Master’s Thesis</td>
<td>6</td>
</tr>
<tr>
<td>EE 5991 Graduate Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Minimum total semester credit hours required 31

<table>
<thead>
<tr>
<th>Nonthesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses (any four)</td>
<td>12</td>
</tr>
<tr>
<td>Additional graduate electrical engineering courses*</td>
<td>15</td>
</tr>
<tr>
<td>Electives (may be courses from outside electrical engineering)*</td>
<td>6</td>
</tr>
<tr>
<td>EE 5991 Graduate Seminar</td>
<td>1</td>
</tr>
</tbody>
</table>

Minimum total semester credit hours required 34

*Chosen with approval of the Electrical Engineering Graduate Program Committee
Degree plans must be consistent with the guidelines established by the Electrical Engineering Graduate Program Committee. In addition to other University-wide requirements for the Master’s degree, candidates are required to pass a comprehensive examination and/or a thesis defense administered by the student’s advisory committee, chaired by a tenured or tenure-track graduate faculty member.

**Doctor of Philosophy Degree in Electrical Engineering**

The Department of Electrical Engineering offers advanced coursework integrated with research leading to the Doctor of Philosophy degree in Electrical Engineering. The program has emphases in Signals and Systems (communications, signal processing, digital systems, and control). The Ph.D. in Electrical Engineering will be awarded to candidates who have displayed an in-depth understanding of the subject matter and demonstrated the ability to make an original contribution to knowledge in their field of specialty.

The regulations for this degree comply with the general University regulations (refer to Chapter 3, General Academic Regulations, and Chapter 5, Doctoral Degree Regulations).

**Admission Requirements.** The minimum requirements for admission to the Doctor of Philosophy in Electrical Engineering degree program are as follows:

- Normally, a student must hold a Master’s degree before being granted admission to the program. Some exceptionally talented students may enter the Doctor of Philosophy program directly upon receiving a Bachelor’s degree in Electrical Engineering, with the special approval of the Electrical Engineering Doctoral Studies Committee.

- Applicants without a Master’s degree program must have a grade point average (GPA) of 3.3 or better in the last 60 hours of undergraduate coursework in Electrical Engineering.

- Applicants with a Master’s degree must have a GPA of 3.3 or better in their Master’s degree program. Applicants with a Master's degree in Electrical Engineering or in a related field may apply a maximum of 30 hours of previously earned graduate credit toward their doctoral degree. Each student’s transcript will be evaluated by the Doctoral Studies Committee and credit will be designated on a course-by-course basis to satisfy the formal coursework requirements of the degree. A maximum of six hours credit may be awarded for a Master’s thesis.

- A satisfactory score, as specified by the Doctoral Studies Committee for Electrical Engineering, is required on the GRE General Aptitude Test. Students whose native language is not English must achieve a minimum score of 550 on the Test of English as a Foreign Language (TOEFL). If an applicant's performance on a standardized test is used for that purpose, it will be considered with other criteria when making an admissions or competitive scholarship decision and will not be used as the sole criterion for consideration of the applicant or as the primary criterion to end consideration of the applicant.

- Letters of recommendation, preferably three, attesting to the applicant's readiness for doctoral study.

A complete application includes the application form, official transcripts, letters of recommendation, GRE scores, a résumé, a statement of research experience, interests, and goals, and the TOEFL score for those applicants whose native language is not English. Admission is competitive. Satisfying these requirements does not guarantee admission.

**Degree Requirements and Program of Study.** Typical doctoral studies will consist of 90 hours beyond the Bachelor’s degree or 60 hours beyond the Master's degree. Undergraduate courses, general education courses, and prerequisites for graduate courses cannot be counted toward this total. The hours are divided as follows:

- a. Courses required of all students in the proposed program 9
- b. Elective courses prescribed for those students 24
- c. Courses freely elected by students 21
d. Electrical engineering research:
   either doctoral research plus master's thesis (6+12)
   or doctoral research only 18
   Doctoral dissertation 18

Total 90

9 semester credit hours of Required Courses selected from the following:

EE 5123 Computer Architecture
EE 5143 Linear Systems and Control
EE 5153 Random Signals and Noise
EE 5163 Digital Signal Processing
EE 5183 Foundations of Communication Theory

24 semester credit hours of Prescribed Elective Courses selected from the following:

EE 5223 Topics in Digital Design
EE 5243 Topics in Control Systems
EE 5263 Topics in Digital Signal Processing and Digital Filtering
EE 5283 Topics in Communication Systems
EE 5323 VLSI Design
EE 5343 Intelligent Control and Robotics
EE 5363 Digital Image Processing
EE 5383 Digital Information Theory
EE 5423 Topics in Computer Architecture
EE 5443 Discrete-Time Control Theory and Design
EE 5463 Artificial Neural Networks
EE 5483 Probabilistic Coding Theory
EE 6323 Advanced Topics in Computers
EE 6343 Advanced Topics in Control
EE 6363 Advanced Topics in Signal Processing
EE 6383 Advanced Topics in Communications
EE 6951-3 Independent Study
EE 6971-3 Special Problems
EE 7423 VLSI for Signal Processing
EE 7443 Nonlinear Control Systems
EE 7463 Pattern Analysis and Machine Vision
EE 7483 Communication Networks

21 semester credit hours of Free Electives

Students may select free electives from the courses listed above, and from approved graduate courses in Mathematics, Statistics, Computer Science, Physics, and other Engineering disciplines. At least two courses must be from outside of Electrical Engineering. Sample courses in related fields are described below.

EGR 5093 Special Topics in Engineering Analysis
CS 6513 Advanced Architecture
CS 6593 Advanced Topics in Distributed Systems
CS 6643 Parallel Processing
MAT 5293 Numerical Linear Algebra
MAT 5313 Algebra II
MAT 5403 Functional Analysis
ME 5143 Advanced Dynamics  
ME 5173 Nonlinear Systems  
STA 5103 Applied Statistical Methods  
STA 5253 Applied Time Series Analysis  
STA 5513 Mathematical Statistics II  

Electrical Engineering Research (18 Hours):  

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>EE 6961</td>
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Doctoral Dissertation (18 hours):  

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<th>Course Code</th>
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<tbody>
<tr>
<td>EE 7993-6</td>
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</tbody>
</table>

The entire program of study must be approved by the student’s dissertation advisor, dissertation committee, and doctoral studies committee and must be submitted to the Dean of Graduate Studies for final approval. The courses are intended to focus and support the individual’s mastery of his or her particular area of expertise.

**Advancement to Candidacy.** All students seeking a doctoral degree at UTSA must be admitted to candidacy. One of the requirements for admission to candidacy is passing a doctoral qualifying examination. Students should consult the University's Doctoral Degree Regulations for the other requirements.

**Qualifying Examination.** The qualifying examination is divided into written and oral portions.

*Written Portion of the Qualifying Examination.* Prior to taking the written examination, the student must have a Program of Study on file. The written portion of the doctoral qualifying examination is scheduled near the end of the Fall and Spring semesters. Students wishing to take the examination must submit their request in writing to the Doctoral Advisor of Record by the fourth week of that semester. Normally, the written examination is taken in the Fall semester of the student’s second year. Students who fail their first attempt at the written examination are allowed to make a second attempt on the next written examination. No more than two attempts to pass the written examination are permitted.

Students must select and pass three examinations from the five areas corresponding to the five core courses in the graduate program. One of the three examinations must be from the area of specialization declared on the student's Program of Study. The Doctoral Studies Committee will select two Electrical Engineering faculty members per section to write the examination sections.

*Oral Portion of the Qualifying Examination.* The oral examination must be taken within one year after passing the written portion of the qualifying examination. No more than two attempts to pass the oral examination are permitted.

A four member Oral Examination Committee, chaired by the student’s Supervising Professor, conducts the oral examination. A written dissertation proposal should be submitted to the student’s Oral Examination Committee at least two weeks before the oral presentation. The format of the oral examination consists of a public presentation of the student’s dissertation proposal, followed by a period of questioning by the Committee based on the proposal and on relevant background from the student’s Program of Study. Unanimous approval of the Oral Examination Committee is required to pass the oral examination. After the student passes both the written and oral portions of the doctoral qualifying examination, he or she is admitted to candidacy. Admission into the doctoral program does not guarantee advancement to candidacy.

**Final Oral Dissertation Defense.** After admission to candidacy, the next steps are writing the dissertation and passing the final oral defense. The final oral defense is administered and evaluated by the student’s Dissertation Committee and covers the dissertation and the general field of the dissertation. The final oral defense consists of a public presentation of the dissertation, followed by a closed oral defense. The Dissertation Committee must unanimously approve the dissertation.
COURSE DESCRIPTIONS
ELECTRICAL ENGINEERING (EE)

5123 Computer Architecture
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Description of digital computer systems, arithmetic algorithms, central processor design, memory hierarchies and virtual memory, control unit and microprogramming, input and output, coprocessors, and multiprocessing.

5143 Linear Systems and Control
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Advanced methods of analysis and synthesis of linear systems, continuous and discrete-time systems, analytical approach to linear control theory.

5153 Random Signals and Noise
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Study of probability theory, random processes, mean and autocorrelation, stationarity and ergodicity, Gaussian and Markov processes, power spectral density, noise, and linear systems.

5163 Digital Signal Processing
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Study of discrete-time signals and systems, including Z-transforms, fast Fourier transforms, and digital filter theory. Filter design and effects of finite register length, and applications to one-dimensional signals.

5183 Foundations of Communication Theory
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor; EE 5153 suggested.
Basis functions, orthogonalization of signals, vector representation of signals, optimal detection in noise, matched filters, pulse shaping, intersymbol interference, maximum likelihood detection, channel cutoff rates, error probabilities, bandwidth, and power-limited signaling.

5213 Topics in Instrumentation
(2-3) 3 hours credit. Prerequisites: EE 4453 or an equivalent, and EE 5153.
Topics may include the following:
Topic 2: Automatic Test Equipment. Techniques and standards for ATE; VXIbus, IEEE-488, and SCPI.
Topic 3: Virtual Instruments. Implementation of VI as collection of instrumentation resources.
Topic 4: Silicon Instruments. Techniques for fabricating sensors and signal processing elements into integrated systems.
May be repeated for credit as topics vary.

5223 Topics in Digital Design
(3-0) 3 hours credit. Prerequisite: EE 5123 or consent of instructor.
Topics may include the following:
Topic 1: Graph Theory and Networking. Introduction to graphs and digraphs, applications of graphs, Eulerian and Hamiltonian graphs, connectivity, trees, planar graphs, decomposition problems; graph models for electrical and communications networks and computer architectures; communications network application examples, analysis and design.
Topic 2: FPGA and HDL. Fundamental digital systems principles. HDL modeling concepts and styles: structural, RTL, and behavioral modeling styles; modeling for synthesis and verification; modeling combinatorial logic circuits; modeling synchronous logic circuits; modeling finite state machines; testbench developments; performance estimation and improvement.
Topic 3: Microcomputer-Based Systems. 8- and 16-bit microprocessors, bus timing analysis, interfacing principles, LSI and VLSI chip interfacing, use of software development tools such as assemblers, compilers, and simulators, and hardware development tools including logic analyzer.
Topic 4: Low Power VLSI Design. Hierarchy of limits of power, sources of power consumption, voltage scaling approaches; circuit, logic, architecture and system level power optimization; power estimation; advanced techniques for power optimization.

Topic 5: PCI System Design. Understanding PCI specifications including protocol, electrical, mechanical, and timing. Study the protocol for high-speed, high-bandwidth data throughput. Designing a PCI-based system design and implementing in FPGA.

May be repeated for credit as topics vary.

5243  **Topics in Control Systems**  
(3-0) 3 hours credit. Prerequisite: EE 5143.  
Topics may include the following:  
Topic 2: Multivariable Control Systems. Analysis and design of multivariable feedback systems, stability, performance, and robustness. Techniques may include LQG, Youla parameterization, and Nyquist-like methods.  
Topic 3: Optimal Control. Optimal and suboptimal techniques for controller design using the principle of optimality, min-max principles, and induced norm minimization.  
May be repeated for credit as topics vary.

5263  **Topics in Digital Signal Processing and Digital Filtering**  
(3-0) 3 hours credit. Prerequisite: EE 5163 or consent of instructor.  
Topics may include the following:  
Topic 1: Nonlinear Filters. Order statistic filters, morphological filters, stack/Boolean filters, and other related topics.  
Topic 3: Applications of DSP. Remote sensing, biomedical image analysis, underwater acoustics, video compression and processing, and analysis of biological signals.  
Topic 4: Computer Vision. Image perception, parallel and sequential edge detection in the visual system, shape from shading, stereo vision, image segmentation by textural perception in humans, chain codes, B-splines, 3-D representations.  
May be repeated for credit as topics vary.

5283  **Topics in Communication Systems**  
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.  
Topics may include the following:  
Topic 1: Mobile Communications. Multipath-fading channels, diversity reception, the rake receiver, coding for fading channels, cellular networks, traffic capacities, multiaccessing schemes, spread spectrum signaling and code division multiple access, correlation receivers, and multiuser receiver methods.  
Topic 3: Algebraic Coding Theory. Groups and fields, linear codes, hamming distance, cyclic codes, minimum distance bounds, BACH codes and algebraic decoding, Reed Solomon (R) codes, Reed-Muller codes and maximum likelihood decoding, suboptimal decoding, and applications of coding.  
Topic 4: Probabilistic Coding Theory. Channel capacity, convolutional codes (CC), coding and decoding of CCs, structure of CCs, distance and performance bounds, trellis coded modulation, suboptimum receivers, and advanced topics.  
Topic 5: Computer and Communications Networks. Introduction to networks. Transmission media, interfaces, and protocols are addressed. Topics include local area networks, wide-area networks, internetworking, multiple access methods and service integration. ATM and wireless networks will be explored.  
May be repeated for credit as topics vary.
5323 VLSI Design  
(3-0) 3 hours credit. Prerequisite: EE 5123 or consent of instructor.
Analysis and design of integrated devices such as Diode, BJT, and MOSFET. Design of LSI and VLSI digital and analog systems incorporating low-level devices and standard libraries. Trade-offs of various fabrication processes. Design automation and verification. Design and verification using VLSI system design tools such as Mentor Graphics, OCTTOOLs, MAGIC, and SPICE.

5343 Intelligent Control and Robotics  
(3-0) 3 hours credit. Prerequisite: EE 5143.

5363 Digital Image Processing  
(3-0) 3 hours credit. Prerequisite: EE 5163 or consent of instructor.
Study of binary image processing; histogram and point operations; algebraic and geometric image operations; 2-D digital Fourier transforms; convolution; linear and nonlinear filtering; morphological filters; image enhancement; linear image restoration (deconvolution); digital image coding and compression; and digital image analysis.

5383 Digital Information Theory  
(3-0) 3 hours credit. Prerequisite: EE 5183.
Entropy and mutual information; Huffman coding; Tunstall coding; Shannon’s source coding theorem; channel coding theorems; channel capacity; block coding error bounds; random coding bounds; cutoff rate; multiuser information theory; random access channels and protocols; multiaccess coding methods.

5423 Topics in Computer Architecture  
(3-0) 3 hours credit. Prerequisite: EE 5123 or consent of instructor.
Topic 1: Parallel and Distributed Computing. Multiprocessor and multicomputer systems, shared-memory and distributed memory systems, exploitation of parallelism, data partitioning and task scheduling, multiprocessor system interconnects, message passing and data routing, parallel programming.
Topic 2: RISC Processor Design, RISC concept, RISC versus CISC, RISC advantages and disadvantages, various processor survey and applications, study of software development tools: assemblers compilers, simulators, RISC implementations.
Topic 3: Superscalar Microprocessor Architecture, Definition of superscalar, superpipelined, and VLIW processors; available parallelism in programs; branch prediction techniques; memory systems for superscalar processors; trace caches; memory disambiguation and load/store recording; performance evaluation techniques; multimedia extensions in superscalar processors.
Topic 4: Fault Tolerance and Reliable System Design. Reliability and availability techniques, maintainability and testing techniques, evaluation criteria, fault-tolerant computing, fault-tolerant multiprocessors, design methodology for high reliability systems.
Topic 5: Computer Arithmetic. Fundamental principles of algorithms for performing arithmetic operations in digital computers. Number systems, fast implementations of arithmetic operations and elementary functions, design of arithmetic units using CAD tools.
May be repeated for credit as topics vary.

5443 Discrete-Time Control Theory and Design  
(3-0) 3 hours credit. Prerequisite: EE 5143.
Control theory relevant to deterministic and stochastic analysis and design of computer-controlled systems using both state-space and input-output models.
5463 Artificial Neural Networks  
(3-0) 3 hours credit. Prerequisite: EE 5163 or consent of instructor. 
Study of parallel optimization algorithms using Hopfield networks, perceptrons, backpropagation competitive systems, and other unsupervised techniques.

5483 Probabilistic Coding Theory  
(3-0) 3 hours credit. Prerequisite: EE 5183. 
Groups and rings, convolutional codes, probabilistic maximum-likelihood decoding, bandwidth efficient coding, trellis coded modulation (TCM), lattices and coset codes, trellis decoding of block codes, intersymbol interference channels, and reduced-complexity decoding.

5991 Graduate Seminar  
(1-0) 1 hour credit. Prerequisites: Graduate standing and consent of instructor. 
The grade report for the course is either “CR” (satisfactory performance) or “NC” (unsatisfactory performance).

6323 Advanced Topics in Computers  
(3-0) 3 hours credit. Prerequisite: Consent of Graduate Advisor of Record and dissertation director. 
Current topics in the computer area. May be repeated for credit as topics vary.

6343 Advanced Topics in Control  
(3-0) 3 hours credit. Prerequisite: Consent of Graduate Advisor of Record and dissertation director. 
Current topics in the control area. May be repeated for credit as topics vary.

6363 Advanced Topics in Signal Processing  
(3-0) 3 hours credit. Prerequisite: Consent of Graduate Advisor of Record and dissertation director. 
Current topics in the signal processing area. May be repeated for credit as topics vary.

6383 Advanced Topics in Communications  
(3-0) 3 hours credit. Prerequisite: Consent of Graduate Advisor of Record and dissertation director. 
Current topics in the communications area. May be repeated for credit as topics vary.

6951-3 Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record. 
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961 Comprehensive Examination  
1 hour credit. Prerequisite: Approval of the Electrical Engineering Graduate Program Committee to take the Comprehensive Examination. 
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated for credit as many times as approved by the Electrical Engineering Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems  
(1-0, 2, 0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor. 
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, may be applied to the Master’s degree.
6983 Master’s Thesis
3 hours credit. Prerequisite: Consent of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

6991 Research Seminar
1 hour credit.
Required for all Ph.D. students to satisfy one year of research seminar.

7423 VLSI for Signal Processing
(3-0) 3 hours credit. Prerequisite: EE 5123.
VLSI applications in signal processing and telecommunications. General purpose DSP architecture. ASIC architectures: systolic arrays, data-flow multiprocessing, wavefront arrays. Case histories: modems, echo cancellers, digital PLL, etc. High-speed arithmetic and algorithms.

7443 Nonlinear Control Systems
(3-0) 3 hours credit. Prerequisite: EE 5143.
Nonlinear systems modeling, existence and uniqueness of solutions. Stability of nonlinear systems: phase-plane analysis, input-output methods, and Lyapunov stability. Control of nonlinear systems: gain scheduling, feedback linearization, Lyapunov-based design, and applications to physical systems.

7463 Pattern Analysis and Machine Vision
(3-0) 3 hours credit. Prerequisite: EE 5163.
Image formations, early vision, binary machine vision, 2-D representation, 3-D representation, image segmentation, statistical pattern recognition, and knowledge-based vision.

7483 Communication Networks
(3-0) 3 hours credit. Prerequisite: EE 5183.

7953 Doctoral Research
3 hours credit. Prerequisites: Ph.D. student standing and consent of instructor and the Graduate Advisor of Record. May be repeated for a maximum credit of 18 hours.

7993-6 Doctoral Dissertation
3 to 6 hours credit. Prerequisite: Consent of the Doctoral Advisor of Record and Dissertation Advisor. May be repeated for a maximum credit of 18 hours.
Master of Science Degree in Mechanical Engineering

The Master of Science program in Mechanical Engineering is designed to offer students the opportunity to prepare for leadership roles in careers with industry, government, or educational institutions. A thesis option is offered for research-oriented students. A nonthesis option is available for students who prefer a practice-oriented degree in engineering.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, admission will be based on a combination of factors: a Bachelor's degree in mechanical engineering (or a closely related field) from an accredited institution of higher education, or proof of equivalent education at a foreign or unaccredited institution, satisfactory performance on the Graduate Record Examination (GRE), and satisfactory undergraduate grade point average (GPA) in engineering coursework.

An applicant may be admitted on a conditional basis as determined by the Master of Science in Mechanical Engineering Admission Committee. Applicants with a degree in a discipline other than mechanical engineering may be required to make up the deficiencies in the undergraduate mechanical engineering curriculum. Courses listed as deficiencies do not count toward the graduate degree.

Applicants with a mechanical engineering background who wish to continue their education but do not intend to pursue a Master of Science degree in Mechanical Engineering are encouraged to seek admission as special graduate students.

Degree Requirements. The minimum number of semester credit hours required for the degree, excluding required coursework to remove admission deficiencies, is 30 for the thesis option and 33 for the nonthesis option.

A. Degree candidates must complete any two courses selected from the following list of core courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>ME 5113</td>
<td>Selected Topics in Control Engineering</td>
</tr>
<tr>
<td>ME 5143</td>
<td>Advanced Dynamics</td>
</tr>
<tr>
<td>ME 5243</td>
<td>Advanced Thermodynamics</td>
</tr>
<tr>
<td>ME 5413</td>
<td>Foundations of Solid Mechanics</td>
</tr>
<tr>
<td>ME 5613</td>
<td>Advanced Fluid Mechanics</td>
</tr>
</tbody>
</table>

B. Degree candidates must complete the following course requirements for one of the degree options:

<table>
<thead>
<tr>
<th>Thesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses (any two)</td>
<td>6</td>
</tr>
<tr>
<td>Designated electives (with approval of the student’s committee chair)</td>
<td>18</td>
</tr>
<tr>
<td>ME 6983 Master’s Thesis</td>
<td>6</td>
</tr>
<tr>
<td>Minimum total semester credit hours required</td>
<td>30</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Nonthesis Option</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core courses (any two)</td>
<td>6</td>
</tr>
<tr>
<td>Designated electives (with approval of the student’s committee chair)</td>
<td>24</td>
</tr>
<tr>
<td>ME 5973 Special Project</td>
<td>3</td>
</tr>
<tr>
<td>Minimum total semester credit hours required</td>
<td>33</td>
</tr>
</tbody>
</table>
In addition to the coursework and other University requirements for the Master’s degree, candidates must pass a thesis or special project defense administered by the student’s advisory committee, chaired by a full-time graduate faculty member. A successful defense satisfies the University’s comprehensive examination requirement.

Degree-seeking students must select a major advisor and a graduate advisory committee (with a minimum of three members) in the first 12 hours of graduate coursework. The chair of the student’s advisory committee, who must be a full-time member of the graduate faculty, is the student’s primary advisor. Within the first 12 hours of graduate coursework, degree candidates must meet with the committee chair to develop a degree plan for their program of study. New students who have not selected a graduate advisory committee should seek advice from the Graduate Advisor of Record on course selection during the first semester.

COURSE DESCRIPTIONS
MECHANICAL ENGINEERING
(ME)

5013 Topics in Mechanical Engineering
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering or consent of instructor.
Current topics in Mechanical Engineering. May be repeated for credit as topics vary.

5113 Selected Topics in Control Engineering
(3-0) 3 hours credit. Prerequisite: ME 4523 or an equivalent.
State variable control principles of controllability, observability, stability, state feedback, observer, discrete-time systems, pulse width modulation (PWM) control, Kalman filter, discrete-time control implementation issues, multi-input multi-output (MIMO) control, various nonlinear controls.

5143 Advanced Dynamics
(3-0) 3 hours credit. Prerequisite: ME 3103 or an equivalent.
Review of Newtonian mechanics, 3-D particle kinematics, dynamics of a system of particles, analytical mechanics, Lagrange’s equations, kinematics and rigid-body dynamics, Eulerian angles, computational analysis using a symbolic language.

5153 Structural Dynamics
(3-0) 3 hours credit. Prerequisite: ME 3103 or an equivalent.
Matrix methods for analysis of dynamics of complex structures, computer solutions, systems identifications, and experimental model analysis.

5173 Nonlinear Systems
(3-0) 3 hours credit. Prerequisite: ME 3103 or an equivalent.

5183 Mechanical Vibrations
(3-0) 3 hours credit. Prerequisite: ME 3103 or an equivalent.

5243 Advanced Thermodynamics
(3-0) 3 hours credit. Prerequisite: ME 3293 or an equivalent.
Concepts and postulates of macroscopic thermodynamics; formulation or thermodynamic principles; stability of thermodynamic systems.
5303 **Advanced Heat and Mass Transfer**  
(3-0) 3 hours credit. Prerequisite: ME 4313 or an equivalent.  
Derivation of energy and mass conservation equations with constitutive laws for conduction, convection, radiation, and mass diffusion. Dimensional analysis, heat exchangers, boiling and condensation, steady and transient solutions.

5333 **Conduction**  
(3-0) 3 hours credit. Prerequisite: ME 4313 or an equivalent.  
Derivation of governing equations, steady and transient solutions, variable property effects, numerical methods.

5343 **Convection**  
(3-0) 3 hours credit. Prerequisite: ME 4313 or an equivalent.  
Derivation of equations of convection of mass, momentum, and energy; scale analysis; boundary layer solutions; classical, laminar convection problems; turbulent convection.

5353 **Radiation**  
(3-0) 3 hours credit. Prerequisite: ME 4313 or an equivalent.  
Thermal radiation laws; geometric factors, black bodies; gray enclosures; nongray systems; combined conduction, convection, and radiation.

5413 **Foundations of Solid Mechanics**  
(3-0) 3 hours credit. Prerequisite: ME 3813 or an equivalent.  
Variational mechanics, energy methods, elementary viscoelastic/plastic problems, and wave propagation. (Formerly EGR 5543. Credit cannot be earned for both ME 5413 and EGR 5543)

5453 **Advanced Strength of Materials**  
(3-0) 3 hours credit. Prerequisite: ME 3813 or an equivalent.  
Analysis of stress and strain, two-dimensional problems in elasticity, failure theories, bending, torsion, elastic stability, and energy methods. (Formerly EGR 5553. Credit cannot be earned for both ME 5453 and EGR 5553)

5463 **Fracture Mechanics**  
(3-0) 3 hours credit. Prerequisite: ME 3813 or an equivalent.  
Modeling of linear elastic, elastic-plastic, time-dependent and dynamic crack problems, including both mathematical foundations and experimental determination of fracture toughness of engineering materials. (Formerly EGR 5313, Credit cannot be earned for both ME 5463 and EGR 5313)

5473 **Viscoelasticity**  
(3-0) 3 hours credit. Prerequisite: ME 3813 or an equivalent.  
Principle of fading memory, integro-differential constitutive laws, mechanical models, time and temperature superposition, and linear and nonlinear methods. Applications to polymers, composites, and adhesives. (Formerly EGR 5323, Credit cannot be earned for both ME 5463 and EGR 5323)

5513 **Advanced Mechanism Design**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering.  
Advanced topics in kinematic synthesis of linkage, static and dynamic force analyses, and computer-aided design of mechanisms.

5533 **Advanced Machine Design**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering.  
Advanced problems in machine design, including bearings, brakes and clutches, gears, shafts, springs; advanced stress analysis.
5543 Probabilistic Engineering Design
(3-0) 3 hours credit. Prerequisite: STA 2303 or an equivalent.
Stochastic methods in mechanical engineering design; probability density generation, probabilistic analysis, and random processes.

5553 Advanced Design of Cams and Gears
(3-0) 3 hours credit. Prerequisite: Graduate standing in engineering.
Advanced problems in design of cam follower systems; gear trains and spur, helical, bevel, and worm gears.

5613 Advanced Fluid Mechanics
(3-0) 3 hours credit. Prerequisite: ME 3663 or an equivalent.
Dynamics of incompressible fluid mechanics viscous flow; Navier-Stokes equations; boundary layer theory; and numerical operations for incompressible fluid flow.

5633 Gas Dynamics
(3-0) 3 hours credit. Prerequisite: ME 3663 or an equivalent.
Integral and differential forms of the conservation equations, one-dimensional flow, oblique shock and expansion waves, and supersonic, transonic, and hypersonic flows.

5643 Boundary Layer Theory
(3-0) 3 hours credit. Prerequisite: ME 3663 or an equivalent.
Viscous flow, integral and differential equations of motion, and exact and numerical solutions for laminar and turbulent flows.

5653 Computational Fluid Dynamics
(3-0) 3 hours credit. Prerequisite: ME 3663 or an equivalent.
The mathematical models for fluid-flow simulations at various levels of approximation, basic description techniques, and the nature of flow equations and their boundary conditions.

5683 Advanced Design of Thermal and Fluid Systems
(3-0) 3 hours credit. Prerequisites: ME 3663 and ME 4313 or their equivalents.
Development of energy systems, power systems, and the mechanics of combustion.

5713 Mechanical Behavior of Materials
(3-0) 3 hours credit. Prerequisite: ME 3243 or an equivalent.
Mechanical behavior of engineering materials (metals, alloys, ceramics, and polymers) elasticity, dislocation theory, strengthening mechanism, fracture, fatigue, creep, and oxidation.

5743 Composite Materials
(3-0) 3 hours credit. Prerequisites: ME 3243 and ME 3813 or their equivalents.
Introduction to mechanics of composites, micromechanics, macromechanics, lamination theory, design, and applications of fiber-reinforced composites and particulate composites. (Formerly EGR 5413, Credit cannot be earned for both ME 5473 and EGR 5413)

5813 Biomaterials
(3-0) 3 hours credit. Prerequisite: ME 3243 or an equivalent.
Fundamentals in applications of biomaterial science and engineering principles and concepts to repairing, replacing, and protecting human tissues and organs.

5823 Mechanical Behavior of Living Tissues
(3-0) 3 hours credit. Prerequisites: ME 3243 and ME 3813 or their equivalents.
Stress-strain relationships, viscoelasticity, mechanical properties, and mechanical modeling of collagenous and mineralized human tissues.
5833 Biomechanics
(3-0) 3 hours credit. Prerequisites: ME 3243, ME 3663 and ME 3813 or their equivalents.
Fundamentals in applications of engineering mechanics to studying and modeling fluid flow, tissue, organ, and whole body of humans.

5973 Special Project
3 hours credit. Prerequisite: Permission in writing (form available) from the instructor and the Graduate Advisor of Record.
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

5991 Graduate Seminar
(1-0) 1 hour credit. Prerequisites: Graduate standing and consent of instructor.
May be repeated for credit up to a limit of 2 hours.

6951-3 Independent Study
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the Mechanical Engineering Graduate Program Committee to take the Comprehensive Examination.
Independent study for the purpose of taking the Comprehensive Examination. May be repeated for credit as many times as approved by the Mechanical Engineering Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6971-3 Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized studies not normally available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, may be applied to the Master’s degree.

6983 Master's Thesis
3 hours credit. Prerequisite: Consent of the Graduate Advisor of Record and primary thesis advisor.
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
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Photo – College of Liberal and Fine Arts
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Master of Arts Degree in Anthropology

The Master of Arts program in Anthropology emphasizes the anthropology of North and Middle America. Students, in conjunction with faculty, may design their programs on the anthropology of North or Middle America, with a focus on the subdisciplines of archaeology or cultural anthropology. Faculty expertise lies in the archaeology of the Maya region; the archaeology of Texas, the American Southwest, and northern Mexico; the cultural anthropology of Texas and the Plains; ethnography and applied anthropology of Mexico and the United States; and medical anthropology of the Border region.

Program Admission Requirements. Applicants must submit both the University-wide graduate application and the Anthropology supplementary application. The supplementary application is available from the Office of Graduate Studies, the Graduate Advisor of Record, or the Anthropology Web Page (http://www.colfa2.utsa.edu/ant). Complete applications will include a 500-word statement of purpose and two letters of recommendation. Applicants for admission as degree-seeking students must meet University-wide admission requirements and submit Graduate Record Examination (GRE) scores. These scores will be considered only as one element in the evaluation of applicants.

Applicants for admission as degree-seeking students will be evaluated on the basis of letters of recommendation, undergraduate academic record, statement of purpose, and GRE test scores. A degree-seeking applicant admitted to the program may receive unconditional, conditional, or probationary admission status.

Applicants for admission as non-degree-seeking students (special graduate students or non-degree-seeking graduate students) need not submit GRE scores but should have completed at least 12 semester credit hours in anthropology (with no more than 6 of the 12 in field school) before application. Non-degree-seeking students may be limited in the courses they are permitted to take. Admission as a non-degree-seeking student does not ensure subsequent admission as a degree-seeking student.

Applicants who are able to visit the UTSA campus are encouraged to meet with the department’s Graduate Advisor of Record and members of the anthropology faculty.

Degree Requirements. The minimum number of semester credit hours required for this degree is 33 (with thesis) or 36 (without thesis). In addition to the University’s general requirements for graduate study and any coursework or other study required as a condition of admission, the Master of Arts degree in Anthropology requires the following:

A. 9 semester credit hours of required basic courses:
   - ANT 5023 History, Method, and Theory of Archaeology
   - ANT 5033 Paradigms of Americanist Anthropology
   - ANT 5073 Advanced Biological Anthropology

B. 3 semester credit hours from one of the following methods courses, depending on the student’s interest area:
   - ANT 5513 Seminar in Analytical Methods in Archaeology
   - ANT 6353 Field Research Methods in Cultural Anthropology

C. 15 semester credit hours of elective courses chosen in consultation with the student’s advisor and subject to the following conditions:
   1. Students will normally take a minimum of 9 semester credit hours of electives in regular, organized graduate anthropology courses (this excludes fieldwork, independent studies, and internships).
2. Students are expected to develop a primary regional expertise. Knowledge of this region will be evaluated as part of the comprehensive evaluation (see below). In addition, students must take at least one other course focusing on a second region. This course may be in a subdiscipline other than that of the student's main interest.

D. Although there is no program-wide language proficiency requirement, certain programs of study require students to demonstrate proficiency in a second language or in statistics. Students should consult their advisors regarding this matter.

E. A written comprehensive examination, tailored to the student's program and area of concentration, is required. The comprehensive examination will be taken no later than nine months after the completion of the required coursework. Satisfactory performance on the comprehensive examination is required for advancement to Option I or Option II.

F. Option I (with thesis). 6 semester credit hours of ANT 6983 Master's Thesis.

or

Option II (without thesis). 9 semester credit hours of coursework. Students seeking this option must petition the Anthropology Graduate Program Committee. Normally, permission is granted only on presentation of evidence that the student has previously done scholarly work equivalent to that required in a Master's thesis. Such evidence would be a scholarly contribution of monograph length, reflecting in-depth research on a topic. A major published article or monograph may potentially meet these requirements.

### COURSE DESCRIPTIONS

**ANTHROPOLOGY**

**(ANT)**

5023 **History, Method, and Theory of Archaeology**

(3-0) 3 hours credit.

A survey of the history and development of archaeology, research techniques, and method and theory of prehistoric research. May be repeated for credit with different instructors.

5033 **Paradigms of Americanist Anthropology**

(3-0) 3 hours credit.

This course surveys the main conceptual, methodological, and theoretical developments in cultural anthropology, with particular emphasis on their application to the study of indigenous peoples of the Americas.

5043 **Seminar in Laboratory Methods in Anthropology**

(3-0) 3 hours credit.

This seminar reviews the physical and technical aspects of analysis of anthropological materials. May be repeated for credit when topics vary.

5053 **Seminar in Economic Anthropology**

(3-0) 3 hours credit.

Economic anthropology is the comparative study of the organization of production, distribution, and consumption, and the values and meanings associated with those activities. This course provides an overview of the history, scope, and development of economic anthropology, including formalist, substantivist, and Marxist approaches. Ethnographic cases are used to examine economies across different levels of complexity and to explore how anthropologists have described preindustrial and industrial economies.

5073 **Advanced Biological Anthropology**

(3-0) 3 hours credit.

An intensive review of the history of biological anthropology and current developments in method and theory. Topics will be drawn from the four major areas of biological anthropology: genetics and evolutionary theory, human variation and adaptation, primatology, and paleoanthropology.
5283  **Hunters and Gatherers**  
(3-0) 3 hours credit.  
A study of the major issues archaeologists address concerning the cultural ecology and cultural evolution of hunters and gatherers around the world.

5413  **Seminar in the Prehistory of Texas and Adjacent Areas**  
(3-0) 3 hours credit.  
Intensive study of prehistoric and early historic aboriginal cultures of Texas and adjacent areas. Focus is on problems of interpretation, current archaeological research of the region, and the impact of federal legislation on Texas archaeology.

5453  **Seminar on the Archaeology of the American Southwest and Adjacent Regions**  
(3-0) 3 hours credit.  
Review of the major prehistoric cultures of the American Southwest, including the Anasazi, Mogollon, and Hohokam cultural regions and adjacent areas. Emphasis is on current research.

5473  **Settlement Pattern Analysis**  
(3-0) 3 hours credit.  
This course explores the wide array of data and theories used to identify and explain the patterned distribution of human activity. Archaeology’s dependence on settlement pattern data is underscored, and the relationships between data and theory are critically evaluated.

5513  **Seminar in Analytical Methods in Archaeology**  
(3-0) 3 hours credit.  
Basic quantitative and qualitative approaches to the analysis and interpretation of archaeological field and laboratory data are reviewed.

5546  **Current Technological Applications in Archaeology**  
(6-0) 6 hours credit.  
Students will be exposed to the application of current computer-related technologies to archaeology, such as Global Positioning Systems, Total Stations, and/or Geographic Information Systems.

5556  **Field Course in Archaeology**  
(2-12) 6 hours credit. Prerequisite: Consent of instructor.  
The opportunity for advanced training in field procedures and their applications to problem-oriented field research. May be repeated for credit.

5723  **Seminar in Evolution and Human Behavior**  
(3-0) 3 hours credit.  
This seminar focuses on how anthropologists and scholars in related fields approach the relationship between culture change and biological evolution. Topics include the evolution of the capacity for culture in hominids, human evolutionary ecology, and competing models of cultural evolution.

5733  **Seminar in Primate Behavioral Ecology**  
(3-0) 3 hours credit.  
This course draws from current literature in primate behavioral ecology. Topics include kinship and dominance, feeding competition, mating strategies, and social organization. The contribution of primate studies to understanding human evolution is considered. May be repeated for credit when topics vary.

6113  **Seminar in the Anthropology of Mesoamerica**  
(3-0) 3 hours credit.  
Attention is centered on a limited number of significant problems in Mesoamerican anthropology to which materials from archaeology, ethnology, and ethnohistory contribute. Examples of such problems are demography and the rise of Mayan civilization, roots of Mesoamerican peasant culture, and distribution analysis of cultural and language variance. May be repeated for credit when topics vary.
6133 Seminar in Medical Anthropology
(3-0) 3 hours credit. Prerequisite: ANT 3173 recommended.
Course focuses on a limited number of significant problems in medical anthropology to which materials from
ethnohistory, archaeology, ethnology, paleopathology, and cultural ecology contribute. Topics may include
interaction of genetic and cultural influences and health consequences of technological change. May be repeated for
credit when topics vary.

6203 Seminar in Recent Trends in Archaeological Method and Theory
(3-0) 3 hours credit.
A survey of major issues in archaeological method and theory. Attention is focused on recent methodological and
theoretical developments in archaeology. May be repeated for credit with different instructors.

6213 Topics in the Anthropology of Native North America
(3-0) 3 hours credit.
An organized course examining topics of current interest to anthropologists with a focus on North America. May be
repeated for credit.

6223 The Archaeology of Household and Residence
(3-0) 3 hours credit.
This course examines the data, methods, and theories used to reconstruct the composition and activities of domestic
groups. The relevance of household studies in archaeology is stressed through inspection of the economic, political,
and ideological links between domestic groups and broader social formations.

6303 Seminar in Research Design and Proposal Writing
(3-0) 3 hours credit.
This course familiarizes students with the philosophical foundations of social science research, the structure and
types of research designs, and pragmatic considerations of data acquisition and analysis. The relationship between
theory and research design and methods is emphasized. The final project is a thesis research proposal.

6353 Field Research Methods in Cultural Anthropology
(3-0) 3 hours credit.
The study and practice of field research methods of cultural anthropology emphasizing participant observation and
use of informants.

6443 Supervised Field Research
(0-9) 3 hours credit. Prerequisite: Consent of instructor.
The course is designed to offer the opportunity for intensive training and requires the student to carry out independent
research and analysis of field data. The grade report for the course is either “CR” (satisfactory performance) or “NC”
(unsatisfactory performance). May be repeated for credit.

6503 Seminar in Cultural Resource Management
(3-0) 3 hours credit.
This seminar reviews the legislative basis, practical application, and current state of cultural resource management in
Texas and the United States.

6931-3 Internship in Anthropology
1 to 3 hours credit.
A supervised experience, relevant to the student’s program of study, within selected community organizations. Must
be taken on a credit/no credit basis, but not more than 6 hours will apply to the Master’s degree.
**6951-3 Independent Study**
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

**6961 Comprehensive Examination**
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

**6971-3 Special Problems**
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary.

**6981-3 Master’s Thesis**
1 to 3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF ART AND ART HISTORY

Master of Fine Arts Degree in Art

The Master of Fine Arts (M.F.A.) degree in Art is the terminal degree in the field of studio art. UTSA is an accredited institutional member of the National Association of Schools of Art and Design. The emphasis of the M.F.A. program is on conceptual development and its harmony with formal aesthetic and art historical considerations. The objective of the degree is to provide advanced study in the field of art in preparation for a career as a practicing artist, in higher education, or as a professional in other art enterprises.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, applicants are expected to have a Bachelor of Fine Arts degree or a Bachelor of Arts degree with a major in art or the equivalent. As part of their undergraduate degree, students must have completed a minimum of 45 semester credit hours in studio art and 15 semester credit hours in art history.

Application Materials. In addition to filing the regular University application for admission, all applicants must submit to the Department of Art and Art History for evaluation 20 slides (35mm) of their most current work, a statement describing the objectives of proposed graduate study, three letters of recommendation, and unofficial copies of transcripts from all college-level coursework that included art and art history classes. Interested individuals should contact the Graduate Art Advisor at (210) 458-4352 to request an application packet.

Application Materials Deadline. The slides, statement, letters of recommendation, and unofficial transcripts are to be sent to the Graduate Art Advisor in the Department of Art and Art History.

For Fall Semester enrollment: April 1
For Spring Semester enrollment: November 1

Notification: Although admission is not official until the Office of Graduate Studies sends notification, the Department Office will ordinarily notify the applicant of the art faculty’s recommendation regarding admission into the M.F.A. program by May 1 (for fall application) or by December 1 (for spring application). Applicants should notify the Graduate Advisor of their decision to enroll by May 15 and December 15 respectively.

Note: Due to the format of studio laboratory art courses, auditing is not permitted.

Degree Requirements. A minimum of 60 semester credit hours is required for the Master of Fine Arts degree, exclusive of coursework or other study required to remove admission deficiencies. Full-time enrollment of 9 or more semester credit hours during regular semesters is expected of degree-seeking students. In addition to satisfying all University-wide requirements, M.F.A. students must pass the first semester review of their progress for continuation in the M.F.A. program. Other qualifying examinations may be required. Courses in which a grade of “C” or lower is earned will not count toward the minimum 60 hours required for the M.F.A. degree.

Candidates for the degree must complete the following:

A focused program of studio art in the student’s major field including Graduate Studio Seminar 30 hours
Art electives outside the student’s area of focus or major field 12 hours
Free elective 3 hours
Art history and criticism including AHC 5123 12 hours
ART 6843 Master of Fine Arts Exhibition 3 hours
COURSE DESCRIPTIONS

ART

(ART)

5153 Painting
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
The exploration of painting’s broad capacity for conceptual and formal inquiry. May be repeated for credit.

5253 Drawing
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
Drawing joins knowledge and imagination with the investigation of materials, ideas, and imagery. May be repeated for credit.

5353 Printmaking
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
Emphasis on intaglio, lithography, monotype, relief, and photo processes in black and white and color. Experimentation in processes and imagery is encouraged. May be repeated for credit.

5453 Photography
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
Emphasis on the medium as an art form, including black and white, color, and nonsilver processes. May be repeated for credit.

5553 Sculpture
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
Emphasis on the creative development of sculptural ideas in a variety of materials and technical methods and approaches. May be repeated for credit.

5753 Ceramics
(0-6) 3 hours credit. Prerequisite: B.F.A. or equivalent.
Emphasis on the discipline as an expressive art form, using a variety of technical processes and materials and approaches to ceramics. May be repeated for credit.

6013 Practicum in the Visual Arts
3 hours credit. Prerequisite: Consent of instructor.
Students participate in projects on an individual basis. These may include community-oriented activities such as workshops for community centers, special art programs for public or private educational organizations, service projects for displays, murals and exhibitions for special environments, or supervised assistance in instructional activities. The instructor supervises and evaluates the student’s activities. May be repeated once for credit.

6023 Graduate Studio Seminar
(0-6) 3 hours credit. Prerequisite: Graduate standing.
An organized class concerned with the exploration of current formal and conceptual problems in art through discussions, critiques, and work executed for the class in the student’s major field: painting, drawing, printmaking, sculpture, photography, or ceramics. May be repeated for credit.

6843 Master of Fine Arts Exhibition
3 hours credit. Prerequisite: Completion of studio course requirements in the major.
Concentrated studio activity in the major field of study emphasizing preparation of work for the concluding exhibition, in consultation with the Graduate Advisor of Record and upon approval of the Graduate Program Committee in the program. Enrollment in this course is required each term in which the exhibition is in progress.
6953 **Independent Study**
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students desiring specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master of Fine Arts degree.

6973 **Special Problems**
(0-6) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. May be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master of Fine Arts degree.

**Master of Arts Degree in Art History**

The Master of Arts degree in Art History offers the opportunity for advanced study in art history, with an emphasis on Spanish, pre-Columbian, Latin American Colonial to Modern, and contemporary Hispanic art in the United States; contemporary United States art and criticism; and the cultural and artistic traditions of San Antonio’s immediate region. The degree is designed to prepare the student for a career as a teacher of art history at the junior-college level and other arts-related professions or to serve as a basis for entering doctoral studies elsewhere.

**Program Admission Requirements.** In addition to the University-wide graduate admission requirements, applicants are expected to have completed an undergraduate major (24 hours) in art history or the equivalent in related fields that combine substantial studies in the humanities and visual arts. Students with no studio background will be required to take one undergraduate studio art course.

**Application Materials.** Each applicant must provide at least one example of scholarly writing, a written statement of purpose, and three letters of recommendation from persons who can evaluate the applicant's academic record, skills, motivation, and potential. In addition, the applicant must submit scores from the Graduate Record Examination (GRE). These scores will be used as one element in the evaluation of the applicant. Contact the Department Office at (210) 458-4352 to receive an information packet and the necessary forms.

**Application Materials Deadlines.** The writing example, statement, letters of recommendation, and GRE scores should be sent directly to the Graduate Advisor in the Department of Art and Art History by the University’s admission deadlines. Earlier application, however, will result in a more thorough evaluation.

**Degree Requirements.** The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 36. In addition, students are required to pass a language examination demonstrating a reading knowledge of a foreign language. In most cases, this will be Spanish. The suitability of another language will be determined by the student’s advisor. This test should be completed before the student earns 18 hours of graduate work in this program. Courses in which a grade of “C” or lower is earned will not count toward the minimum 36 hours required for the Master of Arts degree in Art History.

Candidates for the degree must complete the following:

A. 3 semester credit hours required:

   AHC 5123 Seminar in Research Methods and Writing (must be taken in student’s first year)

B. 21 semester credit hours of art history electives approved by the student’s advisor, distributed across the disciplines offered by the program:
AHC 5813  Topics in Art History
AHC 5823  Topics in Mesoamerican Pre-Columbian Art
AHC 5833  Topics in Spanish Art
AHC 5843  Topics in Latin American Colonial Art
AHC 5853  Topics in Contemporary Latin American Art
AHC 5863  Topics in Contemporary U.S. Art
AHC 6813  Practicum in Art History and Criticism
AHC 6833  Art Gallery and Museum Practices
AHC 6843  Project in Art History
AHC 6913  Seminar in Art History

C. 6 semester credit hours of free electives. These are courses outside the discipline of art history in the supporting fields of Spanish, history, anthropology, or studio art (as approved by the Art History Advisor)

D. 6 semester credit hours of AHC 6983 Master’s Thesis

In addition to the semester-credit-hour requirements set forth above, all candidates for the degree are required to pass the Comprehensive Examination, a slide and essay examination designed to test students’ knowledge of the history of European art, art of the Americas, and areas of concentration. The Comprehensive Examination is normally taken during or immediately after the semester in which the student completes his or her coursework and before completion of the thesis.

### COURSE DESCRIPTIONS

**ART HISTORY AND CRITICISM (AHC)**

**5123 Seminar in Research Methods and Writing**
(3-0) 3 hours credit. Prerequisite: Graduate standing.
A basic methodology course designed to offer the opportunity for the graduate student to gain an introduction to all facets of the discipline of art history and criticism, including research, documentation, and historical and critical writing.

**5813 Topics in Art History**
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123.
A course designed to deal with specialized areas in art history. May be repeated for credit when topics vary.

**5823 Topics in Mesoamerican Pre-Columbian Art**
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123.
A study of specific developments in the pre-Columbian art of Mesoamerica. May be repeated for credit when topics vary.

**5833 Topics in Spanish Art**
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123.
A study of specific aspects of Spanish art and architecture, from 711 to the nineteenth century. May be repeated for credit when topics vary.

**5843 Topics in Latin American Colonial Art**
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123.
A study of specific topics in South and Central American art and architecture from 1500 through the early nineteenth century. May be repeated for credit when topics vary.

**5853 Topics in Contemporary Latin American Art**
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123.
A study of issues in contemporary Latin American art. May be repeated for credit when topics vary.
5863  **Topics in Contemporary U.S. Art**  
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123. Specific directions in modern and contemporary art history, with emphasis on critical theory. May be repeated for credit when topics vary.

6813  **Practicum in Art History and Criticism**  
3 hours credit. Prerequisites: Graduate standing, consent of instructor, and completion of or concurrent enrollment in AHC 5123.  
A learning laboratory in which the principles and methodologies of art history, art criticism, and museology are applied in a practical manner outside the classroom in areas such as museum and gallery activities, historical preservation, research for private collections, and community-oriented educational or information functions and publications. Projects are initiated by students, with close supervision and evaluation by the instructor. May be repeated for credit, but not more than 6 hours will apply to the Master of Arts degree in Art History.

6833  **Art Gallery and Museum Practices**  
3 hours credit. Prerequisites: Graduate standing, consent of instructor, and completion of or concurrent enrollment in AHC 5123. An introduction to the organization and operation of gallery and/or museum activities: cataloging, research, and preparation and installation of art exhibitions.

6843  **Project in Art History**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor and project director. A professional project in art history. Projects include but are not limited to historic preservation, publications, and exhibition curation. May be repeated for credit, but not more than 6 hours will apply to the Master of Arts degree in Art History.

6913  **Seminar in Art History**  
(3-0) 3 hours credit. Prerequisites: Graduate standing and completion of or concurrent enrollment in AHC 5123. A research course dealing with a particular problem or aspect of art history. Topics include but are not limited to Mayan vase painting, the Hispanic *retablo*, Francisco Goya, images of women in Latin American colonial art, Frida Kahlo, Marcel Duchamp, and contemporary Latino/a painters. May be repeated for credit when topics vary.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master of Arts Degree in Art History.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination). Credit earned in AHC 6961 may not be counted in the 36 hours required for the Master of Arts degree in Art History.

6983  **Master’s Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor and thesis director. Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master of Arts degree in Art History. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
### DEPARTMENT OF COMMUNICATION

#### COURSE DESCRIPTIONS

**COMMUNICATION (COM)**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
<th>Prerequisite(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5213</td>
<td>Principles of Print and Multimedia Design</td>
<td>(3-0) 3 hours</td>
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</tr>
<tr>
<td></td>
<td>Principles and theory of design methodology for print and visual materials. Emphasis on conceptualizing print and multimedia products for information delivery, from assessment of needs and purpose to problem solving and implementation. Hands-on introduction to tools and techniques for production.</td>
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<tr>
<td>5223</td>
<td>Multimedia Design and Production I</td>
<td>(3-0) 3 hours</td>
<td>COM 5213</td>
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<tr>
<td></td>
<td>Introduction to the design and development of multimedia. Advanced study of conceptualization. Hands-on skill development in creating basic digital elements for use in multimedia, such as graphics and animation, and combining these elements into interactive programs.</td>
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</tr>
<tr>
<td>5233</td>
<td>Multimedia Design and Production II</td>
<td>(3-0) 3 hours</td>
<td>COM 5223</td>
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<tr>
<td></td>
<td>Advanced skill development in multimedia production techniques. Incorporation of advanced features such as audio, video, and search-and-query features of interactive programs. Introduction to theory and techniques of field video production.</td>
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<tr>
<td>5253</td>
<td>Advanced Video Production Processes</td>
<td>(3-0) 3 hours</td>
<td>COM 5233 or consent of instructor</td>
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<tr>
<td></td>
<td>Advanced theory and techniques of video production designed to develop skills in all aspects of electronic video production. The course includes all preproduction, production, and postproduction elements related to the production of video programs for promotion, teleconferencing, and education and distance learning.</td>
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DEPARTMENT OF ENGLISH, CLASSICS, AND PHILOSOPHY

Master of Arts Degree in English

The Master of Arts degree in English offers the student an opportunity to acquire a general knowledge of English and American literature, to understand the historical and cultural contexts in which that literature was produced, to develop skills in critical analysis, and to conduct literary, rhetorical, and linguistic research.

Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, the applicant must have completed at least 18 semester credit hours of work (exclusive of freshman courses) in English with a grade point average of 3.3 (on a 4.0 scale) in all work taken in English at the upper-division and graduate levels. This work must include at least 12 semester credit hours of upper-division English literature courses, and the student must have a grade point average of 3.3 in these courses. The applicant must submit scores from the Graduate Record Examination (GRE) General Test. These scores considered in comparison with scores from applicants of similar socioeconomic background will be used as one element in the evaluation of the applicant. These requirements may be waived in unusual circumstances upon the approval of the Graduate Program Committee.

Degree Requirements. The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 36. Any grade lower than “B” in a graduate course will not count toward the 36 semester credit hours of coursework required in items A and B below.

Candidates for the degree must complete the following requirements:

A. 24 semester credit hours in the major, distributed as follows:

1. Core Courses. 6 semester credit hours required:

   ENG 5013 Introduction to the Graduate Study of Literature (normally must be taken in the student’s first semester)
   ENG 5053 Topics in Literary Genres (3 hours)

2. Historical Periods. 9 semester credit hours, at least 3 of which must include the study of American literature and at least 3 of which must be from before the 19th century, selected from the following:

   ENG 5223 Medieval Literature
   ENG 5313 Renaissance Literature
   ENG 5413 Restoration and Eighteenth-Century Literature
   ENG 5513 Nineteenth-Century British Literature
   ENG 5613 Nineteenth-Century American Literature
   ENG 5733 Twentieth-Century British and American Literature I
   or
   ENG 5743 Twentieth-Century British and American Literature II
   ENG 5753 World Literatures in English

3. Major English Authors. 6 semester credit hours in the following:

   ENG 5943 Topics in Major English Authors

4. American Literature. 3 semester credit hours

   ENG 5933 Topics in American Literature
B. 12 semester credit hours of electives in English. In consultation with the Graduate Advisor of Record, students will select a cogent program of elective courses. Students who have a grade point average of 3.3 or better, with the approval of the Graduate Program Committee, may select a coherent program of 12 semester credit hours in Mexican American studies, composition and rhetoric, cultural studies, the study of women and gender, linguistics, or other approved areas. Students who wish to choose electives outside of English must consult with the Graduate Advisor of Record before enrolling in elective courses.

Thesis Option: Students who have completed 24 or more semester credit hours in an approved program of study with a grade point average of 3.5 or better, upon submission and approval of a thesis proposal to a Thesis Director and the Graduate Program Committee, may elect to include 3 or 6 hours of ENG 6983, Master's Thesis in their 12 elective hours. Students choosing to write a creative thesis must have completed, among their approved electives, 6 hours of ENG 5143, ENG 5153, or ENG 6043, 3 hours of which must be in the genre of the thesis.

Note: ENG 5013 must be taken in the student's first semester.

As soon as a student completes 12 hours of graduate coursework in English, he or she must meet with the Graduate Advisor to draw up a program of study.

In addition to the semester-credit-hour requirements set forth above, candidates for the degree are required to pass the Comprehensive Examination. The Comprehensive Examination, composed of both written and oral portions, is offered two times a year, each fall and spring semester, and may be offered during the summer term. It is normally taken in the semester in which the candidate is due to complete his or her graduate study. The Comprehensive Examination may be taken only twice.

**Doctor of Philosophy Degree in English**

The Doctor of Philosophy (Ph.D.) degree in English offers students opportunities for advanced study and research in cross-cultural, transnational approaches to English language and literary studies, with coursework required in U.S. Latina/o literature and the theory and practice of teaching composition. The Ph.D. in English is awarded to candidates who complete all required coursework, demonstrate in-depth, cross-cultural knowledge of English-language literature, and produce an original contribution to their field of specialization.

The regulations for this degree comply with the general University requirements (refer to Chapter 3, General Academic Regulations, and 5, Doctoral Degree Regulations).

**Admission Requirements.** In addition to satisfying the University-wide graduate admission requirements, the minimum requirements for admission to the doctoral program in English are as follows:

1. The student must have a Master's degree in English or a related discipline with a grade point average (GPA) of 3.5 or better OR a Bachelor's degree in English or a related discipline with a GPA of 3.5 or better.

2. A minimum of at least 18 upper-division and/or graduate hours in English literary studies with a GPA of 3.5 or better.

In addition, applicants must submit:

1. A statement of purpose (2-3 pages)
2. A writing sample (minimum 15-page research paper)
3. Three letters of recommendation attesting to the student's academic training, capability, and potential.
4. Graduate Record Examination (GRE) scores from both the General Examination and the English Subject Test; these scores will be considered in comparison with scores from applicants of similar socioeconomic background.
5. Students who have received degrees from non-English speaking universities must submit Texas of English as a Foreign Language (TOEFL) scores of no less than 550.
Degree Requirements. The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 39 graduate hours beyond the Master’s degree.

Students who are accepted into the doctoral program without a Master’s degree must complete all requirements for the Master of Arts degree in English or its equivalent. Courses in which students receive any grade lower than “B” will not count toward the 39 semester credit hours of coursework required in items A through D below.

Candidates for the doctoral degree must complete the following requirements:

A. Core Curriculum (9 semester credit hours)

   ENG 5183 Theory and Practice of Teaching Composition
   ENG 6013 Bibliography and Research
   ENG 6053 Latina/o Studies: Text and Context

B. Seminars (9 semester credit hours)

   ENG 7053 Seminar: Latina/o Studies
   ENG 7063 Seminar: Issues in Culture
   ENG 7073 Seminar: Theory and Criticism

C. Electives

   a. Prescribed electives (3 hours)

      ENG 6023 Rhetoric and Composition: Text and Context
      or
      ENG 6033 Language and Linguistics: Text and Context

   b. Free electives (minimum 12 semester credit hours, including at least 6 in ENG graduate courses). The student, in consultation with an academic advisor and the Doctoral Advisor of Record, will select at least 12 hours of freely elected courses. Students will select coursework from available graduate courses in ENG or, with approval of the Graduate Program Committee, related disciplines.

D. Doctoral research (minimum 6 semester credit hours)

   ENG 7311-3 Doctoral Dissertation

The entire program of study must be approved by the student’s dissertation advisor, dissertation committee, and Graduate Program Committee and must be submitted to the Dean of Graduate Studies through the Dean of the College for final approval.

Language Requirement. In addition to fluency in English, students must demonstrate proficiency in Spanish or another language that is approved in advance by the Graduate Program Committee. Proficiency may be demonstrated in one of the following ways:

1. Successful completion of an upper-division undergraduate course or a graduate course with a grade of “B” or better. The course must be approved in advance by the Graduate Program Committee.
2. Passing the Educational Testing Service (Princeton) examination in the approved language with a satisfactory score as determined by the Graduate Program Committee.
Admission to Candidacy. A student will be admitted to candidacy after completing all University and program requirements, passing the Qualifying Examination, and completing a dissertation prospectus. The Qualifying Examination will be based on three areas of literary study, one of which must be cross-cultural in focus; all three must be relevant to the student's anticipated dissertation and selected in consultation with the student’s examination committee. In consultation with the examination committee, the student will prepare reading lists in each area and compose position papers in each of the three areas. The examination committee must approve the reading lists and conduct an oral examination on the reading lists and the position papers. The Qualifying Examination will be completed when the examination committee approves the student’s dissertation prospectus (ca. 15-20 pages) and recommends admission to candidacy to the Dean of Graduate Studies through the Graduate Program Committee and the Dean of the College.

Dissertation and Final Oral Examination (Defense of the Dissertation). Candidates must demonstrate their ability to conduct independent research by completing and defending an original dissertation that makes a significant contribution to the field of English language or literatures. The student in consultation with his or her dissertation advisor determines the research topic. A dissertation committee, selected by the student and dissertation advisor and approved by the Dean of the College and the Dean of Graduate Studies, will guide and critique the candidate’s research. The dissertation committee must unanimously approve the completed dissertation. The dissertation shall then be defended publicly before the dissertation committee and interested members of the University community; the defense will focus on the relation between the dissertation and the student’s field of specialization.

COURSE DESCRIPTIONS

ENGLISH

(ENG)

5013 Introduction to the Graduate Study of Literature
(3-0) 3 hours credit.
Introduction to the premises, concepts, and methods of literary study, including literary history, terminology, bibliography, and various critical and theoretical approaches to literature. Normally must be taken in the student's first semester of graduate study.

5053 Topics in Literary Genres
(3-0) 3 hours credit.
Consideration of texts selected to illustrate the structural, conceptual, and contextual properties of a specific genre, e.g., poetry, fiction, or drama. May be repeated for credit when topics vary.

5073 Topics in Individual Authors
(3-0) 3 hours credit.
Critical study of representative works of one or more major authors. May be repeated for credit when topics vary.

5133 Development of Rhetoric and Composition
(3-0) 3 hours credit.
Survey of the development of rhetorical theory, with emphasis on how present composition theory and practice reflect earlier traditions.

5161 Practicum in Rhetoric
(1-0) 1 hour credit. Prerequisite: Consent of instructor.
Applied study of the rhetorical and linguistic foundations of written English. May be repeated for credit.

5173 Theory and Practice of Teaching Literature
(3-0) 3 hours credit.
Critical study of literary interpretations that illuminate classic and contemporary texts to form the basis of teaching. Applications of theory and research to the teaching of literature.
5183  **Theory and Practice of Teaching Composition**  
(3-0) 3 hours credit.  
Introduction to current scholarship in composition and applications to the teaching of writing.

5223  **Medieval Literature**  
(3-0) 3 hours credit.  
Critical study of works from the Anglo-Saxon period through the fifteenth century, excluding Chaucer. Some readings in modern translation, some in Middle English.

5313  **Renaissance Literature**  
(3-0) 3 hours credit.  
Critical study of works of poetry, drama, and prose of the sixteenth and seventeenth centuries, excluding Shakespeare and Milton.

5413  **Restoration and Eighteenth-Century Literature**  
(3-0) 3 hours credit.  
Critical study of works of poetry, prose, and drama of the Restoration and the eighteenth century.

5513  **Nineteenth-Century British Literature**  
(3-0) 3 hours credit.  
Critical study of representative works of verse and prose of nineteenth-century British writers.

5613  **Nineteenth-Century American Literature**  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in ENG 5013.  
Critical study of works of poetry and prose of nineteenth-century American writers.

5633  **Topics in the Study of Literature**  
(3-0) 3 hours credit.  
Exploration of the ways that important texts, theories, and cultural or intellectual movements have shaped the study of literature and literary forms. May be repeated for credit when topics vary, but not more than 6 hours will apply to the Master of Arts degree in English.

5733  **Twentieth-Century British and American Literature I**  
(3-0) 3 hours credit.  
Critical study of works of British and American poetry, fiction, and drama from 1900 to 1950.

5743  **Twentieth-Century British and American Literature II**  
(3-0) 3 hours credit.  
Critical study of works of British and American poetry, fiction, and drama from 1950 to the present.

5753  **World Literatures in English**  
(3-0) 3 hours credit.  
Critical study of an historical grouping of world literatures in English, such as literature of the Indian subcontinent, Latin America, Africa, or the Caribbean.

5763  **Latina/o Literature**  
(3-0) 3 hours credit.  
Critical study of poetry, prose, and drama of Latina/o writers.

5773  **Literary Representations of Female Identity**  
(3-0) 3 hours credit.  
Critical study of women’s writing and/or representations of female identity.
5933 Topics in American Literature  
(3-0) 3 hours credit.  
Critical study of selected American authors, themes, or cultural, historical, or aesthetic issues. May be repeated for credit when topics vary.

5943 Topics in Major English Authors  
(3-0) 3 hours credit.  
Critical study of the major works and influence of one of the following authors: Chaucer, Shakespeare, Milton. May be repeated for credit when topics vary.

6013 Bibliography and Research  
(3-0) 3 hours credit.  
Introduction to the tools and technology of professional literary research and also research in cross-cultural studies, including Latina/o Studies.

6023 Rhetoric and Composition: Text and Context  
(3-0) 3 hours credit.  
Advanced study and research of topics and movements in rhetoric and composition. May be repeated for credit when topics vary, but no more than 6 hours may be applied for the Master’s or Doctoral degree in English without the approval of the Graduate Program Committee.

6033 Language and Linguistics: Text and Context  
(3-0) 3 hours credit.  
Advanced study and research of topics and movements in language and/or linguistics. May be repeated for credit when topics vary, but no more than 6 hours may be applied for the Master’s or Doctoral degree in English without the approval of the Graduate Program Committee.

6043 Creative Writing  
(3-0) 3 hours credit. Prerequisite: Approval of Instructor and Graduate Advisor of Record.  
Intensive workshop in creative writing. May be repeated for credit when topics vary, but no more than six hours may be applied to the Master’s or doctoral degree without prior approval of the Graduate Program Committee.

6053 Latina/o Studies: Text and Context  
(3-0) 3 hours credit.  
Advanced study and research of Latina/o texts. May include some literature in translation. May be repeated for credit when topics vary.

6063 Cross Cultural Issues: Text and Context  
(3-0) 3 hours credit.  
Advanced study and research of primary literary texts in the context of key cultural and/or cross-cultural issues. May be repeated for credit when topics vary.

6073 Theory and Criticism: Text and Context  
(3-0) 3 hours credit.  
Advanced study and research of topics and movements in literary theory and criticism. May be repeated for credit when topics vary.
6951.3 **Independent Study**
1 or 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master of Arts degree in English.

6961 **Comprehensive Examination**
1 hour credit. Prerequisite: Approval of the Graduate Advisor of Record.
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated once. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” or “NC.” Credit earned in ENG 6961 may not be counted in the 36 hours required for the Master’s or for the 39 hours required for the Doctoral degree in English.

6973 **Special Problems**
(3-0) 3 hours credit.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. May be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master’s or Doctoral degree in English.

6983, 6 **Master’s Thesis**
3 or 6 hours credit. Prerequisites: Permission of the thesis advisor and the Graduate Advisor of Record.
Supervised thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required in each term in which the thesis is in progress.

7053 **Seminar: Latina/o Studies**
(3-0) 3 hours credit. Prerequisite: ENG 6013.
Advanced and intensive research of key issues in Latina/o Studies. May be repeated for credit when topics vary.

7063 **Seminar: Issues in Culture**
(3-0) 3 hours credit. Prerequisite: ENG 6013.
Advanced and intensive research of key issues in cultural and/or cross-cultural studies. May be repeated for credit when topics vary.

7073 **Seminar: Theory and Criticism**
(3-0) 3 hours credit. Prerequisite: ENG 6013.
Advanced and intensive research of key issues in theory and criticism. May be repeated for credit when topics vary.

7083 **Seminar: New Texts/New Contexts**
(3-0) 3 hours credit. Prerequisite: ENG 6013
Advanced and intensive research of recent writings or movements influencing literary and cultural studies. May be repeated for credit when topics vary.

7113 **Supervised Teaching in English**
3 hours credit. Prerequisites: Admission to the doctoral program in English and approval of the Graduate Advisor of Record.
Development and implementation of an undergraduate course in English under the supervision of a member of the English graduate faculty. May be repeated for credit.
7211-3  **Directed Readings**  
1 to 3 hours credit. Prerequisites: ENG 6013 and completion of at least 12 additional hours of 6000-level and/or 7000-level ENG coursework and permission of the Graduate Program Committee. Reading, research, discussion, and writing under the direction of a member of the graduate faculty. Enables students to prepare one of their fields of specialization when other appropriate classes are unavailable. May be repeated for credit, but no more than 12 hours will count toward the doctoral degree.

7311-3  **Doctoral Dissertation**  
1 to 3 hours credit. Prerequisites: Admission to candidacy for the Doctoral degree, completion of 33 hours of coursework approved by the Graduate Advisor and the Graduate Program Committee, and fulfillment of the Language Requirement. May be repeated for credit but no more than 18 hours may be applied to the Doctoral degree.

7961  **Qualifying Examination**  
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Qualifying Examination. Independent study course for the purpose of taking the Qualifying Examination. May be repeated for credit as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Qualifying Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).
DEPARTMENT OF HISTORY

Master of Arts Degree in History

The Master of Arts degree in History offers students the opportunity to pursue the advanced study of history. The program is designed to develop historical skills and to expand students’ understanding of the conceptualization and practice of history. Explicit attention is focused on historical comparisons and historical comparative frameworks.

Program Admission Requirements.

To be admitted to the program, students should have:

1. 18 semester credit hours in history or courses with significant historical content (12 of these hours must be at the upper-division level); and

2. A grade point average of 3.0 or better in the last 60 hours on undergraduate education.

Students who do not meet the above requirements, and who have 12 semester credit hours of courses with significant historical content, may seek admission if they meet one or more of the following conditions:

1. A minimum grade point average of 2.8

2. A grade point average of 3.0 in 15 hours of graduate or professional courses.

Students may submit a 500-word essay outlining their qualifications and goals.

Applicants for admission as non–degree-seeking students (special graduate students or non–degree-seeking graduate students) should have completed at least 12 semester hours in history or a related field before application. Non–degree-seeking students may be limited in the courses they are permitted to take. Admission as a non–degree-seeking student does not ensure subsequent admission as a degree-seeking student. Consult the catalog on regulations regarding “special graduate student” and “non–degree-seeking status.”

Degree Requirements. The minimum number of semester credit hours required for this degree is 33. This is exclusive of coursework or other study required for admission.

Degree candidates must complete

A. 6 semester credit hours in

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<th>Course</th>
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<td>HIS 5023</td>
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<td>HIS 5113</td>
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B. 3 semester credit hours in Comparative History (HIS 6483 or other courses identified as meeting the requirement)

C. 6 semester credit hours consisting of the sequence

<table>
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<th>Course</th>
<th>Credit Hours</th>
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<tr>
<td>HIS 6813</td>
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<td>HIS 6903</td>
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This sequence will vary in subject. A student should take HIS 6813 and then HIS 6903 in the same academic year.
D. 15 semester credit hours of elective courses, chosen in consultation with the student’s advisor.

- At least 6 hours must be outside the student’s focus area; focus areas are United States History and World History.
- Students electing to write a thesis will complete HIS 6983 Master’s Thesis (6 hours) in accordance with University regulations as stated in Options for Master's Degrees in Chapter 4, Master's Degree Regulations. Students must pass the comprehensive examination before enrolling in HIS 6983.
- Up to 6 hours of graduate-level courses outside the program may be taken with prior approval of the Graduate Advisor of Record.
- Up to 6 hours of undergraduate-level courses may be taken for graduate credit with approval of instructor.
- Up to 6 hours of Independent Study hours may be taken with approval of instructor.

E. Students must pass the comprehensive examination before they can enroll in HIS 6983. Nonthesis students should take the examination in the last semester of their program.

Students are encouraged to pursue languages or other formal competencies as appropriate to their needs.

COURSE DESCRIPTIONS
HISTORY
(HIS)

5023 Historical Methods
(3-0) 3 hours credit.
This course introduces students to the historian’s craft through an examination of basic research and analytical skills. These skills include: reading and analyzing primary and secondary works (literary and nonliterary), diverse methodologies, archival and library research (both traditional and electronic), and the design of a research proposal. [Students are expected to take this course at the outset of their graduate studies.]

5053 Topics in Medieval Europe
(3-0) 3 hours credit.
An examination of the major problems in the history of medieval Europe, from the second to the fourteenth century. The course focuses on changing interpretations in medieval history but also stresses the reading of primary texts.

5063 Topics in Early Modern European History
(3-0) 3 hours credit.
An examination of the major historiographical and historical problems in early modern European history, from the fourteenth century to the seventeenth century.

5093 Designing a History Course
(3-0) 3 hours credit.
A comprehensive approach to constructing history survey courses for the college level. Topics may include a survey of current curriculum debates; course and syllabus design; selection of textbook and other readings; evaluation and grading; leading discussions; nontraditional instructional methods, including the use of new technologies; and lecture preparation and presentation.

5113 Historical Approaches and Interpretations
(3-0) 3 hours credit.
This course promotes an understanding of how historians conceptualize the study of history by asking historical questions and using different historical approaches to develop answers. This will foster the ability to develop and critique an argument, to conduct bibliographic reviews, and to identify competing schools of thought. This course will also investigate how historical interpretations change over time. [Students are expected to take this course at the outset of their graduate studies.]
5123  **The American Revolution, 1763–1789**  
(3-0) 3 hours credit.  
A history of British America from the imperial crisis of 1763 to the ratification of the United States Constitution in 1789, with emphasis on the early beginnings of the American nation and social, economic, military, and cultural features of the revolutionary movement.

5153  **The Civil War and Reconstruction, 1850–1877**  
(3-0) 3 hours credit.  
An examination of the political, social, and economic factors in the 1850s that led to the American Civil War, as well as a study of the military, diplomatic, and political consequences of the war and efforts to create a new union.

5163  **History of the U.S. South**  
(3-0) 3 hours credit.  
This course examines the social, political, cultural, and economic developments that shaped life in the southern United States in the nineteenth and twentieth centuries. Topics may include race relations; southern politics; the economic transformation of the region; and religious identities and faiths.

5183  **From the Gilded Age to the Twenties**  
(3-0) 3 hours credit.  
An examination of developments in the United States in the late nineteenth and early twentieth century. Topics may include state building, the organization of industrialization, reform movements, and the effects of immigration and urbanization on American society.

5193  **The United States Since the Great Depression**  
(3-0) 3 hours credit.  
Analysis of recent American history with emphasis on the rise of the United States as a world power, the Great Depression, FDR and the New Deal, World War II, the Cold War, and an assessment of the administrations of recent presidents.

5203  **American Political History**  
(3-0) 3 hours credit.  
Examines the role of government and the political process in the United States. Topics may include the origins of the political system, the evolution of political parties, and the expansion of the public sector.

5263  **The Spanish Borderlands, 1521–1821**  
(3-0) 3 hours credit.  
A comprehensive study of Spanish exploration and colonization in the borderlands adjacent to the international boundary between the southwestern United States and Mexico. Emphasis on Hispanic institutions and cultural values that shaped the development of a frontier society on the eve of Mexican independence. Attention is given to bibliographic sources and specialized readings.

5303  **Twentieth-Century Texas**  
(3-0) 3 hours credit.  
An examination of Texas society, culture, and politics in modern times. Topics may include the period of reform in the 1890s, the boom in oil, the growth of cities, the politics of the Progressive Era, the developments of the Twenties, the Depression and New Deal, World War II, the era of Lyndon Baines Johnson, and the expansion of industry in the state and the Sun Belt.

5313  **South Texas: Rural and Urban**  
(3-0) 3 hours credit.  
An overview and analysis of the development of South Texas, from pre-Columbian cultures to the rise of urbanization. Emphasis on Spanish exploration and settlement of Nuevo Santander, contact with indigenous cultures, the impact of nineteenth-century warfare, and the rapid transformation of the region through urbanization.
5423 Colonial Mexico  
(3-0) 3 hours credit.  
A detailed examination of the Spanish conquest and colonization of Mexico from 1521 to Independence. Special attention is paid to the transformation of Indian society under Spanish rule, the development of the colonial economy, and the formation of an interrelated colonial elite.

5433 Modern Mexico  
(3-0) 3 hours credit.  
Examines the history of Mexico following independence from Spain in 1821. Consideration is given to the disintegration of the colonial system, nineteenth-century reforms, the Porfiriato, the Mexican Revolution, and their effects on contemporary Mexico. Students may have the opportunity to work in Mexico.

5453 The French Revolution and the Greater Caribbean  
(3-0) 3 hours credit.  
This course explores the French Revolution and its impact on the French colonies in the western hemisphere. The course provides a comparative analysis of notions of citizenship and the variety of factors that shaped the practice of rights before, during, and after the revolutionary struggle in both France and the Greater Caribbean.

5613 Stalin and Stalinism  
(3-0) 3 hours credit.  
This course examines the essential features of Stalinism, identifying their antecedents and comparing Stalinism with other social revolutionary or state-building strategies.

5653 Modern Chinese History  
(3-0) 3 hours credit.  
This course provides an overview of Chinese history since 1550, with particular attention to the major historiographical debates in recent scholarship. Topics may vary, and the latest ones include ethnic and cultural identities in modern China and themes in local and transnational history.

5693 Indian Subcontinent  
(3-0) 3 hours credit.  
This course provides students with an opportunity to learn about the cultures and histories of the Indian subcontinent. We will pay particular attention to the major historiographical debates in recent scholarship. Topic will vary and may include India, Pakistan, Afghanistan, Nepal, Sri Lanka, and/or Bangladesh.

5733 Migration in Historical Context  
(3-0) 3 hours credit.  
What has caused people to migrate as individuals and as groups? To what extent has geographical mobility been a function of economic mobilization, political transformation, social upheaval, and/or technological revolution? How has the migratory process, in turn, affected the migrants themselves, both in their place of origin, and in the host society? This course is a graduate-level exploration of these and other related questions on migration and may be explicitly comparative. Specific theme, regional focus, and time period may vary and may draw from a variety of historical situations.

6113 Law and Society in America  
(3-0) 3 hours credit.  
An examination of the role of law as both a reflection and initiator of change in American life, from colonial times to the present. Topics range from seventeenth-century slavery to the equal rights revolution of the twentieth century.

6123 Growing Up in America  
(3-0) 3 hours credit.  
Did childhood and adolescence exist in the past? Will they tomorrow? This course investigates changes in growing up over the course of American history. Perspectives come from the social sciences, psychology, literature, first-person testimonies, visual materials, and film, all viewed in historical perspective. (This course may employ an explicitly comparative approach.)
6133 The United States and the World  
(3-0) 3 hours credit. 
An examination of the relationship between the United States and foreign nations and peoples from the late eighteenth century through the Cold War era. Using selected episodes, the course will focus on: the domestic courses for American policies and activities; the ways in which foreign peoples prompted, perceived, and influenced those policies and actions; and the impact the United States has had overseas.

6163 Women in the United States  
(3-0) 3 hours credit. 
Analyzes the experiences of women in the United States from the colonial period to the present. Topics may include economic roles, legal issues, religion, culture, feminist movements, and family life.

6173 Latina/os in the United States  
(3-0) 3 hours credit. 
Examines the Mexican American, Cuban American, and Puerto Rican American experience in the United States, treating the historical relationship between this nation and the countries of origin and the interaction between these groups and mainstream society.

6193 The City in History  
(3-0) 3 hours credit. 
This course explores the roles of the urban place in the formation of modern culture, society, and polity. It interprets the shifting functions of the “urban factor” in social and cultural change. (This course may employ an explicitly comparative approach.)

6313 Comparative Borders  
(3-0) 3 hours credit. 
This course explores borders and their role in regional, national and international history. While the course will center on the U.S.–Mexico border, Asian, European, and African borders will also be explored. It will use a diversity of perspectives from the social sciences, literature, and history. This course will employ an explicitly comparative approach.

6323 Comparative Environmental History  
(3-0) 3 hours credit. 
This course explores the role of environmental factors in world history. It provides students the opportunity to consider the importance of often overlooked actors such as plants, animals, and diseases alongside more familiar human cultural and social institutions. We consider how the inhabitants of different continents and nations were shaped by nature, shaped their own very different environments, and made sense of these processes.

6413 Topics in U.S. History  
(3-0) 3 hours credit. 
Examines topics of current interest to historians of the United States. May be repeated for credit when topics vary.

6423 Topics in European History  
(3-0) 3 hours credit. 
Examines topics of current interest to historians of Europe. May be repeated for credit when topics vary.

6433 Topics in Latin American History  
(3-0) 3 hours credit. 
Examines topics of current interest to historians of Latin America. May be repeated for credit when topics vary.

6443 Comparative Nationalism in the Modern World  
(3-0) 3 hours credit. 
This course offers a comparative investigation of nationalism around the globe from 1700 until the present. Interdisciplinary perspectives will be used to examine the growth of nations, the nation-state, ethnic identity, and community as well as related subjects such as race and racism, fascism, minorities, gender, immigration, and genocide.
6453  **Comparative U.S. Home Fronts: Civil War to Cold War**  
(3-0) 3 hours credit.  
This course will examine the United States during wartime, with a focus on activities on the home-front. This course will examine the different ways U.S. conflicts from the Civil War to the Cold War have shaped the politics and culture of the United States. Issues considered in this course may include war’s effect on race and gender relations, propaganda during wartime, war and notions of citizenship, and war and the growth of the national state. (This course may employ an explicitly comparative approach.)

6463  **Topics in African History**  
(3-0) 3 hours credit.  
This seminar is a graduate-level introduction to African history. The course will emphasize the ways in which events and processes in the African past can be juxtaposed usefully with developments in other regions of the world. Topics and themes may include regional trading networks, the range of political/governmental structures, and cultural variation.

6473  **Topics in Asian History**  
(3-0) 3 hours credit.  
Examines topics of current interest to historians of Asia. May be repeated for credit when topics vary.

6483  **Topics in Comparative History**  
(3-0) 3 hours credit.  
This course provides an introduction to one or more of the major approaches, methods, or theories in comparative history today. It may consider, for example, comparison of events, social movements, social or political institutions, social groups, economic developments, regions or nations, among other topics. May be repeated for credit when topics vary.

6813  **Proseminar in History**  
(3-0) 3 hours credit.  
A detailed investigation of a major historical subject, with particular attention to current research and major interpretations. Intended as preparation for HIS 6903. May be repeated for credit when topics vary.

6903  **Research Seminar in History**  
(3-0) 3 hours credit. Prerequisite: HIS 6813 in the specific subject of the seminar or consent of instructor.  
An examination of research materials pertinent to topics in history explored in HIS 6813, of methodologies developed to interpret these materials, and of theoretical issues guiding inquiry. Preparation of a primary research paper required. May be repeated for credit when topics vary.

6913  **Making History in the Digital Age**  
(3-0) 3 hours credit.  
This course will explore some of the newer applications of information technology for presenting history to students and the public. Training will be offered in developing multimedia presentations for the classroom or public spaces, such as museums and the Web. Prior experience with computers is not required.

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.
6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.
Independent study to prepare for the Comprehensive Examination. Students will select fields of study and prepare for examination under faculty supervision. Enrollment is required each term in which the Comprehensive Examination is taken. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973 Special Problems
(3-0) 3 hours credit.
An organized course providing specialized study in a historical field not normally available as part of the regular course offerings. May be repeated for credit when topics vary.

6983 Master’s Thesis
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF MODERN LANGUAGES AND LITERATURES

Master of Arts Degree in Spanish

The Master of Arts degree in Spanish offers the student the opportunity for an in-depth view of Hispanic literatures, cultures, and language, underscoring the unity of the Hispanic world rather than its national components. Elective courses in linguistics offer an opportunity to further the student’s grasp of the Spanish language in its geographical, cultural, and social variations.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, applicants are expected to have 15 or more upper-division hours in Hispanic cultures, literatures, or linguistics and a mastery of oral and written skills in Spanish in an academic register. Upper-division grammar, oral communication, and language courses may not be included in this requirement. Students are required to have written and oral proficiencies assessed during their first semester of study.

A grade point average of 3.0 (on a 4.0 scale) is required in undergraduate coursework in Spanish. These requirements may be waived in unusual circumstances upon the approval of the Graduate Program Committee.

Admission determinations are based on the grade point average, undergraduate coursework, fluency in Spanish, the personal statement, and the letter(s) of recommendation.

Application Materials. In addition to filing the regular University application for admission, all applicants must submit to the Spanish Graduate Committee for evaluation a one- to three-page statement written in Spanish describing the objectives of proposed graduate study and at least one letter of recommendation from a prior teacher or professional colleague.

Degree Requirements. The number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 36. A maximum of one grade of “C” shall be applicable toward coursework for the Master of Arts degree.

Candidates for the degree must complete the following:

A. 3 semester credit hours of SPN 5373 Introduction to Graduate Spanish Studies. This course must be taken within the first 18 hours of graduate work.

B. 18 semester credit hours distributed as follows:
   6 hours in culture (SPN)
   6 hours in Spanish language and linguistics (SPN and LNG)
   6 hours in literature (SPN)

C. 15 semester credit hours of electives in Spanish (SPN), Linguistics (LNG), or other courses as approved by the Graduate Advisor of Record

D. Thesis Option

   SPN 6983: Master’s Thesis. The satisfactory completion of a thesis in accordance with University regulations as stated under Options for Master’s Degrees in Chapter 4, Master’s Degree Regulations. If this option is chosen, then the number of electives in Item C is reduced accordingly.
COURSE DESCRIPTIONS
SPANISH
(SP)

5023 Writing and Editing in Spanish
(3-0) 3 hours credit.
Theory and practice of advanced Spanish stylistics. Development of writing skills and practice in editing Spanish texts. Can be repeated for credit up to 6 hours, and with approval of the Graduate Advisor of Record.

5123 Hispanic Film
(3-0) 3 hours credit.
Hispanic societies, history, culture, and language of film as interpreted by representative directors. May be repeated for credit when topics vary.

5373 Introduction to Graduate Spanish Studies
(3-0) 3 hours credit
An introduction to graduate studies in Spanish. Emphasis on critical writing and research skills, including bibliography and electronic media. Incorporates critical and methodological approaches to Hispanic literature, culture, and linguistics. This course must be taken within the first 18 hours of graduate studies.

5413 History of Ideas in the Hispanic World
(3-0) 3 hours credit.
Selected Spanish, Latin American and/or U.S. Latina/o issues representative of major currents of thought affecting the evolution of Hispanic cultural history. May be repeated for credit when topics vary.

5463 Spanish Civilization
(3-0) 3 hours credit.
A study of the social, political, and cultural history of Spain from prehistory (the Caves of Altamira) to the present.

5473 Latin American Civilization
(3-0) 3 hours credit.
A study of the social, political, and cultural history of the Latin American countries from pre-Columbian civilizations through the Conquest, Colonial period, and Independence to the present.

5483 Studies in Hispanic Culture
(3-0) 3 hours credit.
Studies of different facets of Hispanic culture not normally available as part of regular course offerings. May be repeated for credit when topics vary.

5633 Spanish Medieval-Golden Age Literature
(3-0) 3 hours credit.
Study of Medieval, Renaissance, and/or Golden Age Spanish texts in a variety of contexts that may include historical, cultural, or theoretical approaches. Topics may include: poetry, narrative, drama, Don Quijote. May be repeated for credit when topics vary.

5703 Modern Spanish Literature
(3-0) 3 hours credit.
Selected Spanish literary works from 1700 to the present. May be repeated for credit when topics vary.

5763 Latin American Literature to Modernism
(3-0) 3 hours credit.
In-depth study of selected literary works by Indian, Spanish, and Creole authors. May be repeated for credit when topics vary. Topics may include the Conquest, the Colonial period, the nineteenth century.
5773  **Latin American Literature from Modernism to the Present**  
(3-0) 3 hours credit.  
Studies in contemporary prose, poetry, and/or drama. May be repeated for credit when topics vary.

5803  **Mexican American Literature**  
(3-0) 3 hours credit.  
The consideration of Mexican American literature in the context of the Hispanic tradition. Different genres, themes, and authors will be examined in terms of ethnic, social, and linguistic characteristics as well as artistic merit. May be repeated for credit when topics vary.

5813  **Studies in Hispanic Literature**  
(3-0) 3 hours credit.  
Study in selected areas of Hispanic literature not normally available as part of regular course offerings. May be repeated for credit when topics vary.

5843  **History of the Spanish Language**  
(3-0) 3 hours credit.  
Chronological development of the Spanish language, focusing on areas such as phonology, morphology, and lexicon.

5853  **Spanish of the Southwest**  
(3-0) 3 hours credit.  
An in-depth study of the contact variety of Spanish spoken by Mexican Americans in the U.S. Southwest, including San Antonio. Complementary descriptive and sociolinguistic approaches are incorporated.

5863  **Spanish Phonetics and Phonology**  
(3-0) 3 hours credit.  
The framework of articulatory phonetics and its application to the description of Spanish. Analysis of the sound system of Spanish in both traditional and contemporary phonological frameworks, with attention given to regional variation.

5883  **Spanish Morphology and Syntax**  
(3-0) 3 hours credit.  
An introduction to the grammatical description and analysis of the Spanish language, focusing on the levels of word, phrase, and sentence. Consideration is given to different schools of thought about linguistic analysis (structural, functional, transformational) as they apply to the Spanish language.

5893  **Hispanic Dialectology**  
(3-0) 3 hours credit.  
A study of regional and social variation in Peninsular, Latin American, and U.S. Spanish, including phonology, grammar, and lexicon of vernacular dialects. Perspectives of traditional dialectology and modern sociolinguistics.

5903  **Topics in Hispanic Linguistics**  
(3-0) 3 hours credit.  
Study in selected areas of Hispanic linguistics not normally available as part of regular course offerings. May be repeated for credit when topics vary.

5953  **A Functional-Notional Approach to Contemporary Hispanic Culture**  
(3-0) 3 hours credit.  
Identification of the segments of contemporary Spanish pertinent to the major functions or purposes of language use in a given part of the Spanish-speaking world. Identification of the extended vocabulary clusters or notions pertinent to major topics or situations in contemporary life in a given part of the Spanish-speaking world. Relation of these elements to approaches to speaking, listening, reading, and writing. May be repeated for credit when topics vary, but not more than 6 hours will apply to the Master of Arts degree in Spanish.
6813  **Seminar in Hispanic Studies**  
(3-0) 3 hours credit. Prerequisite: 24 semester credit hours of graduate-level Spanish.  
In-depth study and major research project in areas such as Hispanic culture, literature, and/or language. May be repeated once for credit as an elective.

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master of Arts degree in Spanish.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination). Credit earned in SPN 6961 may not be counted in the 36 hours required for the Master of Arts degree in Spanish.

6973, 6  **Special Problems**  
(3-0), (6-0) 3 or 6 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. May be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master of Arts degree in Spanish.

6983  **Master’s Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master of Arts degree in Spanish. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

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**COURSE DESCRIPTIONS**  
**FOREIGN LANGUAGES**  
*(FL)*

5003  **Foreign Language Studies I**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Consideration of foreign language instruction research and practice regarding facilitation of speaking, listening, reading, and writing, with consideration of vocabulary extension and treatment of accuracy. Special emphasis on Spanish, French, and German.

5013  **Foreign Language Testing**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Consideration of content and approaches for testing achievement and proficiency, at the various levels, in listening, speaking, reading, writing, vocabulary, structure, and culture in the foreign languages. Special emphasis on Spanish, French, or German.
5023  Foreign Language Studies II  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Consideration of foreign language instruction research and practice regarding special areas for integration such as video, audio, computer, literature, composition, culture-authentic materials, and/or higher-order thinking-skills materials. Special emphasis on Spanish, French, or German. May be repeated for credit when topics vary.

5033  Foreign Languages and Intercultural Communication  
(3-0) 3 hours credit.  
Investigation of intercultural communication research in specific language communities and its application to effective interaction with speakers of a variety of foreign languages. Consideration of sociolinguistic norms, semantic variation, and nonverbal language relevant to selected foreign language communities in the United States and abroad compared with mainstream U.S. English norms.

5043  Principles of Translation  
(3-0) 3 hours credit. Prerequisite: Previous coursework or experience in translation or consent of instructor.  
A survey of approaches to translation, practice, and theory, with hands-on experience in a variety of genres (for example, literary prose, poetry, essay, narration) and vocabularies (e.g., legal, medical, business, etc.). May be repeated when languages vary, i.e., Spanish/English, French/English, or German/English.

COURSE DESCRIPTIONS  
FRENCH  
(FRN)

5813  Topics in French Linguistics  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A course focusing on a selected area of French linguistics, such as grammar, stylistics, phonetics, or applied linguistics. May be repeated for credit when topics vary.

5913  Topics in French Literature and Culture  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A course focusing on a selected period or aspect of French literature and culture, such as contemporary France, the nineteenth-century novel and society, or twentieth-century theater. May be repeated for credit when topics vary.

COURSE DESCRIPTIONS  
GERMAN  
(GER)

5813  Topics in German Linguistics  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
A course focusing on a selected area of German linguistics, such as grammar, stylistics, phonetics, or applied linguistics. May be repeated for credit when topics vary.

5913  Topics in German Literature and Culture  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Selected topics relative to German literature and culture, including such areas as contemporary Germany and profiles of particular segments of German society. May be repeated for credit when topics vary.
COURSE DESCRIPTIONS
LINGUISTICS
(LNG)

5013 Sociolinguistics
(3-0) 3 hours credit. Prerequisite: LNG 3813, an equivalent, or consent of instructor. Theory, research, and methods for the study of linguistic variation and language use in context. Quantitative and qualitative approaches are included.

5153 Topics in Contemporary Linguistics
(3-0) 3 hours credit. Prerequisite: LNG 3813, an equivalent, or consent of instructor. Contemporary approaches to language analysis and description. May be repeated for credit when topics vary.
Master of Music Degree

The Master of Music degree program in the Department of Music is accredited by the National Association of Schools of Music.

The Master of Music degree offers the opportunity for advanced study for qualified students who wish to emphasize music performance, conducting, music education, or piano pedagogy and performance. The Music Performance Emphasis offers specialized curricular tracks in instrumental and vocal performance. The Conducting Emphasis offers specialized curricular tracks in instrumental and choral conducting. The Music Education Emphasis offers specialized curricular tracks in instrumental music education, choral music education, or general music education.

Program Admission Requirements. In addition to satisfying the University-wide admission requirements, applicants are expected to hold the Bachelor of Music degree or Bachelor of Music Education degree with a major in their intended area of graduate emphasis, or the equivalent; submit three recommendations from established professionals commenting on the appropriateness of graduate study in music for the applicant; and complete one of the following:

Music Performance: Audition in person or provide a recent tape demonstrating the level of mastery in the proposed performance medium.

Conducting: Audition in person or provide a recent videotape demonstrating the level of mastery in a rehearsal or performance situation.

Music Education: Music Education Entrance Examination.

Piano Pedagogy and Performance: Audition in person or provide a recent tape demonstrating the level of mastery in piano.

Students are required to take placement examinations in music theory and music history before taking graduate courses. The student's advisor will counsel the student in correcting deficiencies and selecting courses for the student's degree program.

Degree Requirements.

Courses in which a grade of “C” or lower is earned will not count toward the minimum number of hours required for the Master of Music degree.

Students selecting the Music Performance Emphasis are required to complete 31 semester credit hours, including 1 semester credit hour for a recital. Voice principals must take diagnostic examinations in French, German, Italian, and English lyric diction. If the student is not found proficient in any one of the languages, the appropriate course will be required.

Conducting Emphasis

Candidates for the Master of Music degree with an emphasis in Conducting must complete

A. 10 semester credit hours in the area of emphasis as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS  5554</td>
<td>Music Performance–Performance Emphasis (two semesters)</td>
</tr>
<tr>
<td>MUS  6941</td>
<td>Recital</td>
</tr>
<tr>
<td>MUS  6961</td>
<td>Comprehensive Examination</td>
</tr>
</tbody>
</table>
B. 15 semester credit hours of music electives (approved by advisor) to include the areas of theory and analysis, history and literature, research, pedagogy, and performance. Six hours of these music electives must be satisfied by the completion of MUS 5223 Ensemble Repertoire and MUS 5523 Rehearsal Techniques.

C. 6 semester credit hours of electives (approved by advisor), of which no more than 2 hours may be in a music ensemble.

**Music Performance Emphasis**

Candidates for the Master of Music degree with an emphasis in Music Performance must complete

A. 10 semester credit hours in the area of emphasis as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 554</td>
<td>Music Performance–Performance Emphasis (two semesters)</td>
</tr>
<tr>
<td>MUS 6941</td>
<td>Recital</td>
</tr>
<tr>
<td>MUS 6961</td>
<td>Comprehensive Examination</td>
</tr>
</tbody>
</table>

B. 15 semester credit hours of music electives (approved by advisor) to include the areas of theory and analysis, history and literature, research, pedagogy, and performance

C. 6 semester credit hours of electives (approved by advisor), of which no more than 2 semester credit hours may be in a music ensemble.

**Music Education Emphasis**

Candidates for the Master of Music degree with an emphasis in Music Education must complete

A. 12 semester credit hours in the area of emphasis as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 5403</td>
<td>Psychological Foundations of Music Education</td>
</tr>
<tr>
<td>MUS 5413</td>
<td>Research in Music Education</td>
</tr>
<tr>
<td>MUS 6423</td>
<td>Seminar in Music Education</td>
</tr>
<tr>
<td>MUS 6913</td>
<td>Project in Music Education</td>
</tr>
</tbody>
</table>

B. 24 semester credit hours of electives (approved by advisor) to include the areas of theory and analysis, history and literature, research, and performance (no more than 2 semester credit hours may be in a music ensemble). The remaining hours of electives are to be taken in the area of specialization (instrumental music education, choral music education, music technology, or general music education) and must be approved by the advisor.

**Piano Pedagogy and Performance Emphasis**

Candidates for the Master of Music degree with an emphasis in Piano Pedagogy and Performance must complete

A. 22 semester credit hours in the area of emphasis as follows:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MUS 5433</td>
<td>Performance Repertoire-Piano</td>
</tr>
<tr>
<td>MUS 5533</td>
<td>Pedagogy of Music Performance (2 semesters)</td>
</tr>
<tr>
<td>MUS 5542</td>
<td>Music Performance (3 semesters)</td>
</tr>
<tr>
<td>MUS 5572</td>
<td>Class Piano Pedagogy</td>
</tr>
<tr>
<td>MUS 5421</td>
<td>Practicum in Advanced Teaching</td>
</tr>
<tr>
<td>MUS 6923</td>
<td>Project in Piano Pedagogy</td>
</tr>
<tr>
<td>MUS 6941</td>
<td>Recital</td>
</tr>
</tbody>
</table>
B. 9 semester credit hours of music electives (approved by advisor) to include the areas of theory and analysis, history and literature, research, and performance.

C. 5 semester credit hours of electives (approved by advisor), of which no more than 2 semester credit hours may be in a music ensemble.

Special Degree Requirements. Students selecting the Music Performance Emphasis are required to participate for two semesters in an ensemble appropriate to their program of study.

Students selecting the Music Performance Emphasis or Conducting Emphasis will complete a recital document and oral examination. Students selecting the Music Education Emphasis will complete written and oral examinations. Students selecting the Piano Pedagogy and Performance Emphasis will complete an oral examination.

COURSE DESCRIPTIONS

MUSIC

(MUS)

5003 Graduate Music Theory Review
(3-0) 3 hours credit.
Designed to satisfy deficiencies indicated by the Graduate Music Theory Placement Examination. Harmonic analysis, part-writing, form, sight-singing and aural skills, as well as twentieth-century materials will be reviewed. A grade of “B” or higher is required before taking further graduate studies in music theory. May not be counted toward any Master of Music degree program.

5013 Graduate Music History Review
(3-0) 3 hours credit.
Designed to satisfy deficiencies indicated by the Graduate Music History Placement Examination. Surveys the styles, periods, composers, and historical developments of Western art music. A grade of “B” or higher is required before taking further graduate studies in music history. May not be counted toward any Master of Music degree program.

5103 Applied Systems of Analysis
(3-0) 3 hours credit. Required of all students for a Master of Music degree.
A study of techniques designed to assist the conductor-performer-analyst in a better understanding of music through the application of different analytical systems, with an emphasis on the Schenker-Salzer Systems of Analysis.

5163 Composition
3 hours credit. Prerequisites: Graduate standing in Music and consent of instructor.
Private study for the development of techniques and tools for composition, with emphasis on the craft of writing chamber works for various media in contemporary styles. Seminar attendance may be required.

5223 Ensemble Repertoire
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A study of repertoire for ensembles including a historical perspective. Section 1, Choral; Section 2, Instrumental. May be repeated for credit.

5233 Introduction to Music Research
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A survey of references and sources consulted in graduate music courses; format for papers and thesis, including footnotes and bibliography. Research methods in music are explored.
5263  **Topics in Music History**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
A study of works and styles appropriate to the topics listed below. Topics are (1) Middle Ages; (2) Renaissance; (3) Baroque Period; (4) Classic Period; (5) Romantic Period; (6) Twentieth Century; and (7) Music Practices and Styles. May be repeated for credit when topics vary. Topics may be taken concurrently.

5403  **Psychological Foundations of Music Education**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
A study of the psychological foundations of music education. An investigation of topics such as perception of and responses to music, the nature of musical attributes, music learning, and the measurement of musical behavior.

5413  **Research in Music Education**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
An introduction to historical, philosophical, descriptive, and experimental research in music education. Students will conduct a research study and prepare a final report.

5421  **Practicum in Advanced Teaching**  
(1-0) 1 hour credit. Prerequisite: MUS 5533 or consent of the instructor.  
Observation and teaching of an advanced undergraduate student under the direct supervision of a studio professor.

5433  **Performance Repertoire**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
A study of the solo, chamber, and orchestral repertoire. May be repeated for credit when topics vary.

5511  **Secondary Performance**  
1 hour credit.  
Private instruction for graduate students desiring secondary study in the following areas: baritone, bassoon, clarinet, classical guitar, conducting, contrabass, cornet, flute, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, and voice. Seminar attendance may be required. May be repeated for credit.

5523  **Rehearsal Techniques**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
A study of rehearsal techniques, including tone development, phrasing, rehearsal score study, style, and rehearsal organization. Topics are (1) Choral; (2) Instrumental. May be repeated for credit when topics vary. Topics may be taken concurrently.

5533  **Pedagogy of Musical Performance**  
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.  
Techniques and materials of teaching musical performance to students of all levels. A critical comparison of existing materials is included. Each student is required to demonstrate teaching techniques. May be repeated for credit when topics vary.

5542  **Music Performance**  
2 hours credit.  
Private instruction in baritone, bassoon, clarinet, classical guitar, conducting, contrabass, cornet, flute, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, or voice. Seminar attendance may be required. May be repeated for credit.

5554  **Music Performance–Performance Emphasis**  
4 hours credit. Prerequisite: Graduate standing in music and successful audition.  
Private instruction for graduate students with emphasis in performance or conducting. Instruction offered in baritone, bassoon, clarinet, classical guitar, conducting, contrabass, cornet, flute, harpsichord, horn, oboe, organ, percussion, piano, saxophone, trombone, trumpet, tuba, viola, violin, violoncello, or voice. Seminar attendance may be required. May be repeated for credit.
5572 Class Piano Pedagogy
(2-0) 2 hours credit. Prerequisite: Graduate standing in music.
A study of pedagogical techniques and materials used in teaching class piano. Students will have an opportunity to
tutor individual students under the supervision of the instructor.

5583 Advanced Instrumental Techniques
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A study of advanced playing and teaching techniques, selection of materials, and maintenance care. Topics are (1)
Winds and Percussion; (2) Strings. Designed primarily for instrumental music teachers.

5593 Elementary Music
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A study of the current methods and materials used in teaching elementary music. Classroom instruments are also
studied.

5711 Graduate Ensemble
(0-3) 1 hour credit.
The study of selected ensemble works through participation in rehearsal and performance. May be repeated for credit.

6233 Twentieth-Century Analytical Techniques
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
Applied analysis of contemporary music using techniques designed to aid the performer and music educator in a
fuller understanding of the music of our century. Interpretation of new notation and specific performance techniques
for both solo and ensemble are emphasized.

6313 The Use of Microcomputers in Music Education
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A study of the role of microcomputers in music education. Students are given the opportunity to learn basic
programming techniques with specific applications to music instruction. Currently available software and hardware
applicable to music instruction are examined.

6353 Multimedia Production
(3-0) 3 hours credit.
Provides instruction on the development of computer-aided presentations and interactive applications that integrate
various media including music, narration, sound, text, and graphics. Students use current multimedia development
and presentation packages to apply concepts of effective production management, audiovisual design, and
educational psychology. Supplementary instruction includes scanning, digital audio/video manipulation, and graphics
creation. Projects are individualized to reflect each student's chosen discipline. (Credit cannot be earned for both
MUS 6353 and C&I 6353.)

6423 Seminar in Music Education
(3-0) 3 hours credit.
Studies in the philosophy, historical background, and current trends in music education.

6543 Diction for Singers
(3-0) 3 hours credit. Prerequisite: Graduate standing in music.
A study of performance diction for singers. The pronunciation of the language as it applies to public performance.
Topics include English, French, Italian, and German. May be repeated for credit when topics vary.

6913 Project in Music Education
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and project director.
Offers the opportunity to complete a professional project in music education relevant to the student's background,
interests, and/or needs. The project should include, but not necessarily be limited to, appropriate written
documentation. May be repeated for credit, but not more than 3 hours will apply to the Master of Music degree.
Enrollment is required each term in which the project is in progress.
Project in Piano Pedagogy
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and music performance instructor. Offers the opportunity to complete a professional project in piano pedagogy relevant to the student's background, interests, and/or needs. The project should include, but not necessarily be limited to, appropriate written documentation.

Recital
1 hour credit. Prerequisites: Permission of the Graduate Advisor of Record and music performance instructor. Concurrent registration required in MUS 5554, or MUS 5542 for piano pedagogy and performance emphasis. A recital approximately one hour in length; required of all students in the performance, or conducting, or piano pedagogy and performance emphasis.

Independent Study
1 to 3 hours credit. Prerequisites: Permission in writing (form available) of the instructor and the Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours will apply to the Master of Music degree.

Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination). Credit earned in MUS 6961 may not be counted in the total hours required for the music education emphasis. MUS 6961 is required of all students in the performance or conducting emphasis.

Special Problems
(1-0, 2-0, 3-0) 1 to 3 hours credit. Prerequisite: Consent of instructor. Offers the opportunity for specialized study not normally or not often available as part of the regular course offerings. May be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master of Music degree.
Master of Arts Degree in Political Science

The Master of Arts degree in Political Science is a professional degree designed to provide students with skills in acquiring and analyzing data on political behavior within societies, the relationship between data and theory, the interplay between politics and economics, and the basis of divergent theoretical perspectives. Students may choose to specialize in one of four areas: American government, international politics, political economy, or political theory and public law. Students choosing the specialization in American government may focus in one or two sub-fields: American institutions and processes (furthering career possibilities in three branches of government, bureaucracy, or nongovernmental arena) where students focus on legislative and executive structures and processes, or political communications and behavior (leading to possible careers in public opinion polling, political campaign management, advertising, print or broadcast political journalism, or public relations and affairs) where students take coursework in political psychology, campaigns, and media and politics. Students choosing the specialization in international politics (leading to possible careers in comparative analysis and international relations in the public and private sectors) may acquire the skills to compare political systems and behavior in different countries, and to analyze the way governments and international organizations interact in the global political arena. Students choosing the specialization in political economy (leading to possible careers in public or private sectors of domestic or international business and government) have the opportunity to acquire detailed knowledge and skills in a variety of areas, including political economy, business and labor, and budgeting and finance in the public sector. Students specializing in political theory and public law (leading to possible careers in teaching or judicial systems) focus on courses in political philosophy, jurisprudence, and law and politics. All specializations further students’ preparation for additional graduate or professional education.

Program Admission Requirements. To qualify for unconditional admission, applicants must satisfy University-wide graduate admission requirements, submit Graduate Record Examination (GRE) scores, have completed 18 hours in upper-division undergraduate or graduate-level courses in political science or related fields, have a 3.0 grade point average in the last 60 hours of undergraduate and graduate work, and be accepted by the Graduate Program Committee. There is no minimum GRE score below which applicants will be automatically disqualified. Applicants who do not meet the above requirements for unconditional admission will be considered for admission under the condition that they take specific courses and achieve specific grades. Students may also be admitted as special graduate students. Admission as a special graduate student does not guarantee subsequent admission as a degree-seeking graduate student. These students must reapply for degree-seeking status.

Degree Requirements. The minimum number of semester credit hours required for the degree, exclusive of coursework or other study required to remove deficiencies and courses in foreign languages, is 36. Admission to the program may require students without a basic foundation in statistics and/or social science research methods to complete an undergraduate-level course in one of those areas before enrolling in POL 5013 Research Methods. Students selecting the political economy and international politics specializations are required to demonstrate reading proficiency in a foreign language through a written examination or by receiving an “A” or “B” in a foreign language course.

Degree candidates must complete

A. 12 semester credit hours of core courses

| POL 5003 Political Inquiry |
| POL 5013 Research Methods |

Plus 6 semester hours from the following:

| POL 5023 Political Economy |
| POL 5043 International Politics |
| POL 5063 Political Philosophy |
| POL 5153 American Government and Politics |
B. 18 semester credit hours (for the Master’s thesis) or 21 semester credit hours (for the Master’s essay) of designated elective courses in consultation with the faculty advisor. Students may receive up to 6 semester credit hours for courses taken outside of political science after consultation with their advisor.

C. Students specializing in American government must complete POL 5153 and at least 9 semester credit hours from courses numbered 5100-5199; 5400-5499; or other courses with permission of advisor.

For a concentration in Political Communication and Behavior, students must complete POL 5033 and at least 6 semester credit hours from the following:

POL  5403  Topics in Political Communications and Behavior
POL  5413  Political Psychology
POL  5423  Campaign Management and Consulting
POL  5433  Electoral Behavior
POL  5443  Polling and Survey Research Techniques

For a concentration in American Institutions and Processes, students must complete POL 5163 and at least 6 semester credit hours from the following:

POL  5103  Topics in American Politics
POL  5133  Ethnic and Gender Politics
POL  5503  Constitutional Law and Judicial Decision-Making
POL  5173  Policy Process
POL  5183  Congress
POL  5193  Presidency

D. Students specializing in international politics must complete POL 5043 and at least 9 semester credit hours from the following:

POL  5303  Topics in Comparative and International Politics
POL  5703  American Foreign Policy
POL  5713  Comparative Political Systems
POL  5723  International Organizations
POL  5733  Political Actors and Systems in Latin America
POL  5743  Electoral Systems in the Americas
POL  5903  Political Geography
PAD  5653  Public Policy and Public Administration in Latin America
PAD  5663  Development Administration

E. Students specializing in political economy must complete POL 5023 and at least 9 semester credit hours from the following:

POL  5803  Topics in Political Economy
POL  5813  Principles of Economic Governance
POL  5823  Political Economy of the Americas
POL  5833  Business and Labor in U.S. Politics
ECO  5303  International Trade and Finance
POL  5903  Political Geography
PAD  5363  Public Sector Financial Management
F. Students specializing in political theory and public law must complete POL 5063 and at least 9 semester credit hours from the following:

- POL 5203 Topics in Political Theory
- POL 5223 Issues in Contemporary Political Theory
- POL 5503 Constitutional Law and Judicial Decision-Making
- POL 5523 Litigation Politics
- POL 6103 Seminar in Theories of Politics and Law

G. Students must complete the core course requirements within their first 18 hours of coursework. Students must complete at least 21 hours of coursework and maintain a 3.0 grade point average before they may enroll in POL 6983 Master's Thesis (6 semester credit hours) or POL 6993 Master's Essay (3 semester credit hours).

**COURSE DESCRIPTIONS**

**POLITICAL SCIENCE**

**POL**

5003 Political Inquiry
(3-0) 3 hours credit.
A critical survey of political science as an academic and an applied discipline. Topics may include links to and differences from the other social sciences; the relationship of theory, facts, and values; policy analysis and prescription; ethics and politics; approaches to research; and teaching politics.

5013 Research Methods
(3-0) 3 hours credit.
Methods of inquiry in political science. Topics may include major theoretical and research traditions, quantitative and qualitative approaches, problems of conceptualization and operationalization, research design, data collection techniques, probability and sampling, descriptive and inferential statistics, and use of standard computer packages.

5023 Political Economy
(3-0) 3 hours credit.
Analysis of the interplay of politics and economics in the domestic and international arenas. Divergent theoretical perspectives and their basis in the work of classical and contemporary political economists and social theorists. Topics may include the politics and economics of international trade, technology policy, educational reform, industrial restructuring, privatization, environmental policy, and labor-market policy.

5033 Political Communications and Behavior
(3-0) 3 hours credit.
An examination of major theories and research dealing with human behavior and interaction in politics, drawing on the literature of political sociology, political communications, political anthropology, and political psychology. Professional applications such as public opinion polling, political journalism, public relations, campaign management, political advertising, and political consulting are considered.

5043 International Politics
(3-0) 3 hours credit.
An examination of the core theories that address international politics. The course studies comparative theories as well as those that analyze power and security issues in the international arena.

5063 Political Philosophy
(3-0) 3 hours credit.
A broad survey of central political issues and thinkers. Students will be introduced to the philosophies of thinkers such as Plato, Hobbes, Locke, Rousseau, and Marx.

UTSA 2003–2005 Graduate Catalog
5103  **Topics in American Politics**  
(3-0) 3 hours credit.  
An examination of an individual topic or set of issues in American politics. May be repeated for credit when topics vary.

5133  **Ethnic and Gender Politics**  
(3-0) 3 hours credit.  
How ethnic and gender differences influence political behavior, policy-making, and policy outcomes in the United States. Theories of ethnic relations and feminist and other theories of gender relations. Strategies for dealing with ethnic conflict and gender discrimination and harassment. (Formerly POL 5123. Credit cannot be earned for both POL 5133 and POL 5123.)

5153  **American Government and Politics**  
(3-0) 3 hours credit.  
An examination of the major issues, problems, and processes of American government and administration.

5163  **American Political Development**  
(3-0) 3 hours credit.  
This course presents a macropolitical perspective on American politics. It introduces students to debates in political science about change and development in political authority relations since the founding of the Republic. Topics may include the nature of regimes and regime change; the relationship between ideology and political culture; developments in institutional authority and in the balance of power among institutions such as the three branches of government, federal and state authority, and the military; continental development; the emergence of the regulatory state; the United States as a world power; and the representative process and forms of popular organization.

5173  **Policy Process**  
(3-0) 3 hours credit.  
This course examines theories of the policy-making and -executing process, and the actors, institutions, and politics that are involved in the process. (Credit cannot be earned for both POL 5173 and PAD 5323.)

5183  **Congress**  
(3-0) 3 hours credit.  
The study of the U.S. Congress. Topics may include Congressional procedure and policy making, representation, and elections. The course also considers the various approaches used in the scholarly study of Congress, including behavioral, rational choice, and historical methods.

5193  **Presidency**  
(3-0) 3 hours credit.  
This course examines the origins and development of the presidency, the relationship of the institution of the presidency with major actors in the governmental process, and the modern practice of presidential leadership in the United States.

5203  **Topics in Political Theory**  
(3-0) 3 hours credit.  
An examination of an individual topic, theorist, or set of issues in political theory. May be repeated for credit when topics vary.

5223  **Issues in Contemporary Political Theory**  
(3-0) 3 hours credit.  
An introduction into some of the major issues and trends within political theory over the last century. Authors may include Gramsci, Adorno, Heidegger, Fanon, de Beauvoir, Habermas and Derrida.
5303  Topics in Comparative and International Politics  
(3-0) 3 hours credit.  
An examination of an individual topic or set of issues in comparative and/or international politics. May be repeated for credit when topics vary.

5403  Topics in Political Communications and Behavior  
(3-0) 3 hours credit.  
An examination of an individual topic or set of issues in political communications and behavior. May be repeated for credit when topics vary.

5413  Political Psychology  
(3-0) 3 hours credit.  
The application of psychological theories to the explanation and prediction of political phenomena at individual, small group, organizational, and nation-state levels. Topics may include political socialization, personality and political leadership, the social psychology of mass participation, rational choice and symbolic politics paradigms of political behavior, psychological models of international conflict, and models of political cognition.

5423  Campaign Management and Consulting  
(3-0) 3 hours credit.  
An examination of strategies and techniques employed in managing electoral and lobbying campaigns. Topics may include development of comprehensive campaign plans, techniques of fund-raising and budgeting, advertising and public relations, canvassing phone banks, sociodemographic targeting, use of polls, image management, and use of mass media.

5433  Electoral Behavior  
(3-0) 3 hours credit.  
An examination of political science theory and research on elections and voting behavior in the United States and other countries. Topics may include electoral cycles and realignment patterns; the impact of media coverage and campaign tactics on opinions, turnout, and electoral outcomes; and the sociodemographic and psychological variables influencing voting and nonvoting.

5443  Polling and Survey Research Techniques  
(3-0) 3 hours credit.  
The sources, dynamics, and political effects of public opinion. Emphasis is on applied quantitative and qualitative techniques of data collection and analysis commonly used by political scientists, polling organizations, and political consultants in measuring citizen orientations. Topics may include survey methods, interviewing, focus groups, debate meters, sociodemographic targeting, content analysis, frame analysis, simulation, multidimensional scaling, and cluster analysis.

5503  Constitutional Law and Judicial Decision-Making  
(3-0) 3 hours credit.  
An advanced course in constitutional law and interpretation. Emphasis is on written judicial decisions, the political environment of judicial decision-making, and the impact of constitutional policy on society.

5523  Litigation Politics  
(3-0) 3 hours credit.  
An examination of litigation as a means of social change, effectuation of justice, and political pressure and reform. Explores the litigation process from historical and political context, through its origins, court proceedings, and impact.

5623  Intergovernmental Relations in the United States  
(3-0) 3 hours credit.  
The administrative and political effects of the division of authority among coordinate units of government. Federal-state, state-local, local-federal, state-state, local-local, and governmental-nongovernmental relations are examined.
5703  **American Foreign Policy**  
(3-0) 3 hours credit.  
An intensive analysis of the policy formulation process and the substance of selected contemporary problems in foreign policy. Political and institutional factors affecting foreign policies are stressed, along with the analysis of policy options.

5713  **Comparative Political Systems**  
(3-0) 3 hours credit.  
Comparative analysis of institutions, processes, and policy objectives in Western, Communist, and developing political systems.

5723  **International Organizations**  
(3-0) 3 hours credit.  
An examination of international political and economic organizations, as well as major issues involving them. Topics may include alliance systems, regional development, common markets, peacekeeping, international conferences, United Nations, IMF, World Bank, and regional organizations.

5733  **Political Actors and Systems in Latin America**  
(3-0) 3 hours credit.  
An examination of politics in Latin America. The course centers the analysis around two axes: the interplay between civil society and the state and patterns of inter-American relations.

5743  **Electoral Systems in the Americas**  
(3-0) 3 hours credit.  
A comparative study of campaigns and elections in the Americas. The course assesses similarities and differences of electoral systems in the region with particular emphasis on North American politics (Canada, the United States, and Mexico).

5803  **Topics in Political Economy**  
(3-0) 3 hours credit.  
An examination of an individual topic or set of issues in political economy. May be repeated for credit when topics vary.

5813  **Principles of Economic Governance**  
(3-0) 3 hours credit.  
Examination of the changing principles and practices of economic governance in Western democracies. The shift to market-oriented governance techniques. Theories of state-business relations. Case studies of specific national and regional governance regimes. Topics may include fiscal and monetary policy, the management of welfare systems, industrial development and antitrust, communications policy, trade policy, natural resource management, and regional development.

5823  **Political Economy of the Americas**  
(3-0) 3 hours credit.  
An examination of the changing relationship among the state, society, and the private sector in Latin America and its influence on hemispheric relations. Topics may include state ownership and privatization, industrial policy, trade union influence, foreign investment and foreign trade policy, and the impact of NAFTA, GATT, and other international agreements.

5833  **Business and Labor in U.S. Politics**  
(3-0) 3 hours credit.  
An examination of the influence of business and labor organizations on public policy formation, implementation, and elections. Theories and case studies of business and labor influence. Interest group organization, strategies, and tactics. Policy areas may include industrial relations and labor law, regulatory practices, foreign trade, the environment, government subsidization, taxation, and finance.
5853 Economic Geography
(3-0) 3 hours credit.
Substantive and theoretical consideration of the economic implications of geography. Topics include the development of industrial patterns, subsistence patterns, transportation systems, and resource exploitation. Central place theory, Boserup’s theory of agricultural growth, and theoretical matters are considered. (Credit cannot be earned for both POL 5853 and GRG 5303.)

5863 International Health Issues
(3-0) 3 hours credit.
This course investigates salient health issues in countries other than the United States. Focus is on the health problems of developing countries. (Credit cannot be earned for both POL 5863 and PAD 5863.)

5903 Political Geography
(3-0) 3 hours credit.
Investigates the role of the political state in society and the evolution of state organization from classical times to the present. Topics may include centrifugal and centripetal forces, geopolitics, territorial morphology, boundaries, core areas and emerging supranationalism. (Credit cannot be earned for both POL 5903 and GRG 5903.)

5913 Design and Management of Geographic Information Systems
(3-0) 3 hours credit.
A graduate-level introduction to the use of industry-standard GIS software. Topics include GIS data structures, system design, and methods of data exploration and analysis. The course includes discussion of issues related to planning, implementing, and managing large-scale GIS projects for research projects or organizations. (Credit cannot be earned for both POL 5913 and GRG 5913.)

5923 Advanced Research Methods
(3-0) 3 hours credit.
An in-depth examination of regression analysis. Advanced topics may include recursive and nonrecursive causal modeling, factor analysis, and structural equation modeling. (Formerly POL 5213. Credit cannot be earned for POL 5923 and POL 5213.)

6103 Seminar in Theories of Politics and Law
(3-0) 3 hours credit. Prerequisite: 6 hours from the list of courses specializing in political theory and public law. (See section F above.)
This course provides students with the opportunity to analyze and critique significant theories of politics and law. Emphasizing student development of critical, analytic, and synthetic abilities, this course explores major works of political philosophy and jurisprudence and culminates in theory construction by students.

6951,3 Independent Study
1 or 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not usually available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6963,6 Internship
3 or 6 hours credit.
Practical experience in a workplace setting in which classroom knowledge of political institutions and processes and public policy can be deepened and applied. May be repeated for credit to a maximum of 6 hours.

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not usually available as part of the regular course offerings. Special Problems may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.
6983  **Master's Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director. 
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the master's degree. Credit will be awarded on completion of the thesis. Enrollment is required each term in which the thesis is in progress.

6993  **Master's Essay**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and master's essay director. 
Master's essay research and preparation. May not be repeated for credit. Credit will be awarded on completion of the essay. Enrollment is required in the first term in which the essay is in progress.

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### COURSE DESCRIPTIONS

**GEOGRAPHY (GRG)**

5303  **Economic Geography**  
(3-0) 3 hours credit. 
Substantive and theoretical consideration of the economic implications of geography. Topics include the development of industrial patterns, subsistence patterns, transportation systems, and resource exploitation. Central place theory, Boserup's theory of agricultural growth, and other theoretical matters are considered. (Credit cannot be earned for both GRG 5303 and POL 5853.)

5323  **Seminar in Urban Geography**  
(3-0) 3 hours credit. 
Advanced study of urban structure and urban dynamics viewed from a spatial perspective. Topics may include urbanization, housing and neighborhood space, intraurban migration, the location of economic activity in the city, and urban land-use systems. May be repeated for credit when the topics vary.

5903  **Political Geography**  
(3-0) 3 hours credit. 
Investigates the role of the political state in society and the evolution of state organization from classical times to the present. Topics may include centrifugal and centripetal forces, geopolitics, territorial morphology, boundaries, core areas and emerging supranationalism. (Credit cannot be earned for both GRG 5903 and POL 5903.)

5913  **Design and Management of Geographic Information Systems**  
(3-0) 3 hours credit. 
A graduate-level introduction to the use of industry-standard GIS software. Topics include GIS data structures, system design, and methods of data exploration and analysis. The course includes discussion of issues related to planning, implementing, and managing large-scale GIS projects for research projects or organizations. (Credit cannot be earned for both GRG 5913 and POL 5913.)

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor. 
An organized course offering the opportunity for specialized study not usually available as part of the regular course offerings. Special Problems may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.
DEPARTMENT OF PSYCHOLOGY

Master of Science Degree in Psychology

The Master of Science degree in Psychology is designed to address the needs of two groups of students: students who wish to pursue doctoral studies and need additional coursework and research experience in order to be competitive for admission to doctoral programs, and students who need graduate-level training in order to be competitive for jobs in behavioral science laboratories or industrial/organizational settings. The program is designed to give students extensive research experience and coursework in experimental methodology, statistics, and the content areas of experimental psychology (e.g., social, personality, cognitive, developmental, clinical).

Program Admission Requirements. Degree-seeking students normally are not admitted for the summer semesters due to course-sequence requirements in the program. Applicants for unconditional admission in the Fall or Spring Semesters must meet University-wide admission requirements in addition to the following psychology admission requirements:

1. Scores on the verbal and quantitative sections of the Graduate Record Examination (GRE) must be submitted before the application is considered complete and will be used as part of the selection criteria for admission to the program.
2. Completion of a minimum of 18 undergraduate semester credit hours in psychology (12 of which must be at the upper-division level). These hours must include at least one course in statistics and one course in experimental psychology. A single course that combines instruction in statistics and experimental methodology may be accepted, pending the approval of the Graduate Committee in Psychology.
3. A grade point average of at least 3.0 in the last 60 hours of undergraduate coursework and a 3.0 grade point average in psychology courses.
4. Completion of the Psychology Graduate Application, which addresses issues pertaining to research experience and professional goals. Call the Department of Psychology to request the application.
5. Two letters of recommendation from behavioral scientists with whom the applicant has taken undergraduate or graduate courses. Recommendation forms are included with the Psychology Graduate Application.

All application materials must be submitted by the University's fall application deadline. The Psychology Graduate Application and the letters of recommendation should be sent directly to the Graduate Advisor of Record in the Department of Psychology. The University application form and application fee, official school transcripts, and GRE scores should be sent directly to the Office of Graduate Studies.

Applicants who do not meet requirements for unconditional admission will be considered for admission on a conditional basis if there are indications of unrealized potential.

The highly individualized nature of the program dictates that a limited number of students be admitted each year. For this reason, early submission of application materials is strongly encouraged.

Degree Requirements. The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 36. Typically, students complete the program in two years (taking three courses a semester, excluding summers) or three years (taking two courses a semester, excluding summers).

Degree candidates must complete

A. 15 semester credit hours of core courses

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>PSY 5113</td>
<td>Contemporary Research Paradigms in Psychology</td>
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<tr>
<td>PSY 5213</td>
<td>Design Considerations in Behavioral Research</td>
</tr>
<tr>
<td>PSY 5413</td>
<td>Inferential Statistics</td>
</tr>
<tr>
<td>PSY 6113</td>
<td>Perspectives in Measurement of Behavior</td>
</tr>
<tr>
<td>PSY 6213</td>
<td>Correlation and Regression Analyses</td>
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</tbody>
</table>
B. 9 hours chosen from

- PSY 5303 Research Seminar in Developmental Psychology
- PSY 5313 Research Seminar in Psychopathology
- PSY 5323 Research Seminar in Individual Differences and Personality Assessment
- PSY 5333 Research Seminar in Social Psychological Research
- PSY 5343 Research Seminar in Human Cognition
- PSY 5353 Research Seminar in Industrial/Organizational Psychology
- PSY 5363 Research Seminar in Health Psychology and Stress
- PSY 5373 Research Seminar in Program Evaluation

C. 6 hours of electives chosen from

- PSY 6513 Psychology Research Internship
- PSY 6523 Research Apprenticeship in Psychology
- PSY 6951-3 Independent Study
- PSY 6973 Special Problems

D. Option 1 (with thesis): A Master's thesis and 6 hours of PSY 6983 Master's Thesis

Option 2 (without thesis): 3 additional hours must be completed from the seminar option listed in Section B and PSY 6513 or PSY 6523 must be completed for an additional 3 hours of credit from the electives listed in Section C. Students seeking this option must notify the Psychology Graduate Program Committee of their intent at least one semester prior to their anticipated graduation date. Students should expect to take the comprehensive examination required for this option during the semester in which they plan to complete the degree. The comprehensive examination can be attempted twice but only once a semester.

Students admitted to the program should consult their assigned faculty advisors or the Graduate Advisor of Record for specific program requirements.

The program does not require proficiency in a foreign language. A written thesis proposal, approved by the student's thesis committee, is required before the student may register for PSY 6983 Master's Thesis.

COURSE DESCRIPTIONS

PSYCHOLOGY
(PSY)

5113 Contemporary Research Paradigms in Psychology
(3-0) 3 hours credit. Prerequisite: Consent of the instructor or admission to the psychology program.
An introduction to the research questions and the theoretical and methodological assumptions that characterize different subfields in psychology.

5213 Design Considerations in Behavioral Research
(3-0) 3 hours credit. Prerequisite: Consent of the instructor or admission to the psychology program.
An examination of criteria and procedures for translating questions of theory and application into effective and relevant research plans.

5303 Research Seminar in Developmental Psychology
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor.
A critical analysis of the theories and empirical evidence that form the basis for understanding developmental change. Special emphasis is given to the issue of measurement of age-related change.
5313  Research Seminar in Psychopathology  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the theories, research methodology, and empirical evidence that form the basis for understanding and treating mental disorders.

5323  Research Seminar in Individual Differences and Personality Assessment  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the theories and empirical data regarding the psychological processes that underlie individual differences in personality.

5333  Research Seminar in Social Psychological Research  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the theories and empirical findings regarding the psychological processes that underlie human social behavior.

5343  Research Seminar in Human Cognition  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the ways that humans select, organize, store, retrieve, modify, and apply information as they cope in adapting to the world. The seminar focuses on selected topics of significance in the contemporary information-processing literature.

5353  Research Seminar in Industrial/Organizational Psychology  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the theories, research methodology, and empirical findings that form the basis for understanding work behavior. Additional focus on methods used to assess and evaluate behavior and jobs.

5363  Research Seminar in Psychology and Health  
(3-0) 3 hours credit. Prerequisite: Completion of or concurrent enrollment in PSY 5213 or consent of the instructor. A critical analysis of the role of psychological factors in physical health. Topics may include the mind-body relationship, pain, stress, chronic illness, interpersonal relationships in health care, personality and illness, and death and dying.

5373  Research Seminar in Program Evaluation  
(3-0) 3 hours credit. Prerequisites: PSY 5213 and PSY 5413 or instructor permission. Application of psychological theory, methodology, and analyses to the systematic design and evaluation of social problems, programs, and policies. Topics may include needs assessment, goals analysis, ethical and design considerations, quasi-experimental designs, data collection challenges, relative merits of quantitative and qualitative measures, formative assessment, impact assessment, and decision making with fragmentary or flawed data.

5413  Inferential Statistics  
(3-0) 3 hours credit. Prerequisite: PSY 5213. Application of selected parametric and nonparametric procedures to the analysis and interpretation of empirical data.

6113  Perspectives in Measurement of Behavior  
(3-0) 3 hours credit. Prerequisite: PSY 5213 or consent of the instructor. An examination of criteria and procedures for the development of valid and reliable measures of behavior.

6213  Correlation and Regression Analyses  
(3-0) 3 hours credit. Prerequisite: PSY 5213 or consent of the instructor. Application of selected multivariate procedures to the analysis and interpretation of empirical data.

6513  Psychology Research Internship  
3 hours credit. Prerequisites: Consent of instructor and student’s graduate advisor. Students assist in conducting supervised research in a local organization. May be repeated for credit to a maximum of 6 hours.
6523 **Psychology Research Apprenticeship**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and student’s Graduate Advisor.  
Under faculty supervision, students will be responsible for developing experimental procedures, conducting experimental sessions, analyzing data, and preparing reports in an active research setting. The area of research will be determined by consensus of the student, the instructor, and the student’s Graduate Advisor. May be repeated for credit to a maximum of 6 hours.

6951-3 **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961 **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973 **Special Problems**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and student’s graduate advisor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. The course may be repeated for credit when the topics vary, but no more than 3 hours, regardless of discipline, may be applied to the Master’s degree.

6983, 6 **Master’s Thesis**  
3 or 6 hours credit. Prerequisites: Written thesis proposal must be approved by the Graduate Program Committee prior to enrollment.  
Supervised thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF SOCIOLOGY

Master of Science Degree in Sociology

The Master of Science degree in Sociology is designed to prepare graduates with the skills necessary to enter the professional workforce as sociologists or to pursue further study at the doctoral level. Students have the opportunity to acquire a knowledge base in sociological methods, theory and in areas of growing community concern, including health, aging, civil-military relations, socioeconomic development, gender issues, and race and ethnic relations. They will have the necessary research skills to define social issues and problems, select data collection techniques, establish appropriate analysis methods, develop statistical reports, and undertake policy analyses for businesses, governmental agencies, and nonprofit organizations.

Program Admission Requirements. To qualify for unconditional admission, applicants must satisfy University-wide and college-wide graduate admission requirements, and be recommended for admission by the Graduate Program Committee. Applicants must have completed 18 semester hours of undergraduate courses, 12 of which must be at the upper-division level, in sociology or related areas, including a course in theory and a course in research methods or statistics. Applicants who do not meet these requirements will be considered for conditional admission. Conditional applicants must submit indicators of preparation for graduate study, such as completion of additional undergraduate coursework to remove deficiencies, completion of 9 or more semester credit hours of graduate courses, and the achievement of a 3.0 grade point average. An applicant not eligible for either unconditional or conditional admission may be recommended for admission as a special graduate student. This does not guarantee subsequent admission as a degree-seeking graduate student; such students must reapply for degree-seeking status.

Degree Requirements. The minimum number of semester credit hours required for the degree, exclusive of coursework or other study required to remove deficiencies, is 36.

Degree candidates must complete

A. 6 semester credit hours of core courses:

   SOC 5003 Sociological Theory
   SOC 5013 Advanced Conceptualization and Measurement
   or
   SOC 5033 Qualitative Research Methods

B. 18 semester credit hours of prescribed electives from the following courses:

   SOC 5023 Quantitative Research Methods
   SOC 5043 Evaluation Research
   SOC 5103 Complex Organizations
   SOC 5113 Civil Military Relations
   SOC 5123 Family Contexts and Social Change
   SOC 5133 Sociology of Health and Health Care
   SOC 5143 Demography and Community Trends
   SOC 5153 Sociology of Tourism and Leisure
   SOC 5203 Social Stratification
   SOC 5213 Race and Ethnic Relations
   SOC 5223 Mexican Americans: Community, Culture, and Class
   SOC 5233 Gender and Society
   SOC 5243 Aging and Society
   SOC 5253 Border Studies
   SOC 5263 Cultural Studies
   SOC 5313 Theories of Identity
SOC 5323 Sociology of Childhood
SOC 5333 Language and Society
SOC 5343 Education and Reproduction of Inequality
SOC 5353 Crime and Delinquency
SOC 5413 Sociology of Music
SOC 5513 Comparative/Historical Sociology
SOC 6903 Topics in Advanced Sociology
SOC 6953 Independent Study
SOC 6961 Comprehensive Examination

C. 6 semester credit hours of electives taken outside of sociology

D. 6 semester credit hours of Internship or Thesis

Internship option. Students may participate in an internship (the nonthesis option) after completion of 18 semester credit hours. Internships offer work-oriented experiences in local organizational settings where the principles, theories, concepts, and methods of the discipline can be applied. A research paper under the supervision of assigned faculty is required.

Thesis option. Students may select the thesis option after they have completed 24 semester credit hours.

E. Comprehensive examination. Degree candidates are required to pass both written and oral comprehensive examinations. Examinations are scheduled after a student has completed at least 30 semester credit hours in the program.

COURSE DESCRIPTIONS
SOCIOLOGY
(SOC)

5003 Sociological Theory
(3-0) 3 hours credit.
The nature of sociological theory, the major varieties of theory, the theorists who developed them, and the social and historical contexts of theory development and construction. Issues concerning the relation of theory and research are also explored.

5013 Advanced Conceptualization and Measurement
(3-0) 3 hours credit. Prerequisite: 3 semester hours of undergraduate research methods. Advanced quantitative research methods. Topics may include index construction and scaling, analysis of variance, multiple correlation, and regression, with use of applicable computer programs to analyze local, state, and/or national data sets.

5023 Quantitative Research Methods
(3-0) 3 hours credit. Prerequisite: SOC 5013. Analyses are pursued using a variety of multivariate statistical techniques developed to meet specialized research problems. Topics may include log-linear analysis, factor analysis, path analysis, discriminant function analysis, logistic regression, and/or LISREL.

5033 Qualitative Research Methods
(3-0) 3 hours credit. Qualitative strategies and techniques used in social science research, including field methods such as participant observation, in-depth interviews, and the collection of documents. Emphasis is on understanding the ways people interpret their experiences and construct and share their reality.
5043  Evaluation Research
(3-0) 3 hours credit.
Theory and practice of evaluation of public policy and social service programs. Evaluation theories, models, and key evaluation studies are reviewed. Practical and political issues involved in the design and implementation of evaluations are addressed. Evaluation of a social agency or program may be included.

5103  Complex Organizations
(3-0) 3 hours credit. Prerequisites: SOC 5003 and SOC 5013.
Structure and dynamics of large organizations, with emphasis on outcomes related to varying organizational contexts. The influence of culture and society on organizational behavior is also examined.

5113  Civil Military Relations
(3-0) 3 hours credit. Prerequisite: SOC 5013.
Theories of military organization and the impact of the military on societies and communities. Topics may include race and gender relations, military unions, coup d'etats, war, and technology.

5123  Family Contexts and Social Change
(3-0) 3 hours credit.
Family system organization and process within the broader context of community and society. Emphasis is on the changing historical roles of families, as well as cross-cultural, socioeconomic, race and ethnic, and gender variability in the family. The impact of education, the economy, and politics is also considered.

5133  Sociology of Health and Health Care
(3-0) 3 hours credit.
The relation of social behavior to health status, epidemiology, and the social organization of medicine in the United States and cross-culturally. Emphasis is on the development of the health care industry and problems associated with the delivery of health care services.

5143  Demography and Community Trends
(3-0) 3 hours credit. Prerequisite: SOC 5013.
Basic demographic perspectives and data; methods of analysis of population size, distribution, and composition; determinants and consequences of population trends. Applications of computer programs for demographic analysis may be included.

5153  Sociology of Tourism and Leisure
(3-0) 3 hours credit.
Interdisciplinary survey of current theories and research on leisure activity. Leisure trends and their effects on tourism and economic development are examined.

5203  Social Stratification
(3-0) 3 hours credit.
Theory and research pertaining to structures of social inequality—their causes, forms, and consequences. Emphasis is on the distribution of power, prestige, and economic privilege, and patterns of social mobility in the United States.

5213  Race and Ethnic Relations
(3-0) 3 hours credit.
Dominant-subordinate relations between various racial and ethnic groups, from cross-cultural theoretical perspectives. Models of assimilation, cultural pluralism, and colonialism are investigated, as are their implications for minority and majority group members.

5223  Mexican Americans: Community, Culture, and Class
(3-0) 3 hours credit.
Sociological focus on the Mexican American population. Emphasis is on the theories used to interpret the experiences of this group, particularly those oriented to issues of stratification and social mobility.
5233 **Gender and Society**  
(3-0) 3 hours credit. Prerequisites: SOC 5003 and SOC 5013.  
Interdisciplinary survey of theory and current research on gender and gender-related issues. Gender-based theories are examined and compared to explanations for other forms of social stratification. Implications for family dynamics, the labor force, and the economy are explored.

5243 **Aging and Society**  
(3-0) 3 hours credit.  
Theory and research on the structure and dynamics of age stratification. Historical and cross-cultural differences in the status of the elderly are emphasized, as are the policy implications of demographic shifts toward an aging population.

5253 **Border Studies**  
(3-0) 3 hours credit.  
An examination of borders in an era of globalization, with emphasis on the United States–Mexico border. Themes may include a theoretical criticism of American mainstream border studies and its more important representatives.

5263 **Cultural Studies**  
(3-0) 3 hours credit.  
A study of the significance of culture in society, including the relationship between culture, consciousness, the economy, identity, and history. The development of the field and crucial debates in the literature will be examined. The relationship of Cultural Studies with Critical Theory, feminist theory, multicultural theory, and media studies will be explored.

5313 **Theories of Identity**  
(3-0) 3 hours credit.  
An examination of different theories that make sense of how people construct social and cultural identities. The course will cover theories of identity developed by symbolic interactions, Marxism, psychoanalysis, structuralism, and poststructuralism. Special emphasis will be devoted on how feminism and post-colonial theory have dealt with issues of identity construction.

5323 **Sociology of Childhood**  
(3-0) 3 hours credit.  
Explores concepts, theories, and empirical research focusing on childhood and children. Topics may include social structure and its consequences for children's lives, how circumstances, meanings, and representations of childhood differ across cultures.

5333 **Language and Society**  
(3-0) 3 hours credit.  
An examination of the work of important scholars in the study of language and social behaviors.

5343 **Education and Reproduction of Inequality**  
(3-0) 3 hours credit.  
Examines the relation between types of societies and systems of education, the connection between schooling and societal stratification, and how schooling contributes both to social mobility and to the reproduction of the prevailing social order.

5353 **Crime and Delinquency**  
(3-0) 3 hours credit.  
The role of crime and delinquency in society is analyzed. A consideration of the relationship among data, theory, and policy as integral components of crime and delinquency forms a central theme of this course. Independent empirical work is required.
5413  Sociology of Music
(3-0) 3 hours credit.
Explores the social significance of music in people’s everyday life. Includes an examination of different schools of thought that have explored the relationship of music and identity. Examines different approaches and case studies of popular musics of the world, i.e., conjunto and tejano, tango and rock, and salsa.

5513  Comparative/Historical Sociology
(3-0) 3 hours credit.
Comparative strategies and historical methods are examined through methodological readings and evaluations of important works in the field; an examination of how theoretical concerns and historical-comparative evidence are brought to bear on the study of organizational structures, institutional relationships, political conflicts, cultural patterns, and social change.

6903  Topics in Advanced Sociology
(3-0) 3 hours credit. Prerequisites: SOC 5003 and SOC 5013.
A seminar offering the opportunity for specialized study not usually available as part of the regular course offerings. Topics may include social gerontology, deviance, demography of aging, social psychology, religion, culture and society, mass communications, and research applications. May be repeated for credit when topics vary.

6951-3 Independent Study
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Sociology Graduate Advisor of Record.
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not usually available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961  Comprehensive Examination
1 hour credit. Prerequisite: Approval of the Sociology Graduate Program Committee to take the Comprehensive Examination.
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Sociology Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6963,6 Internship
3 or 6 hours credit. Prerequisites: Consent of instructor and 18 semester credit hours of graduate work.
Work-oriented experience within a local organizational setting where the principles, theories, concepts, and methods of the discipline can be applied. A research paper under the supervision of assigned faculty is required.

6973  Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not usually available as part of the regular course offerings. Special Problems may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master's degree.

6983,6 Master’s Thesis
3 or 6 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director, and 24 semester credit hours of graduate work.
Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
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Photo – College of Public Policy
Master of Science in Justice Policy

The Master of Science in Justice Policy (M.S. in Justice Policy) is designed to provide students with competency in policy planning and evaluation, and skills for managing justice agencies in complex and dynamic environments. The program assists students to develop and apply research expertise to the study and resolution of contemporary justice policy problems.

Program Admission Requirements. To qualify for unconditional admission, applicants must satisfy University-wide graduate admission requirements and submit all transcripts and Graduate Record Examination (GRE) General Test scores. Applicants admitted unconditionally as a degree-seeking student must possess a baccalaureate degree from an accredited university or equivalent training at a foreign institution; a grade point average of 3.0 or better in the last 60 hours of undergraduate work as well as all previous graduate work; 18 hours in criminal justice, criminology, or a closely-related discipline, or professional experience in the justice system; coursework in criminology theory, organization theory and research methods; good standing at the last institution attended; and the recommendation of the Justice Policy Graduate Admissions Committee. When GRE scores are used to determine an admission, applicants will be compared to applicants with similar socioeconomic backgrounds. Students who do not meet these criteria may be admitted conditionally or on probation as degree-seeking or special students depending on the nature of the deficiency.

Degree Requirements. The minimum number of semester credit hours required for the degree, exclusive of coursework or other study to remove deficiencies, is 36.

Degree candidates must complete

A. 15 semester hours of core courses

   CRJ 5113 Research Methods and Quantitative Analysis
   CRJ 5123 Justice Policy Formation and Implementation
   CRJ 5133 Management of Justice Organizations
   CRJ 6113 Advanced Research Applications
   CRJ 6363 Paradigms of Justice Policy

   Students are expected to complete core courses within their first 21 hours of course work. Normally, students should enroll in CRJ 5113 and CRJ 5123 in their first semester.

B. 9 semester credit hours of prescribed electives from the following:

   CRJ 5023 History of Justice Policy Development
   CRJ 5323 Program Evaluation: What Works, What Doesn’t
   CRJ 6003 Decision Analysis in Criminal Justice Settings
   CRJ 6103 Seminar on Topics in Theory of Crime and Justice
   CRJ 6123 Seminar on Topics in Research Methods
   CRJ 6203 Seminar on Topics in Corrections Policy
   CRJ 6223 Ethics and the Practice of Social Control
   CRJ 6303 Seminar on Topics in Policing and Crime Control
   CRJ 6403 Seminar on Topics in Law, Society and Justice Policy
   CRJ 6503 Applied Policy Research
   CRJ 6951,3 Independent Study
   CRJ 6961 Comprehensive Examination
C. 6 semester credit hours of free electives

Students must select an additional 6 hours of elective credits from outside the discipline. Outside electives must be chosen from designated courses in related UTSA graduate disciplines, following consultation with the faculty advisor. Approved free elective courses are listed in Section D of the Policies and Procedures for the Master of Science in Justice Policy program.

D. 6 semester hours of Master’s Thesis or Justice Policy Research Project

Students may enroll in the CRJ 6983,6 Justice Policy Research Project or CRJ 6993,6 Master’s Thesis after 24 credit hours. CRJ 6983,6 Justice Policy Research Project requires faculty supervision and approval of the final report by the Graduate Studies Committee. CRJ 6993,6 Master’s Thesis requires compliance with UTSA Thesis Requirements and thesis defense.

E. Comprehensive examination

Candidates for the Master’s degree will also be required to pass a written comprehensive examination. Students will be eligible to take the comprehensive examination after successfully completing 30 hours of the program. Students must register for one semester credit hour of Comprehensive Examination in semester in which the examination is to be taken.

COURSE DESCRIPTIONS
JUSTICE POLICY
(CRJ)

5023 History of Justice Policy Development
(3-0) 3 hours credit.
History and development of crime control policy in America. Sources of policy initiatives (e.g., economics, law, social conditions, political environment); criminal justice policy process; dynamics of policy formation; implementation and evaluation. Case studies and simulations in externalities.

5113 Research Methods and Quantitative Analysis
(3-0) 3 hours credit. Prerequisite: CRJ 3013 or equivalent.
Advanced practice with research design, quantitative techniques, and statistical software used in policy research. Familiarizes students with conventions for statistical report writing and data presentation.

5123 Justice Policy Formation and Implementation
(3-0) 3 hours credit.
Detailed study of policy formation and implementation process, stakeholder networks; agenda setting; policy crafting; constituency building; consideration of alternatives; political decision making and resolution; short-term and long-term implementation issues; role of evaluation and evaluators.

5133 Management of Justice Organizations
(3-0) 3 hours credit.
Management theory; organizational dynamics; leadership and administration research related to public and private justice organizations; case studies and simulations of common administrative problems; operational policies; implementation and evaluation.

5323 Program Evaluation: What Works, What Doesn’t
(3-0) 3 hours credit. Prerequisite: CRJ 5113 or its equivalent, or permission of the instructor.
Introduction to methods for assessing whether policy relevant justice programs work as envisioned; different evaluation methods will be explored including process, output, outcome, and cost-benefit analysis; evaluation considerations in development of policy; and common problems associated with evaluation research.
6003  **Decision Analysis in Criminal Justice Settings**  
(3-0) 3 hours credit.  
Surveys decision-analysis concepts and tools for application to policy problems in criminal justice involving risk, uncertainty, and conflicting objectives. Consider both qualitative and quantitative decision-making models. Introduction to decision-analysis software.

6103  **Seminar on Topics in Theory of Crime and Justice**  
(3-0) 3 hours credit.  
Consideration of selected topics related to the theory of crime and justice. Explores particular theories or perspectives of crime and its implications for justice policy. Topics may focus on traditional or emerging theories of crime and justice. May be repeated for credit when topics vary.

6113  **Advanced Research Applications**  
(3-0) 3 hours credit. Prerequisite: CRJ 5113 or its equivalent, or permission of the instructor.  
Survey of multivariate statistical techniques. Advanced practice conducting quantitative analyses using criminal history, offender tracking, and other justice policy information systems. Introduction to problems of data manipulation and interpretation using common agency databases.

6123  **Seminar on Topics in Research Methods**  
(3-0) 3 hours credit. Prerequisite: CRJ 5113 or its equivalent.  
Study of qualitative or quantitative methods not addressed as part of the regular course offerings. Topics may include systems analysis in criminal justice, interrupted time-series analysis, and qualitative methods in criminal justice research. May be repeated for credit when topics vary.

6203  **Seminar on Topics in Corrections Policy**  
(3-0) 3 hours credit.  
Consideration of selected topics in the field of corrections. Topics may include offender classification, case management, pretrial supervision, management of confinement facilities, juvenile justice, special needs populations, comparative corrections and criminal sanctions on individuals or corporations. May be repeated for credit when topics vary.

6223  **Ethics and the Practice of Social Control**  
(3-0) 3 hours credit.  
Survey of the major schools of ethics theory; sources of the ethical and philosophical foundations for justice, social control, and criminal justice functions; common ethical quandaries confronting formal agencies of social control; the role of law, facts, and values in ethical use of formal social control. Externalities related to operational, administrative, and political decision making.

6303  **Seminar on Topics in Policing and Crime Control**  
(3-0) 3 hours credit.  
Consideration of selected topics related to police and private sector crime control practices. Topics may include the roles, responsibilities and limitations of public and private enforcement; surveillance, use of force, minority relations, extralegal practices, labor relations, security operations, terrorism, and national security. May be repeated for credit when topics vary.

6363  **Paradigms of Justice Policy**  
(3-0) 3 hours credit. Prerequisites: CRJ 5113 or its equivalent, and 9 additional hours in the program.  
Examination of the major paradigms of justice policy from early deistic and philosophical perspectives to modern and postmodern perspectives of social justice; and exploration of policy implications of these perspectives.

6403  **Seminar on Topics in Law, Society and Justice Policy**  
(3-0) 3 hours credit.  
Consideration of selected topics related to law and society issues. Topics may include decision-making by groups or individuals, criminal law and courts, international law, sentencing reforms, and history of law. May be repeated for credit when topics vary.
6503  **Applied Policy Research**  
(3-0) 3 hours credit.  
Organized applied policy research by a group of students under faculty direction. Research conducted within justice agencies on policy or program evaluation. Involves out-of-class data collection and analysis. Reports are produced for participating agencies.

6951,3  **Independent Study**  
1 or 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not usually available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours will apply to the Master's degree.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6983,6  **Justice Policy Research Project**  
3 or 6 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and Justice Policy Research Project Advisor.  
A policy research project of thesis quality involving interaction with one or more justice agencies, conducted by the student under the supervision of a faculty member. May be repeated for credit, but no more than 6 hours may be applied to the Master's degree. Credit will be awarded upon submission and acceptance of the formal research report.

6993,6  **Master's Thesis**  
3 or 6 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis advisor.  
Thesis research and preparation. May be repeated for credit but no more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
Master of Public Administration Degree

The Master of Public Administration (M.P.A.) is a professional degree designed to prepare individuals for positions in management and policy analysis at several levels of government, in nonprofit agencies, and in the private sector where knowledge of government is important.

Program Admission Requirements. Applicants must satisfy University-wide graduate admission requirements, submit either Graduate Record Examination (GRE) General Test or Graduate Management Admission Test (GMAT) scores, submit a letter of intent, and complete undergraduate courses in research methods or statistics, economics, and U.S. government (politics). The letter of intent should state the applicant’s reasons for pursuing the M.P.A. and how the degree will help the applicant achieve her or his career goals. Three letters of recommendation are optional. Applicants may be admitted as unconditional, conditional, or special students. Admission as a special graduate student does not guarantee subsequent admission as a degree-seeking student; such students must reapply for degree-seeking status.

Degree Requirements. The minimum number of semester credit hours required for the degree, exclusive of coursework or other study required to remove deficiencies, is 36. In addition to these basic degree requirements, students without previous public service employment must complete an additional 6 semester credit hours. Students have the option of taking 3 or 6 hours of PAD 6963, 6 Internship or PAD 6983, 6 Master’s Thesis, or they can take PAD 6923 Applied Research twice or a combination of courses that meet the 6-hour requirement.

Degree candidates must complete

A. 21 semester credit hours of core courses:

- PAD 5003 Introduction to Public Administration
- PAD 5023 Quantitative Methods for Public Administration
- PAD 5033 Theories of Public Bureaucracy
- PAD 5323 Public Policy Formulation and Implementation
- PAD 5343 Personnel Management in the Public Sector
- PAD 5363 Public Sector Financial Management
- PAD 5393 Economics for Public Administrators

Normally, students enroll in PAD 5003 during their initial semester.

B. 9 semester credit hours in one of the following general tracks, chosen in consultation with the M.P.A. faculty advisor and approved by the Graduate Program Committee Chair:

- Public Management and Administration
- Public Policy

C. 3 semester credit hours of electives

D. Comprehensive examination. Degree candidates are required to pass both written and oral comprehensive examinations. The examinations are administered in the form of a professional quality exit paper written by the student in the required PAD 6923 Applied Research course, and presented to a faculty committee.

E. Thesis option. Students may also elect to complete a thesis as part of their M.P.A. degree program. Arrangements for this option are made through the Graduate Advisor of Record.
COURSE DESCRIPTIONS
PUBLIC ADMINISTRATION
(PAD)

5003 Introduction to Public Administration (3-0) 3 hours credit.
Provides an overview of the theoretical foundations, substance, and boundaries of modern public administration. Examines the traditional management functions in the legal domain performed by public administrators as well as current issues and problems in the field.

5013 Communication Skills for Public Management (3-0) 3 hours credit.
Designed to improve a student’s ability to use oral, written, graphic, or other presentation techniques as a means of expressing and conceptualizing ideas. Focuses on written and oral communications skills in public administration. Topics may include instruction in grant writing and the development and management of conferences, seminars, and workshops. (Formerly PAD 6513. Credit cannot be earned for both PAD 5013 and PAD 6513.)

5023 Quantitative Methods for Public Administration (3-0) 3 hours credit. Prerequisite: Undergraduate statistics or methodology course.
Examines data analysis techniques with emphasis on the social and policy sciences. Topics include descriptive statistics, probability, inference, and regression analysis. Proficiency in the use of statistical software is developed. (Formerly PAD 5903. Credit cannot be earned for both PAD 5903 and PAD 5023.)

5033 Theories of Public Bureaucracy (3-0) 3 hours credit.
This course allows students to examine major theories of organization and assess how these theories fit with and impact on public-sector bureaucracy. Emphasis is on organizational dynamics, behavior in bureaucracies, sources of organizational change, and the integration of theory and practice. (Formerly POL 5353. Credit cannot be earned for both POL 5353 and PAD 5033.)

5223 Urban Management (3-0) 3 hours credit.
An examination of the major economic, social, and political processes involved in managing urban government in the United States. Topics may include contemporary issues in urban areas, urban finance, and intergovernmental dimensions of urban management.

5233 Scope and Methods of Inquiry (3-0) 3 hours credit.
A comprehensive exploration into the nature and modes of analytic inquiry for administrative and decision-making settings. Course material relevant for social sciences, managerial sciences, policy sciences, and other disciplines. Foci include the formulation of research designs, the conduct of literature reviews, scientific investigations, and systematic inquiries. This course is recommended highly for students writing, or preparing to write, exit papers.

5243 Management Information Systems (3-0) 3 hours credit.
This course explores managerial means of accessing, organizing, and using information and data in public organizations. Attention is given to use of the Internet and database and information systems management.

5303 Ethics in Government Administration (3-0) 3 hours credit.
An inquiry into the philosophical and legal foundations of government administration, and the propriety, application, and enforcement of ethical standards for conducting government. Topics may include the dilemmas associated with public administration in democracies, multicultural environments, and societies marked by socioeconomic and ideological stratification.
5313 Public Policy Analysis
(3-0) 3 hours credit.
This course examines the core component of policy making—the examination, comparison, and choice of policy alternatives. The values, assumptions, and tools associated with welfare economics, as well as alternative approaches to analysis will be studied in detail. Key issues such as informational capacity, public input, rhetorical tools of argument, and ethical obligations of the policy analyst may also be covered.

5323 Public Policy Formulation and Implementation
(3-0) 3 hours credit.
A broad overview of the creation and execution of public policy at all levels and venues of government. Through theoretical approaches and case studies, this course examines key issues such as the impact of politics on policy formulation; the role of public opinion and interest groups; the dynamics of small-group decision making; rulemaking; and variables influencing successful implementation.

5333 Program Evaluation
(3-0) 3 hours credit. Prerequisite: PAD 5023 or consent of instructor.
The process, politics, and methodology of analyzing and evaluating public programs. Addresses uses and limitations of methods such as cost-benefit analysis, time-series analysis, and case studies. Students are required to produce a report evaluating a program.

5343 Personnel Management in the Public Sector
(3-0) 3 hours credit.
An examination of the theory and practice of human resource management in public organizations, including the economic, political, and social factors shaping human resource policies in the public sector. The course is designed to provide students with an understanding of the techniques for managing personnel in the public sector. (Formerly POL 5343. Credit cannot be earned for both POL 5343 and PAD 5343.)

5353 Issues in Public Services and Employment
(3-0) 3 hours credit.
Examines current issues in the public service such as productivity improvement, workforce development, total quality management, labor/management relations, transformational leadership, and reinventing government. May be repeated when topics vary.

5363 Public Sector Financial Management
(3-0) 3 hours credit.
Addresses policies, procedure, and skills relevant to financial management in public sector organizations. Emphasis is on the practice of budgeting, financial reporting, revenue generation, capital budgeting, and debt management.

5393 Economics for Public Administrators
(3-0) 3 hours credit.
Develops the tools of economic theory and demonstrates their use for public policy analysis and evaluation. Topics addressed may include discrimination, tax incidence, housing, income maintenance, job training, and environmental issues.

5423 Employment and Training Programs
(3-0) 3 hours credit.
An analysis of public policies and programs relating to the development, sustainment, and utilization of the workforce in the areas of labor economics, education and training, and income maintenance.

5443 Diversity Policies and Management
(3-0) 3 hours credit.
Examines current policies and management practices associated with cultural, ethnic, and gender differences in the workplace. Includes analysis of the theoretical and historical bases for affirmative action policies, the impact of such policies, and their interaction with civil service systems and collective bargaining structures. (Formerly PAD 5433. Credit cannot be earned for both PAD 5433 and PAD 5443.)
5463 Intergovernmental Relations
(3-0) 3 hours credit.
Examines the origins and dimensions of American federalism and intergovernmental administration, including the impact of the federal system on contemporary public policy. Topics may include fiscal federalism, intergovernmental relations, and the character of federal relations involving the borderlands.

5473 Land Use Policy
(3-0) 3 hours credit.
An overview of the formulation and implementation of land use policies in the United States, with an emphasis on South Texas. Topics may include the history of land use policies, the clash of interests and values, the difficulties of land use in growing areas, and the role of legal controversies.

5483 Environmental Policy
(3-0) 3 hours credit.
This course explores the distribution and public policy dimensions of environmental hazards across urban and regional boundaries, as well as economic, racial, and gender boundaries.

5503 Introduction to Urban Planning
(3-0) 3 hours credit.
The course explores the development and evolution of city planning. An introduction to the major concepts and procedures used by planners with emphasis on developing the urban general plan. Issues such as neighborhood revitalization, community planning, and the reflective practitioner may also be examined.

5513 Urban and Regional Economic Development
(3-0) 3 hours credit.
Scope and status of urban-regional economic development. Analyses of factors contributing to the economic growth or decline of U.S. cities or regions. Roles of government in urban and regional economic development and public/private cooperation. Case studies of specific urban areas.

5563 Urban Planning Methods
(3-0) 3 hours credit. Prerequisite: PAD 5503 or consent of instructor.
This course focuses on the analytical tools and research methods available to the city planner in addressing social, economic, and environmental problems. Urban data collection, analysis, and demographics are addressed.

5623 Comparative Public Administration
(3-0) 3 hours credit.
Analysis of a variety of contemporary administrative systems in Western, former Communist, and developing nations. Special attention to historical development, organization, function, and recruitment in selected bureaucracies. Examines relationships between bureaucracies and other components of the political system.

5653 Public Policy and Administration in Latin America
(3-0) 3 hours credit.
Focuses on the distinctions of public policy formation and administration in Latin American countries. Interrelationships among countries and with the United States are also addressed.

5663 Development Administration
(3-0) 3 hours credit.
Explores the basic relationship between administration and development in underdeveloped, newly developing, and developed societies. The role of development administration and supranational organizations, as well as regional and international political economic organizations, is also analyzed.
5813 Health Issues and Policies  
(3-0) 3 hours credit.
This course explores selected policy areas and related contemporary topics. May be repeated once for credit when topics vary.

5863 International Health Issues  
(3-0) 3 hours credit.
This course investigates salient global health issues and its impact on local and regional development. Much of the course focuses on health problems of developing countries and the success of modern political, administrative, and economic policies to deal with them. Health problems in developed countries are also analyzed. (Credit cannot be earned for both PAD 5863 and POL 5863.)

5913 Nonprofit Organizations  
(3-0) 3 hours credit.
The focus of this course is on the role and characteristics of nonprofit organizations. Topics may include advocacy, governance, accountability, philanthropy, voluntarism, and financial resources. In different semesters, focus may be on organizations dealing with health and human services, community development, housing, education, energy, and the environment.

5923 Nonprofit Leadership and Management  
(3-0) 3 hours credit.
This course focuses on leadership and managerial responsibilities and techniques in nonprofit organizations. Topics may include the roles and functions of boards of directors; the communication of a vision and effectively moving toward it; coordinating committees of governmental and business leaders; organizing, coordinating, and facilitating meetings; the cultivation and use of volunteers; and the management of change and conflict.

5933 Fiscal Resource Development and Management in Nonprofit Organizations  
(3-0) 3 hours credit.
Designed to promote an understanding of philanthropy, fundraising, grants, contracting, resource development planning, and financial management appropriate to nonprofit groups.

5943 Strategic Planning and Management for Public and Nonprofit Organizations  
(3-0) 3 hours credit.
This course offers students an introduction to the context and processes of strategic planning and management in public and nonprofit organizations. Emphasis will be placed on topics such as developing an external organizational focus; identifying political, social, and economic trends; and developing and managing a strategic plan.

5953 Grant Development and Proposal Writing  
(3-0) 3 hours credit.
This course will provide an overview of the various stages of the grant-seeking and grant-making processes. Topics that may be covered include types of grants and funders; the development of an idea; the creation of community partnerships; identification of possible funding sources; the design and evaluation of a proposed program; proposal writing; and the grant review process.

6213 Social Justice  
(3-0) 3 hours credit.
The provision of normative guidance for understanding social issues and tracing the consequences of public service policies and programs through various constructions of justice. Competing facts and values that surround the contemporary debate over justice policy and practice. Topics may include human agency; resistance to domination; developing alternative organizations; development of moral reasoning and values; and distributive justice. This seminar is designed to get participants to embrace praxis.
6233  Law and Policy  
(3-0) 3 hours credit.  
An overview of the inter-relationship of law, courts, and public policy. The course will stress a dual focus on the legal tools of policy makers, and courts as venues for policy formulation. Specific topics to be covered include philosophies of the role of law in society, types of law, and the various intersections of law and policy.

6243  Administrative Law  
(3-0) 3 hours credit.  
This course covers the procedural requirements that administrative agencies must adhere to and the body of law that defines those requirements. Topics may include rule-making, administrative hearings, and freedom of information, as well as broader questions of agency empowerment and the place of judicial review.

6543  Urban Service Systems  
(3-0) 3 hours credit.  
Study of urban service systems such as infrastructure, public safety, housing, and transportation systems. Economy, equity, and effectiveness are also addressed. Political and social dimensions may also be examined.

6923  Applied Research  
(3-0) 3 hours credit.  
Provides the opportunity to apply substantive expertise and research methods to managerial or policy issues in the public sector. May be repeated once for credit with a different emphasis.

6951,3 Independent Study  
1 or 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not usually available as part of the regular course offerings. May be repeated for credit, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961  Comprehensive Examination  
1 hour credit. Prerequisite: Approval of the appropriate Graduate Program Committee Chair to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6963,6 Internship  
3 or 6 hours credit. Prerequisite: Consent of instructor and 18 semester credit hours of graduate work. Work-oriented experience in a local organizational setting where the principles, theories, concepts, and methods of the discipline can be applied. A research paper under the supervision of assigned faculty is required.

6973  Special Topics  
(3-0) 3 hours credit.  
An organized course offering the opportunity for specialized study not usually available as part of the regular course offerings. Special problems may be repeated for credit when topics vary, but no more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6983,6 Master’s Thesis  
3 or 6 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director and 24 semester credit hours of graduate work. Thesis research and preparation. May be repeated for credit, but no more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis.
Photo – College of Sciences
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COLLEGE OF SCIENCES

DEPARTMENT OF BIOLOGY

Master of Science Degree in Biology

The graduate program offers opportunities for advanced study and research leading to the Master of Science degree in Biology. A thesis option is offered to students who want an opportunity to develop expertise in research techniques and data analysis; a nonthesis option is offered for those who want the opportunity to earn the Master of Science degree primarily through organized coursework. The thesis option is recommended for students who plan a career in research or contemplate pursuing a doctorate in one of the life sciences. The nonthesis option might be suitable for students interested in secondary school teaching in the life sciences.

Graduate faculty research interests include biochemistry, cellular biology, developmental biology, ecology, genetics, microbiology, neurobiology, physiology, and plant sciences. The multidisciplinary nature of the program also allows students the opportunity to broaden their educational background at the graduate level. Individual programs are organized around each student’s interests in consultation with the student’s graduate advisor.

Qualified students are encouraged to apply for teaching assistantships and fellowships. Requests should be sent to the Chair of the Department of Biology when application is made for admission to UTSA.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, applicants are expected to have completed an undergraduate major in one of the biological sciences, with coursework comparable to that required for the Bachelor of Science degree in Biology at UTSA. Students whose undergraduate preparation is deficient in certain areas but who meet the minimum University standards for admission may be conditionally admitted and required to complete specific undergraduate or graduate courses as conditions of admission. In such cases, students should anticipate that additional time will be required to complete the degree. To be considered for degree-seeking status, applicants must submit two letters of recommendation to the Graduate Program Committee Chair in the Department of Biology; they must also submit scores from the Graduate Record Examination (GRE) with their application.

Degree Requirements. Degree candidates are required to complete a minimum of 36 semester credit hours approved by the student’s Graduate Advisor of Record. These hours are subject to the following conditions:

• A minimum of 18 semester hours of graduate credit in organized classes must be earned within the department. This may include up to 6 semester credit hours of approved upper-division undergraduate coursework and a maximum of 3 semester credit hours in a graduate seminar (BIO 7051).
• An additional 18 semester hours of graduate credit as approved by the Graduate Advisor of Record. This may include a maximum of 6 hours of BIO 5973 Directed Research. For students electing the nonthesis option, a minimum of 3 semester credit hours of BIO 5973 must be included. Students electing the thesis option must complete 6 semester credit hours of BIO 6983 Master’s Thesis as part of this total.

Comprehensive Examination. As specified by University regulations, candidates must pass a comprehensive examination administered by their graduate committee. This examination is normally given in the semester before the semester during which degree requirements are to be completed. Certain rules must be adhered to concerning the composition of the Master’s Thesis Committee and the Master’s Comprehensive Examination Committee. Only tenured or tenure-track faculty members can chair these committees, and no more than one member of either committee can be a nontenured or nontenure-track faculty member, or be from another university. Students electing the thesis option must successfully defend their thesis research before their graduate committee prior to the submission of the thesis to the Dean of Graduate Studies for approval.
**Master of Science Degree in Biotechnology**

The Master of Science degree in Biotechnology offers opportunities for advanced study and research related to the rapidly developing field of applied biology. A broad common base of knowledge for biotechnology is provided in the Master's degree by a comprehensive core curriculum that encompasses key areas in biology, computer science, and statistics. Additional coursework is selected from one of two concentrations, from which specialized courses may be chosen. These concentrations are molecular neurobiology and bioprocessing technology. The opportunity to develop additional technical expertise is also available through directed research.

**Program Admission Requirements.** In addition to satisfying the University-wide graduate requirements, applicants are expected to have completed an undergraduate major in the sciences with coursework comparable to the core required for the Bachelor of Science degree in Biology at UTSA. Students must also have completed courses equivalent to BIO 3713, 3722 Microbiology and Laboratory and CS 1073 Introductory Computer Programming for Scientific Applications. Students whose undergraduate preparation is deficient in certain areas but who meet the minimum University standards for admission may be conditionally admitted and required to complete specific undergraduate or graduate courses as conditions of admission. Courses listed as deficiencies do not count toward the graduate degree. In such cases, students should anticipate that additional time will be required to complete the degree. To be considered for degree-seeking status, applicants must submit two letters of recommendation to the Graduate Program Committee Chair in the Department of Biology; they must also submit scores from the Graduate Record Examination (GRE) with their application.

**Degree Requirements.** Degree candidates are required to complete a minimum of 36 semester credit hours approved by the student's Graduate Advisor of Record. These hours are subject to the following conditions:

**Program of Study**

A. Biotechnology core curriculum (15 semester credit hours):

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>BIO 5353</td>
<td>Molecular and Biochemical Genetics</td>
</tr>
<tr>
<td>BIO 6803</td>
<td>Advanced Immunology and Immunochemistry</td>
</tr>
<tr>
<td>BIO 7513</td>
<td>Advanced Biochemistry</td>
</tr>
<tr>
<td>BIO 7643</td>
<td>Cellular and Molecular Biology</td>
</tr>
<tr>
<td>STA 5073</td>
<td>Methods of Statistics I</td>
</tr>
</tbody>
</table>

B. Biotechnology electives. Each student must complete 21 semester credit hours of biotechnology electives, at least 9 of which must be selected from a single concentration:

*Concentration 1: Molecular Neurobiology*

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>BIO 5423</td>
<td>Neuroanatomy</td>
</tr>
<tr>
<td>BIO 5433</td>
<td>Neurophysiology</td>
</tr>
<tr>
<td>BIO 5443</td>
<td>Neurochemistry</td>
</tr>
<tr>
<td>BIO 5523</td>
<td>Enzymes</td>
</tr>
<tr>
<td>BIO 5563</td>
<td>Biochemical Macromolecules</td>
</tr>
<tr>
<td>BIO 5833</td>
<td>Membrane Structure and Function</td>
</tr>
<tr>
<td>BIO 7571-3</td>
<td>Experimental Techniques in the Life Sciences</td>
</tr>
</tbody>
</table>

*Concentration 2: Bioprocessing Technology*

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<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 5363</td>
<td>Microbial Genetics</td>
</tr>
<tr>
<td>BIO 5523</td>
<td>Enzymes</td>
</tr>
<tr>
<td>BIO 5563</td>
<td>Biochemical Macromolecules</td>
</tr>
<tr>
<td>BIO 6553</td>
<td>Fermentation Science</td>
</tr>
<tr>
<td>BIO 6563</td>
<td>Food Science and Technology</td>
</tr>
<tr>
<td>BIO 6873</td>
<td>Microbial Physiology and Energetics</td>
</tr>
</tbody>
</table>

UTSA 2003–2005 Graduate Catalog
C. Directed research. Students may elect to develop expertise in research techniques in a selected emphasis on biotechnology through BIO 5973 Directed Research.

D. Master's thesis option. Students electing the thesis option must complete 6 semester credit hours of BIO 6983 Master's Thesis.

Comprehensive Examination. As specified by University regulations, degree candidates must pass a comprehensive examination administered by their graduate committee. This examination is normally given in the semester before the semester during which degree requirements are to be completed. Certain rules must be adhered to concerning the composition of the Master's Thesis Committee and the Master's Comprehensive Examination Committee. Only tenured or tenure-track faculty members can chair these committees, and no more than one member of either committee can be a nontenured or nontenure-track faculty member, or be from another university. The examination is normally given in the semester before the semester during which the degree requirements are to be completed. Students electing the thesis option must successfully defend their thesis research before their graduate committee before the submission of the thesis to the Dean of Graduate Studies for approval.

Doctor of Philosophy Degree in Biology

The Department of Biology offers opportunities for advanced study and research leading to the Doctor of Philosophy degree in Biology. The degree program has emphases in molecular and cellular neurobiology. The Ph.D. in Biology is awarded to candidates who have displayed an in-depth understanding of the subject matter and demonstrated the ability to make an original contribution to knowledge in their field of specialty.

The regulations for this degree comply with the general University regulations (refer to Chapter 3, General Academic Regulations, and Chapter 5, Doctoral Degree Regulations).

Admission Requirements. Applicants must have a Bachelor of Arts or a Bachelor of Science degree from an accredited university and a minimum grade point average of 3.0 in upper-division and graduate work, preferably in biology. Applicants must submit scores from the Graduate Record Examination (GRE) with their application. Applicants whose native language is not English must score at least 550 on the Test of English as a Foreign Language (TOEFL). The Doctoral Studies Committee, comprised of members selected from the graduate faculty, is responsible for advising students. Admission requires appointment to a teaching assistantship, research assistantship, or research fellowship.

Degree Requirements. The degree requires a minimum of 92 semester credit hours beyond the baccalaureate degree. The core curriculum consists of 30 semester credit hours of formal coursework, including elective courses that support the emphasis in neurobiology, and required teaching, research, and completion of the dissertation following advancement to candidacy. Enrollment in the Life Sciences Colloquium and Seminar in Life Sciences is required each semester of enrollment and may be taken for a maximum combined total of 26 semester credit hours. A minimum of 36 semester credit hours in doctoral research, including 12 hours for the doctoral dissertation, must be completed. Any grade lower than “B” in a graduate course or in remediate coursework at the undergraduate level will not count toward the 92 hours. Students matriculating with a Master's degree may use up to 30 semester credit hours toward the degree provided the courses are comparable to core and elective courses.
Program of Study

A. Core curriculum (15 semester credit hours required):
   
   BIO 7113 Supervised Teaching in Life Sciences  
   BIO 7413 Research Ethics and Responsible Conduct in Research  
   BIO 7513 Advanced Biochemistry  
   BIO 7573 Experimental Techniques in the Life Sciences  
   BIO 7643 Cellular and Molecular Biology

B. Colloquia and seminars (26 semester credit hours maximum):
   
   BIO 7041 Life Sciences Colloquium  
   BIO 7051 Seminar in Life Sciences

C. Doctoral research (36 semester credit hours minimum):
   
   BIO 7211-3 Doctoral Research (24 hours minimum)  
   BIO 7311-3 Doctoral Dissertation (12 hours minimum)

D. Electives (15 semester credit hours minimum):
   
   BIO 5423 Neuroanatomy  
   BIO 5433 Neurophysiology  
   BIO 5443 Neurochemistry  
   BIO 5453 Neuroendocrinology  
   BIO 5473 Developmental Neurobiology  
   BIO 5503 Sensory Physiology  
   BIO 5543 Pharmacology and Toxicology  
   BIO 5833 Membrane Structure and Function  
   BIO 6803 Advanced Immunology and Immunochemistry

The entire program of study must be approved by the student’s dissertation advisor, dissertation committee, and doctoral studies committee and must be submitted to the Dean of Graduate Studies for final approval.

Advancement to Candidacy. Advancement to candidacy requires a student to complete University and program requirements and to pass written and oral qualifying examinations following completion of course requirements. The examination is administered by the Doctoral Studies Committee and is conducted by the Dissertation Committee as outlined below. No more than two attempts to pass qualifying examinations are allowed. Results of the written and oral examinations must be reported to the Doctoral Studies Committee and the Dean of Graduate Studies. Admission into the doctoral program does not guarantee advancement to candidacy.

Dissertation. Candidates must demonstrate their ability to conduct independent research by completing and defending an original dissertation. The research topic is determined by the student in consultation with his or her supervising professor. A dissertation committee selected by the student and supervising professor and approved by the Dean of the College and the Dean of Graduate Studies guides and critiques the candidate’s research. The Dissertation Committee must approve the completed dissertation.

Final Oral Examination. Following an open presentation of the dissertation findings, the Dissertation Committee conducts a closed oral examination dealing primarily with the relation of the dissertation to the general field of specialty. Results of the oral examination must be reported to the Dean of Graduate Studies. Awarding of the degree is based on the approval of the Dissertation Committee, approved by the Dean of Graduate Studies. The Dean of Graduate Studies certifies the completion of all University-wide requirements.
COURSE DESCRIPTIONS

BIOLOGY

(BIO)

5013  **Survey of Environmental Sciences**
(3-0) 3 hours credit. Prerequisite: Graduate standing.
An integrative examination of living and nonliving environmental systems. A detailed study of interrelationships among plants, animals, and the environment, addressing the chemical, physical, and biological properties of living systems, and the principles that drive their evolution. (Same as ES 5013. Credit cannot be earned for BIO 5013 and ES 5013.)

5023  **Molecular and Genetic Bases of Living Systems**
(3-0) 3 hours credit. Prerequisite: Graduate standing.
A comprehensive survey of modern principles of quantitative, molecular, and cell biology. An integrated examination of the biochemical, biophysical, and genetic properties of procaryotic and eukaryotic cells and multicellular organisms.

5243  **Advanced Plant Ecology**
(3-0) 3 hours credit. Prerequisite: BIO 3283, BIO 3292, or consent of instructor.
A study of the major biomes of the world, including North America and Texas, and the factors that influence the development of these biomes. Special consideration is given to species interactions that lead to high and low density species. (Same as ES 5243. Credit cannot be earned for BIO 5243 and ES 5243.)

5263  **Microbial Ecology**
(3-0) 3 hours credit. Prerequisite: BIO 3713 or consent of instructor.
Interrelationships between microorganisms and their environment, including natural habitats of microorganisms, normal human flora, and pathogens. Special consideration is given to application of genetically engineering microorganisms for environmental problems. (Same as ES 5263. Credit cannot be earned for BIO 5263 and ES 5263.)

5313  **Cytogenetics**
(3-0) 3 hours credit. Prerequisite: BIO 2313 or an equivalent.
An analysis of chromosome structure and function, gene location, crossing-over, and variations in chromosome structure and number.

5333  **Advanced Population Genetics**
(3-0) 3 hours credit. Prerequisites: BIO 2313 and BIO 2322, or their equivalents. Biostatistics highly recommended.
An experimental approach to the interaction of genotype and environment in populations, with emphasis on mutagenesis, selection, polymorphism, and adaptive mechanisms.

5353  **Molecular and Biochemical Genetics**
(3-0) 3 hours credit. Prerequisites: BIO 2313 and BIO 3513, or their equivalents.
Molecular and biochemical aspects of structure, replication, mutation, and phenotypic expression of genetic material.

5363  **Microbial Genetics**
(3-0) 3 hours credit. Prerequisites: BIO 2313 and BIO 3713, or their equivalents.
A study of bacterial, fungal, and viral genetics. Emphasis on the current literature, data interpretation, and experimental techniques.

5403  **Advanced Comparative Animal Physiology**
(3-0) 3 hours credit. Prerequisite: BIO 4353 or an equivalent.
Physiology of the organs and organ systems of animals.
5423 Neuroanatomy
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
The anatomy of the vertebrate nervous system.

5433 Neurophysiology
(3-0) 3 hours credit. Prerequisite: BIO 4353 or an equivalent.
Physiology of the nervous system. Emphasis on sensory and motor systems and neural correlations of behavior.

5443 Neurochemistry
(3-0) 3 hours credit. Prerequisites: BIO 3513, 3522, and 4433.
An examination of basic biochemical phenomena involved in normal neural processes and some pathological changes associated with neurobiological diseases and disorders.

5453 Neuroendocrinology
(3-0) 3 hours credit. Prerequisites: BIO 3813 and 4433.
Anatomical and molecular neurobiology of the endocrine hypothalamus and associated organs. Morphological, cellular, and feedback mechanisms of endocrine regulation are emphasized.

5463 Reproductive Biology
(3-0) 3 hours credit. Prerequisites: Courses in organ physiology and endocrinology or consent of instructor.
A comparative study of mammalian reproduction with emphasis on vertebrate/mammalian reproduction, including cellular and systems mechanisms, hormonal regulation, and the effects of environmental factors.

5473 Developmental Neurobiology
(3-0) 3 hours credit. Prerequisite: BIO 4433 or consent of instructor.
A study of the development of the nervous system, with an emphasis on neurogenesis, neuronal migration, growth factors, axonal guidance, and the role of neuronal activity in synapse stabilization.

5483 Computational Neuroscience
(3-0) 3 hours credit. Prerequisite BIO 3433 or equivalent.
A non-mathematical approach to the computational functions of the brain, including sensory coding, neural control of movement, and the computational properties of neurons and neuronal networks.

5503 Sensory Physiology
(3-0) 3 hours credit. Prerequisite: BIO 4433 or consent of instructor.
Principles of sensory physiology, including sensory transduction and central processing of sensory information in vertebrate and invertebrate species.

5523 Enzymes
(3-0) 3 hours credit. Prerequisite: BIO 3513 or an equivalent.
A study of enzyme structure and mechanism, inhibitors, cofactor, kinetics, and regulation.

5543 Pharmacology and Toxicology
(3-0) 3 hours credit. Prerequisites: BIO 3513, 3522, 3413, and 3422.
A review of the beneficial, adverse, and toxic reactions of individuals to a variety of drugs and environmental substances. Chemical, biochemical, pharmacological, toxicological, genetic, teratogenic, and pathological aspects are examined.

5563 Biochemical Macromolecules
(3-0) 3 hours credit. Prerequisite: BIO 3513 or an equivalent.
Structure, function, and isolation of macromolecules. Emphasis is on nucleic acids and proteins and their interactions.

5583 Neuropharmacology
(3-0) 3 hours credit. Prerequisites: Graduate standing in the life sciences.
A study of drugs that affect nervous tissue, specifically those affecting the brain and autonomic nervous system.
5633  Cytodifferentiation  
(3-0) 3 hours credit. Prerequisite: Graduate standing in the life sciences.  
Detailed study of selected areas of developmental biology relating to cellular differentiation, including nuclear-cytoplasmic interactions, induction, and reversibility of differentiation.  

5743  Biochemical Virology  
(3-0) 3 hours credit. Prerequisite: Graduate standing in the life sciences.  
A detailed study of the diversity of viruses and biochemical mechanisms for their replication.  

5833  Membrane Structure and Function  
(3-0) 3 hours credit. Prerequisite: BIO 3513 or an equivalent.  
A study of the composition, organization, transport functions, and permeability of natural and model membranes.  

5971-3  Directed Research  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.  

6113  Advanced Plant Physiology  
(3-0) 3 hours credit. Prerequisite: BIO 4603 or consent of instructor.  
Principles of plant physiology and biochemistry, with particular emphasis on plant hormones, nitrogen fixation, plant respiration, photosynthesis, and current research work. (Same as ES 6113. Credit cannot be earned for BIO 6113 and ES 6113.)  

6133  Methods in Field Biology  
(3-0) 3 hours credit. Prerequisite: BIO 3283 or an equivalent.  
Examination of techniques to collect, identify, and preserve plants and animals. Field methods used in the analysis of populations and communities are considered. (Same as ES 6133. Credit cannot be earned for both BIO 6133 and ES 6133.)  

6213  Advanced Ecology  
(3-0) 3 hours credit. Prerequisite: BIO 3283 or an equivalent.  
Interaction of organisms with their environment, allelopathy, competition, distribution, succession, and factors that control growth and dispersal. Special consideration is given to the concepts of climax, succession, and land management. (Same as ES 6213. Credit cannot be earned for BIO 6213 and ES 6213.)  

6373  Invertebrate Physiology  
(3-0) 3 hours credit. Prerequisite: BIO 3413.  
An investigation of the mechanisms of respiration, movement, ion and water regulation, and hormonal integration in the invertebrates.  

6483  Animal Behavior  
(3-0) 3 hours credit. Prerequisite: BIO 3413 or consent of instructor.  
An examination of neural, endocrine, genetic, and environmental determinants of behavior.  

6553  Fermentation Science  
(3-0) 3 hours credit. Prerequisites: BIO 3713 and 3722, or their equivalents.  
The principles and theory underlying industrial fermentations, such as vessel design and construction, media design, upscaling fermentations, process control, and product isolation.
6563 **Food Science and Technology**  
(3-0) 3 hours credit. Prerequisites: BIO 3713 and 3722, or their equivalents.  
The science underlying industrial processes related to foods. The latest applications of technologies such as strain isolation and improvement, raw material selection and storage, process monitoring, and the assessment of chemical and microbiological status of products.

6663 **Experimental Parasitology**  
(3-0) 3 hours credit. Prerequisite: A course in parasitology or consent of instructor.  
A study of animal parasites, with special emphasis on the physiology of host-parasite interactions.

6773 **Host-Parasite Interactions**  
(3-0) 3 hours credit. Prerequisite: BIO 3713 or consent of instructor.  
A study of infectious disease processes, with emphasis on host-parasite relationships of selected microbial pathogens.

6803 **Advanced Immunology and Immunochemistry**  
(3-0) 3 hours credit. Prerequisite: BIO 4743 or consent of instructor.  
The study of current concepts of humoral and cell-mediated immunity, with emphasis on molecular mechanisms.

6823 **Molecular Radiation Biology**  
(3-0) 3 hours credit. Prerequisite: BIO 3513 or consent of instructor.  
A study of biological effects of ionizing and nonionizing radiation, with emphasis on repair mechanisms of radiation damage at the cellular and subcellular level. Applications in cancer therapy are included.

6873 **Microbial Physiology and Energetics**  
(3-0) 3 hours credit. Prerequisite: BIO 3713 or consent of instructor.  
Consideration of physiological activities of microorganisms, with special emphasis on metabolic capabilities of bacteria and other microorganisms.

6951-3 **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961 **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973 **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. This course may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, may be applied to the Master’s degree.

6983 **Master’s Thesis**  
3 hours credit. Prerequisites: Permission of the Graduate Advisor and thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
7041 Life Sciences Colloquium
(1-0) 1 hour credit. Prerequisite: Graduate standing.
Discussions of current journal articles, reviews, and recent advances in specialized areas of the biological sciences. May be repeated for credit as topics vary. The grade report for this course is either “CR” (satisfactory participation in the colloquium) or “NC” (unsatisfactory participation in the colloquium). (Formerly BIO 5041. Same as ES 6941. Unless topic varies, credit cannot be earned for both BIO 7041 and ES 6941.)

7051 Seminar in Life Sciences
(1-0) 1 hour credit. Prerequisite: Graduate standing.
Formal presentations of research by outside authorities in the biological sciences. May be repeated for credit. The grade report for this course is either “CR” (satisfactory participation in the seminar) or “NC” (unsatisfactory participation in the seminar).

7113 Supervised Teaching in Life Sciences
3 hours credit. Prerequisite: Admission to candidacy for the doctoral degree. May be repeated for credit.

7211-3 Doctoral Research
1 to 3 hours credit. Prerequisite: Admission to candidacy for the doctoral degree. May be repeated for credit, but no more than 24 hours may be applied to the doctoral degree.

7311-3 Doctoral Dissertation
1 to 3 hours credit. Prerequisite: Admission to candidacy for the doctoral degree and completion of at least 21 hours of BIO 7211-3. May be repeated for credit, but no more than 12 hours may be applied to the doctoral degree.

7413 Research Ethics and Responsible Conduct in Research
(3-0) 3 hours credit.
A case-study approach to formal training in the responsible conduct of research. Includes areas of conflict of interest; responsible authorship; policies for handling misconduct; policies regarding the use of human and animal subjects; and data management.

7513 Advanced Biochemistry
(3-0) 3 hours credit. Prerequisite: BIO 3513 or an equivalent.
An in-depth discussion of structure-function relationships in biological systems, including bioenergetics of metabolism and hormonal and nonhormonal regulation of metabolic pathways. (Formerly BIO 5513. Credit cannot be earned for both BIO 7513 and BIO 5513.)

7571-3 Experimental Techniques in the Life Sciences
(0-2, 0-4, 0-6) 1 to 3 hours credit. Prerequisite: Consent of instructor. Topics include research methods in cell and molecular biology, molecular neurobiology, and microbiology. May be repeated for credit as topics vary. (Formerly BIO 5571-3.)

7643 Cellular and Molecular Biology
(3-0) 3 hours credit. Prerequisite: BIO 3513 or consent of instructor. Structure of eucaryotic and procaryotic cells, functions of biomembranes and cytoplasmic organelles, and regulation of cellular activity. (Formerly BIO 6643. Credit cannot be earned for both BIO 7643 and BIO 6643.)
DEPARTMENT OF CHEMISTRY

The Master of Science in Chemistry offers opportunities for advanced study and research designed to prepare students for roles in industry, government, or educational institutions. A thesis option is recommended for students who are planning a career in research or who contemplate pursuing a doctorate in their program of study. A nonthesis option is also available for students.

Chemistry includes programs of study in analytical and environmental chemistry, bioorganic chemistry, biophysical chemistry, inorganic chemistry, organic chemistry, physical chemistry, and chemical physics.

A limited number of teaching and/or research assistantships and fellowships are available to qualified students. Financial assistance is awarded on a competitive basis.

Master of Science Degree in Chemistry

The purpose of the Master of Science (M.S.) degree program in Chemistry is to offer students the opportunity to acquire a sound preparation of the fundamentals in several areas of chemistry, to introduce students to recent advances in chemical theory and methods, and to encourage research in a specific area of study.

Graduate study in chemistry is offered leading to the M.S. degree with the following interest areas: analytical and environmental chemistry, bioorganic chemistry, biophysical chemistry, inorganic chemistry, organic chemistry, physical chemistry, and chemical physics.

Faculty expertise in each of the interest areas offers the opportunity for direct student-faculty interaction for thesis development through coursework and research. Additional cooperative projects and programs are available with other area research institutions.

Qualified students are encouraged to apply for teaching and/or research assistantships and fellowships. Requests should be sent to the Graduate Advisor of Record for Chemistry when application is made for admission to UTSA.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, applicants must complete or have completed a minimum of 24 undergraduate semester hours in chemistry, 12 or more of which must be upper-division courses. Included in the undergraduate chemistry requirement are two semesters each of organic and physical chemistry with the appropriate laboratories. All undergraduate chemistry courses must be completed with a minimum grade point average of 3.0.

Applicants must submit scores from the Graduate Record Examination (GRE). When GRE scores are used to determine an admission, applicants will be compared to applicants with similar socioeconomic backgrounds.

A minimum of two letters of recommendation from persons familiar with the applicant's undergraduate scholastic record must be sent to the Department of Chemistry at the same time application is made for admission to UTSA.

Thesis Option in Chemistry

Degree Requirements. The Master of Science program requires the successful completion of a minimum of 34 semester credit hours. Candidates must complete the following:

A. Required courses (25 semester credit hours):

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 5113</td>
<td>Advanced Organic Chemistry I</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5133</td>
<td>Advanced Inorganic Chemistry</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5163</td>
<td>Advanced Instrumental Analysis</td>
<td>3 hours</td>
</tr>
<tr>
<td>Code</td>
<td>Course Title</td>
<td>Credit Hours</td>
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</tr>
<tr>
<td>CHE 5192</td>
<td>Advanced Spectral Measurement and Interpretation I</td>
<td>2 hours</td>
</tr>
<tr>
<td>CHE 5202</td>
<td>Advanced Spectral Measurement and Interpretation II</td>
<td>2 hours</td>
</tr>
<tr>
<td>CHE 5213</td>
<td>Chemical Thermodynamics</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5271</td>
<td>Graduate Seminar in Chemistry</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 6983</td>
<td>Master's Thesis, including an oral defense of the written thesis</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

Registration for CHE 5271 is required for each semester of residence, although no more than 3 semester credit hours can be applied to the Master’s degree.

B. A minimum of 6 semester credit hours of electives in chemistry, as approved by the Graduate Advisor of Record, is required.

The following interest areas are available for study:

- Analytical and environmental chemistry
- Bioorganic chemistry
- Biophysical chemistry
- Inorganic chemistry
- Organic chemistry
- Physical chemistry and chemical physics

C. A minimum of 3 semester credit hours of supportive electives are required in chemistry, advanced mathematics, computer science, earth and physical sciences, and/or biology as approved by the Graduate Advisor of Record.

D. Students must pass a final oral comprehensive examination, scheduled during the student’s last semester of work, for completion of the degree program.

E. Students must successfully defend their thesis research results before their graduate committee prior to the submission of the thesis to the Dean of Graduate Studies for approval.

**Nonthesis Option in Chemistry**

**Degree Requirements.** This program requires the successful completion of a minimum of 37 semester credit hours. Candidates for the degree must complete the following:

A. **Required courses (25 semester credit hours):**

<table>
<thead>
<tr>
<th>Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHE 5113</td>
<td>Advanced Organic Chemistry I</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5133</td>
<td>Advanced Inorganic Chemistry</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5163</td>
<td>Advanced Instrumental Analysis</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5192</td>
<td>Advanced Spectral Measurement and Interpretation I</td>
<td>2 hours</td>
</tr>
<tr>
<td>CHE 5202</td>
<td>Advanced Spectral Measurement and Interpretation II</td>
<td>2 hours</td>
</tr>
<tr>
<td>CHE 5213</td>
<td>Chemical Thermodynamics</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5271</td>
<td>Graduate Seminar in Chemistry</td>
<td>3 hours</td>
</tr>
<tr>
<td>CHE 5973</td>
<td>Directed Research</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

Registration for CHE 5271 is required for each semester of residence, although no more than 3 semester credit hours can be applied to the degree.

B. 6 semester credit hours of laboratory work in chemistry in two distinctly different areas, normally taken as Independent Study and completed before enrolling in CHE 5973
C. 6 semester credit hours of elective organized course support work within the College of Sciences or College of Engineering, as approved by the Graduate Advisor of Record

D. Students must pass a final oral comprehensive examination, scheduled during the student’s last semester of work, for completion of the degree program

COURSE DESCRIPTIONS

CHEMISTRY

(CHE)

5113  Advanced Organic Chemistry I
(3-0) 3 hours credit. Prerequisites: 8 hours each of undergraduate organic chemistry and physical chemistry or graduate standing in chemistry. An advanced study of topics in organic chemistry such as stereochemistry, conformational analysis, nonbenzenoid aromaticity, and organic reaction mechanisms.

5133  Advanced Inorganic Chemistry
(3-0) 3 hours credit. Prerequisite: CHE 4263 or an equivalent. Modern theories of chemical bonding, structure of inorganic compounds, reaction mechanisms, organometallic chemistry, and cluster compounds.

5163  Advanced Instrumental Analysis
(3-0) 3 hours credit. Prerequisites: CHE 3224 and 4253 or an equivalent. The physical and chemical principles of modern instrumental techniques used for chemical analysis, with emphasis on absorption, emission, magnetic resonance, and Raman spectroscopies; mass spectrometry; chromatography; and electrochemical techniques.

5192  Advanced Spectral Measurement and Interpretation I
(0-6) 2 hours credit. Prerequisites: CHE 5163, 4253, and 4373 or their equivalents; or consent of the instructor. Enrollment will normally be limited to M.S. degree-seeking students. A regularly scheduled topics course linked with CHE 5202 (spring semester) including experimentation, data analysis, and problem solving using modern chemical instrumentation. In the CHE 5192 and CHE 5202 sequence, students must demonstrate basic competency in a minimum of three of the following: FT-NMR, FT-IR, UV-vis and fluorescence, mass spectrometry, computer-based chemical modeling, gas and liquid chromatography, and spectral data analysis. May be repeated for credit with the approval of the Graduate Advisor of Record when topics vary, but no more than 2 semester credit hours can be applied to the Master’s degree. A grade of “RP” will be given in CHE 5192 until both CHE 5192 and CHE 5202 are completed; this occurs when the student has shown competency in a minimum of three techniques.

5202  Advanced Spectral Measurement and Interpretation II
(0-6) 2 hours credit. Prerequisites: CHE 5163, 3243, and 4373 or their equivalents; or consent of the instructor. Enrollment will normally be limited to M.S. degree-seeking students. A regularly scheduled topics course linked with CHE 5192 (fall semester) including experimentation, data analysis, and problem solving using modern chemical instrumentation. In CHE 5192 and CHE 5202 sequence, students must demonstrate basic competency in a minimum of three of the following: FT-NMR, FT-IR, UV-vis and fluorescence, mass spectrometry, computer-based chemical modeling, gas and liquid chromatography, and spectral data analysis. May be repeated for credit with the approval of the Graduate Advisor of Record when topics vary, but no more than 2 semester credit hours can be applied to the Master’s degree. A grade of “RP” will be given in CHE 5202 until both CHE 5192 and CHE 5202 are completed; this occurs when the student has shown competency in a minimum of three techniques.
5213 Chemical Thermodynamics
(3-0) 3 hours credit. Prerequisites: 8 hours each of undergraduate organic chemistry and physical chemistry or graduate standing in chemistry.
An advanced study of chemical thermodynamics. Discussion of chemical, electrochemical, and interphase equilibria.

5223 Chemical Kinetics
(3-0) 3 hours credit. Prerequisite: CHE 3224 or an equivalent.
An advanced study of topics in chemical kinetics, such as formal kinetics, theory of rates of chemical reactions, and reaction mechanisms.

5243 Quantum Chemistry
(3-0) 3 hours credit. Prerequisites: CHE 4253 and MAT 2213 or consent of instructor.
A study of concepts and methods of quantum mechanics, with emphasis on the nature of the chemical bond and the interaction of electromagnetic radiation with molecules.

5271 Graduate Seminar in Chemistry
(0-3) 1 hour credit. Prerequisite: Graduate standing in chemistry or consent of the Graduate Advisor of Record.
Current research and literature seminars presented by faculty, visiting lecturers, and Master's candidates. Chemistry master's-degree-seeking students must register every semester while in residence, but only 3 hours will apply toward the Master's degree.

5503 Bioorganic Chemistry
(3-0) 3 hours credit. Prerequisite: CHE 5113 or consent of the instructor.
Chemical transformations of biologically important organic compounds; examination of enzyme active sites. Discussion of theories of catalysis, stereochemistry, electron-transfer, and molecular structure in the context of biological systems.

5513 Biophysical Chemistry
(3-0) 3 hours credit. Prerequisites: CHE 5113 and CHE 5213 or consent of the instructor.
Physical chemistry of natural macromolecular systems. Spectroscopy: UV Visible and CD spectroscopy of proteins and nucleic acids; fluorescence of proteins, nucleic acids, and extrinsic labels; nuclear and electron magnetic resonance of enzymes and cell membranes. Thermodynamics of macromolecular interactions; linked functions and allosteric models.

5623 Statistical Thermodynamics
(3-0) 3 hours credit. Prerequisite: CHE 3224 or an equivalent.
A molecular approach to the study of the physico-chemical properties of gases, liquids, and solids. A molecular study of chemical and interphase equilibria.

5902 Teaching Seminar
(1-2) 2 hours credit. Prerequisites: Graduate standing in chemistry and concurrent designation as a teaching assistant in the chemistry program or consent of instructor.
The course is designed to improve the instructional effectiveness of graduate students' teaching at the college level. The course will cover but is not limited to board-work, clear speech, teacher-student interaction, professional responsibilities, course content and pace, grading policy, quiz writing, sensitivity training to student needs, information on technical support, and guest lecturers on special topics. The grade report for the course is either “CR” (satisfactory performance) or “NC” (unsatisfactory performance). May be repeated when the topics vary. This course may not be applied as credit toward any M.S. degree in the Department of Chemistry.

5973 Directed Research
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.
The directed research course may involve either a laboratory or a theoretical problem. Normally a written report is required. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.
6113 Advanced Organic Chemistry II  
(3-0) 3 hours credit. Prerequisite: CHE 5113 or consent of instructor.  
Study of organic reaction mechanisms.

6123 Methods of Organic Synthesis  
(3-0) 3 hours credit. Prerequisite: CHE 5113 or consent of instructor.  
A study of modern methods of organic functional group transformation and of simple carbon skeleton construction;  
introduction to the synthon concept and to retrosynthetic analytical methodology for designing rational synthetic  
approaches to complex organic molecules.

6153 Advanced Topics in Inorganic and Physical Chemistry  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and Graduate Advisor of Record.  
An organized course offering the opportunity for a specialized study of advanced aspects of inorganic and/or physical  
chemistry. The course may be repeated for credit, but not more than 6 hours may be applied to the Master's degree.

6163 Advanced Topics in Analytical and Structural Chemistry  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and Graduate Advisor of Record.  
An organized course offering the opportunity for a specialized study of advanced techniques of chemical analysis  
and/or determination of molecular structure. The course may be repeated for credit, but not more than 6 hours may be  
applied to the Master's degree.

6173 Advanced Topics in Organic, Medicinal, Bioorganic, and Biophysical Chemistry  
(3-0) 3 hours credit. Prerequisites: Consent of instructor and Graduate Advisor of Record.  
An organized course offering the opportunity for a specialized study of advanced aspects in organic, medicinal,  
bioorganic, and/or biophysical chemistry. The course may be repeated for credit, but not more than 6 hours may be  
applied to the Master's degree.

6183 Topics in the Chemistry of Natural Products  
(3-0) 3 hours credit. Prerequisites: CHE 5113 and CHE 6123; CHE 5503 is recommended.  
Selected topics in the chemistry and biochemistry of natural products and related compounds of biological and  
medicinal interest. Course may be repeated for credit when topics vary, but not more than 6 hours may apply to the  
Master's degree.

6903 Progress in Chemistry  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for a specialized study of current aspects of chemistry not normally  
available as part of the regular course offerings. The course may be repeated for credit, but not more than 6 hours may  
be applied to the Master's degree.

6951-3 Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and  
the student's Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students  
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated  
for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6961 Comprehensive Examination  
1 hour credit. Prerequisite: Approval of the appropriate Graduate Program Committee.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times  
as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive  
Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR”  
(satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the  
Comprehensive Examination).
6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6983 Master's Thesis
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF COMPUTER SCIENCE

Master of Science Degree in Computer Science

The Master of Science degree program in Computer Science offers integrated studies involving software and hardware. A thesis option is available for students who wish to have research experience.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, a Bachelor of Arts or Bachelor of Science degree in Computer Science equivalent to that offered by UTSA is required. Students who do not qualify for unconditional admission may be admitted on a conditional basis. Students who are admitted on a conditional basis may be required to complete specific undergraduate courses as conditions of admission. If such courses are listed as deficiencies, they will not count toward the graduate degree. In such cases, students should anticipate that additional time will be required to complete the degree. Applicants are required to submit scores from the Graduate Record Examination (GRE). When GRE scores are used to determine an admission, applicants will be compared to applicants with similar socioeconomic backgrounds.

Degree Requirements. Candidates for the degree are required to successfully complete 36 semester credit hours of graduate coursework.

A. The following four courses (12 hours) are required of all students:
   - CS 5363 Programming Languages and Compilers
   - CS 5513 Computer Architecture
   - CS 5523 Operating Systems
   - CS 5633 Analysis of Algorithms

B. Students must complete at least 18 semester credit hours of additional eligible graduate courses, 12 hours of which must be in the Department of Computer Science. With prior approval of the Graduate Advisor of Record, students may apply a maximum of 6 hours of graduate courses from other disciplines to the degree.

C. Students must either write a Master’s thesis and enroll in 6 semester credit hours of CS 6983 or complete 6 hours of additional graduate coursework in the Department of Computer Science.

D. Students must pass a final oral examination, scheduled during the student’s last semester of work, for completion of the degree program.

Doctor of Philosophy Degree in Computer Science

The Department of Computer Science offers advanced coursework and research leading to the Doctor of Philosophy degree in Computer Science. The program emphasizes high-performance computing. Successful Ph.D. candidates must demonstrate an in-depth knowledge of computer science and must deliver an original contribution to the field.

The regulations for this degree comply with the general University regulations (refer to Chapter 3, General Academic Regulations, and Chapter 5, Doctoral Degree Regulations).

Admission Requirements. The minimum requirements for admission to the doctoral degree program in computer science are as follows:

- a B.A., B.S., or M.S. degree in computer science or related area
- a cumulative grade point average of 3.30 or higher in the last 60 hours of coursework
- a score of at least 1500 on the GRE general test (verbal, math, and analytical sections); exceptions can be made in cases with a strong justification, such as a high grade point average and/or extensive research. The GRE computer science subject test is strongly recommended but not required. When GRE scores are used to determine an admission, applicants will be compared to applicants with similar socioeconomic backgrounds.
• a score of at least 550 on the Test of English as a Foreign Language (TOEFL) for applicants whose native language is not English and who have not graduated from a United States institution
• three letters of recommendation attesting to the applicant’s readiness for doctoral study.

Admission is competitive. Satisfying the minimum requirements does not guarantee admission. An application should also include a résumé and a statement of research experience and interest.

Students who apply will automatically be considered for one of a small number of doctoral student stipends. Some teaching and research assistantships are also available.

**Degree Requirements.** Candidates for the degree are required to successfully complete 69 semester credit hours of graduate coursework.

**Course Requirements.** Course requirements for the doctoral degree program in computer science are as follows:

A. Core courses (18 semester credit hours)

```
CS 5513  Computer Architecture
CS 5523  Operating Systems
CS 5633  Analysis of Algorithms
CS 6553  Performance Evaluation
CS 6643  Parallel Processing
CS 6653  Parallel Algorithms
```

B. Designated electives (12 semester credit hours in a single focus)

One of the following two focuses is recommended. Other focuses must be approved by the Doctoral Studies Committee.

1. High-Performance Programming Environments Focus:

```
CS 5113  Computer Graphics
CS 5363  Programming Languages and Compilers
```

Plus two courses from the following:

```
CS 6113  Program Visualization and Monitoring
CS 6363  Advanced Compiler Construction
CS 6513  Advanced Architecture
CS 6523  Distributed Operating Systems
CS 6543  Networks
CS 6593  Advanced Topics in Distributed Systems
```

2. High-Performance Computational Techniques Focus:

```
CS 5603  Numerical Analysis
CS 6613  Parallel Numerical Methods and Software
```

Plus two courses from the following:

```
CS 6103  Distributed Software Development
CS 6243  Machine Learning
CS 6253  Topics in Neural Networks
CS 6693  Advanced Topics in Application Development
CS 6723  Image Processing
```

C. Free electives. 9 semester credit hours selected from computer science and related areas with approval of the Graduate Advisor.
D. Computer science research (30 semester credit hours):

- CS 7123 Research Seminar (6 hours)
- CS 7211-6 Doctoral Research (12 hours)
- CS 7311-6 Doctoral Dissertation (12 hours)

Applicants with a Master of Science degree in Computer Science from another college or university may apply a maximum of 12 hours of previously earned graduate credits toward their doctoral degree. Each student’s transcript will be evaluated by the Doctoral Studies Committee, and credit will be designated on a course-by-course basis to satisfy the formal coursework requirements of the degree.

**Advancement to Candidacy.** Students seeking a doctoral degree must be admitted to candidacy. One of the requirements for admission to candidacy is passing a doctoral qualifying examination. Students should consult the University’s Doctoral Degree Regulations for other requirements.

**Qualifying Examination.** The qualifying examination is divided into written and oral portions.

**Written Portion.** The written portion of the doctoral qualifying examination (written examination) is scheduled at the beginning of the Fall and Spring Semesters. Full-time doctoral students must take the written examination by the beginning of their third semester. Normally, the written examination is taken at the start of the student’s second year at the beginning of the Fall Semester. Students who fail their first attempt at the written examination are allowed to make a second attempt on the next written examination. No more than two attempts to pass the written examination are permitted.

**Oral Portion.** After the student has completed the coursework in his or her proposed program of study (core courses, designated electives, and free electives), the next step is the oral portion of the qualifying examination. The oral examination is conducted by a faculty committee, which is chaired by the student’s program advisor. The oral examination consists of a presentation of the student’s dissertation proposal followed by a period of questioning based on the dissertation proposal and the student’s proposed program of study. Unanimous approval of the examination committee is required to pass the oral examination. No more than two attempts to pass the oral examination will be permitted. The oral examination must be taken within one year after completion of all coursework.

**Doctoral Dissertation and Final Oral Examination.** After passing the qualifying examination, the next steps are writing a dissertation and passing the final oral examination. The final oral examination is administered and evaluated by the student’s Dissertation Committee and covers the dissertation and the general field of the dissertation. The final oral examination consists of an open presentation of the dissertation followed by a closed oral examination. Unanimous approval of the Dissertation Committee is required to pass the final oral examination. Also, the written dissertation must be unanimously approved by the Dissertation Committee.

### COURSE DESCRIPTIONS

#### COMPUTER SCIENCE (CS)

**5053 Computing and the World Wide Web**

(3-0) 3 hours credit.

An introduction to computer applications and the World Wide Web for noncomputer scientists. May not be applied toward the Master of Science degree or the Doctor of Philosophy degree in Computer Science. (Credit cannot be earned for both CS 5003 and CS 5053.)
5063  **Computers for Teachers**  
(3-0) 3 hours credit. Prerequisite: Some programming experience. 
Modern approaches to computing and program design in an object-oriented programming language such as Java. 
Emphasis in this course is on the design and implementation of computer-based solutions to problems in a variety of 
application areas. Curriculum materials and teaching strategies will be developed for teaching these concepts at the 
high school level. May not be applied to the Master of Science degree in Computer Science or the Doctor of 
Philosophy degree in Computer Science. (Formerly CS 5023. Credit cannot be earned for both CS 5023 and CS 5063.)

5073  **Advanced Topics for Teachers**  
(3-0) 3 hours credit. Prerequisite: CS 5063 or the equivalent. 
A formal and in-depth study of algorithms, data structures and abstraction using an object-oriented language such as 
Java. Curriculum materials and teaching strategies will be developed for teaching these topics. Large programs such 
as case studies will be used to present some of these topics along with examples of how to use a case study in the high 
school curriculum. May not be applied to the Master of Science degree in Computer Science or the Doctor of 
Philosophy degree in Computer Science.

5083  **Computer-based Multimedia for Teachers**  
(3-0) 3 hours credit. Prerequisite: CS 5053 or the equivalent. 
Creation and use of multimedia to enhance student learning. Emphasis in this course is on designing and creating 
Web-based multimedia resources to illustrate and clarify difficult concepts. Existing graphical software packages will 
be used to accomplish the creation of instructional multimedia materials. May not be applied to the Master of Science 
degree in Computer Science or the Doctor of Philosophy degree in Computer Science.

5103  **Software Engineering**  
(3-0) 3 hours credit. Prerequisites: CS 2733 or CS 2734 and CS 3343. 
Discussion of issues relevant to the development of large software systems, such as specification; design and 
synthesis of reliable software; proof of correctness; self-checking software; reconfiguration; recovery; fault-tolerant 
systems; and system reliability modeling.

5113  **Computer Graphics**  
(3-0) 3 hours credit. Prerequisites: CS 3343 and MAT 2233. 
The course emphasizes generative computer graphics, interactive construction of graphic objects; database design; 
composite object construction; and hidden-surface algorithmic techniques. Emphasis is on vector graphic devices and 
on the production of high-resolution images.

5233  **Artificial Intelligence**  
(3-0) 3 hours credit. Prerequisite: CS 3343. 
This course covers artificial intelligence from the standpoint of general problem-solving techniques. Major topics 
include search, knowledge representation, planning, machine learning, and natural language processing. 
Programming projects are in LISP.

5253  **Expert Systems**  
(3-0) 3 hours credit. Prerequisite: CS 5233. 
This course presents an in-depth study of the area of artificial intelligence known as expert systems. Example expert 
systems are examined as a means of identifying the generally accepted methodologies for developing such systems as 
well as the basic research issues involved.

5293  **Numerical Linear Algebra**  
(3-0) 3 hours credit. Prerequisite: MAT 3633 or an equivalent. 
Direct and iterative methods for solving general linear systems, the algebraic eigenvalue problem, least square 
problems, and solutions of sparse systems arising from partial differential equations. (Same as MAT 5293. Credit 
cannot be earned for both CS 5293 and MAT 5293.)
5353  **Formal Languages, Automata, and Theory of Computation**  
(3-0) 3 hours credit. Prerequisites: CS 3343 and CS 3233.  
Formal models of computation and syntax.

5363  **Programming Languages and Compilers**  
(3-0) 3 hours credit. Prerequisites: CS 3343 and CS 3233.  
A study of modern programming languages with emphasis on their implementation. Topics include scanning, parsing, syntax-directed translation, code generation, and optimization. (Formerly CS 5303. Credit cannot be earned for both CS 5363 and CS 5303.)

5443  **Database Management Systems**  
(3-0) 3 hours credit. Prerequisite: CS 3743.  
Design and implementation of database management systems. Topics include storage management, query optimization, concurrency control, crash recovery, integrity, and security in relational databases, object-oriented databases, object-relational databases, parallel databases, and distributed databases.

5513  **Computer Architecture**  
(3-0) 3 hours credit. Prerequisites: CS 3733 and CS 4753.  
Study of modern computer architecture, including parallel computers, multiprocessors, pipelines, and fault tolerance.

5523  **Operating Systems**  
(3-0) 3 hours credit. Prerequisites: CS 3733 and CS 4753.  
Operating systems concepts with an emphasis on concurrency, resource management, and distributed systems.

5603  **Numerical Analysis**  
(3-0) 3 hours credit. Prerequisite: MAT 3633 or consent of instructor.  
Emphasis on the mathematical analysis of numerical methods. Areas of study include solution of nonlinear equations and function optimization, approximation theory, and numerical quadrature. (Same as MAT 5603. Credit cannot be earned for both CS 5603 and MAT 5603.)

5623  **Simulation Techniques**  
(3-0) 3 hours credit. Prerequisites: CS 1723 and STA 3523 or STA 3543, or consent of instructor.  

5633  **Analysis of Algorithms**  
(3-0) 3 hours credit. Prerequisite: CS 3343.  
Models of computation, design techniques such as divide-and-conquer and dynamic programming, graph algorithms, and sets and union-find. Additional topics chosen from pattern matching, integer and polynomial arithmetic, and the fast Fourier transform.

5971-6  **Directed Research**  
1 to 6 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record in which the course is offered.  
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.

6103  **Distributed Software Development**  
(3-0) 3 hours credit. Prerequisites: CS 5103 and CS 5523.  
Development and management of distributed software, including cooperative tools and CASE. The course considers the aspects of managing the configuration of software during its life cycle. Topics include identification, control, auditing, and status accounting. Simulation of a configuration control board process.
6113  **Program Visualization and Monitoring**  
(3-0) 3 hours credit. Prerequisite: CS 5113.  
Concepts and techniques of software instrumentation. Window systems programming for postmortem and real-time visualization of program behavior. Applications of visual execution monitors in performance evaluation and debugging.

6133  **Software Specification and Verification**  
(3-0) 3 hours credit. Prerequisite: CS 5633.  
This course focuses on languages for specification of programs as well as on verification techniques for sequential, concurrent, and distributed programs.

6243  **Machine Learning**  
(3-0) 3 hours credit. Prerequisite: CS 5233 or CS 5633.  
This course studies machine learning techniques in the area of artificial intelligence. Topics include inductive learning, unsupervised learning, speedup learning, and computational learning theory.

6253  **Topics in Neural Networks**  
(3-0) 3 hours credit. Prerequisite: CS 5233 or CS 5633.  
Analysis of neural networks. Topics selected from biological nervous systems and learning, threshold logic units, perceptrons, spatial and temporal associative memories, Hopfield nets, backpropagation, Boltzmann machines, Kohonen networks, the Neocognitron, and mathematical models of neural systems. Advanced topics include neural network design, competitive learning, the CMAC model, adaptive resonance theory, bidirectional associative memories, Kanerva self-propagating search, advanced simulated annealing, neurocomputer implementations, and advanced genetic algorithms. May be repeated for credit when topics vary.

6363  **Advanced Compiler Construction**  
(3-0) 3 hours credit. Prerequisite: CS 4713 or CS 5363.  
Areas of study include code generation techniques for vector machines and multiprocessors, implementation of higher-level imperative and functional languages, and run-time system support for distributed programming languages.

6453  **Advanced Database Systems**  
(3-0) 3 hours credit. Prerequisite: CS 5443 or consent of instructor.  
Design and implementation of advanced database systems. Topics include data models, storage management, query optimization, transaction processing, integrity, security, and performance evaluation of emerging new database systems. Current database research topics will be explored.

6463  **Advanced Topics in Computer Science**  
(3-0) 3 hours credit. Prerequisites: Graduate standing and consent of instructor.  
Advanced topics in an area of computer science. May be repeated for credit when topics vary.

6513  **Advanced Architecture**  
(3-0) 3 hours credit. Prerequisites: CS 5513 and CS 5523.  
Areas of study include advanced architectures, including massively parallel and distributed systems. Issues of communication, fault tolerance, and performance are addressed.

6523  **Distributed Operating Systems**  
(3-0) 3 hours credit. Prerequisites: CS 5513 and CS 5523.  
Distributed operating systems issues, including migration, naming, reliability, security, resource allocation, and scheduling are addressed in heterogeneous and homogeneous systems. Time-critical data such as video and audio are considered.
6543 **Networks**  
(3-0) 3 hours credit. Prerequisite: CS 5523.  
This course introduces the underlying concepts and principles of modern computer networks, with emphasis on protocols, architectures and implementation issues in the Internet. Prerequisites include basic computer architecture and programming experience in C and Unix.

6553 **Performance Evaluation**  
(3-0) 3 hours credit. Prerequisites: CS 5523 and CS 5513.  
Performance modeling, analysis, simulation, and measurement.

6593 **Advanced Topics in Distributed Systems**  
(3-0) 3 hours credit. Prerequisite: CS 5523.  
Advanced topics in distributed systems. May be repeated for credit when topics vary.

6613 **Parallel Numerical Methods and Software**  
(3-0) 3 hours credit. Prerequisites: CS 5603 and CS 6643.  
The major goal of this course is to introduce students to the methods, tools, and ideas of parallel numerical computation. Important scientific application development and the basic methods for their solutions are addressed. Relevant mathematical software is reviewed, and its use is outlined. Extensive examples and case studies are given. Techniques of constructing parallel numerical software are studied.

6643 **Parallel Processing**  
(3-0) 3 hours credit. Prerequisite: CS 5513.  
Parallel models of computation, performance measurement, and modeling of parallel algorithms and application studies on parallel computers.

6653 **Parallel Algorithms**  
(3-0) 3 hours credit. Prerequisites: CS 5513 and CS 5633.  
Theoretical analysis of parallel algorithms and models. Studies of the fastest and most efficient parallel algorithms for a variety of problems. Emphasis is on fundamental results and techniques and on rigorous analysis of algorithmic performance. The structures and mapping relationships between the dominant network architectures and algorithms are also covered.

6693 **Advanced Topics in Application Development**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Advanced applications in applications development. May be repeated for credit when topics vary.

6723 **Image Processing**  
(3-0) 3 hours credit. Prerequisites: Consent of instructor; MAT 2233 and CS 5633, or the equivalent.  
Topics include image acquisition, enhancement, transformations, filters, compression, segmentation and edge detection, morphology, and recognition.

6953 **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6961 **Comprehensive Examination**  
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive
Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6983  **Master’s Thesis**  
3 hours credit. Prerequisite: Consent of thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

7123  **Research Seminar**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Presentation and analysis of literature in a selected area of research. May be repeated, but only 6 hours will count toward the Ph.D. degree requirements.

7211-6  **Doctoral Research**  
1 to 6 hours credit. Prerequisite: Successful completion of the written part of the Qualifying Examination.  
May be repeated for credit, but no more than 12 hours may be applied to the Ph.D. degree requirements. (Formerly CS 7243.)

7311-6  **Doctoral Dissertation**  
1 to 6 hours credit. Prerequisite: Admission to candidacy for doctoral degree.  
May be repeated for credit, but no more than 12 hours may be applied toward the Ph.D. degree requirements. (Formerly CS 7693.)
DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCE

Master of Science Degree in Environmental Science

The Department of Earth and Environmental Science offers opportunities for advanced study and research leading to the Master of Science degree in Environmental Science. The Master of Science degree is awarded to candidates who have displayed an in-depth understanding of the subject matter and demonstrated the ability to make an original contribution to knowledge in their field of specialty.

The regulations for this degree comply with the general University regulations as outlined in this catalog and indicated below.

Program Admission Requirements. In addition to satisfying the university-wide graduate admission requirements, all prospective students must have a Bachelor of Arts or Bachelor of Science degree from an accredited university and a minimum grade point average of 3.0 in upper-division and graduate work. The degree should be in biology, ecology, environmental science, chemistry, geology, geography, engineering, or some other related scientific discipline. Applicants whose native language is not English must score at least 550 on the Test of English as a Foreign Language (TOEFL). Two or more letters of recommendation from persons familiar with the applicant's academic record are required and should be sent to the Department Chair. Incomplete applications will not be considered until all required items are in an applicant's file. The Graduate Studies Committee, comprised of members selected from the graduate faculty, will be responsible for recommending acceptance into the program and will take the lead in advising students. Some teaching assistantships, research assistantships, or research fellowships are available, but require separate application. When Graduate Record Examination (GRE) scores are used to determine an admission, applicants will be compared to applicants with similar socioeconomic backgrounds.

Degree Requirements. The Master of Science degree requires a minimum of 36 semester credit hours beyond the baccalaureate degree (exclusive of coursework or other study required to remove deficiencies). There are five areas of specialization or emphases for the Master of Science degree in Environmental Science. The areas include water resources, environmental management, ecology and environmental conservation, environmental quality and protection, and environmental spatial analysis. A thesis option is recommended to students who want an opportunity to develop expertise in research, including experimental design, data collection, and data analyses. A nonthesis option is available for those who want the opportunity to earn the Master of Science degree primarily through organized coursework. The thesis option is recommended for students who are planning a career in environmental education, research, or who are planning to go on and earn a doctorate degree.

Research interests of the graduate faculty include the areas indicated above. However, specific information about research in progress is available from the Department office or from individual faculty members. The broad nature of the environmental science program allows students the opportunity to broaden their scientific background at the graduate level. Individual programs are organized around each student's interests in consultation with the student's graduate advisor and graduate committee.

Degree candidates are required to complete a minimum of 36 semester credit hours approved by the student's Graduate Advisor of Record. These credit hours are subject to the following conditions:

1. A minimum of 18 semester hours of graduate credit in organized classes must be earned within the Environmental Science program. This may include up to 6 semester credit hours of approved upper-division undergraduate coursework and a maximum of 3 semester credit hours in a graduate seminar or 3 semester credit hours in colloquium (ES 5991 or ES 6941).
2. An additional 18 semester hours of graduate credit as approved by the Graduate Advisor of Record is required. This may include 6 hours of ES 6953, Independent Study. Students electing the thesis option must complete 6 semester hours of ES 6983, Master's Thesis as part of this total.
3. Comprehensive Examination, ES 6961, if taken, may not be applied to the 36-semester-hour-minimum required of students.
4. Students are expected to participate in graduate seminars and colloquia while in the program.
Graduate Committee. As specified by University regulations, candidates for the Master of Science degree must have a Graduate Committee. The Committee will be chaired by the student’s graduate advisor and will consist of a minimum of two other members. The Committee should be appointed in the first semester of the student’s graduate program. Each student must decide if he or she is going to complete the thesis or nonthesis option because that will determine the type of committee appointed. Certain rules must be adhered to concerning the composition of the Master’s Thesis Committee and the Master’s Comprehensive Examination Committee. Only tenured or tenure-track faculty members can chair these committees, and no more than one member of either committee can be a nontenured or a nontenure-track faculty member or be from another university or be from another department.

Nonthesis Option. Nonthesis students should consult the Graduate Advisor of Record on their Program of Study.

Comprehensive Examination. Candidates for the Master of Science degree must pass a comprehensive examination administered by their Graduate Committee. The student should normally schedule this examination the semester before the degree requirements are to be completed. The examination for nonthesis students will be written; will cover at least four major areas of environmental science; and will take three to four hours to complete. The student’s Graduate Committee will determine the content of the examination. Normally, the examination will consist of academic material that the student is expected to have mastered during his or her course of study. The examination may only be taken twice. If it is not passed the first time it may be scheduled again in the following semester. Passing the examination will indicate successful mastery of the material in the student’s area of specialization.

Thesis Option. Candidates for the Master of Science degree electing the thesis option must also pass a comprehensive examination. The examination for thesis students will be oral; will cover the thesis proposal prepared by the student in one of the areas of environmental science; and will take one to two hours to complete. Candidates must successfully defend the thesis research before their Graduate Committee. The thesis defense will be done in an open, publicly advertised forum. The thesis defense is usually the last thing the student does before submission of the thesis to the Dean of Graduate Studies for approval.

Thesis Option Program of Study. Candidates should choose one of the following programs of study:

Water Resources

27 semester credit hours of required coursework:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ES 5023</td>
<td>Environmental Statistics</td>
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<tr>
<td>ES 5603</td>
<td>Hydrogeology</td>
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<tr>
<td>ES 5703</td>
<td>Advanced Hydrogeology</td>
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<tr>
<td>ES 6013</td>
<td>Instrumental Environmental Methods for Environmental Analysis</td>
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<td>ES 6123</td>
<td>Environmental Quality</td>
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<td>or</td>
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<td>ES 6223</td>
<td>Aqueous Geochemistry</td>
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<tr>
<td>ES 6953x2</td>
<td>Independent Study</td>
</tr>
<tr>
<td>ES 6983x2</td>
<td>Master’s Thesis</td>
</tr>
</tbody>
</table>

9 semester credit hours minimum, selected from graduate course offering in civil engineering and environmental science with approval of the Graduate Advisor of Record.

Environmental Management

27 semester credit hours of required coursework:

<table>
<thead>
<tr>
<th>Course</th>
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<tbody>
<tr>
<td>ES 5023</td>
<td>Environmental Statistics</td>
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<tr>
<td>ES 5033</td>
<td>Geographical Information Systems</td>
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<tr>
<td>ES 5103</td>
<td>Applied Ecology</td>
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<tr>
<td>ES 5233</td>
<td>Experimental Design and Analysis</td>
</tr>
<tr>
<td>ES 5503</td>
<td>Environmental Regulations</td>
</tr>
</tbody>
</table>
ES 6013 Instrumental Environmental Methods for Environmental Analysis
ES 6953 Independent Study
ES 6983x2 Master’s Thesis

9 semester credit hours minimum, selected from graduate course offerings in environmental science with approval of the Graduate Advisor of Record.

Ecology and Environmental Conservation

27 semester credit hours of required coursework:

ES 5023 Environmental Statistics
ES 5233 Experimental Design and Analysis
ES 5243 Advanced Plant Ecology
ES 6133 Methods in Field Ecology
ES 6213 Advanced Ecology
ES 6953x2 Independent Study
ES 6983x2 Master’s Thesis

9 semester credit hours minimum, selected from graduate course offerings in environmental science with approval of the Graduate Advisor of Record.

Environmental Quality and Protection

30 semester credit hours of required coursework:

ES 5023 Environmental Statistics
ES 5033 Geographical Information Systems
ES 5493 Water Pollution Control
ES 5603 Hydrogeology

ES 6123 Environmental Quality
or
GEO 6203 Aqueous Geochemistry
ES 6941x3 Environmental Science Colloquium
or
ES 5991x3 Graduate Seminar in Environmental Science
ES 6953x2 Independent Study
ES 6983x2 Master’s Thesis

6 semester credit hours minimum, selected from graduate course offerings in environmental science with approval of the Graduate Advisor of Record.

Environmental Spatial Analysis

30 semester credit hours of required coursework:

ES 5033 Geographical Information Systems
ES 5053 Remote Sensing
ES 5103 Applied Ecology
ES 5233 Experimental Design and Analysis
ES 5503 Environmental Regulations
ES 6503 GPS Mapping
ES 6513 Advanced GIS
ES 6543 Internet Served GIS
ES 6983x2 Master’s Thesis

6 semester credit hours minimum, selected from graduate course offerings in environmental science with approval of the Graduate Advisor of Record.

**COURSE DESCRIPTIONS**

**ENVIRONMENTAL SCIENCE**

**ES**

5013 **Survey of Environmental Science**
(3-0) 3 hours credit. Prerequisite: Graduate standing.
An integrative examination of living and nonliving environmental systems. A detailed study of interrelationships among plants, animals, and the environment, addressing the chemical, physical, and biological properties of living system, and the principles that drive their evolution. (Same as BIO 5013. Credit cannot be earned for both ES 5013 and BIO 5013.)

5023 **Environmental Statistics**
(3-0) 3 hours credit. Prerequisites: MAT 1033 and STA 1993 or their equivalent, or consent of instructor.
Introductory course in systems analysis emphasizing its application for the management of environmental and public systems. Problem formulation, mathematical modeling, and procedures are introduced through case studies that include energy consumption, soil contamination, leak detection, and air pollution. In these case studies, students become acquainted with quantitative governmental regulations formalized by the Environmental Protection Agency. Quantitative tools include exploratory data analysis, design of experiments, analysis of variance, regression analysis, and time series. Optimization techniques are taught within regression analysis.

5033 **Geographical Information Systems**
(2-2) 3 hours credit.
Application of the computer to environmental planning and management problems through a Geographical Information System (GIS). Using the computer as a mapping device for query, analysis, creation and display of spatially related data. Additional topics include using the Global Positioning System (GPS) for data acquisition. (Formerly ENV 5033. Credit cannot be earned for both ES 5033 and ENV 5033.)

5043 **Global Change**
(3-0) 3 hours credit. Prerequisite: Graduate standing in the program or consent of instructor.
Changes in the global distribution of plants and animals and the causes of the changes will be examined. Factors that are apparently coupled to changes in the atmosphere and environmental temperature will be examined.

5053 **Remote Sensing**
(2-2) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Interpretation of remotely sensed environmental data such as aerial and satellite photo imagery. Topics include photogrammetric correction, photo interpretation, classification of land use cover and features and the use of image analysis software, and heads-up digitizing.

5103 **Applied Ecology**
(3-0) 3 hours credit.
The impact of humanity’s activities on the environment: their effect on water, land, animal, and human resources. An evaluation of present and future strategies to preserve a healthy environment. (Formerly ENV 6613 and ES 6203. Credit cannot be earned for ES 5103, and either ENV 6613 or ES 6203.)
5123 **Project Analysis**  
(3-0) 3 hours credit.  
This course examines the complex processes and factors in the evaluation of large-scale projects involving natural resources. It brings together the tools required to evaluate the physical, economic, financial, legal, and political constraints of these projects. (Formerly ENV 6873 and ES 6873. Credit cannot be earned for ES 5123, and either ENV 6873 or ES 6873.)

5213 **Environmental Geology**  
(3-0) 3 hours credit.  
Geologic materials and processes as related to their influence on the human physical environment. Effects of landscape modification and geologic hazards such as earthquakes and landslides. Properties of minerals, rocks, and soils and geologic aspects of waste disposal and water resources are examined. (Course cannot be used for graduate credit by students in Geology.) (Formerly ENV 5363. Credit cannot be earned for both ES 5213 and ENV 5363.)

5233 **Experimental Design and Analysis**  
(3-0) 3 hours credit. Prerequisite: ES 5023 or an equivalent or consent of instructor.  
Fundamental concepts of the statistical design and analysis of environmental experiments will be presented. Students will be required to design experiments and to analyze data using computer software.

5243 **Advanced Plant Ecology**  
(3-0) 3 hours credit. Prerequisites: BIO 3283, BIO 3292, or consent of instructor.  
A study of the major biomes of the world, including North America and Texas, and the factors that influence the development of these biomes. Special consideration is given to species interactions that lead to high and low density species. (Same as BIO 5243. Credit cannot be earned for both ES 5243 and BIO 5243.)

5263 **Microbial Ecology**  
(3-0) 3 hours credit. Prerequisite: BIO 3713 or consent of instructor.  
Interrelationships between microorganisms and their environment, including natural habitats of microorganisms, normal human flora, and pathogens. Special consideration is given to application of genetically engineering microorganisms for environmental problems. (Same as BIO 5263. Credit cannot be earned for both ES 5263 and BIO 5263.)

5403 **Industrial Process**  
(3-0) 3 hours credit.  
Introduces basic physical, chemical, and biological processes used to produce products. Examines specific industries with the goal of enabling students to understand industrial process design and operation well enough to assess them from the perspective of environmental management.

5493 **Water Pollution Control**  
(3-0) 3 hours credit.  
Principles and methods of water pollution control process design and operation; selection and optimization of total treatment processes as well as appurtenances and accessory equipments; and methods involved in the design process and the selection of the hardware. (Formerly ENV 6893. Credit cannot be earned for both ES 5493 and ENV 6893.)

5503 **Environmental Regulations**  
(3-0) 3 hours credit.  
Current environmental enabling acts and regulations are covered, with emphasis on federal acts, such as the National Environmental Policy Act, Clean Water Act, Resource Conservation and Recovery Act, and associated regulations. Management strategies for environmental compliance are also presented. (Formerly ENV 5003. Credit cannot be earned for both ES 5503 and ENV 5003.)
5603 Hydrogeology
(3-0) 3 hours credit. Prerequisite: GEO 4623 with a grade of “C” or better or consent of instructor.
Geologic principles governing the flow of ground water; emphasis on hydrology, flow system evolution and aquifer
analysis. Field trips required. (Same as GEO 5603. Credit cannot be earned for both ES 5603 and GEO 5603.)

5613 Economics of Environmental Resources
(3-0) 3 hours credit.
A study of governmental and private programs to promote prudent, efficient use of natural resources by society. Cost-
benefit analysis is utilized to evaluate alternate solutions in formulating policy. (Formerly ENV 6623. Credit cannot
be earned for both ES 5613 and ENV 6623.)

5603 Advanced Hydrogeology
(3-0) 3 hours credit. Prerequisites: GEO 5603 and consent of instructor.
Numerical and analytical flow models, hydrogeochemical models, contaminant hydrogeology and contaminant
transport. (Same as GEO 5703. Credit cannot be earned for both ES 5603 and GEO 5703.)

5803 Environmental Planning and Management
(3-0) 3 hours credit.
Regional, state, and national efforts to plan for the allocation and use of environmental resources are analyzed. Focus
is on the strengths and weaknesses of traditional planning processes and regulation mechanisms. Technical,
economic, and institutional considerations that influence plan development, preparation, and implementation are
covered, as are citizen participation and conflict resolution. Students will prepare in-depth case studies. (Formerly
ENV 6653. Credit cannot be earned for both ES 5803 and ENV 6653.)

5991 Graduate Seminar in Environmental Science
(0-3) 1 hour credit. Prerequisite: Graduate standing in the program or consent of instructor.
Topical issues of current research will be examined. Presentations will be by current faculty, invited guests and
Master’s candidates. Only 3 hours may be applied toward the Master’s degree. (Same as GEO 5991. Credit cannot be
earned for both ES 5991 and GEO 5991.)

6003 Risk and Decision Analysis
(3-0) 3 hours credit. Prerequisite: ES 5023 or consent of instructor.
Advanced application of systems analysis to the solution of environmental problems and the building and solving of
mathematical models. The role of analytical tools such as cost analysis, decision, and utility theory as they are applied
to the efficient utilization of natural resources are also covered. (Formerly ENV 6903. Credit cannot be earned for
both ES 6003 and ENV 6903.)

6013 Instrumental Environmental Methods for Environmental Analysis
(2-2) 3 hours credit. Prerequisite: One year of college chemistry or consent of instructor.
A survey of instrumental techniques and standard methods for analysis of environmental pollutants. Designed
primarily for students interested in environmental management and protection, the focus of the course will vary but
will emphasize some aspect of environmental quality, water and soil in particular.

6023 Environmental Outreach and Interpretation
(3-0) 3 hours credit. Prerequisite: Graduate standing or consent of instructor.
Introduction to various methods for carrying out environmental education for influencing a community’s awareness,
knowledge and response to environmental issues. Course topics include the diffusion of innovations, media relations,
urban and rural sociology, history of environmental extension in the United States and presentation techniques.

6103 Environmental Impacts
(3-0) 3 hours credit.
Atmosphere, lithosphere, hydrosphere, and biosphere are treated as interrelated systems. Human impact and
interaction within and among these systems are studied. Preparation and evaluation of environmental impact
statements and assessments are included. (Formerly ENV 5533 and ES 5203. Credit cannot be earned for ES 6103,
and either ENV 5533 or ES 5203.)
6113  **Advanced Plant Physiology**  
(3-0) 3 hours credit. Prerequisite: BIO 4603 or consent of instructor.  
Principles of plant physiology and biochemistry, with particular emphasis on plant hormones, nitrogen fixation, plant respiration, photosynthesis, and current research work. (Same as BIO 6113. Credit cannot be earned for both ES 6113 and BIO 6113.)

6123  **Environmental Quality**  
(2-3) 3 hours credit. Prerequisite: A 2000 or 3000 level chemistry course, GEO 3374 or consent of instructor.  
Principles of surface and aquatic chemistry as applied to soil and natural water systems. Application of aforementioned principles in the study of environmental quality issues will be included. Lab will focus on analysis of pollutants using modern analytical techniques.

6133  **Methods in Field Ecology**  
(3-0) 3 hours credit. Prerequisite: BIO 3283 or an equivalent.  
Examination of techniques to collect, identify, and preserve plants and animals. Field methods used in the analysis of populations and communities are considered. (Same as BIO 6133. Credit cannot be earned for both ES 6133 and BIO 6133.)

6213  **Advanced Ecology**  
(3-0) 3 hours credit. Prerequisite: BIO 3283 or an equivalent.  
Interaction of organisms with their environment, allelopathy, competition, distribution, succession, and factors that control growth and dispersal. Special consideration is given to the concepts of climax, succession, and land management. (Same as BIO 6213. Credit cannot be earned for both ES 6213 and BIO 6213.)

6223  **Aqueous Geochemistry**  
(2-3) 3 hours credit. Prerequisite: GEO 3374 or consent of instructor.  
An in-depth study of geochemical principles and practices focusing primarily on the aquatic environment. Designed to familiarize advanced students of Geochemistry, Environmental Science, and Environmental Engineering with those aspects of applied chemistry that have relevance in the care of environmental research and practice. (Same as GEO 6203. Credit cannot be earned for both ES 6223 and GEO 6203.)

6503  **GPS Mapping**  
(2-2) 3 hours credit. Prerequisite: ES 5033 or equivalent or consent of instructor.  
Methods for using the Global Positioning System to create natural resource inventory maps. Course will cover such topics as differential correction of data, coordinate systems, phase processing, base station and rover operation and mission planning.

6513  **Advanced GIS**  
(2-2) 3 hours credit. Prerequisite: ES 5033 or consent of instructor.  
Geographic Information Systems (GIS) is an excellent tool for modeling, analyzing, and managing environmental systems. This course teaches advanced concepts and applications of industry standard GIS software in an environmental context. Additional topics include data acquisition with the Global Positioning System (GPS), digitizing, remote sensing, Graphical User Interface (GUI) manipulation, and scripting.

6523  **Professional Practice in Environmental Planning and Management**  
(3-0) 3 hours credit.  
A study of the standards of environmental practice in the private and public sectors; professional ethics and responsibilities, proposals, contracts, mediation, professional liability, report preparation, and other aspects of professional practice are covered. (Formerly ENV 5023. Credit cannot be earned for both ES 6523 and ENV 5023.)

6533  **Diplomacy and Ethics for Resource Management**  
(3-0) 3 hours credit.  
Exploration of issues embedded in resource diplomacy and ethics in the twenty-first century. Resource diplomacy and ethics are examined in the context of technology, economics, and institutions.
6543  **Internet Served GIS**  
(2-2) 3 hours credit. Prerequisite: ES 5003 or consent of instructor.  
Distributed Geographic Information (DGI) using a Geographic Information System (GIS) can be an extremely powerful tool for environmental outreach and public input. This course will focus upon developing GIS applications to be served out via the Internet or a Local Area Network (LAN). Additional topics include the use of web authoring software.

6813  **Water Resources**  
(3-0) 3 hours credit. 
Application of management principles to the efficient use of water resources by people and their public and private institutions. Water is examined in terms of its value, use, and changing role in the context of economics, history, politics, and technology. (Formerly ENV 6813. Credit cannot be earned for both ES 6813 and ENV 6813.)

6823  **Land Resources**  
(3-0) 3 hours credit. Prerequisite: ES 5033 or consent of instructor. 
The changing role of land as a resource as it relates to human and technological development. Land use and land-use planning in the rural-urban fringe is considered, as is the management of land as a resource in range, forestry, and agricultural production. (Formerly ENV 6823. Credit cannot be earned for both ES 6823 and ENV 6823.)

6833  **Energy Resources**  
(3-0) 3 hours credit. 
Energy utilization, energy resources development, availability of alternatives and energy resources management, conservation, and policy are presented. Applicable physical principles related to the economics, conservation, and technology of energy are covered. (Formerly ENV 6833. Credit cannot be earned for both ES 6853 and ENV 6853.)

6853  **Air Quality Management**  
(3-0) 3 hours credit. 
Introduction to the field of air pollution control: sources and physical, chemical, and biological effects of air pollutants. Overall objectives and systematic efforts to deal with air pollution, including air quality criteria; development of air quality standards and plans for implementing them. (Formerly ENV 6863. Credit cannot be earned for both ES 6863 and ENV 6863.)

6883  **Solid Waste Management**  
(3-0) 3 hours credit. 
Practical aspects of solid waste management, with emphasis placed on the interrelationship of environmental, economic, institutional, and technological aspects of source reduction, recycling, waste to energy, and perpetual care. (Formerly ENV 6883. Credit cannot be earned for both ES 6883 and ENV 6883.)

6901-3  **Experimental Techniques in the Environmental Sciences**  
1 to 3 hours credit. Prerequisite: Consent of instructor. 
Topics will include various research methods in environmental science. May be repeated for credit as topics vary.

6941  **Environmental Science Colloquium**  
(1-0) 1 hour credit. Prerequisite: Graduate standing. 
Discussions of current journal articles, reviews, and recent advances in specialized areas of the biological sciences. May be repeated for credit as topics vary. The grade report for this course is either “CR” (satisfactory participation in the colloquium) or “NC” (unsatisfactory participation in the colloquium). (Same as BIO 7041. Unless topic varies, credit cannot be earned for both BIO 7041 and ES 6941.)

6951-3  **Independent Study**  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master's degree.
6961 **Comprehensive Examination**
1 hour credit. Prerequisite: Approval of the appropriate Graduate Program Committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6963 **Internship**
3 hours credit. Prerequisites: Graduate standing and consent of Graduate Advisor of Record.
An opportunity for students to work in a setting that permits them to apply what they have learned in the formal instruction part of the program. May be repeated for credit, but not more than 3 hours will apply to the Master's degree.

6973 **Special Problems**
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to a Master's degree.

6983 **Master's Thesis**
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director.
Thesis research preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.

**Master of Science Degree in Geology**

The Master of Science (M.S.) degree program in Geology offers students the opportunity for advanced study and research leading to the M.S. degree in the following emphasis areas: water resources (hydrogeology), environmental geology, and applied geology.

Qualified students are encouraged to apply for teaching and/or research assistantships and fellowships. Requests should be addressed to the Chair of the Department of Earth and Environmental Science when application is made for admission to UTSA.

**Program Admission Requirements.** In addition to satisfying the University-wide graduate admission requirements, applicants are expected to have completed an undergraduate degree in geology (equivalent to UTSA's) or a bachelor's degree in chemistry, physics, mathematics, computer science, life sciences, or engineering from an accredited institution of higher education. Applicants with deficiencies in their academic background are required to consult with the Graduate Advisor of Record to establish an acceptable program of study with the approval of the graduate faculty. In such cases, students should anticipate that additional time will be required to complete the degree.

Applicants must submit scores from the Graduate Record Examination (GRE). When GRE scores are used to determine admission, applicants will be compared to applicants with similar socioeconomic backgrounds. Three letters of recommendation should be sent to the Chair of the Department of Earth and Environmental Science.
Thesis Option in Geology

Degree Requirements. The Master of Science program in Geology requires the successful completion of a minimum of 33 semester credit hours.

Candidates for the degree must complete

A. 8 semester credit hours minimum in the geology core curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 5991</td>
<td>Graduate Seminar in Geology</td>
<td>2 hours</td>
</tr>
<tr>
<td>ES 5991</td>
<td>Graduate Seminar in Environmental Science</td>
<td>2 hours</td>
</tr>
<tr>
<td>GEO 6983</td>
<td>Master’s Thesis</td>
<td>6 hours</td>
</tr>
</tbody>
</table>

No more than 2 semester credit hours of GEO 5991 Graduate Seminar or ES 5991 and 6 semester credit hours of GEO 6983 Master’s Thesis can be applied to the Master’s degree.

B. Candidates must choose one of the following three emphases:

Water Resources (Hydrogeology)

12 semester credit hours minimum, to include the following courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 5603</td>
<td>Hydrogeology</td>
</tr>
<tr>
<td>GEO 5703</td>
<td>Advanced Hydrogeology</td>
</tr>
<tr>
<td>GEO 6203</td>
<td>Aqueous Geochemistry</td>
</tr>
<tr>
<td>GEO 6603</td>
<td>Subsurface Fluid Mechanics</td>
</tr>
</tbody>
</table>

13 semester credit hours minimum, selected from the graduate course offerings in geology, environmental science, civil engineering, and biology with approval of the Graduate Advisor of Record.

Environmental Geology

6 semester credit hours in

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 5203</td>
<td>Advanced Environmental Geology</td>
</tr>
<tr>
<td>GEO 5304</td>
<td>Advanced Geomorphology</td>
</tr>
</tbody>
</table>

10 semester credit hours minimum, selected from the graduate course offerings in geology.

9 semester credit hours minimum, selected from the graduate course offerings in the College of Sciences or College of Engineering.

Applied Geology

25 semester credit hours minimum, selected from graduate course offerings with the approval of the Graduate Advisor of Record.

C. Under special circumstances, students may take up to 6 semester credit hours of upper-division undergraduate work in the College of Sciences or College of Engineering with approval of the Graduate Advisor of Record.

D. Students must pass a final oral comprehensive examination. This examination should be scheduled during the student’s last semester of work, for completion of the degree program. The comprehensive examination does not count toward the student’s program of study.
Nonthesis Option in Geology

The nonthesis option applies only to the Water Resources (Hydrogeology) and Environmental Geology emphases.

Degree Requirements. The Master of Science program in Geology requires the successful completion of a minimum of 39 semester credit hours.

Candidates for the degree must complete

A. 5 semester credit hours minimum in the geology core curriculum:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 5991</td>
<td>Graduate Seminar in Geology</td>
<td>2 hours</td>
</tr>
<tr>
<td>or</td>
<td>ES 5991 Graduate Seminar in Environmental Science</td>
<td>2 hours</td>
</tr>
<tr>
<td>GEO 5973</td>
<td>Directed Research</td>
<td>3 hours</td>
</tr>
</tbody>
</table>

No more than 2 hours of GEO 5991 Graduate Seminar or ES 5991 Graduate Seminar and 3 hours of GEO 5973 Directed Research can be applied to the Master's degree.

B. Candidates must choose one of the following two emphases:

*Water Resources (Hydrogeology)*

12 semester credit hours minimum, to include the following courses:

- GEO 5603 Hydrogeology
- GEO 5703 Advanced Hydrogeology
- GEO 6203 Aqueous Geochemistry
- GEO 6603 Subsurface Fluid Mechanics

22 semester credit hours minimum, selected from the graduate course offerings in geology, environmental science, civil engineering, and biology with approval of the Graduate Advisor of Record.

*Environmental Geology*

6 semester credit hours minimum, to include the following courses:

- GEO 5203 Advanced Environmental Geology
- GEO 5304 Advanced Geomorphology

10 semester credit hours minimum, selected from the graduate course offerings in geology.

18 semester credit hours minimum, selected from the graduate course offerings in geology, environmental sciences, civil engineering, chemistry, and biology with approval of the Graduate Advisor of Record.

C. Under special circumstances, students may take up to 6 hours of upper-division undergraduate work within the College of Sciences or College of Engineering with approval of the Graduate Advisor of Record.

D. Candidates are required to pass an oral comprehensive examination after they have completed at least 30 semester credit hours of coursework. GEO 6961 Comprehensive Examination (1 hour) does not contribute toward the 39-semester-credit-hour minimum.
COURSE DESCRIPTIONS
GEOLOGY
(GEO)

5203  Advanced Environmental Geology  
(3-0) 3 hours credit. Prerequisite: GEO 4063 or consent of instructor.  
Study of the geology of the environment, with emphasis on the physical and social effects of catastrophic geologic  
processes on engineered structures.

5304  Advanced Geomorphology  
(3-2) 4 hours credit. Prerequisites: GEO 4113 and 4121 or consent of instructor.  
Interpretation of landforms, with emphasis on mechanics of surficial processes and the relationship to type of rock  
material, structure, and climate. Field trips required. (Formerly GEO 5303. Credit cannot be earned for both GEO  
5303 and GEO 5304.)

5423  Advanced Mineralogy  
(2-3) 3 hours credit. Prerequisite: GEO 3043, 3052 or consent of instructor.  
Study of crystal chemistry, thermodynamics, and phase equilibria of various mineral groups; petrology and  
paragenesis relationships are examined. Field trips required.

5454  Advanced Paleontology  
(3-3) 4 hours credit. Prerequisite: GEO 3083, 3123, 3131 or consent of instructor.  
Study of fossil assemblages, environmental significance of fossil associations, and reconstruction of depositional  
environments as related to the separation and differentiation of rock units in time and space. Field trips required.

5504  Advanced Stratigraphy  
(3-3) 4 hours credit. Prerequisite: GEO 3083, 3123, 3131 or consent of instructor.  
Chronologic study of stratigraphic systems, physical properties and facies, depositional and paleogeographic  
implications, correlation, nomenclature, and biostratigraphy. Sequence stratigraphy and seismic and log analyses are  
studied. Field trips required. (Formerly GEO 5503. Credit cannot be earned for both GEO 5503 and GEO 5504.)

5603  Hydrogeology  
(3-0) 3 hours credit. Prerequisite: GEO 4623 with a grade of C or better or consent of instructor.  
Geologic principles governing the flow of ground water; emphasis on hydrology, flow system evolution and aquifer  
analysis. Field trips required. (Same as ES 5603. Credit cannot be earned for both GEO 5603 and ES 5603.)

5703  Advanced Hydrogeology  
(3-0) 3 hours credit. Prerequisites: GEO 5603 and consent of instructor.  
Numerical and analytical flow models, hydrogeochemical models, contaminant hydrogeology and contaminant  
transport. (Same as ES 5703. Credit cannot be earned for both GEO 5703 and ES 5703.)

5804  Igneous-Metamorphic Petrology  
(3-3) 4 hours credit. Prerequisite: GEO 3043, 3052, 3103, 3111 or consent of instructor.  
Origin and evolution of magmas. Origin and development of metamorphic grade, facies, and textures. Detailed study  
of igneous and metamorphic rock suites. Field trips required.

5853  Mapping of Complex Geological Structures  
(0-6) 3 hours credit. Prerequisites: GEO 4946 or an equivalent and consent of instructor.  
Field study of an area of complex geology. Field mapping, written reports, and field trips are required. May be  
repeated for credit up to a maximum of 6 hours when topic varies.
5894 Advanced Structural Geology  
(3-3) 4 hours credit. Prerequisite: GEO 3103, 3111 or consent of instructor.  
In-depth study of the various aspects of structural geology: stress and strain, behavior of materials, failure criteria, fault analysis, rheological properties of geologic materials, fold analysis, and subsurface analysis. Field trips required.

5904 Carbonate Petrology  
(3-3) 4 hours credit. Prerequisite: GEO 3043, 3052, 3123, 3131 or consent of instructor.  
Thin-section analysis and hand-specimen study of carbonate sediment and rocks, carbonate classifications, carbonate facies, models, and carbonate diagenesis. Field trips required.

5954 Sandstone Petrology  
(3-3) 4 hours credit. Prerequisite: GEO 3043, 3052, 3123, 3131 or consent of instructor.  
Thin-section analysis and hand-specimen study of clastic rocks, classifications, interpretation of provenance, clastic sedimentary facies, and clastic diagenesis. Field trips required.

5971-3 Directed Research  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the student's Graduate Advisor of Record.  
The directed research course may involve a laboratory, field-based, or theoretical problem. May be repeated for credit, but not more than 3 hours, regardless of discipline, will apply to the Master's degree.

5991 Graduate Seminar in Geology  
(0-3) 1 hour credit. Prerequisite: Graduate standing in geology or consent of the Graduate Advisor of Record.  
Topical issues chosen by faculty and current research seminars presented by faculty, visiting lecturers, and Master's degree candidates. Only 2 hours may be applied toward the Master's degree. (Same as ES 5991. Credit cannot be earned for both GEO 5991 and ES 5991.)

6153 Depositional Systems  
(3-0) 3 hours credit. Prerequisite: GEO 5954 or consent of instructor.  
The processes, characteristics, and relationships among continental, transitional, and marine depositional systems; specific relationships that must be understood for each subsystem and how each subsystem relates to the global system. Field trips required.

6183 Basin Analysis and Sedimentary Geology  
(3-0) 3 hours credit. Prerequisite: GEO 6153 or consent of instructor.  
An interdisciplinary integration of geodynamics, mathematical and physical modeling, and sedimentary geology. Emphasizes basin formation, nature and maturation of the basin fill, and timing of events. Case histories of various basins illustrate approaches. Field trips required.

6203 Aqueous Geochemistry  
(2-3) 3 hours credit. Prerequisite: GEO 3374 or consent of instructor.  
An in-depth study of geochemical principles and practices focusing primarily on the aquatic environment. Designed to familiarize advanced students of Geochemistry, Environmental Science and Environmental Engineering with those aspects of applied chemistry that have relevance in the care of environmental research and practice. (Same as ES 6203. Credit cannot be earned for both GEO 6203 and ES 6203.)

6304 Isotope Geology  
(3-2) 4 hours credit. Prerequisite: GEO 3374.  
6403  **Advanced Geophysics**  
(3-0) 3 hours credit. Prerequisite: GEO 3383 or consent of instructor.  
Seismological and other geophysical methods and data for studying the physical and mechanical properties of the earth's crust, mantle, and core.

6603  **Subsurface Fluid Mechanics**  
(3-0) 3 hours credit. Prerequisites: MAT 2213 and consent of the instructor.  
Fluid properties, fluid dynamics, Navier-Stokes equations, laminar flow, stability, boundary-layer theory, and flow nets.

6803  **Electron Microscopy and Microbeam Analysis**  
(1-4) 3 hours credit. Prerequisite: Consent of instructor.  
Geological and geochemical applications of electron microscopy, X-ray microanalysis, and image analysis. The theory and development of electron imaging and analysis as well as case studies. The laboratory focuses on sample preparation, imaging, and elemental analysis.

6961  **Comprehensive Examination**  
1 hour credit. Prerequisites: Completion of at least 30 semester credit hours of coursework and approval of the appropriate Graduate Program Committee to take the Comprehensive Examination.  
Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6973  **Special Problems**  
(3-0) 3 hours credit. Prerequisite: Consent of the instructor.  
An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when the topics vary, but not more than 6 hours, regardless of discipline, will apply to a Master's degree. Field trips may be required.

6983  **Master's Thesis**  
3 hours credit. Prerequisites: Permission of the thesis director.  
Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master's degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF MATHEMATICS

Master of Science Degree in Mathematics

The Master of Science degree in Mathematics is offered with two concentrations: mathematics and mathematics education.

Program Admission Requirements. In addition to satisfying the University-wide graduate admission requirements, a Bachelor of Arts or Bachelor of Science in Mathematics or Statistics or a closely related field is highly recommended as preparation. Students who do not qualify for unconditional admission should anticipate that additional undergraduate and/or graduate coursework may be required to complete the degree. Applicants are required to submit scores from the Graduate Record Examination (GRE). These scores will be used as one element in the evaluation of applications for admission.

Degree Requirements. Degree candidates are required to successfully complete 36 semester credit hours.

A. All students, regardless of concentration, must complete the following 9 hours of coursework:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 5203</td>
<td>Theory of Functions of a Real Variable I</td>
</tr>
<tr>
<td>MAT 5283</td>
<td>Linear Algebra and Matrix Theory</td>
</tr>
<tr>
<td>STA 5503</td>
<td>Mathematical Statistics I</td>
</tr>
</tbody>
</table>

B. In addition, students must apply towards the degree the required courses for one of the following concentrations:

**Mathematics (9 semester credit hours):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 5173</td>
<td>Algebra I</td>
</tr>
<tr>
<td>MAT 5223</td>
<td>Theory of Functions of a Complex Variable I</td>
</tr>
<tr>
<td>MAT 5603</td>
<td>Numerical Analysis</td>
</tr>
</tbody>
</table>

**Mathematics Education (9 semester credit hours):**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAT 5023</td>
<td>Problem-Solving Seminar</td>
</tr>
<tr>
<td>MAT 5033</td>
<td>Foundations and Fundamental Concepts of Mathematics</td>
</tr>
<tr>
<td>MAT 5043</td>
<td>Euclidean and Non-Euclidean Geometry</td>
</tr>
</tbody>
</table>

C. Students must either write a Master’s thesis or complete 6 semester credit hours of advanced courses in the department as approved by the Graduate Advisor of Record.

D. Students must normally take an additional 12 semester credit hours of coursework chosen from eligible graduate courses in the Department of Mathematics. Students pursuing the concentration in Mathematics Education may apply a maximum of 9 semester credit hours of graduate coursework from other disciplines as approved by the Graduate Advisor of Record. Students pursuing the concentration in Mathematics may apply a maximum of 6 semester credit hours of graduate coursework from other disciplines as approved by the Graduate Advisor of Record.

E. Students are required to pass an advanced comprehensive examination or successfully defend their thesis research results.

For more details and information about a sequence requirement, see the Graduate Advisor of Record.
COURSE DESCRIPTIONS
MATHEMATICS
(MAT)

5003  Modern Mathematics for Teachers
(3-0)  3 hours credit.
A practical orientation concerned with the classroom uses of mathematics for teachers of K-12. May not be applied
toward the Master of Science degree in Mathematics.

5013  Computers for Mathematics Teachers
(3-0)  3 hours credit.
A course for mathematics teachers on integrating the computer into the mathematics curriculum, with an algorithmic-
oriented introduction to computer programming in BASIC or Pascal and the extensive use of mathematical software
packages such as Derive. This course may not be applied to the Master of Science degree in Mathematics with a
concentration in Mathematics or the Master of Science degree in Statistics. (Same as CS 5023. Credit cannot be
earned for both MAT 5013 and CS 5023.)

5023  Problem-Solving Seminar
(3-0)  3 hours credit.
Students will have the opportunity to engage in extensive experience and practice in solving mathematical problems.

5033  Foundations and Fundamental Concepts of Mathematics
(3-0)  3 hours credit.
Topics include the study of mathematics in antiquity as an empirical science, the shift from inductive reasoning to
axiomatic structures, the development of geometry in the plane and 3-space, the discovery of analysis, the emergence
of axiomatic systems, and the focus on algebraic structures. This course may not be applied to the Master of Science
degree in Mathematics with a concentration in Mathematics or the Master of Science degree in Statistics.

5043  Euclidean and Non-Euclidean Geometry
(3-0)  3 hours credit.
Topics will be selected from advanced Euclidean and non-Euclidean geometry, solid analytic geometry, and
differential geometry. This course may not be applied to the Master of Science degree in Mathematics with a
concentration in Mathematics or the Master of Science degree in Statistics.

5103  Introduction to Mathematical Analysis
(3-0)  3 hours credit. Prerequisite: MAT 4213 or consent of instructor.
Axiomatic construction of the reals, metric spaces, continuous functions, differentiation and integration, partial
derivatives, and multiple integration. This course may not be applied to the Master of Science degree in Mathematics
with a concentration in Mathematics or the Master of Science degree in Statistics. For the Mathematics Education
concentration, this course can substitute for MAT 5203.

5173  Algebra I
(3-0)  3 hours credit. Prerequisite: MAT 4233 or consent of instructor.
The opportunity for development of basic theory of algebraic structures. Areas of study include finite groups,
isomorphism, direct sums, polynomial rings, algebraic numbers, number fields, unique factorization domain, prime
ideals, and Galois groups.

5203  Theory of Functions of a Real Variable I
(3-0)  3 hours credit. Prerequisite: MAT 4213 or consent of instructor.
Measure and integration theory.
5213  **Theory of Functions of a Real Variable II**  
(3-0) 3 hours credit. Prerequisite: MAT 5203.  
Further development of measure and integration theory, metric space topology, and elementary Banach space theory.

5223  **Theory of Functions of a Complex Variable I**  
(3-0) 3 hours credit. Prerequisite: MAT 3213 or MAT 4213.  
Complex integration, Cauchy’s theorem, calculus of residues, and power series.

5233  **Theory of Functions of a Complex Variable II**  
(3-0) 3 hours credit. Prerequisite: MAT 5223.  
Infinite products, entire functions, Picard’s theorem, Riemann mapping theorem, and functions of several complex variables.

5243  **General Topology I**  
(3-0) 3 hours credit. Prerequisite: MAT 4273 or consent of instructor.  
Topological spaces, metric spaces, continua, and plane topology.

5253  **General Topology II**  
(3-0) 3 hours credit. Prerequisite: MAT 5243.  
Areas of study include introductory algebraic topology and introduction to topology of manifolds.

5283  **Linear Algebra and Matrix Theory**  
(3-0) 3 hours credit. Prerequisite: MAT 2233 or an equivalent.  
A study of linear algebraic structures and algebraic properties of matrices.

5293  **Numerical Linear Algebra**  
(3-0) 3 hours credit. Prerequisite: MAT 2233 or an equivalent.  
Direct and iterative methods for solving general linear systems, the algebraic eigenvalue problem, least squares problems, and solutions of sparse systems arising from partial differential equations. (Same as CS 5293. Credit cannot be earned for both MAT 5293 and CS 5293.)

5313  **Algebra II**  
(3-0) 3 hours credit. Prerequisite: MAT 5173.  
Areas of study include: groups, rings, fields, Galois theory, ideal theory, and representations of groups, module theory, and homological algebra.

5403  **Functional Analysis I**  
(3-0) 3 hours credit. Prerequisites: MAT 2233, MAT 4273, and MAT 5203, or their equivalents.  

5413  **Functional Analysis II**  
(3-0) 3 hours credit. Prerequisite: MAT 5403  
Riesz representation theorem, spectral theory, Banach algebras, and C*-algebras.

5553  **Harmonic Analysis**  
(3-0) 3 hours credit. Prerequisites: Either MAT 3223 and MAT 4223 or consent of instructor.  

5603  **Numerical Analysis**  
(3-0) 3 hours credit. Prerequisite: MAT 3633 or consent of instructor.  
Emphasis on the mathematical analysis of numerical methods. Areas of study include solution of nonlinear equations and function optimization, approximation theory and numerical quadrature. (Same as CS 5603. Credit cannot be earned for both MAT 5603 and CS 5603.)
5613  **Numerical Solutions of Differential Equations**  
(3-0) 3 hours credit. Prerequisite: MAT 5603 or an equivalent.  
Emphasis on the mathematical analysis of numerical methods. Areas of study include the analysis of single and  
multistep methods of ordinary differential equations. Analysis of finite difference and finite element methods for  
partial differential equations. (Same as CS 5613. Credit cannot be earned for both MAT 5613 and CS 5613.)

5653  **Differential Equations I**  
(3-0) 3 hours credit. Prerequisites: MAT 3613 and MAT 4213, or consent of instructor.  
Solution of initial-value problems, linear systems with constant coefficients, exponentials of operators, canonical  
forms and generic properties of operators, and contractions.

5663  **Differential Equations II**  
(3-0) 3 hours credit. Prerequisite: MAT 5653.  
Dynamic systems, the fundamental existence and uniqueness theorem, stability, the Poincare-Bendixson theorem,  
introduction to perturbation, and bifurcation theory.

5673  **Partial Differential Equations I**  
(3-0) 3 hours credit. Prerequisite: MAT 3623, MAT 5663, or consent of instructor.  
Classical theory of initial value and boundary value problems for partial differential equations.

5683  **Partial Differential Equations II**  
(3-0) 3 hours credit. Prerequisite: MAT 5673.  
Modern topics in partial differential equations.

5833  **Perturbation Theory in Applied Mathematics**  
(3-0) 3 hours credit. Prerequisite: MAT 3613, MAT 5653, or consent of instructor.  
Perturbation theory, asymptotic analysis, and boundary layer expansions.

5973  **Directed Research**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the  
student’s Graduate Advisor of Record.  
The directed research course may involve either a laboratory or a theoretical problem. May be repeated for credit, but  
not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6603  **Optimization Techniques in Operations Research**  
(3-0) 3 hours credit. Prerequisite: MAT 2213, MAT 2233, or consent of instructor.  
Analysis and application of optimization techniques in operations research. Emphasis on linear programming,  
nonlinear programming, and integer programming.

6901  **Teaching Seminar**  
(1-0) 1 hour credit. Prerequisite: Designation as a teaching assistant in the Department of Mathematics.  
Designed to improve the instructional effectiveness of graduate students’ teaching at the college level. Topics include  
boardwork, clear speech, teacher-student interaction, professional responsibilities, course content and pace, grading  
policy, test writing, sensitivity to student needs, information and technical support and guest lectures on special  
topics. The grade report for the course is either “CR” (satisfactory performance) or “NC” (unsatisfactory  
performance). This course may not be applied as credit toward a Master of Science degree in Mathematics.

6953  **Independent Study**  
3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the  
student’s Graduate Advisor of Record.  
Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students  
needing specialized work not normally or not often available as part of the regular course offerings. May be repeated  
for credit, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.
6961 Comprehensive Examination
1 hour credit. Prerequisite: Approval of the appropriate graduate program committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. May be repeated as many times as approved by the Graduate Program Committee. Enrollment is required each term in which the Comprehensive Examination is taken if no other courses are being taken that term. The grade report for the course is either “CR” (satisfactory performance on the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination).

6963 Topics in Mathematics Education
(3-0) 3 hours credit. Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. This course may be repeated for credit when topics vary. This course may not be applied toward any Master’s degree in the Department of Mathematics.

6973 Special Problems
(3-0) 3 hours credit. Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Problems courses may be repeated for credit when topics vary, but not more than 6 hours, regardless of discipline, will apply to the Master’s degree.

6983 Master’s Thesis
3 hours credit. Prerequisites: Permission of the Graduate Advisor of Record and thesis director. Thesis research and preparation. May be repeated for credit, but not more than 6 hours will apply to the Master’s degree. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.
DEPARTMENT OF PHYSICS AND ASTRONOMY

Currently programs are in effect at the undergraduate level only.
Photo - School of Architecture
SCHOOL OF ARCHITECTURE

Master of Architecture Degree

The Master of Architecture is an accredited first professional degree in architecture in preparation for becoming a licensed architect. It consists of a two-year sequence of courses that must be preceded by a preprofessional four-year degree such as the undergraduate Bachelor of Science in Architecture offered at UTSA or its equivalent. The Master of Architecture degree received its initial accreditation from the National Architectural Accrediting Board (NAAB) effective January 2001. The program gives students a thorough background in the principles and techniques of architectural design and theory related to contemporary practice and focused on continued expansion of the profession’s knowledge base.

In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure.

Students may select one of three specializations: Architectural Design, International Practice, or Historic Preservation. The specialization in Architectural Design broadens students’ understanding and appreciation of the fundamentals of design programming, conceptualization, and developmental processes within regional and urban contexts. The specialization in International Practice focuses on the unique characteristics of international design and urban development traditions and conventions by addressing sustainable design and practice from a global perspective. The specialization in Historic Preservation acquaints students with preservation theory and techniques, including new construction which is sensitive to historic context and adaptive use approaches to utilizing sound and significant architecture in meeting contemporary spatial needs. Each specialization places particular emphasis on the architecture of South Texas and the Rio Grande Valley on both sides of the river.

Program Admission Requirements

In addition to University-wide admission requirements, applicants must

1. Submit Graduate Record Examination (GRE) scores by the semester deadline. These scores will be considered in comparison with scores from applicants of similar socioeconomic background.
2. Have completed a preprofessional architecture curriculum with a minimum grade point average of at least 3.0 in the last 60 hours of undergraduate studies and 3.0 in architecture courses
3. Submit a portfolio, two letters of recommendations, and a personal statement as described in the next section.

Admission determinations are based on the above criteria.

Students lacking required undergraduate courses or possessing a Bachelor’s degree unrelated to a preprofessional architecture degree may be offered conditional admission with the stipulation that they undertake additional undergraduate coursework before proceeding with graduate study. Applicants must maintain a minimum grade point average of at least 3.0 in this coursework.

Application Materials

Each applicant must submit a portfolio, two letters of recommendation from persons knowledgeable about the applicant’s ability to undertake graduate work, and a personal statement of professional goals discussing areas of special interest. The portfolio should demonstrate the applicant’s creative and communication skills through samples of past work and projects (do not include slides nor original work). The portfolio, letters of recommendation, and statement of professional goals should be sent directly to the Graduate Advisor of the Architecture Program by the University’s admission deadlines. The application form, transcripts, Graduate Record Examination (GRE) scores, and fees should be sent directly to the Office of Graduate Studies.

Contact the School of Architecture at (210) 458-4299 or http://www.utsa.edu/architecture for information regarding application materials.
Degree Requirements. The minimum number of semester credit hours required for this degree, exclusive of coursework or other study required to remove admission deficiencies, is 48. Credit toward the program is earned only for the grades “A,” “B,” and “C.” Students must also maintain an overall grade point average of 3.0 with a maximum of 6 semester credit hours with the grade of “C.”

Students admitted to the program must consult the Graduate Advisor of Record for specific program requirements for their individual study sequence. The program does not require proficiency in a foreign language, although proficiency in Spanish will enhance the student’s ability to participate in the international aspects of the program.

Candidates for the degree must complete

A. 24 semester credit hours of required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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<tbody>
<tr>
<td>ARC 5173</td>
<td>Architectural Theory and Criticism</td>
</tr>
<tr>
<td>ARC 5613</td>
<td>Architecture of the Americas</td>
</tr>
<tr>
<td>ARC 6146</td>
<td>Advanced Design Studio (two semesters equaling 12 hours)</td>
</tr>
</tbody>
</table>

B. 9 semester credit hours of prescribed coursework depending upon specialization in either of the following areas:

Architectural Design

<table>
<thead>
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<tr>
<td>ARC 5173</td>
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<td>Architecture of the Americas</td>
</tr>
</tbody>
</table>

Historic Preservation

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ARC 5203</td>
<td>History and Theory of Preservation</td>
</tr>
<tr>
<td>ARC 5233</td>
<td>Architectural Surveys and Measured Drawings</td>
</tr>
<tr>
<td>ARC 6413</td>
<td>Preservation Technology</td>
</tr>
</tbody>
</table>

International Practice

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>ARC 5303</td>
<td>International Practice Seminar</td>
</tr>
<tr>
<td>ARC 6123</td>
<td>Morphology of South Texas and the Borderlands</td>
</tr>
<tr>
<td>ARC 6233</td>
<td>Design and Development of Multicultural Communities</td>
</tr>
</tbody>
</table>

C. 9 semester credit hours of electives. Students interested in emphasizing construction management may take selected courses in architecture, civil engineering, finance, and management of technology. Elective courses must constitute a coherent program of scholarship, and the student’s elective program must be prepared in consultation with the Graduate Advisor of Record.

D. 6 semester credit hours of ARC 6983 Master’s Thesis

Upon completion of 24 semester credit hours toward the Architecture degree, the student must meet with the Graduate Advisor to draw up a program of study.

Comprehensive Examination. A candidate for the Master of Architecture degree must, in addition to other requirements, pass a written comprehensive examination. Students must be registered for ARC 6961 Comprehensive Examination during the semester in which they are taking the Comprehensive Examination.
Comprehensive Examinations are given only to students who:

1. have satisfied all admission conditions
2. are in good academic standing
3. have an approved program of study
4. have selected a supervising professor and thesis committee with an approved thesis topic
5. are enrolled in ARC 6961 Comprehensive Examination. Note: credit earned for ARC 6961 will not count toward the 48 semester credit hours required for the degree.

The Comprehensive Examination tests the student's knowledge in architectural theory and design and in the student's specialization. It is normally taken after the completion of the required coursework listed in part A above and at least two of the specialization courses listed in part B above.

COURSE DESCRIPTIONS
ARCHITECTURE
(ARC)

5133  Advanced and International Professional Practice and Ethics
(3-0) 3 hours credit.
A seminar dealing with national and international business and legal environments in the design and construction industry. Topics include agreement and delivery options, forms of construction, project procedures and administration, liability, contract documents, and ethics.

5143  Sustainable Architecture Seminar
(3-0) 3 hours credit.
Review of the natural and historical practices that have created current regional ecological conditions. Investigation of current design practices from scientific, ethical, economic, practical, and aesthetic perspectives and the architect's responsibility and liability in the creation and sustainability of conditions that protect and enhance ecological systems.

5173  Architectural Theory and Criticism
(3-0) 3 hours credit.
Seminar survey of historical basis and contemporary development of architectural theory and the criteria used in architectural criticism from both Western and non-Western perspectives.

5203  History and Theory of Preservation
(3-0) 3 hours credit.
A seminar on the history, philosophy, and methodology of historic preservation and restoration.

5213  Theories and Philosophies of Regionalism
(3-0) 3 hours credit.
Seminar focusing on issues of regionalism; appropriate interventions between the natural environment and the history and traditions of the built environment that together maintain and contribute to a sense of place.

5233  Architectural Surveys and Measured Drawings
(3-0) 3 hours credit. Prerequisite: ARC 5203.
Documentation and interpretation of sites and buildings and graphic recording techniques.

5303  International Practice Seminar
(3-0) 3 hours credit. Prerequisite: Consent of instructor.
A seminar focusing on the professional, legal, social, and cultural issues that affect international architecture, construction, and urban development.
5313  **Housing Design**  
(3-0) 3 hours credit.  
Evolution of housing design with emphasis on sustainable design methods, materials, techniques, and solutions applicable to the Texas–Mexico region.

5323  **Sustainable Facilities Design and Planning**  
(3-0) 3 hours credit.  
Analysis, design, and planning of sustainable educational, institutional, private, and industrial facilities within the Texas–Mexico region; examination of current problems, energy use, design retrofit, and development of maquiladoras.

5403  **Historic Preservation Seminar**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Selected topics in architecture, design, preservation, and planning. May be repeated for credit when topics vary, but not more than 6 hours will apply to the Master of Architecture degree.

5423  **Legal and Economic Aspects of Preservation**  
(3-0) 3 hours credit.  
Laws and regulations that affect preservation of the built environment, nationally, regionally, and locally. Fundamentals of legal protection for and regulation of historic cultural resources in light of contemporary attitudes toward the historic environment. Economic bases of the use of historic buildings and sites examined in terms of contemporary social and cultural attitudes that determine effective strategies of preservation action.

5613  **Architecture of the Americas**  
(3-0) 3 hours credit.  
Development of the architecture of North, Central, and South America from the earliest human settlements to the present.

5623  **Regional and Vernacular Architecture**  
(3-0) 3 hours credit.  
History of the settlement patterns of immigrants to the North American continent and the response to climate, material availability, and economic constraints that required adaptation of housing, farm, and industrial structures. Consideration of the anonymous builders of the South Texas/North Mexico region and the special problems their structures pose as objects worthy of preservation.

5633  **Construction Management**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Organization of construction resources and activities to include consideration of scheduling, methods of construction, project planning and management, cost accounting, and personnel utilization.

6113  **Special Topics**  
(3-0) 3 hours credit. Prerequisite: Consent of instructor.  
Selected topics in architecture, international practice, historic preservation, and construction management. May be repeated for credit when topics vary, but not more than 6 hours will apply to the Master of Architecture degree.

6123  **Morphology of South Texas and the Borderlands**  
(3-0) 3 hours credit.  
A seminar analyzing the infrastructure of South Texas and the borderlands and their evolution and interaction.

6146  **Advanced Design Studio**  
(1-10) 6 hours credit.  
Advanced problems in architectural or urban design to develop skills in areas of students’ and faculty member’s choice, including international architecture and preservation. May be repeated for credit, but not more than 12 hours will apply to the Master of Architecture degree.
6233  Design and Development of Multicultural Communities  
(3-0) 3 hours credit.  
A study of sustainable design, planning, economic, financial, and environmental issues that shape multicultural communities in the Americas.

6413  Preservation Technology  
(1-4) 3 hours credit.  
Techniques of preservation: methods of analysis, history of materials, and technology used in old buildings. Emphasis on buildings as integrated sets of subsystems and how these are affected by the processes of material deterioration, conservation, and techniques of intervention. May be repeated for credit once when topics vary.

6423  Architectural Conservation Theory  
(3-0) 3 hours credit.  
A study of the problems of older sites and buildings and the techniques employed in preserving and restoring them.

6943  Professional Internship  
3 hours credit. Prerequisites: Graduate standing, 18 semester hours of graduate work, and consent of instructor. Supervised professional practice experience with public agencies or private firms. Individual conferences and written reports required. May be repeated for credit, but not more than 6 hours will apply to the Master of Architecture degree.

6951-3  Independent Study  
1 to 3 hours credit. Prerequisites: Graduate standing and permission in writing (form available) of the instructor and the Graduate Advisor of Record. Independent reading, research, discussion, and/or writing under the direction of a faculty member. For students needing specialized work not normally or not often available as part of the regular course offerings. May be repeated for credit, but not more than 6 hours, regardless of discipline, will apply to the Master of Architecture degree.

6961  Comprehensive Examination  
1 hour credit. Prerequisite: Approval of the Graduate Program Committee to take the Comprehensive Examination. Independent study course for the purpose of taking the Comprehensive Examination. The grade report for the course is either “CR” (satisfactory performance of the Comprehensive Examination) or “NC” (unsatisfactory performance on the Comprehensive Examination). Credit earned in ARC 6961 may not be counted toward the 48 hours required for the Master of Architecture degree. May be repeated once.

6973,6  Special Problems  
(3-0, 6-0) 3 or 6 hours credit. Prerequisite: Consent of instructor. An organized course offering the opportunity for specialized study not normally or not often available as part of the regular course offerings. Special Programs may be repeated for credit when topics vary, but not more than 6 semester credit hours for ARC 6973 or 12 hours for ARC 6976 will apply to the Master of Architecture degree.

6981,3  Master’s Thesis  
1 or 3 hours credit. Prerequisites: Graduate standing and permission of the Architecture Graduate Advisor and thesis committee chair. May be repeated for credit, but not more than 6 hours will apply to the Master of Architecture degree. Successful completion of ARC 6961 is required for enrollment in the second semester of Masters Thesis. Credit will be awarded upon completion of the thesis. Enrollment is required each term in which the thesis is in progress.