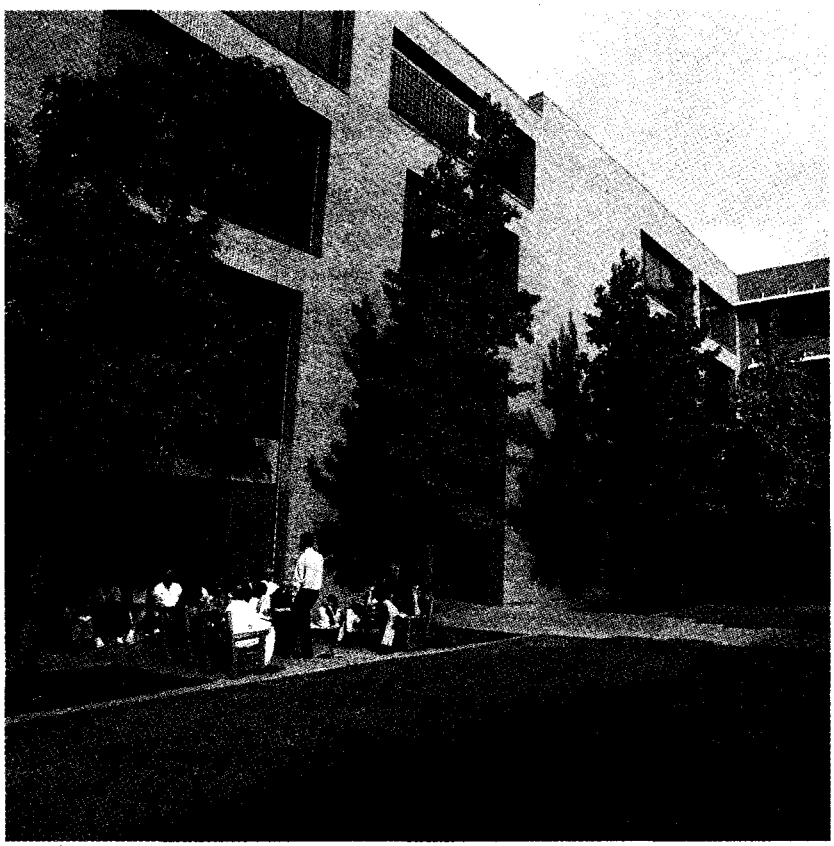

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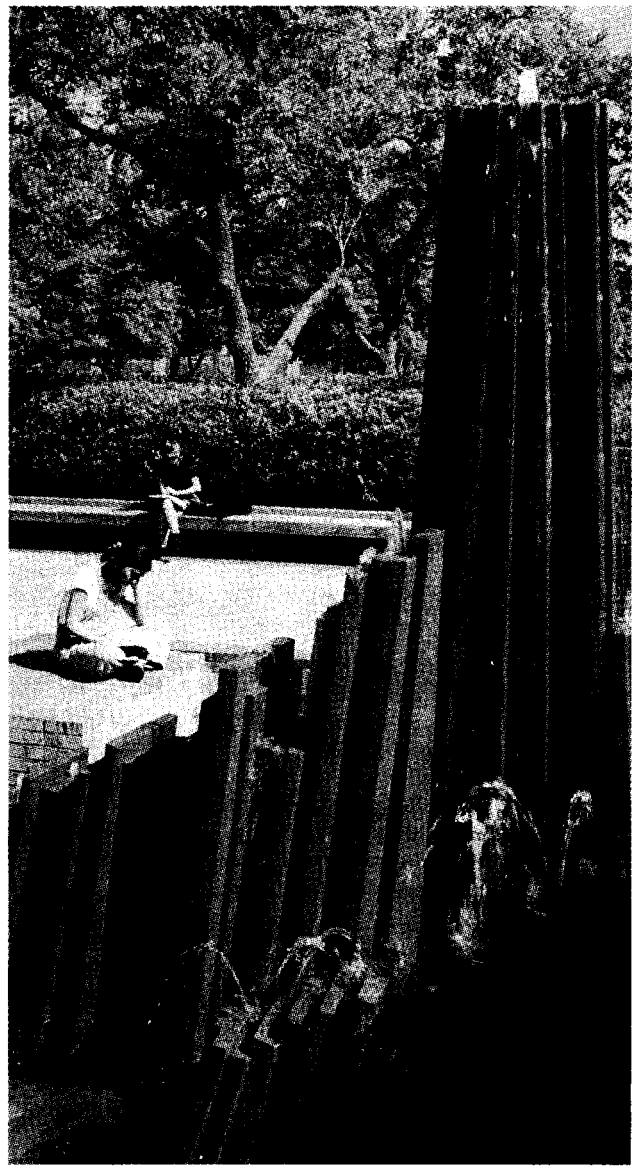

1998-1999 Graduate School Calendar, Inside Front Cover

1999-2000 Graduate School Calendar, Inside Back Cover

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by the Office of University Publications

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The University of Texas System

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Government

The government of U.T. Arlington is vested in a nine-member Board of Regents of The University of Texas System, nominated by the Governor, and approved by the Senate. The Office of the Chancellor is the chief administrative office of The University of Texas System and is located in Austin. The chief administrative officer of U.T. Arlington is the President, under authority of the Office of the Chancellor of the U.T. System and the Board of Regents. A complete statement of the authority and duties of the Regents and of the several officers, together with an account of the organization of the system, is published in the **Rules and Regulations of the Board of Regents of The University of Texas System.**

This catalog is a general information publication only. It is not intended to nor does it contain all regulations that relate to students. The provisions of this catalog do not constitute a contract, express or implied, between any applicant, student, or faculty member and The University of Texas at Arlington or The University of Texas System. The University reserves the right to withdraw courses at any time, change fees, rules, calendar, curriculum, degree programs, degree requirements, graduation procedures, and any other requirements affecting students. Changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

Students are held individually responsible for complying with all requirements of the rules and regulations of the University and the Board of Regents of The University of Texas System. Failure to read and comply with policies, regulations and procedures will not exempt a student from whatever penalties he or she may incur.

The University of Texas at Arlington

University Profile

The University of Texas at Arlington is located on a modern, 392-acre campus in the center of the Dallas/Fort Worth Metroplex. The 18-acre RiverBend campus in East Fort Worth houses the Automation and Robotics Research Institute. A rapidly growing library, well-equipped engineering and science laboratories, several specialized research centers, and joint programs with other institutions of The University of Texas System as well as with other regional and national academic and research institutions provide graduate students at U.T. Arlington with excellent opportunities for advanced study and research. The campus and Metroplex area offer a wide variety of cultural and recreational opportunities including museums, concerts, ballet, theater, family recreation, professional sports and other interests.

Founded in 1895 as Arlington College, a private liberal arts institution, U.T. Arlington has changed with the times and its surroundings, undergoing a maturing process and a succession of names, ownerships and missions. In 1959, it was elevated to senior college rank and, in 1965, was transferred from the Texas A&M System to The University of Texas System. Its final name change came in 1967, when it became The University of Texas at Arlington.

With an enrollment of more than 19,000 students, U.T. Arlington is the second largest of the 15 institutions in The University of Texas System. The student body has become increasingly diversified with students now representing 46 U.S. states and territories and more than 80 countries. Of the total enrollment, approximately 20 percent are graduate students. The University's academic units include the College of Business Administration, College of Engineering, College of Liberal Arts and College of Science as well as the School of Social Work, School of Architecture, School of Nursing, School of Urban and Public Affairs, Center for Professional Teacher Education and the Graduate School.

U.T. Arlington has emerged as a comprehensive teaching, research and public service university offering an array of bachelor's, master's, doctoral and special professional degrees. Its history of achievement can be attributed to an accomplished faculty, a dedicated student body, an increasing number of successful alumni and the maturation of the Dallas/Fort Worth area as a nationally and internationally significant metropolis.

Mission Statement

The mission of The University of Texas at Arlington is to pursue knowledge, truth and excellence in a student-centered academic community characterized by shared values, unity of purpose, diversity of opinion, mutual respect and social responsibility. The University is committed to lifelong learning through its academic and continuing education programs, to discovering new knowledge through research and to enhancing its position as a comprehensive educational institution with bachelor's, master's, doctoral and nondegree continuing education programs.

Accreditation

The University of Texas at Arlington is accredited by the Commission on Colleges of the Southern Association of Colleges and Schools (1866 Southern Lane, Decatur, Georgia, 30033-4097; Telephone number: 404-679-4501) to award bachelor's, master's and doctoral degrees.

In addition, many of U.T. Arlington's academic departments and schools have received national accreditation from specific agencies. These accreditations are detailed under the individual listings for departments and schools in this catalog.

Equal Opportunity Policy

The University of Texas at Arlington complies with the **Equal Pay Act of 1963**, Titles VI and VII of the **Civil Rights Act of 1964**, **Executive Order 11246**, the **Age Discrimination in Employment Act of 1967**, Title IX of the **Educational Amendments of 1972**, Sections 503 and 504 of the **Rehabilitation Act of 1973**, the **Americans with Disabilities Act, 1990**, the **Vietnam Era Veterans Readjustment Act of 1974**, and the **Rules and Regulations of The Board of Regents of The University of Texas System.**

It is the policy of The University of Texas at Arlington that to the extent provided by these applicable laws no person shall, on the basis of race, color, national origin, religion, age, sex, disabilities, or veteran status be denied employment or admission, be excluded from participation in, be denied the benefits of, or subject to discrimination under, any program or activity which it sponsors or conducts. It is also the University's policy to maintain an environment free from discrimination on the basis of sexual orientation. Inquiries concerning the application of this policy should be directed to the Office of Equal Opportunity and Affirmative Action, 710 S. Davis, Office and Classroom Building (OCB), (817) 272-2106.

Sexual Harassment Policy

The University of Texas at Arlington is committed to an academic and working environment free from inappropriate conduct of a sexual nature. Sexual harassment is a prohibited practice under Title VII of the **1964 Civil Rights Act** for employees as amended by the **Equal Employment Opportunity Act of 1973**, and for students under Title IX of the **Education Amendments of 1972**. Sexual harassment, sexual misconduct and consensual relationships between faculty members and the students they currently teach or supervise, and between employees in positions of authority and their subordinates, are prohibited under University policy and are sanctionable.

Sexual harassment includes, but is not limited to, unwelcome sexual advances, requests for sexual favors, insults, sexual threats, innuendoes and other verbal or physical conduct of a sexual nature under circumstances where: (1) submission to such conduct is made either explicitly or implicitly a term or condition of employment (or a student's status in a course, program or activity; (2) submission to, or rejection of such conduct by an employee is used as a basis for employment decisions affecting the individual (or in the case of a student, it is used as a basis for academic or other decisions affecting a student); or (3) such conduct has the purpose or effect of unreasonably interfering with the individual's employment (or the student's educational experience), or creating an intimidating, hostile or offensive academic environment.

Inappropriate sexual behavior should be reported to the Office of Equal Opportunity and Affirmative Action, 710 S. Davis, Office and Classroom Building (OCB), 817-272-2106.

The Graduate School

The Graduate School is administratively located in the Office of Research and Graduate Studies. The Dean of Graduate Studies also carries the title of Vice Provost for Research.

The goal of graduate study is the development of a student's ability for creative research, critical evaluation and scholarship in a particular discipline or in interrelated disciplines. Graduate study actively involves students in research, and by sharing in investigations with their professors, graduate students acquire the spirit as well as methods of creative scholarship. Achievement of the goal is demonstrated by preparations of reports, theses and dissertations. In practice-oriented and teaching-oriented graduate programs, emphasis is on preparation for careers in application of existing knowledge in professional practice and teaching.

The Graduate School is the focus of advanced studies and research in the University and, in that capacity, has the dual but interdependent functions of training scholars and promoting varied research activities. A Graduate Faculty of more than 400 makes the Graduate School an important influence in creating high standards for academic accomplishment and in achieving an intellectual environment of the highest quality for the University community.

The Graduate School of The University of Texas at Arlington was established in 1966 with the initiation of six master's degree programs. Doctoral degree programs were begun in 1969 with a Ph.D. program in engineering. Today the University offers master's degrees in 60 disciplines or interdisciplinary programs and 20 doctoral degree programs.

Directory of Offices

All of the offices listed below, unless otherwise indicated, are located in Davis Hall. The telephone numbers are Dallas/Fort Worth Metroplex numbers. The area code for all numbers is 817. The University postal zip code is 76019.

Office/Location	Phone	Fax	E-mail
Dean of Graduate Studies, *Rm. 333*	272-2681	272-2627*	graduate.school@uta.edu
Graduate Admissions, *Rm. 333*	272-2688	272-2627*	graduate.school@uta.edu
International Student Admissions and Student Visas, *Rm. 333*	272-2688	272-2627*	graduate.school@uta.edu
Graduate Advisor - *See departmental and program description.*			
Counseling and Career Development, *Rm. 216*	272-3671	272-5792	ccddesk@uta.edu
Financial Aid, *Rm. 252*	272-3561	272-3555	fao@uta.edu
International Office *Lower Level. University Center*	272-2355	272-5005	international@uta.edu
Office for Students with Disabilities *Lower Level, University Center*	272-3364 272-3323 (TDD)	272-5221	
Student Health Services, *605 S. West Street*	272-2771	272-2744	bilyeu@uta.edu
Housing, *210 University Center*	272-2791	272-2717	housing@uta.edu
Office of Multicultural Services *Lower Level, University Center*	272-2099	272-5656	gonzales@uta.edu
SOAR - Special Services *Rm. 132, Hammond Hall*	272-3684	272-3770	soar_student_support_services_@uta.edu soar_mcnair_scholars_program@uta.edu soar_cost_share@uta.edu
Student Affairs *Lower Level, University Center*	272-2354	272-5221	
Transcripts and Records, *Rm. 129*	272-2137	272-3223	
Veterans' Administration Representatives, *Rm. 129*	272-3373	272-3223	bautista@uta.edu

* For correspondence only. Application materials are not accepted by fax.

Facilities for Advanced Studies and Research

Academic Computing Services (ACS)

Academic Computing Services provides computing facilities and services for the academic and research needs of the University. ACS installs and maintains a data network that provides reliable access to the computing resources on UTA's campus, as well as the Internet at large. ACS also provides assistance to UTA students, faculty and staff in the use of UTA's computing resources.

ACS supports both large, centralized computing resources, as well as distributed client/server computing. The large centralized resources consist of:

1. An SGI Origin 2000, with sixteen R10000 processors, 4GB of memory and 99GB of disk space, runs IRIX 6.4.1 and scientific application software. This system is dedicated exclusively for UTA's researchers.
2. A DEC AlphaServer 4000, with one 21164 Alpha Processor, 1GB of memory and 50 GB of RAID disk space, runs Digital UNIX 4.0, various compilers, utilities, and statistical packages/libraries. This system supports both teaching and researching activities.
3. A SUN Ultra Enterprise 3000, with two 250MHZ UltraSPARC processors, 1GB of memory and 75GB of RAID disk space, runs Sun Solaris 2.5.1 and various engineering application software. This system serves as compute and/or print/file servers for teaching and researching purposes.
4. An Aspen 275XS, with one 21064A Alpha Processor, 512MB of memory and 22GB of disk space, runs DEC Open VMS with various compilers and utilities. This system supports both teaching and researching activities.
5. An SGI Origin 200, with two R10000 processors, 256MB of memory and 108GB of disk space, runs IRIX 6.4 and SGI's MediaServer software. This system is dedicated for distance learning at UTA.
6. A DEC AlphaStation 3000/300, with 160 MB of memory and 7GB of disk space, runs Digital UNIX 4.0. This system serves as UTA's Campus-Wide Information Server.

Distributed client/server resources consist of:

1. A SUN Solaris server and 41 Solaris clients. The client stations are SUN Ultra 1 Model 170E with one 167MHZ UltraSPARC processor, 128MB of memory, 3D graphics card and 2GB of disk space. These client stations run Solaris 2.5.1 operating system.
2. Two DEC AlphaServer 4100s, with four 21164 Alpha Processors, 512MB of memory and 100GB of RAID disk space, run Windows-NT Server 4.0. The two AlphaServers, closely clustered with fault tolerance capabilities, serve as print/file and application server to hundreds of Apple Macintosh computers and Windows-NT workstations for student instructional purposes.
3. Three HP Netserver LH Pentium Intel servers, running Windows-NT server operating systems, serve as print/file and application servers to Apple Macintosh computers and IBM-compatible PCs located in ACS-supported Computing Facilities.
4. A DEC Prioris HX6200, with two PentiumPRO processors, 192MB of memory and 12 GB of RAID disk space, runs Windows-NT Server 4.0 and Microsoft SQL Server 6.5.

This distributed client/server environment supports thousands of computers located on the desktops of UTA faculty and staff offices as well as the student computing facilities.

ACS operates seven on-campus computing facilities. The Ransom Computing Facility is open 24 hours per day, seven days a week. This lab provides networked Apple Macintosh computers, IBM-compatible PCs and SUN Solaris client workstations. Color and grayscale laser printing is provided as well as color flat-bed scanners. Ransom also hosts teaching classrooms, equipped with either Mac, PC or UNIX workstations, and a room for computer presentations. The Life Science Computing Facility provides networked Apple Macintosh computers with dot-matrix and laser printers available. The Library Computing Facility provides networked Apple Macintosh and IBM-compatible PC systems with dot-matrix and laser printers available. Color printing is also available in the library Computing Facility. The Fine Arts Computing Facility provides local networked Apple Macintosh computers. The University Hall and Business Computing Facilities provide networked IBM-compatible PC systems with dot-matrix and laser printers available. The Nedderman Computing Facility provides networked IBM-compatible and NCD X-Windows systems with dot-matrix and laser printers.

ACS's major responsibilities include providing a high-speed data network within the UTA campus, as well as interconnections to major regional, national and international networks (e.g. Internet, THEnet, CAPnet, etc.). The campus computer backbone has been upgraded from 10Mbps data service to a fiberoptic-based network providing 100Mbps data service. ACS continually works to extend these high-speed data services to all campus facilities.

Additional information regarding ACS computers, network, and student computing facilities is available at the ACS main office in Room B66, Davis Hall. Staff consultants and documentation for supported software packages are also available. All ACS facilities and resources are available to currently enrolled students, faculty and staff of UTA. ACS Director Norman Weaver may be reached via voice mail at 817-272-3666 or via E-mail at weaver@uta.edu.

The University Libraries

U.T. Arlington Libraries are one of the most important resources on campus for teaching and research. The Central Library, the Architecture and Fine Arts Library, and the Science and Engineering Library contain a rapidly growing collection of more than 2,430,000 books, periodicals, documents, technical reports, microfilm, microfiche, motion pictures, sound recordings, videotapes, filmstrips, computer disks, and maps. They subscribe to more than 5,000 periodicals and newspapers. The Central Library makes available group study rooms, graduate-study carrels, and faculty carrels.

U.T. Arlington Libraries provide a full array of modern technological access to print and electronic information. All the Libraries' collections are listed in the online public access catalog, which provides information on the availability of library materials. The catalog is available through numerous terminals located in the three libraries and through dial-up access both on and off-campus.

The Libraries provide remote access to many electronic databases and online journals. Among the more popular databases are ABI/Inform and Periodicals Abstracts Research II. ABI indexes more than 1,000 journals in the business and management areas. Periodical Research Abstracts II includes indexing for approximately 1,700 general and academic journals covering current affairs, business and industry news, cultural and social issues, sports, leisure, and travel. Over 1,000 of these indexed journals provide full-text retrieval. Another favorite is CARL Uncover which provides citations to articles and tables of contents for 17,000 periodicals, document delivery capability, and current awareness alerts based upon personal profiles. In addition to remote resources, locally networked CD ROM products are available onsite. Electronic publishing is a dynamic field, and the Libraries will endeavor to increase access to these resources.

Assistance in the use of the Libraries' collections is provided by staff in the Central Library's Reference Department, the Special Collections Division, the Architecture & Fine Arts Library, and the Science & Engineering Library. Central Reference is responsible for the humanities, social sciences, business, nursing, education, geology, legal materials, and government publications.

The Government Publications and Maps Collection contains more than 900,000 publications of the United States government and international organizations. In addition, U.T. Arlington Libraries house the Comanche Peak Collection, which is the primary depository for documentation of the Nuclear Regulatory Commission relating to the operation of the TU Electric Plant in Glen Rose, TX.

The Central Library also contains the Minority Cultures Collection, a circulating and reference collection covering the political, social, cultural, economic, and intellectual history of African Americans, Asian Americans, Native Americans, and Mexican Americans in the southwestern United States from U.S. independence to the present, with emphasis on 20th century problems and progress. The Reading Resources Room, which provides a curriculum library and a collection of juvenile and young adult literature, is located on the second floor of the Central Library.

The Special Collections Division contains the Jenkins Garrett Library of Texana and Mexican War material, the Virginia Garrett Cartographic History Library, and the Papers of Robertson's Colony in Texas. Special Collections also includes the Department of Archives, which includes a collection of primary source materials relating to U.T. Arlington's history since 1895 and the history of organized labor in Texas and the Southwest. The division also holds archives and newspapers of Yucatan, colonial archives of Honduras, and collections relating to the political history of Texas.

The Architecture & Fine Arts Library is housed in the Architecture Building. Its collection includes all materials pertinent to architecture, art, photography, and music, including reference, circulating books, reserve, periodicals, scores, musical records, cassettes, and compact discs. It houses a music listening lab.

The Science & Engineering Library is housed in Nedderman Hall. It includes materials pertinent to engineering, biology, physics, chemistry, and mathematics, including reference, circulating books, reserve, and periodicals. The Science & Engineering Library manages the Robotics Information Center, an information service that provides electronic access for research faculty and graduate students in the Automation & Robotics Research Institute in Fort Worth.

Materials not available in the U.T. Arlington Libraries may be borrowed from other libraries through the Interlibrary Loan Office, a unit of the Department of Access Services. The Central Library provides a microform collection and reading/printing equipment, the current periodical collection, and coin-operated typewriters.

Coin-operated photocopy machines are available throughout the Central Library and in the branches. A Photocopy Center that provides mediated copying for patrons on a fee basis is located in the basement of the Central Library. A PC Lab operated by Academic Computing Services on the fifth floor of the Central Library includes both IBM and Apple hardware and a variety of software packages. Many of the PCs are networked to the campus backbone. The ACS Lab is available to U.T. Arlington students and faculty.

Additional library information may be obtained at any of the reference or circulation desks of the three library locations. Regular library hours are posted, as well as the hours for semester breaks, holidays, summer sessions, and other special circumstances. For more information call 817-272-3000. Director: Tom Wilding, Room 611, Central Library, Box 19497, Arlington, TX 76019. Reach the Libraries' web site at <http://www.uta.edu/library/> or by E-mail at: <cenref@library.uta.edu>

Engineering Center for Distance Learning (ECDL)

The Engineering Center for Distance Learning (formerly Engineering Television) was founded in 1982 with the express purpose to serve undergraduate and graduate level engineering courses to off-campus students via live television or videotape. The center is actively sending live television courses to off-campus sites in industry, and to the campuses of certain members of the Alliance for Higher Education (AHE), through a closed-circuit television network operated by AHE.

Live graduate level television courses are currently being delivered statewide to U.T. System components through a compressed digital video network. Recorded copies of each television class are available for check-out by the on- and off-campus student. Complete courses are available by videotape through the center with cooperation of the professor and provide full class materials and off-campus testing. All courses delivered by television or videotape may be taken for full credit or audit.

For further information or course availability via television or videotape, contact the U.T. Arlington Engineering Center for Distance Learning Office, Room 240, Nedderman Hall, Box 19077, Arlington, TX 76019, 817-272-2352, 888-UTA-2352, Fax: 817-272-5630, E-mail: etv@uta.edu, web site: cdl.uta.edu.

Research Centers, Divisions and Special Facilities

Advanced Transportation Research and Applications Center of Texas

Transportation is a highly multidisciplinary field encompassing disciplines including civil engineering, operations research, systems engineering, electrical engineering, city planning, human factors and computer science. The objective of this center is to facilitate research and training activities in transportation through bringing together faculty expertise. Activities include observational, experimental and basic research in transportation, particularly research related to the various aspects of Intelligent Transportation Systems, transportation systems analysis, and public transit planning and operations. Director: James C. Williams, Room 429, Nedderman Hall, 817-272-2894

Aerodynamics Research Center

The Aerodynamics Research Center at The University of Texas at Arlington provides modern test facilities for research and graduate educational programs in experimental aerodynamics, aerothermodynamics, propulsion, and fluid dynamics. Experimental simulation capabilities of the center span the complete flight spectrum from low to hypersonic speeds.

The Aerodynamics Research Center occupies a 1000 square meter laboratory complex housing experimental test facilities, a control room, model shop, instrumentation lab, and adjoining staff office complex. The principal laboratories consist of the Low Speed Wind Tunnel Lab; the High Speed Aerodynamics Lab containing transonic, supersonic, and hypersonic wind tunnels, and a pulse detonation engine facility; and the Aeropropulsion Lab with an arc-heated tunnel. The test labs are equipped with data acquisition and control systems, and supported by flow visualization and force, pressure, and heat transfer measurement systems. The ARC recently acquired an excimer laser and an intensified CCD camera.

Current research activities at the center include transonic flow phenomena associated with rotor blades on helicopters, hypersonic shock wave/turbulent boundary layer interactions, hypersonic plume flowfields, and development of pulsed detonation engines and new hypervelocity facilities. Other research areas include high temperature gas dynamics, unsteady and transient flows, instrumentation development, and detonations and plasmas. Research is funded by federal and state agencies, and by industry.

For information, contact F.K. Lu, P.O. Box 19018, Arlington, TX 76019, 817-272-2603, e-mail: lu@mae.uta.edu.

Applied Physical Electronics Research Center (APERC)

The Applied Physical Electronics Research Center conducts research and development in disciplines that couple electronics with the physical world, such as electro-magnetics, electro-optics and power semiconductor electronics. Special emphasis is placed on defining new approaches to problems and developing technology for defense and industrial applications.

In 1997, the APERC is conducting research in the areas of (1) high-speed power electronics, (2) induction recharging of electric vehicle batteries, (3) electric insulation for compact high-voltage devices, and (4) cryo-cooled electronic power conditioning for mobile electric power systems.

The APERC laboratory maintains a number of lasers, electronics diagnostic systems and machining facilities for use in research. It also conducts an active undergraduate research assistant program. Undergraduate and graduate research assistantships are available for qualified candidates. For more information, contact W.E. Dillon at 817-272-5720 or L.B. Gordon at 817-272-3453, Box 19380, Arlington, TX 76019.

Automation & Robotics Research Institute (ARRI)

The Automation & Robotics Research Institute is the premier manufacturing assistance, research, education and technology transfer center in the Southwest. The institute prides itself on its proven track record of performing world class research for customers, as well as its ability to transfer technology to industry quickly and effectively.

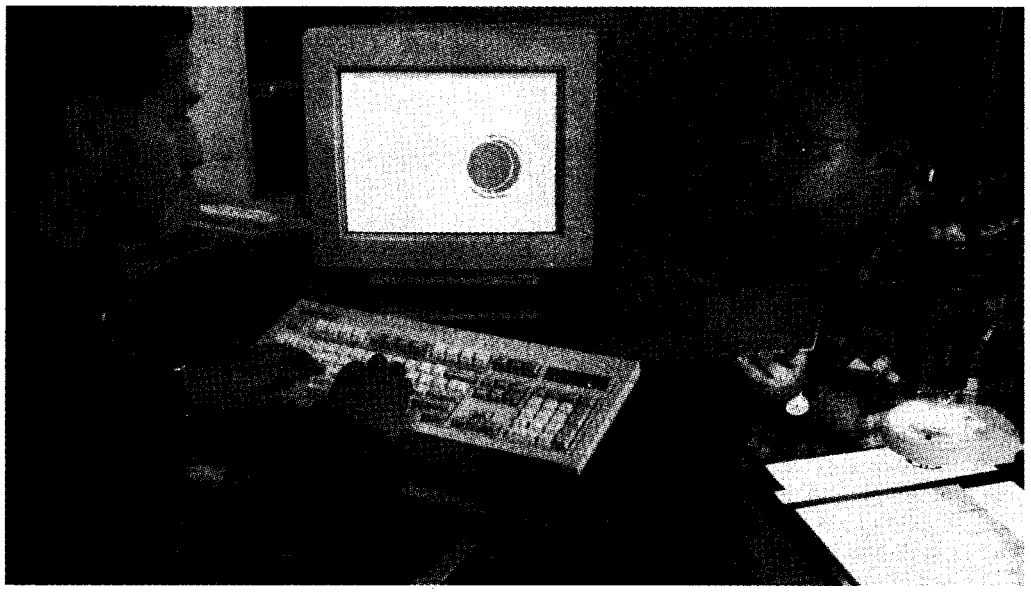
ARRI was conceived through a tripartite agreement among the Fort Worth Chamber Foundation, Newell & Newell (owners of RiverBend Business Park), and The University of Texas System. The Fort Worth Chamber Foundation raised $6 million to fund construction, furnishings, and equipment of the 48,000 square foot research building and to provide capitalization funds for two endowed chairs. Newell and Newell donated a $5 million, 18.5-acre tract at RiverBend for a Research Campus for U.T. Arlington, the first incumbent being ARRI. The facility was completed and occupied in September 1987. The program has received line-item support from the Texas Legislature since 1985. Current total investment exceeds $30 million.

By utilizing the multidisciplinary resources of U.T. Arlington, the major engineering university in the Dallas-Fort Worth Metroplex, ARRI's mission is to advance its customers toward world class manufacturing. The vision of the Institute is to be known as a world class applied research institution where innovative ideas, concepts, and philosophies are applied to solve problems for Institute customers. This vision is being accomplished by undertaking contract work for industry, obtaining state and federal grants in manufacturing, conducting research and development programs funded by corporate members, showcasing manufacturing and distribution automation technology and supporting an aggressive education and technology transfer program.

ARRI has established a rich environment of people, equipment, and know-how in manufacturing. It has contractual and membership relationships with a significant number of Texas companies and is now building relationships with out-of-state companies. Significant is the project teaming between Industry Fellows, faculty, ARRI professional staff, and students. The Institute offers students the opportunity to obtain hands-on expertise working on projects with experienced engineers. These projects include automated surface finishing, enterprise integration, materials handling, information systems, advanced controls and sensors, manufacturing system design and simulation, producibility, shop floor control, continuous enterprise improvement, and others.

In staffing, ARRI's emphasis is placed on the fusion of many talents. Multidisciplinary faculty and students, ARRI's full-time professional staff, and engineers on loan from industry combine their areas of expertise on specific joint projects with state-of-the-art vendor equipment deployed in a user-type environment.

ARRI has established the following programs to support cooperation with industry: Process Automation, Advanced Controls and Sensors, Information Technologies, Enterprise Engineering, and



the Small Integrated Manufacturing Enterprise. It also hosts the Texas Manufacturing Assistance Center, the National Science Foundation funded Agile Aerospace Manufacturing Research Center and the CALS Connectivity Center.

Director: J.J. Mills, 7300 Jack Newell Blvd. S., Fort Worth, TX 76118, 817-272-5900

Center for Accounting Software Evaluation (CASE)

The Center for Accounting Software Evaluation is a depository for accounting software. It provides a one-stop location where the business community can search for and run a wide variety of accounting packages appropriate for broad horizontal use as well as for specialized industries. CASE resources provide extensive research opportunities to both accounting graduate students and faculty and their use has resulted in widely recognized publications in professional accounting and computer journals. Director: Harley Courtney, Room 416, Business Building, 817-272-3065.

Center for Advanced Engineering Systems and Automation Research (CAESAR)

CAESAR is a campus-wide research organization which studies the application of intelligent systems in the areas of health care delivery; education, training and simulation; emergency management; environmental monitoring; manufacturing and design; and unmanned ground vehicles. CAESAR's mission is to link disciplines such as engineering, natural sciences, and social studies and apply them to national challenge applications. CAESAR extends the research arm of each component college, school and department to encompass large, multidisciplinary opportunities and cooperative industry interactions by providing infrastructure and visibility in the area of intelligent systems. Director: Lynn Peterson, CAESAR, Box 19066, Arlington, TX 76019, 817-272-2345.

Center for Advanced Polymer Research

The Center for Advanced Polymer Research is involved in the development of new polymeric materials for new applications. Research groups are focusing efforts in areas of electrically conductive polymers, ionically conductive polymers, potentially superconductive polymers, electroluminescent polymers, plasma polymerization, and other new methods for polymer processing, using graduate students, postdoctoral fellows, and undergraduate students in research positions. Modern experimental facilities have been constructed that give the center state-of-the-art polymer characterization capabilities in high field nuclear magnetic resonance spectroscopy for solids and liquids, electron paramagnetic resonance, Fourier transform infrared spectroscopy, pyrolysis gas chromatography/mass spectrometry, gel permeation and high pressure liquid chromatography, optical and electron microscopy, thermal analysis, electrochemistry, electronic measurements, x-ray photoelectron spectroscopy, GPC with multiangle laser light scattering detector, Raman spectroscopy, theoretical modeling, and carbon, hydrogen, and nitrogen elemental analyses. Joint research programs exist both internally and with industrial and governmental laboratories. Doctoral candidates spend 4-6 months in industrial research internships as part of their degree requirements.

For information, contact Martin Pomerantz, Room 205, Chemistry Research Building, 817-272-3811, at the Department of Chemistry and Biochemistry, Box 19065, Arlington, TX 76019. FAX: 817-272-3808; E-mail: pomerantz@uta.edu

Center for Biological Macrofouling Research

The Center for Biological Macrofouling Research enhances ongoing research programs in the biology, physiology, ecology, and macrofouling control of exotic pest bivalves including: the Asian clam,

Corbicula fluminia, introduced to North America from southeast Asia in the early 1900s; the zebra mussel, *Dreissena polymorpha*, introduced from Europe to the Great Lakes in 1986 and now spreading rapidly through United States and southern Canadian inland waterways; and the marine brown mussel, *Perna perna*, introduced to Texas' Gulf of Mexico shores in 1990. Biofouling of water treatment, industrial, and power-generating raw water systems by Asian clams is costing the United States well over a billion dollars a year. Fouling by zebra mussels (a more serious fouler) is conservatively estimated eventually to cost 3 to 4 billion dollars a year as it spreads throughout North American freshwaters. Brown mussels are rapidly spreading on Gulf of Mexico shores. The center coordinates research efforts, develops new research initiatives, evaluates the efficacy of control measures and acts as a national clearing house for information on the biology and fouling control of these species to the United States power industry, potable water treatment plants, chemical companies, and other industrial users of raw water. The center receives funding from the U.S. power industry, chemical companies, the Office of Army Research, and the U.S. Army Corps of Engineers. The center seeks research funding and contract research from both public and private industrial sources for its continued research on these species. Director: Robert F. McMahon, Room B28, Life Science Building, 817-272-2412

Center for Colloidal and Interfacial Dynamics (CCID)

The objective of CCID is to facilitate and to coordinate the research efforts of faculty, industrial associates, postdoctoral fellows and graduate students interested in rate processes in colloidal systems and at interfaces. Such processes are relevant in chemistry, physics, geology, bio- and environmental sciences, and many areas of engineering. Examples of the studies include the investigation of the rate and mechanism of the formation of colloidal particles and thin films, adsorption-desorption at interfaces, mass transport across membranes, molecular tailoring of surfaces via plasma deposition, photoelectrochemistry and photocatalysis, polymer films bearing colloidal catalyst particles, and improved biocompatibility of materials. State-of-the-art instrumentation includes X-ray photoelectron (XPS), laser Raman, diode-array UV-visible, and Fourier transform IR spectrometers, dynamic light scattering apparatus, several RF plasma reactors, quartz crystal microbalance, cyclic voltametry, electroanalytical, and thermal analysis (DTA, TGA, DMA) instruments. For rate studies on the nanosecond to millisecond time scale, stopped-flow, temperature-jump, pressure-jump, electric field-jump, laser-induced electric birefringence apparatus, and rapid-scan time-resolved spectrometers are available. For information, contact: Zoltan A. Schelly, Department of Chemistry and Biochemistry, Box 19065, University of Texas at Arlington, Arlington, TX 76019-0065, USA. Phone: 817-272-3803. Fax: 817-272-3808. E-mail: schelly@uta.edu; Network: http://www.uta.edu/cos/centers.html.

Center for Composite Materials

The Center for Composite Materials promotes interdisciplinary research in composite materials among faculty, students, postdoctoral fellows, and staff. These materials include polymers, metals, polymeric matrix composites, metal matrix composites, and ceramic composites. Research programs involve multidisciplinary efforts between the Aerospace Engineering, Civil Engineering, Materials Science and Engineering, Mechanical Engineering, Chemistry, Mathematics, and Physics departments and graduate programs. Much of this research involves mechanics, structural modeling, and design as well as the interrelationships between the processing, structure, and properties of structural engineering materials. Available laboratories include shared composite materials laboratories, as well as laboratories within individual research departments or programs. Equipment and facilities used include servohydraulic mechanical testing systems, cabinet x-ray equipment, ultrasonic damage detection, materials fabrication and processing facilities, high temperature autoclaves, thermal analysis (DSC, TGA, TMA, DMA) systems, ultrasonic imaging system, optical and SEM/EDS and STEM/EDS electron microscopes, polymer synthesis and electrochemistry, polymer spectroscopy (NMR, FTIR, EPR, mass) and instrumented impact test facilities. For more information, please contact Wen S. Chan, Room 325G, Engineering Building, 817-272-5638; fax: 817-272-2538; e-mail: chan@mae.uta.edu, at the Mechanical and Aerospace Engineering Department, Box 19023, Arlington, TX 76019.

Center for Criminal Justice Research and Training

The Center for Criminal Justice Research and Training was established in 1977 with the primary mission of providing technical assistance to law enforcement and criminal justice agencies, governmental institutions, and citizens groups concerned with the administration and operation of the criminal justice system.

The center provides assistance when requested in the areas of program evaluation, personnel administration, organizational development, training, staff and program development, and other areas of organizational research. As part of the School of Urban and Public Affairs, the center works cooperatively with other components of the University to develop effective community crime prevention models and to enhance community awareness of needed changes for the solution of crime problems. Interim Director: Robert L. Bing, Room 528, University Hall, 817-272-3318.

Center for Economic Development Research and Service (CEDRAS)

The mission of the Center for Economic Development Research and Service is to provide economic development service to governments, nonprofit organizations and businesses of North Central and Northeast Texas. CEDRAS provides technical assistance, conducts applied research through conferences and publications, and disseminates relevant and timely economic data and information. For information, contact Sherman M. Wyman, Room 509, University Hall, 817-272-3359.

Center for Electron Microscopy

The Center for Electron Microscopy provides facilities for research and training in electron microscopy and related techniques. Course work and individual training are provided for approved undergraduate, graduate, postgraduate students, and faculty who wish to utilize electron microscopy and/or x-ray analysis in their research. The center is housed in a suite of rooms having three electron microscopes: JEOL JEM-1200EX TEMSCAN equipped with a Link AN10000 x-ray and image analysis system; JEOL JSM-35C SEM with a Tracor Northern x-ray and image analysis system; JEOL 300T 5EM with back scatter and x-ray analysis. Three PC-based image analysis systems utilizing JAVA, SIGMA-SCAN PRO, NIH IMAGE, OPTIMAS, IMAGE-PRO PLUS, TOPAS and SABLE are available

for use with both light and electron image applications. The center has darkrooms and preparation and ancillary equipment. Research and training involve faculty, visitors and students from biology, chemistry, geology, physics, psychology, anthropology, materials science and engineering. Director: Howard J. Arnott, Rms. B24 or 241 Life Science Building, 817-272-2413 or 817-272-2427. E-mail: arnott@uta.edu

Center for Electronic Materials, Devices and Systems (CEMDS)

The CEMDS is a National Science Foundation Industry/ University Cooperative Research Center engaged in research in the areas of high-speed electronic devices and circuits. The center is actively involved in developing physical models of electron devices for application to circuits and subsystems. Twelve graduate students, six faculty members, and advanced undergraduate students conduct research in the center. Facilities are available for optical lithography, thin-film deposition, molecular beam epitaxial growth for III-V compound semiconductor devices, on-wafer device measurements, and time and frequency domain microwave and millimeter-wave evaluation (0.1-100 GHz). Graduate assistantships and fellowships may be available for qualified candidates. For information, contact Director, CEMDS, P.O. Box 19016, Arlington, TX 76019-0016, 817-272-3472.

Center for Environmental Design Research (CEDR)

The center was established in 1979 as the consolidation of research activities of the School of Architecture. Its objectives are to develop investigative programs and stimulate research related to architecture, landscape architecture, interior design, and land planning. Areas of concentration include design theory, environmental studies, computer applications, energy conservation, historic preservation, housing, building materials, park planning, and resource management. The faculty associated with the center provide guidance and direction in identifying appropriate governmental agencies, institutions, developers, and builders to facilitate the initiation and execution of research projects. The center assists students pursuing specific theoretical and practical projects and working within a framework for interdisciplinary cooperation. Interested graduate students may serve as research staff and/or receive graduate credit for special projects upon approval of the Graduate Studies Committee and the director of the student's academic program. Director: Pat D. Taylor, 817-272-2801

Center for Environmental Research and Training (CERT)

The Center for Environmental Research and Training is a nationally recognized source for environmental instruction and for research on environmental projects. For nearly a decade, CERT has continued to expand its resource of professional instructors from industry and academia and to enhance the depth and range of its specialized courses. Recently developed courses in air pollution control and permitting, environmental site assessments and audits, and lead abatement have been very popular. Other topics include asbestos abatement, hazardous materials management, and indoor air quality. Director: V.K. Argento, 817-272-3694

Center for Far Eastern Studies

The Center for Far Eastern Studies serves as a forum for research and exchange of ideas and information on issues and situations—political, economic, and cultural—related to the societies and peoples of the Far East. It purports to create, publish, and disseminate materials and to provide an organizational base upon which scholars from within and without the University may carry out their studies on issues and situations related to the Far East. Director: John J. S. Moon, 817-272-2991

Center for Fossil Fuels Chemistry

This Center for Fossil Fuels Chemistry brings together faculty, graduate students, postdoctoral associates, and undergraduate students engaged in fundamental and applied research in the chemistry and utilization of fossil fuels. These include coals, oil shales, oil sands, petroleum crudes and related species. Current projects under investigation include structure elucidation studies of coal and related substances using various reactions and analyses, thermomechanical, thermophysical, and thermochemical changes in fossil fuels on application of heat, study of acoustic, dielectric, and surface properties, and pretreatment of fossil fuels to facilitate processing and use. Research also includes development and evaluation of new catalytic materials for the production of synthetic fuels as well as for the conversion of hazardous organic liquid wastes into useful fuels. Modern, state-of-the-art instrumentation and techniques being used in these studies include gas chromatography/mass spectrometry with laser pyrolysis capability, gas chromatography/Fourier transform infrared spectroscopy, solids and liquids high field nuclear magnetic resonance spectroscopy, thermal, moisture, and elemental analysis equipment, gas, high performance liquid and gel permeation chromatography, and rapid-scanning diode-array ultraviolet/visible spectroscopy. For more information, students may contact Martin Pomerantz in Room 205, Chemistry Research Building, 817-272-3811; E-mail: pomerantz@uta.edu; or Krishnan Rajeshwar, Room 229B, Science Hall, 817-272-3810; E-mail: rajeshwar@uta.edu, both at the Department of Chemistry and Biochemistry, Box 19065, Arlington, TX 76019. Fax: 817-272-3808

Center for Geoarcheological Studies

The Center for Geoarcheological Studies was established as a research center devoted to bringing geological, geophysical, and geochemical techniques to bear on archaeological research problems. The center provides the infrastructure necessary to facilitate studies combining such widely differing disciplines. It is one purpose of the center to identify areas where these disciplines can and should be applied. The center also supports graduate student research oriented toward solving geoarcheological problems. The center's office is located in Room 147, Geoscience. Director: Brooks B. Ellwood, 817-272-2339; ellwood@uta.edu

Center for Greater Southwestern Studies and the History of Cartography

The primary purpose of the Center for Greater Southwestern Studies and the History of Cartography is to encourage interdisciplinary scholarship, research, and teaching that interprets the people, environment, economy, history, and cultures of the Greater Southwest. The Greater Southwest includes the southwestern quarter of the United States and the northern portion of Mexico, a

vast region that has interconnected both countries in times of exploration, conflict, and cooperation. The center is located in the University Library, which houses a nationally recognized Special Collections (including maps, journals, and photographs) pertaining to the region. The faculty and students of the center research such topics as the significance of the Age of Discovery, the exploration and settlement of the New World and its impact on indigenous peoples, comparative frontier experiences, and the relationship between Southwestern cultures and environment and their implications for the future of the Greater Southwest.

The center operates several programs to foster a more complete understanding of the history and cultures of the region among students, scholars, educators, and the general public. Under the guidance of the center director, the center sponsors undergraduate and graduate curricular development; supports the Jenkins and Virginia Garrett Endowed Chair in Southwestern Studies and the History of Cartography and the Sandra Myres Graduate Research Assistant. The center also encourages the research of visiting scholars; conducts outreach programs through summer institutes for college level, elementary and secondary public school teachers; and promotes community involvement through symposia, exhibits, lectures, and public programs. Director: Richard V. Francaviglia, 817-272-3997

Center for Health Services

The mission of this Center is to assist faculty to use a variety of practice models that promote the delivery of community-based, family-focused health care services to people of all ages and in numerous settings. The center is a vehicle through which faculty have the opportunity to demonstrate practice that is fully integrated with education and research. This center provides a unique opportunity to partner with the community, providing cost-effective, acceptable, accessible and holistic health care.

Administration for the Center for Health Services is located in Room 614, Pickard Hall. The mailing address is Box 19407, Arlington, TX, 76019-0407. Director: Dolores Clark, 817-272-2776, e-mail: nsghsvc@uta.edu.

Center for High Energy Physics and Technology

The Center for High Energy Physics and Technology supports U.T. Arlington's participation in leading national and international particle physics experiments by providing the required detector development, detector construction, and computing facilities. The High Energy group participated in the recent discovery of the "top quark" by the D0 experiment at the Fermi National Accelerator Laboratory (Chicago), and is developing detector elements for the upgrade of the D0 detector. For the long term, the group is working on the development and construction of the ATLAS experiment detector at the Large Hadron Collider Facility in Geneva, Switzerland, and on a proton-proton elastic scattering experiment at Brookhaven National Laboratory (Long Island). Center facilities include a high-performance, state-of-the-art computing system, a well equipped detector and electronics development laboratory, and a newly renovated 11,000-square-foot detector construction facility at the Swift Center. Work at the center offers opportunities for research in experimental elementary particle physics ranging from detector design and simulation, software and electronics development, through full high-statistics physics analyses in the effort to understand matter and forces at their most fundamental level. Director: Andrew P. White, Room 241, Science Hall, 817-272-2811

Center for Hispanic/Latin American Studies in Nursing and Health

The Center for Hispanic/Latin American Studies in Nursing and Health is dedicated to fostering understanding between health care professionals and peoples of Hispanic/Latin American origin for the purpose of increasing the quality of health care for these groups. The center is committed to increasing understanding of health and healing through research of individual experience, cultural meanings and the structure of institutions as important variables influencing health outcomes. The center is also dedicated to the provision of educational programs and services which will assist health care providers to gain the necessary knowledge and skills to deliver increasingly sensitive and competent care. The center promotes interdisciplinary and interuniversity collaboration as a strategy for development of resources to solve or deal with bicultural issues facing health care professionals. Contact: Mary Lou Bond, 817-272-2776

Center for Information Technologies Management

Rapidly developing information technologies are presenting information systems executives with the opportunity to provide timely, high-quality information to support decision-making and innovation in all areas of managing an enterprise. Major changes in the business environment, including globalization, corporate mergers, flexible manufacturing, cost paring and downsizing, are increasing the importance of information technologies as organizations struggle to compete and survive.

Advances in computer hardware, software, and communications are driving developments in computer applications across the board, including information processing, office automation, data base management, data communications, artificial intelligence, and systems development methodologies. Managers have to carefully gauge these trends, evaluate the implications for their own environment, and manage the harnessing of the appropriate information technologies.

The Center of Information Technologies Management (CITM) is dedicated to helping managers achieve these objectives. Sponsors and clients of the center benefit from research in a wide variety of important fields, working papers, monographs, workshops, and symposia. Training and consultation for individual clients can be provided. The center, in conjunction with the Disaster Recovery Institute, sponsors the courses and examination leading to designation as a Certified Disaster Recovery Planner. The center has also secured several research grants from government and industry. Director: Sumit Sircar, Room 537, Business Building, 817-272-3569

Center for Medicinal Chemical Research

The purpose of the Center for Medicinal Chemical Research is to develop new drugs of value to the health professional. The current interests of the center include (a) antimicrobial/antiviral agents; (b) prophylactic agents for chemical irritants; (c) substances to enhance protection from exposure to various forms of radiation; (d) antioxidants. In addition to research in these areas, the center enhances educational opportunities for individuals interested in the medicine-chemistry interface. The center includes facilities for synthesis, chemical and biochemical analyses, and microbiological evaluation. For information, contact A.L. Ternay Jr., Room 201, Chemistry Research Building, 817-272-3818, at the Department of Chemistry and Biochemistry, Box 19065, Arlington, TX 76019.

Center for Mexican American Studies

The Center was established in 1993 and is now part of the School of Urban and Public Affairs. Its objectives are to develop faculty and student research programs on the Mexican American people. The center will promote multidisciplinary curriculum offerings; report on critical issues affecting the ethnic group; offer occasional conferences, symposia, and institutes; encourage research on the ethnic community; and recruit students to study the Mexican American people. The center will gather archival material and publish findings. Consulting Director: Neil Foley, 501 Carlisle Hall, 817-272-2933.

Center for Nursing Research

The Center for Nursing Research, established in 1987, facilitates research related to extending the scientific base for nursing practice. Studies related to health services research, nursing administration, and nursing education are supported. Consultation services in grant writing, research methodology, statistical analysis, computer programming and data management are provided to faculty members, nursing students, and collaboratively to health care agencies and/or members of their nursing staff. Students employed in the center are available for literature retrieval related to research, assistance with word processing, data entry and data analysis. Hardware and software are available for these activities. The center has access to equipment and personnel in the School of Nursing Learning Resources Center, including artists and photographers, and equipment which allows rapid development of professional quality slides, graphs, and tables for research publications and presentations. Current research foci include Hispanic health care, nursing practice outcomes and health promotion/illness prevention. Graduate assistantships are available for qualified candidates. For information, contact Carolyn L. Cason, Director, Box 19407, Arlington, TX 76019, 817-272-2776.

Center for Parasitology

The Center for Parasitology was established in 1983 to promote and develop applied and basic research in parasitology. Research emphasis is on immunoparasitology with special focus on immunoevasive strategies employed by parasites. The center is a focal point for collaborative and consultative research involving several other institutions in the area and numerous biomedical companies nationwide. The center supports an active training program for graduate and undergraduate students in parasitology, utilizing over 30 different species of parasites of medical and veterinary importance as research material. Funding for research at the center comes primarily from the biomedical industry. Director: George L. Stewart, Room 331, Life Science, 817-272-2423

Center for Post-Soviet and East European Studies

The Center for Post-Soviet and East European Studies was established in 1968 to coordinate all activities involving U.T. Arlington with that portion of Eastern Europe formerly designated as "Other Socialist Countries" as well as with the former USSR, including the three Baltic Republics and the 12 Commonwealth of Independent States. The center performs five functions: (1) **Research**—academic, political, linguistic, and economic activities; (2) **Interdisciplinary Studies**—classes have been and are constantly being developed integrating several disciplines such as history, political science, and Russian; or Russian and English; (3) **Translations**—English to Russian, Russian to English, or other translations at a reasonable fee are prepared, edited, and computerized at the request of commercial or academic clients; (4) **Exchange Programs**—Exchanges have been effected between U.T. Arlington and countries such as Russia, the former Yugoslavia, Romania, and Ukraine. In addition, the Director of the center serves as the official International Research Exchange (IREX) representative. Numerous former republics of the former USSR annually participate in this IREX program; (5) **Study Abroad**—Since 1970 annual programs have been developed by the center. At present, travel/study programs are conducted during the first half of each summer to the former Soviet Union and during the last half of the summer to the Peoples Republic of China. Director: Charles McDowell, 221 Hammond, 817- 272-2388.

Center for Psychopharmacology Education and Research

The Center for Psychopharmacology Education and Research (CPER) is committed to advancing the knowledge of psychopharmacology and related neurosciences. The center promotes the acquisition of this knowledge through education of Advanced Practice Registered Nurses (APRN's) and other health care professionals.

The center's objectives are: to provide education related to the use of psychopharmacologic agents in the treatment of persons with neurobiologic disorders/mental illness; to provide education related to research methods and findings in psychopharmacology and related neurosciences for APRN's; and to promote psychopharmacological research utilization and activities of APRN's. The center seeks collaborative relationships with educational, research and professional organizations. For more information, contact Director: Elizabeth Poster, UTA Box 19407, University of Texas at Arlington, Arlington, TX 76019-0407, Phone: 817-272-2776, Fax: 817-272-5006.

Center for Research, Evaluation and Technology (CRET)

The Center for Research, Evaluation and Technology, a component of the School of Social Work, was established to conduct applied social research to improve the design, delivery, management, and evaluation of human services. Its goals are to further understanding of human behavior and social conditions, to develop methods for analyzing and evaluating human services programs and interventions, and to provide technical assistance to human services providers. The CRET provides a focus for social welfare research by identifying research issues and identifying and facilitating faculty and graduate students in the conduct of social welfare research. For information, contact center Director Charles H. Mindel, 817-272-3910.

Center for Research and Fieldwork in Anthropology (CRFA)

The Center for Research and Fieldwork in Anthropology was founded in the spring of 1994. Its purpose is to provide opportunities for faculty research projects as well as student participation in ongoing field projects led by UTA anthropology faculty. These projects include field studies in archaeology and cultural anthropology. CRFA field studies also have benefited from cross-disciplinary links with other departments such as geology and other centers such as the Center for Greater Southwestern Studies and the History of Cartography.

CRFA facilities include a newly developed archaeology laboratory where archaeological project artifacts are analyzed, curated and available for study. Director: Jeffery Hanson, 417 University Hall, 817-272-3800

Center for Research on Organizational and Managerial Excellence

The Center for Research on Organizational and Managerial Excellence (CROME) is within the Department of Management in the College of Business Administration. The center's primary purposes are to promote faculty and graduate student basic and applied research addressing the important and complex challenges faced by managers; to promote greater interaction between the University and industry in seeking solutions to these managerial problems; and to gain support from industry, government, and/or private foundations for critical managerial research. The intent of the center is to build stronger ties with external constituents, support faculty research and graduate programs, provide a community service, and add to the positive external image of the College of Business Administration and the University. Research is conducted in all areas of management, including corporate strategy, human resource management, international management, labor relations, organizational behavior, organization theory, and production operations management. Examples of current research through the center are establishment of methods for improving employee motivation; means of effectively managing diversified corporations; means of measuring corporate performance for strategy development and implementation; development of effective leadership approaches; employee participation in the management of a firm; and managerial prevention of stress. Director: Mary E. McLaughlin, 201 Business Building, 817-272-3166

Collection of Vertebrates

The Collection of Vertebrates was established by the Department of Biology in 1956 primarily as a teaching resource to support classroom and field instruction. Since then it has grown into an internationally recognized research facility and serves the needs of faculty and students, as well as national and international scholars. The collection is particularly strong in its herpetological holdings, which include some of the world's largest collections from Texas and the countries of Cameroon, Colombia, Guatemala, and Mexico. Various ancillary materials are available, including voice recordings for many species of tropical frogs, publications, color transparencies, field notebooks and catalogues, and maps. The collection houses about 60,000 amphibians and 50,000 reptiles, which include 50 holotype specimens.

Qualified investigators conducting research on vertebrates are welcome to use the collection's facilities and materials which are located in the Life Sciences Building. For information, contact Jonathan A. Campbell, Curator, 337 Life Science, 817-272-2406.

Community Service Clinic

The Community Service Clinic, established in 1970, is a research, teaching, and service component of the School of Social Work. It serves as a field placement agency for graduate social work students enrolled in the University. Priorities are research and teaching. Counseling services are provided to individuals, couples, families, and groups. In addition to traditional social work treatment services, ongoing research has as its special emphasis the treatment for family violence. Director: Norman H. Cobb, 817-272-2165, and Jacqueline Corcoran, 817-272-5480.

Community Services Development Center

The mission of the Community Services Development Center is twofold: quality education and community improvement. The center conducts research and evaluations, designs innovative programs, and assists in the implementation of effective means to promote self-determination and self-sufficiency. The center encourages the development of necessary services for people who are not able to be self-sufficient. The Community Services Development Center provides practical experiences for interns in Social Work and related fields. The center teaches students to apply theory to practice in order to prevent problems and enhance the effectiveness and efficiency of organizations, communities, and social systems in creating environments conducive to the well-being of all people. Director: Francine Pratt, 817-272-2084

Construction Research Center

The Construction Research Center is engaged in research and educational activities that support the construction industry. The research programs generally include the departments or colleges of Civil and Environmental Engineering, Architecture, Mechanical Engineering, Industrial Engineering, Geology, Economics, and Business Administration. The specified areas of study range from light foundations to the econometrics of the construction industry. Seminars, special courses, and special programs are held for their educational values and for the purposes of disseminating research.

The center is supported by the Construction Research Advisory Committee, which is composed of general contractors, home builders, financial institutions, building material manufacturers and suppliers. Director: John H. Matthys, Room 439, Nedderman Hall, 817-272-3701

CRCA: The Gallery at UTA

CRCA: The Gallery at UTA is devoted to the advanced study of contemporary art and seeks to facilitate research by contemporary artists. Basic to CRCA's philosophy are the ideas that artistic practice is a form of research which is manifested in the artwork, and that parallel to the artwork is the dialogue that generates the work, and is generated by, and around, the work. Activities include exhibitions, lectures and publications. For information, contact the curator, Room 335, Fine Arts Building, Box 19089, 817-272-2891 or 272-3143.

Earth Resource and Environment Center

The Earth Resource and Environment Center was established in 1992 to provide research, development, and technical service to business and government for problems related to the geological environment and to the recovery and use of natural resources. The center consists of 16 faculty and research associates who have had extensive experience in environmental issues and resource recovery. It also provides opportunities for geoscience students interested in working on these problems. The center is located in the Geoscience Building. For information, contact John Wickham, Director, 817-272-2987.

Energy Systems Research Center (ESRC)

The Energy Systems Research Center sponsors research concerning electrical power generation, transmission, distribution, and storage. The center's research is pertinent to the utility industry and is readily applicable to the daily concerns of all practicing engineers. Established in 1968, the ESRC is the largest center of its type and is recognized as one of the most important research centers of its kind in the United States. The ESRC offers a three-phase program of study to serve undergraduate, graduate, and continuing education students. On the undergraduate level, six new power courses have been devised and added to the electrical engineering curriculum. The well-established graduate program supports thirty-five full-time students and ten full-time staff members. The ESRC also supports a relatively large postdoctoral program that requires at least some industrial experience for candidacy. Postdoctoral fellows may assist ESRC students in thesis or dissertation and in graduate seminars; fellows may be asked to perform limited teaching on the graduate level. The ESRC also accepts international exchange scholars from programs such as the Fulbright and IREX. Each year, researchers from different countries join the ESRC to aid in the research effort and to share their knowledge and experience in graduate seminar discussions. These researchers also contribute to the ESRC's special non-degree graduate programs as well as the in-plant and on-campus continuing education programs for practicing power system engineers.

ESRC has completed the construction of a modern power-system laboratory to demonstrate the concept of total automation of the power industry in the future. This laboratory is being used for the training of system operators for power industry and cogeneration companies. This lab is also being used for research on transient, dynamic, and voltage stability of electrical power systems. One of the major efforts of ESRC is to develop the methodology for preventing power system blackouts. This is one of the very few laboratories in the world capable of demanding a real-time behavior of an electrical power system network. ESRC also has an additional facility for digital simulation of a power system particularly designed for operator training. Graduate assistantships, fellowships, and postdoctoral fellowships are available for qualified candidates. Director: Mo-Shing Chen, Room 100B, Engineering Annex Bldg., 817-272-2268

English Language Institute (ELI)

The English Language Institute is a center for instruction of English for speakers of other languages (ESOL) and is a part of the Linguistics program. The purpose of the ELI is to enhance this program in the areas of pedagogy and research for English for speakers of other languages. To this end, the ELI offers an intensive English program to international students desiring to prepare themselves for university study. The intensive English program also serves as an ESOL research and teaching laboratory for faculty and graduate students. As an extension of its concern with ESOL instruction, the English Language Institute provides developmental instruction in ESOL to international students enrolled at U.T. Arlington. Director: Stephen Lewis, Room 405, Hammond Hall, 817-272-2730

Environmental Institute for Technology Transfer (EITT)

The Environmental Institute for Technology Transfer supports environmental research, education, and training in all colleges at U.T. Arlington. Funding from federal, state, and industry sources was approximately $300,000 in 1997. Specific objectives include: (1) provide business and industry with scientific and technical knowledge to comply with environmental regulations; (2) provide industry with a forum to communicate environmental concerns to the regulatory agencies; (3) facilitate University research efforts; (4) accelerate the transfer of environmental technology from invention to application; (5) inform the environmental community of advances in waste reduction, recycling, and control of technology. EITT has an air pollution training center located on the main campus. The center provides professional training for air pollution practitioners. Graduate studies may be pursued in hazardous materials, air pollution, and environmental planning through various graduate departments and the Interdisciplinary Studies Program. See "Opportunities for Graduate Studies in Environmental Science." Research is supported both by industry and government, providing opportunities for on-site experiences at cooperating institutions. For information, contact Gerald Nehman, Director, Box 19050, Arlington, TX 76019-0050.

Fort Worth Federal Records Center

The Fort Worth Federal Records Center, a branch of the National Archives, is a valuable resource center for faculty and students in the Department of History. It has voluminous primary sources concerning the Bureau of Indian Affairs, government agencies, and Federal Courts. The center also has a comprehensive microfilm collection of government records located at the National Archives in Washington, D.C. For other research centers valuable to history students, see the section on the Library, especially the descriptions of the Jenkins Garrett Collection, the Regional Historical Resource Depository, the Division of Archives and Manuscripts, the Minority Cultures Center, and the Center for Greater Southwestern Studies and the History of Cartography. For information, contact Kenneth R. Philp, Room 202, University Hall, 817-272-2861.

Geotechnical Laboratory Testing Facilities

The University of Texas at Arlington Geotechnical Laboratory facilities include three laboratories, covering a total area of 5,230 square feet. The laboratories are equipped with six consolidation, two triaxial, three direct shear, three triaxial hydraulic conductivity and two high pressure hydraulic conductivity test devices. These devices can be used to conduct permeability tests, shear strength tests, and standard and modified consolidation tests on both natural and stabilized soil samples. In addition, the University has equipment that can be used for conducting expansive soil characterization and mineral identification testing. Most of the tests are automated with data acquisition modules and software. All of the equipment is used in research studies on various geotechnical related topics, including expansive soil characterization, soil stabilization and geosynthetic reinforced soils. For more information, contact Anand J. Puppala, Box 19308, Arlington, TX 76019, 817-272-5821.

Human Performance Institute (HPI)

The Human Performance Institute is dedicated to using multidisciplinary scientific bases for human performance measurement, understanding, and enhancement. The institute was formed to integrate several aspects of ongoing research in human performance measurement and to launch a major effort in response to both clearly identified and emerging needs. HPI developed as an outgrowth of the Center for Advanced Rehabilitation Engineering which was established in 1983. The mission of the institute is to define a systematic approach to the measurement and understanding of intrinsic parameters and laws which govern the ability of individuals to perform tasks in daily life, as well as to provide education, promote and conduct research, and serve as a resource in this area. Basic and applied research addresses populations ranging from the severely handicapped through normal individuals and super athletes, reflecting a view of performance as a common theme to all human endeavors. Systems performance theory concepts being developed by investigators are being applied to the engineering design process. Human performance engineering methods are being developed to allow optimum design of the devices and tools people use. These tools may include a wide range of items such as a wheelchair, high performance military aircraft, robot, computer system, or intelligent software.

The HPI includes a multidisciplinary team locally and at collaborating institutions of engineering, life science, and clinical investigators. Local affiliations exist with Texas Woman's University School of Physical Therapy and the University of North Texas School of Music. Graduate students pursuing study in engineering disciplines carry out thesis and dissertation research under faculty supervision. Their efforts are supported by laboratory facilities which include instrumentation and measurement development, a human performance "proving grounds," signal processing and data management, and artificial intelligence/expert systems. For further information, contact G. Kondraske, Director, 817-272-2335.

International Linguistics Center

The International Linguistics Center conducts linguistic training and research in cooperation with the linguistics faculty. It is administered by the Summer Institute of Linguistics, Inc. and located near Arlington, one mile west of Duncanville on Camp Wisdom Road. Its purpose is to provide facilities for linguistic training and research. Investigations are conducted pertaining to the world's languages for use by translators, linguists, missionaries, anthropologists, literacy workers, bilingual educators, government officials, and others. Director: David A. Ross, 972-708-7340.

Inter-University Consortium for Political and Social Research (ICPSR)

The Inter-University Consortium for Political and Social Research is a data collection and dissemination service sponsored by the University of Michigan and supported by universities located in countries throughout the world. The University's membership in the consortium provides faculty and students free access to the largest accumulation of computer-processed and retrievable data available anywhere in the world. A brief sample of the topics covered include census enumerations, urban studies, economic behavior, education, health care, mass political behavior, social institutions, and criminal justice statistics. The consortium also makes available computer support services, including the development of and instruction in the use of computer programs. For more information visit ICPSR's World Wide Web site at http://www.icpsr.umich.edu or contact Michael K. Moore, Room 452, University Hall, 817-272-3996, mmoore@uta.edu.

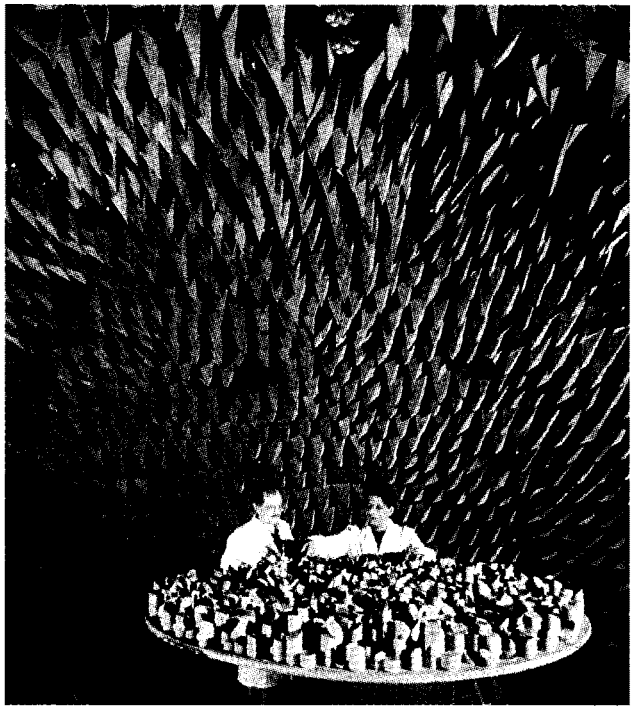
Judith Granger Birmingham Center for Child Welfare

The Judith Granger Birmingham Center for Child Welfare serves as a resource center to improve the conditions of vulnerable children through the advancement and dissemination of knowledge. National, state and regional child welfare reform has been advocated for through the center since its inception in 1994. Education and dissemination efforts of the center address the basic rights of children to be nurtured and protected by their families with the support of their communities.

Objectives of the center include helping equip child welfare practitioners, supervisors and administrators with current, detailed and scientific knowledge about effective practice models, ways to support the adequate development of children and families, and strategies to preserve families. In addition, the center supports the generation of knowledge that addresses the gaps of information areas in child welfare practice. The center communicates its knowledge and the improvement of services to children and families through training and the professionalization in child welfare practice. The center is housed in the School of Social Work.

NASA/U.T. Arlington Center for Hypersonic Research

The NASA/U.T. Arlington Center for Hypersonic Research is one of three centers established at universities in the United States by the National Aeronautics and Space Administration to provide opportunities for graduate-level research and education programs in hypersonic aeronautics. The research work conducted at the center emphasizes high-temperature aspects of hypersonic aerodynamics, propulsion, structures, and materials. Excellent computational and experimental research facilities are available to support the activities of the center. For information, contact Donald R. Wilson or Dale A. Anderson, Box 19018, Arlington, TX 76019, 817-272-2603.



Ryan/Reilly Center for Urban Land Utilization

The center was established in 1983 with the aid of a grant from John Ryan and Michael Reilly. The major purpose of the center is to enhance and support the quality of real estate education in the Dallas/ Fort Worth Metroplex. The center develops and markets real estate and financial seminars for students, faculty, industry members, and the community at large. The center assists in the development of real estate courses emphasizing the operational skills involved in property management, asset management, commercial development, construction management and commercial leasing. Opportunities for interaction (such as research and consulting) between the faculty of the College of Business Administration and financial and real estate groups are encouraged. The center provides graduate placement services to students seeking jobs with real estate and financial firms. Director: Fred A. Forgey, Room 106, Business Building, 817-272-2516, FAX: 817-272-2252

Software Engineering Center for Telecommunications

The Software Engineering Center for Telecommunications was established in 1988 to develop advanced research programs at U.T. Arlington in the formulation and investigation of software engineering concepts. It is also to facilitate the transition of software technology to industry and government. Emphasis is placed on carrying fundamental ideas in software engineering from conceptualization through exploration and realization of prototype software engineering environments, and experimental applications in conjunction with industry and government. Research focus is in the area of telecommunication software systems.

Simply stated, university researchers are developing ideas, methods, tools, and architectures to advance the state-of-the-art in the software engineering area. Industry has challenging problems that can provide the basis for student and faculty research. These advances in computer science need to be transitioned into the real-world problems faced by industry. The Software Engineering Center for Telecommunications is working to bring these two arenas together.

The center is within the Computer Science and Engineering Department. Research assistantships are available to qualified candidates. Director: Pei Hsia, Box 19015, Arlington, TX 76019, 817-272-3785

School of Urban and Public Affairs

Urban Training and Service

An objective of the Training and Service Programs is to draw on the knowledge and skill of school faculty and staff to provide guidance and assistance to Texas public agencies and other community groups striving to deal with changing political, economic and social conditions. The faculty provides a variety of services directly to agencies or other groups requesting assistance and facilitates the work of other school faculty and staff members while conducting training or delivering services. For information, contact David Tees, Room 501B, University Hall, 817-272-3304.

Structural Research Laboratory

The Structural Research Laboratory is engaged in research in the areas of structural testing and experimental mechanics. The laboratory is actively involved in full scale tests of concrete, masonry, steel and composite structural components. Graduate students and advanced undergraduate students conduct research in the laboratory. Available facilities include 200-ton hydraulic testing systems, 30-feet high reaction frame, 3000 square feet testing floor, 40 different sizes portable hydraulic rams, two forklifts, and computerized data acquisition systems. The laboratory also operates two environmental control rooms for use in creep investigation of high strength concrete and structural composites. For information, contact Robert L. Yuan, Box 19308, Arlington, TX 76019, 272-2550.

Wave Scattering Research Center

This center was established in 1984 to conduct theoretical, experimental, and computer simulation research in electromagnetic wave scattering and attenuation from area extensive scenes such as soil, snow, ice, and forested areas, sea surfaces, etc. and artificial canopy models and from objects such as antennas, ships, etc. In addition, the center also conducts research in radar systems, and microwave imaging of man-made terrains and buried objects. The center has an anechoic chamber to conduct controlled bistatic and monostatic measurements of man-made targets. A unique feature of the chamber is that it incorporates a hemispherical structure with 25 receiving horns at the target end of the chamber to allow bistatic measurements to be acquired without having to change or realign any receiving or transmitting antenna. The transceiver includes a HP 8510 network analyzer for recovery of calibrated amplitude and phase information. The source is a phase locked frequency synthesizer operating from two to 18 GHz. It also has a bistatic optical scattering system operating at wavelengths from 400 nm to 1700 nm, a long-path UV spectrometer, a Fourier transform infrared spectrometer (FT-IR), and a millimeter wave spectrometer to monitor air pollution. For information, contact Adrian K. Fung, 252 Nedderman Hall, Box 19016, Arlington, TX 76019, 817-272-3422.

Women and Minorities Research and Resource Center

The Women and Minorities Research and Resource Center was formed in 1989 with two primary purposes. First, the center supports, encourages and disseminates scholarship about women and minorities. This is accomplished primarily through the center's sponsorship of Women's History Month and an annual faculty lecture series. Second, the center provides service to the community on issues related to women and minorities. This is accomplished by maintaining archives of materials on women and minorities, providing speakers for community groups and sponsoring public lectures.

The center also sponsors career workshops, conferences on issues related to women and/or racial and ethnic minorities, and consulting services to community groups. Finally, the center functions as a grant-seeking office and as a resource for individuals and departments seeking grants in areas related to women and/or minorities. The center is located in Room 223 University Hall. Director: Beth Anne Shelton, Women and Minorities Research and Resource Center, Box 19599, Arlington, TX 76019, 817-272-3131, Fax 817-272-3117.

Publications

Rudolf Hermann Memorial Colloquia

The Hermann lecture series, funded by a generous bequest from UTA Department of English patron Rudolf Hermann, is an annual event in which invited lecturers join local speakers to explore issues of current interest in the discipline of English studies and in the humanities generally. UTA and other students, along with members of the Metroplex community, are cordially invited to attend. For more information, contact Philip Cohen, Chair, Department of English, 817-272-2692.

Stochastic Analysis and Applications

This international journal, *Stochastic Analysis and Applications* (Marcel Dekker), affords students and faculty the opportunity to play a role in an important area of mathematical sciences. Editor: G.S. Ladde, 817-272-3261

Summer Institute of Linguistics Publications in Linguistics

The Summer Institute of Linguistics Publications in Linguistics is a joint University of Texas at Arlington-Summer Institute of Linguistics monograph series published approximately four times a year. The series was begun in 1958 primarily as a publishing outlet for linguistic field workers who collect data concerning heretofore unwritten or undescribed languages and has been expanded to include a wide range of content within the field of descriptive linguistics. Monographs range from descriptive studies of the linguistic structures of little known languages to occasional comparative studies of some of the major languages. Editor: Mildred L. Larson, ILC, (214) 709-2400

Terrae Incognitae

Terrae Incognitae is the journal of the Society for the History of Discoveries, published annually out of the Department of History. This journal began publication in 1969, and includes material relating to intercultural contact, mainly between European and other peoples. It also contains an annual review of the literature, and a section of book reviews. Editor: David Buisseret, University Hall 331, 817-272-2898

Walter Prescott Webb Memorial Lectures

The lectures, inaugurated in 1965, are delivered each spring in honor of Texas' most distinguished historian, Walter Prescott Webb. Now considered among the most prestigious history lecture series in the country, the Webb Memorial Lectures give graduate students and others the opportunity to meet and to hear some of the nation's outstanding historians. The four Webb lectures—along with the winning essay of the Webb-Smith Essay Competition—are then published for the History Department by Texas A&M University Press. Chair: Steven Reinhardt, University Hall 355, 817-272-5182

Short Courses, Conferences and Special Programs

Graduate Studies in Environmental Science and Environmental Engineering

Students are provided opportunities to pursue graduate degrees in environmental science and engineering and in civil engineering with an emphasis in environmental engineering. Graduate courses and research programs provide educational opportunities that focus on resolving a broad array of current and future environmental problems.

Information on graduate opportunities between the College of Science and College of Engineering can be obtained by calling the advising offices in the Department of Geology, 817-272-2987, or the Department of Civil and Environmental Engineering, 817-272-2201. Opportunities for studies in geographical information systems and environmental policy and planning are offered through the School of Urban and Public Affairs, 817-272-3071. Programs of work consisting of courses across many disciplines can be developed through the Program in Interdisciplinary Studies, 817-272-2681.

Research opportunities and continuing professional education courses (non-credit) are offered by several centers. These include the Center for Biological Macrofouling Research, Center for Environmental Research and Training, Center for Geoenvironmental and Geoarcheological Studies, and the Environmental Institute for Technology Transfer. Information on these centers can be found under Research Centers, Divisions and Special Facilities in this catalog.

Power Systems Short Courses

Because of the deregulation of the electrical power industry, the Energy Systems Research Center (ESRC) has designed three courses for GenCo, TransCo, and DistCo power systems. The short course in GenCo will emphasize load forecasting and the application of neural networks to power marketing. The TransCo course will focus emphasis on power system reliability. The subject of power system voltage stability and reactive power planning will be major topics. The DistCo course will emphasize future distribution systems which will offer flexibility in the choices for the customer. These three courses are offered anytime during the year upon request.

The "Modeling and Analysis of Modern Power Systems" short course has been presented annually by the Energy Systems Research Center (ESRC) for more than 31 years. It is the longest-running course of its kind in the power field and has attracted engineers from as many as 50 states, 42 countries, and 352 companies. It is an intensive two-week course which is continually updated to reflect the most advanced concepts and practices in planning, design, and operation of electrical power systems.

The ESRC offers the following continuing education courses for the power industry: 1. Practical Training in Power System Load Flow Analysis; 2. Practical Training in Power System Operations; 3. Practical Training in Power System Dynamics; 4. Practical Training in Short Circuit Analysis and Protection of an Electrical Power System; 5. Distribution Power System Engineering; 6. Automatic Mapping and Facilities Management; 7. Industrial Power Systems; 8. Power System Reliability; 9. Introduction to Power Electronics; 10. Computer Control of AC & DC Drives; 11. Eleven Operator Training Courses (Fundamental Theory of SCADA System, EMS and Application Software, Reactive Power and Voltage Instability, Protective Relaying, Transient Stability, Dynamic Stability, and Voltage Stability, Normal Operations, Abnormal Operations, Interconnected System Operation, Modern Power System Control Aids, Programmable Logic Controller (PLC) for Engineers, and Field Trips Related to Operator Training); 12. Field Trips; 13. Power System Engineering; 14. Fundamentals of Power Engineering (Designed for Technicians); 15. Fundamentals of Power Systems (Designed for Technicians); 16. Computers, Electronics and Data Communications (Designed for Technicians); 17. Power System Design; 18. Power System Protection; 19. Introduction to Electrical Power Systems and Power System Operation (Designed for Lawyers). Some of these courses will involve hands-on activities or demonstration in the physical simulation laboratory. All of these courses can be offered anytime during the year upon request.

Dr. Mo-Shing Chen, Professor of Electrical Engineering and Director of the Energy Systems Research Center, is responsible for the courses and is aided by members of the Electrical Engineering Department and the Energy Systems Research Center staff. Director: Mo-Shing Chen, Room 100B, Engineering Annex Bldg., 817-272-2268

Use of Campus Facilities

The property, buildings or facilities owned or controlled by The University of Texas at Arlington are not open for assembly, speech or other activities as are the public streets, sidewalks and parks. No person, organization, group, association or corporation may use property, buildings or facilities owned or controlled by U.T. Arlington for any purpose other than in the course of the regular programs or activities related to the University's role and mission unless authorized by the **Rules and Regulations of the Board of Regents of The University of Texas System**. Any authorized use must be conducted in compliance with the provisions of the **Regents' Rules and Regulations**, the approved rules and regulations of U.T. Arlington, and applicable federal, state and local laws and regulations.

Advanced Degrees and Requirements

The University of Texas at Arlington offers the following graduate degrees and certificates in the areas of study and through the departments and programs indicated.

Departments/Programs	Areas of Study and Degrees/Certificates
Accounting	Accounting, *M.S.*
	Business Administration, *Ph.D.*
	Professional Accounting, *M.P.A.*
	Taxation, *M.S.*
Aerospace Engineering	Aerospace Engineering, *M.S., M.ENGR., Ph.D.*
Anthropology	Anthropology, *M.A.*
Architecture	Architecture, *M.ARCH.*
	Landscape Architecture, *M.L.A.*
Biology	Biology, *M.S.*
	Quantitative Biology, *Ph.D.*
	Mathematical Sciences, *Ph.D.*
Biomedical Engineering	Biomedical Engineering, *M.S., Ph.D.*
Business Administration	Business Administration, *M.B.A., Ph.D.*
Chemistry	Chemistry, *M.S.*
	Applied Chemistry, *Ph.D.*
	Mathematical Sciences, *Ph.D.*
City and Regional Planning	City and Regional Planning, *M.C.R.P.*
Civil and Environmental Engineering	Civil Engineering, *M.S., M.ENGR., Ph.D.*
Computer Science and Engineering	Computer Science, *M.S., M.C.S., Ph.D.*
	Computer Science and Engineering, *M.S., M.ENGR., Ph.D.*
	Mathematical Sciences, *Ph.D.*
	Software Engineering, *M.SW.ENGR.*
Criminology and Criminal Justice	Criminology and Criminal Justice, *M.A.*
Education	Teaching, *M.E.T.*
Economics	Economics, *M.A.*
Electrical Engineering	Electrical Engineering, *M.S., M.ENGR., Ph.D.*
English	English, *M.A., Ph.D.**
	Humanities, *M.A., M.A.T.*
Environmental Science and Engineering	Environmental Science and Engineering, *M.S., Ph.D.*
Finance and Real Estate	Business Administration, *M.B.A., Ph.D.*
	Real Estate, *M.S.*
Foreign Languages	French, German, Spanish, *M.A.*
	Humanities, *M.A., M.A.T.*
Geology	Geology, *M.S.*
	Mathematical Sciences, *Ph.D.*
History	History, *M.A., Ph.D.**
	Humanities, *M.A., M.A.T.*
	Archival Administration, *Certificate of Archival Administration*
Humanities	Humanities, *M.A., M.A.T.*
Industrial Engineering	Industrial Engineering, *M.S., M.ENGR., Ph.D.*
Information Systems and Management Sciences	Business Administration, *M.B.A., Ph.D.*
	Information Systems, *M.S.*
	Mathematical Sciences, *Ph.D.*
Interdisciplinary Studies	Interdisciplinary Studies, *M.A., M.S.*
Landscape Architecture	Landscape Architecture, *M.L.A.*
Linguistics	Linguistics, *M.A., Ph.D.**
	Humanities, *M.A., M.A.T.*
	Teaching English to Speakers of Other Languages, *Certificate in TESOL*
Management	Business Administration, *M.B.A., Ph.D.*
	Personnel and Human Resource Management, *M.S.*
Management of Technology	Management of Technology, *M.S.*
Marketing	Business Administration, *M.B.A., Ph.D.*
	Marketing Research, *M.S.*
Materials Science and Engineering	Materials Science and Engineering, *M.S., M.ENGR., Ph.D.*
Mathematics	Mathematics, *M.S.*
	Mathematical Sciences, *Ph.D.*
Mathematical Sciences	Mathematics, Applied Mathematics, *Ph.D.*
Mechanical Engineering	Mechanical Engineering, *M.S., M.ENGR., Ph.D.*
Nursing	Nursing, *M.S.N.*
Physics	Physics, *M.S.*
	Physics and Applied Physics, *Ph.D.*
	Mathematical Sciences, *Ph.D.*
Political Science	Political Science, *M.A.*
	Humanities, *M.A., M.A.T.*
Psychology	Psychology, *M.S.*
	General Experimental Psychology, *Ph.D.*
	Mathematical Sciences, *Ph.D.*
Public Administration	Public Administration, *M.P.A.*
Real Estate	Real Estate, *M.S.*
Social Work	Social Work, *M.S.S.W., Ph.D.*
Sociology	Sociology, *M.A.*
	Humanities, *R5A., M.A.T.*
Urban and Public Affairs	Urban Affairs, *M.A.*
	City and Regional Planning, *M.C.R.P.*
	Public and Urban Administration, *Ph.D.*

* Doctoral programs in English (literature and rhetoric/composition), history and linguistics are pending approval. If approved, these programs will become effective for fall 1998. Contact the appropriate Graduate Advisor for information.

Requirements for the Master's Degree

The following minimum requirements apply to all master's degrees including the MA, MS, MArch, MAT, MBA, MCRP, MCS, MEngr, MSWEngr, MET, MLA, MPA (Accounting), MPA (Public Administration), MSN and MSSW offered by The University of Texas at Arlington. Additional requirements may be imposed for specialized or professional degree programs, or by individual departments or interdepartmental or intercampus graduate studies committees. These requirements are included in descriptions of individual degree programs.

Departmental, Program and College Program Manuals for Students

Many departments and programs issue program manuals, procedures and policy manuals, graduate student handbooks, and other informational publications for students and faculty in graduate programs. These publications may provide detailed and useful information; however, they are not statements of official policy of The University of Texas at Arlington nor of The University of Texas System. In all matters, the **Rules and Regulations of the Board of Regents of The University of Texas System**, the *Handbook of Operating Procedures* of The University of Texas at Arlington, and the Graduate Catalog of The University of Texas at Arlington shall supersede departmental, program, or college publications.

Graduate Program Degree Requirements and Academic Performance Standards for Master's Degrees

Degree requirements and academic performance standards given in this section are the minimum required by Graduate School and University policy. Satisfying these general requirements and standards, however, does not imply that all degree and program requirements have been met. Many programs set special course requirements and may require higher grade-point averages or other academic standards than those given in this section. Such program requirements and standards are included in individual program descriptions in this catalog and in departmental and college program manuals or policy statements. These special requirements shall not be considered in conflict with this catalog and shall have the same force as this catalog.

Undergraduate Preparation

Minimum undergraduate preparation acceptable for graduate concentration in most areas is 12 semester hours of advanced undergraduate work in that area; however, this requirement varies widely, and individual department and program descriptions should be consulted for specific requirements. The appropriate Committee on Graduate Studies may administer an oral, written, or both oral and written examinations to an applicant to assess undergraduate preparation for graduate work. The committee may require the student to eliminate deficiencies in undergraduate preparation before being granted unconditional acceptance into the graduate program.

Residence

Master's degree candidates are expected to spend the equivalent of two semesters of full-time study in residence at The University of Texas at Arlington.

Supervising Committees

The Dean of Graduate Studies will appoint for each master's program student a supervising committee upon recommendation by the Graduate Advisor and the appropriate Committee on Graduate Studies. The committee will consist of at least three members or associates of the Graduate Faculty and will be responsible for the design of the student's program. Any external members must be in addition to the three members from the Graduate Faculty and must be approved by the Dean of Graduate Studies. The supervising committee conducts the final thesis examination for thesis degree plan candidates and determines scope, content, and form of the final master's comprehensive examination for thesis substitute and non-thesis degree plan candidates.

Degree Plans and Hours Required

Three degree plans (thesis, thesis substitute and non-thesis) leading to the master's degree are available. All programs except those in Humanities, Education and Public Administration offer the thesis degree plan. In certain departments and programs, a student may follow a thesis substitute or non-thesis degree plan upon recommendation of the appropriate Committee on Graduate Studies and approval by the Dean of Graduate Studies. Plans available in each department or program are listed in the catalog in the section on departmental and program descriptions.

The **thesis degree plan** requires a minimum of 30 semester hours, of which at least 24 hours must be in course work and six hours in a thesis course. The thesis must be approved by the thesis advisor and by a supervising committee of three or more members appointed by the Dean of Graduate Studies. The thesis is subject to final approval by the Dean of Graduate Studies. A student receiving advice and assistance from a faculty member in the preparation of a thesis must register for the appropriate course even if the student is not on campus. Each semester, after consulting with his/her Graduate Advisor, the student must register for the amount of thesis credit commensurate with the efforts to be expended by the student and the thesis advisor in the preparation of the thesis. Once the student is enrolled in the thesis course, continuous enrollment is required. The student must be enrolled in six hours of thesis during the semester the student finishes the thesis requirements and files for graduation. The degree candidate must defend the thesis in a final oral examination open to all members of the faculty.

The **thesis substitute degree plan** requires a minimum of 33 semester hours of which at least 27 hours must be in course work and three hours in an appropriate project or research course. The thesis substitute may include: (1) Internship reports in programs in which the internship has been determined by the Dean of Graduate Studies to be an essential component; (2) reports prepared in certain graduate seminar, conference, or research courses; or (3) a design thesis in Architecture. The internship substitute requires a minimum of six semester hours in the internship course.

The **non-thesis degree plan** requires a minimum of 36 semester hours of course work, of which at least 24 hours must be in the major area(s) of study.

Approval of Program of Work

A Tentative Program of Work listing all transfer courses, courses in progress, and courses required by the student's committee or department must be filed in the Graduate School during the student's first semester of full-time work on the master's program, but not later than the completion of the first 12 hours of graduate work. If the student desires to apply up to nine semester hours of transfer credit to his/her degree program, the Tentative Program of Work must be filed during the student's first semester whether or not the student is engaged in full-time graduate work.

In all degree plans, the entire degree program must be approved by the appropriate Committee on Graduate Studies and the Dean of Graduate Studies.

Candidacy

A student will be admitted to candidacy for the master's degree only when the requirements listed previously have been met. The student must file a Final Program of Work and Application for Candidacy with the Dean of Graduate Studies no later than 30 days after the first day of classes of the semester in which he/she plans to receive the degree (see Graduate School calendar for specific date). A student planning to receive a degree at the end of the summer session must file the Final Program of Work and an Application for Candidacy with the Dean of Graduate Studies no later than 30 days after the first class day of the 11-week summer session (see Graduate School calendar for specific date). In addition, the student must submit an Application for Graduation by the same deadline.

Final Master's Examination

A final program examination is required for all master's degree candidates. The final master's examination can result in: 1) Pass with a recommendation to the Dean of Graduate Studies that the candidate be certified to receive the earned degree; 2) a conditional pass with the requirement that additional conditions be met which may include further work on the thesis or thesis substitute, additional course work with a minimum specified grade-point average, or both (in all cases, the final master's examination must be repeated within a specified period); 3) failure, with permission to be reexamined after a specified period; or 4) failure, with recommendation to the Dean of Graduate Studies that the candidate be dismissed from the program. Most programs limit to two the number of repeats of the final master's examination. Additional repeats require specific advanced written approval by the Dean of Graduate Studies.

For **thesis degree plan** candidates, the examination will be an oral defense of the thesis. The examination will be conducted by all members of the student's supervising committee, but will be open to all members of the faculty. The thesis examining committee must have copies of the thesis at least two weeks prior to the thesis defense.

For **thesis substitute** or **non-thesis degree plan** candidates, the final examination will be a comprehensive examination that is written, oral, or both. The scope, content, and form of the examination(s) shall be determined and administered by all members of the student's supervising committee. Students in the College of Business Administration fulfill the comprehensive examination requirement as follows: Accounting, Professional Accounting, Master of Business Administration, Personnel and Human Resource Management, and Taxation—successful completion of BUSA 5333; Real Estate—successful completion of REAE 5319; Information Systems—successful completion of INSY 5345 or 5375; Marketing Research—successful completion of MKRS 5395 and MKRS 5398. Students in the Master of Science in Social Work fulfill the comprehensive examination requirement upon successful completion of Social Work 6305. Students in the Master of Architecture program fulfill the comprehensive examination requirement upon successful completion of six hours of advanced design studio (non-thesis) or design thesis (thesis substitute). Students in the Master of Public Administration program fulfill the comprehensive examination upon successful completion of URPA 5343.

The student's Graduate Advisor must submit a request for the thesis defense or comprehensive examination to the Graduate School no later than two weeks before the proposed examination date. The request must indicate the time, place, and form (oral and/or written) of the examination and be signed by all members of the examining committee, confirming their intention to be present.

The Final Master's Examination Report must be filed in the Graduate School no later than three weeks before the date on which the candidate expects the degree to be conferred. Thesis degree plan candidates must deposit three unbound copies of the final approved thesis with the Graduate School by that date. Candidates will be billed for the required fees as explained in the Tuition and Fees section of this catalog.

Master's Thesis

A thesis degree plan student must be enrolled in a six-semester hour thesis course (usually 5698) in the semester in which the thesis is defended. Social work students will enroll in SOCW 6393 to conduct thesis research and SOCW 6398 in the semester in which the thesis is defended. The final copies of the master's thesis must be prepared according to regulations described in the current edition of the *Thesis and Dissertation Manual of Style* on the World Wide Web at http://www.uta.edu/etd/ and K. Turabian, A Manual for Writers of Term Papers, Theses, and Dissertations (6th ed.), available at the University Bookstore. Thesis fees are explained in the Tuition and Fees section of this catalog.

All theses and dissertations must conform to University requirements regarding placement in the University Library, microfilming, publication of abstracts in *Masters Abstracts International* or *Dissertation Abstracts International*, and access and citation for scholarly purposes. The three copies of the thesis or dissertation which are required to be submitted to the Dean of Graduate Studies are University property and a student may make no private agreements with employers, funding sources, or others which restrict or infringe upon University rights. Thesis copyrights, where applicable, are held by the student author.

Each semester the Graduate School offers to all students enrolled in thesis or dissertation courses the opportunity to attend a seminar on thesis and dissertation preparation. Requirements described in the *Thesis and Dissertation Manual of Style* are explained, and general Graduate School procedures of particular importance to degree candidates are outlined.

Personnel in the Graduate School examine each thesis and determine whether or not it meets Graduate School requirements for format and mechanical presentation. To reduce the number of last-minute inconveniences for the student, the student is required to submit the master copy of the final draft of the thesis before

additional required copies are prepared. ***The master copy must be received no later than 10 working days before the deadline to allow at least three days for Graduate School examination, time for the student to make necessary corrections and time to have the final required copies made.*** (See the Graduate School calendar for specific deadline dates.) After the Graduate School receives the master copy of the final draft, the student will normally be given a written format evaluation within 72 hours (excluding weekends, holidays, and graduate registration periods).

Time Limit

Programs for the master's degree must be completed within six years (time in military service excluded) from initial registration in the Graduate School.

Foreign Language Requirement

A reading knowledge of at least one foreign language (classical or modern) is required by some departments or programs for master's degree candidates. Specific language requirements, if any, are given in the individual departmental and program degree descriptions.

Master of Arts (MA)

The University of Texas at Arlington offers the MA degree in the following areas:

Anthropology
Criminology and Criminal Justice
Economics
English
French
German
History
Humanities
Interdisciplinary Studies
Linguistics
Political Science
Sociology
Spanish
Urban Affairs

Master of Science (MS)

The University of Texas at Arlington offers the MS degree in the following areas:

Accounting
Aerospace Engineering
Biology
Biomedical Engineering
Chemistry
Civil Engineering
Computer Science
Computer Science and Engineering
Electrical Engineering
Environmental Science and Engineering
Geology
Industrial Engineering
Information Systems
Interdisciplinary Studies
Management of Technology
Marketing Research
Materials Science and Engineering
Mathematics
Mechanical Engineering
Personnel and Human Resource Management
Physics
Psychology
Taxation

Specialized and Professional Master's Degrees

The University of Texas at Arlington offers the following specialized and professional master's degrees:

Master of Architecture
Master of Arts in Teaching *(see Humanities)*
Master of Business Administration
Master of City and Regional Planning
Master of Computer Science
Master of Education in Teaching
Master of Engineering
Master of Landscape Architecture
Master of Professional Accounting
Master of Public Administration
Master of Science in Nursing
Master of Science in Social Work
Master of Software Engineering

Requirements for each of these degrees, with the exception of the Master of Engineering, are listed under the appropriate department or program.

Master of Engineering Degree Requirements

The Master of Engineering degree is offered by the Graduate Programs in Aerospace Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Materials Science and Engineering, Mechanical Engineering, and Computer Science and Engineering. The degree is practice-oriented requiring 36 semester hours.

The required distribution of coursework is as follows:

One-third of total credit hours—engineering design, analysis, synthesis courses.
One-third of total credit hours—combination of advanced mathematics, basic science, engineering science or design.
One-third of total credit hours—to complement the specified portions of the program and provide a meaningful total program in keeping with the educational objectives of the student and the college.

Certificates

The University of Texas at Arlington offers the following certificates through the Graduate School:

Archival Administration (History)
Teaching English to Speakers of Other Languages (Linguistics)

Requirements for each of these certificates are described under the department or program specified in parentheses after the certificate title.

Dual Degree Programs

Students may pursue dual degree programs other than those specifically defined in the catalog with prior approval of the appropriate Committees on Graduate Studies and the Dean of Graduate Studies. Students wishing to pursue dual degree programs other than those specifically defined in the catalog should contact the Graduate School for details.

Students in any dual degree program must be admitted to each participating program. Students accepted into dual degree programs must submit separate Programs of Work for each degree, showing only courses which meet requirements for the specified degree, including those joint courses which meet requirements for both degrees. Unless otherwise stated under the dual degrees programs specified elsewhere in this catalog, the number of hours which may be used jointly will be determined by the total number of hours required by both degree programs if completed separately.

a. Six semester hours may be used jointly when the total number of hours required for both degrees is 60;
b. Six to 12 semester hours may be used jointly when the total number of hours required for both degrees is between 60 and 72 hours;
c. Six to 18 semester hours may be used jointly when the total number of hours required for both degrees exceeds 72 hours.

Admission to and enrollment in the programs for a dual degree must be concurrent. A student must be admitted to the second program before completing more than 15 semester hours in the first, exclusive of leveling, deficiency or foundation courses, and must complete the second degree within one academic year following completion of the first.

Requirements for the Doctor of Philosophy Degree

The Doctor of Philosophy (Ph.D.) is the highest degree offered by The University of Texas at Arlington. The degree is awarded only for academic work of distinction through which the student demonstrates superior scholarship and capacity for original work. Requirements for the doctoral degree listed below are the minimum required by the Graduate School. Meeting all of these requirements does not result automatically in the awarding of the doctoral degree. All departments and programs have additional requirements for a high level of scholarly achievement that must be met by successful doctoral candidates. In all doctoral programs, the basic requirements are that a student (1) attain mastery of a field of knowledge as determined by the appropriate Committee on Graduate Studies and demonstrated in a general examination; and (2) present evidence of a capacity to complete a significant program of original research by preparation of a dissertation.

To be admitted to a doctoral program, an applicant must have completed a master's degree or at least 30 semester credit hours of graduate coursework.

Departmental, Program and College Program Manuals for Students

Many departments and programs issue program manuals, procedures and policy manuals, graduate student handbooks, and other informational publications for students and faculty in graduate programs. These publications may provide detailed and useful information; however, they are not statements of official policy of The University of Texas at Arlington nor of The University of Texas System. In all matters the **Rules and Regulations of the Board of Regents of The University of Texas System**, the *Handbook of Operating Procedures* of The University of Texas at Arlington, and the Graduate Catalog of The University of Texas at Arlington shall supersede departmental, program, or college publications.

Graduate Program Degree Requirements and Academic Performance Standards for Doctoral Degrees

Degree requirements and academic performance standards in the section entitled "Requirements for the Doctor of Philosophy Degree" are the minimum required by Graduate School and University policy. Satisfying these general requirements does not imply that all degree and program requirements have been met. Many programs set special course requirements and may require higher grade-point averages or other academic standards than those in this section. Such program requirements and standards are included with individual program descriptions in this catalog and in departmental, program, and college program manuals or policy statements. These special course requirements published in departmental, program, or college program manuals or policy statements shall not be considered in conflict with this catalog and shall have the same force as this catalog.

Residence

Residence requirements vary widely among doctoral programs. For specific requirements, consult the Degree Requirements section under individual departments and programs offering the doctoral degree.

Courses and Semester Hour Requirements

The doctoral degree cannot be earned solely by passing certain courses and accumulating a specified number of credit hours; however, a department or program may require a core group of courses for all of its doctoral students. Courses are generally concentrated in the student's major field, but some are normally taken in one or more complementary minor fields. In interdepartmental programs, the major work may be divided among two or more primary fields.
The Graduate School imposes no specific semester-hour requirements for the doctoral degree except for residence requirements included in individual degree program descriptions.

Foreign Language Requirement

Prior to scheduling the doctoral comprehensive examination, the Graduate School requires evidence that the student has a reading knowledge of one foreign language applicable to the student's field of study or has attained proficiency in a research-tool area such as

computer sciences or experimental statistics. Other suitable foreign language substitute may be approved by the Dean of Graduate Studies. Foreign language competency is specifically required for the Ph.D. degree program in Humanities*. The Ph.D. program in Chemistry requires competency in an approved computer language, and the Ph.D. program in Psychology has established a computer knowledge requirement in lieu of the foreign language requirement. There is no foreign language requirement for the Ph.D. in the various engineering fields, but a research tool may be required as determined by the student's committee.

The foreign language requirement may be met by: (1) successfully passing an examination prepared by an appointee of the Dean of Graduate Studies; (2) making an acceptable score on the Educational Testing Service Graduate School Foreign Language Test; or (3) earning a grade of B or higher in French, German, or Russian 4331 and 4332, or equivalents. The foreign language substitute requirement may be met by a method determined by the appropriate Committee on Graduate Studies and approved by the Dean of Graduate Studies.

***The Ph.D. program in Humanities is being phased out. See program description for information.**

Diagnostic Evaluation

During the student's first year of doctoral program work, the student must demonstrate potential to successfully complete a degree program. The method of assessing the student's potential will be determined by the appropriate Committee on Graduate Studies and may be in the form of a written or oral examination, personal interviews with faculty members, successful completion of certain courses in the first semester of residence, or by any combination of these methods. Results of the diagnostic evaluation may be: (1) approval to continue in the doctoral program; (2) approval to continue with specified remedial work; (3) failure, but with permission for assessment through a second diagnostic evaluation after a specified period; or (4) failure and termination in the program.

The diagnostic evaluation report must be filed in the Graduate School by the student's Graduate Advisor during the student's first year of doctoral program work but no later than the completion of the first 18 semester hours of course work beyond appropriate master's level course work, or the equivalent.

Doctoral Committees

After the student successfully completes the diagnostic evaluation, the Dean of Graduate Studies will assign an examining committee, members of which are recommended by the Graduate Advisor and appropriate Committee on Graduate Studies. The committee will consist of at least five members, four of whom must be from the student's major area, including at least one from each minor field. In interdisciplinary programs, at least two members must represent each field concerned, but in no case will the committee consist of fewer than five members. The committee is responsible for design and direction of the student's program. After the student has passed the comprehensive examination (see next paragraph), the doctoral supervising committee may be altered or expanded to accommodate the dissertation research needs of the student, but the committee must continue to include at least five members of the Graduate Faculty. External members must be in addition to the five members of the Graduate Faculty and must be approved by the Dean of Graduate Studies.

Comprehensive Examination

Students are eligible to take the comprehensive examination after giving evidence to their doctoral committee of adequate academic achievement by having completed all or most course work requirements and by having met the language or language substitute regulation if required in the degree program. The comprehensive examination usually marks the end of formal course work and the beginning of concentrated work on dissertation research and preparation. The student must be enrolled in the Graduate School in the semester in which he/she takes the comprehensive examination.

The comprehensive examination may be written, oral, or both written and oral. Its scope, content, and form shall be determined by the student's examining committee with approval of the appropriate Committee on Graduate Studies. The student's Graduate Advisor must submit a Request for the Comprehensive Examination to the Graduate School no later than two weeks before the proposed examination date. The request must indicate the time, place, and form (oral and/or written) of the examination and include signatures of all members of the examining committee.

In some departments and programs comprehensive examinations are given semiannually; in these areas students should consult the Graduate Advisor in that program for appropriate regulations and procedures.

The comprehensive examination may result in (1) approval and recommendation to proceed to the next phase of the program; (2) approval to remain in the program but a requirement to meet certain specified additional criteria; (3) failure, but with permission to retake the examination after a period specified by the examining committee; or (4) failure with recommendation not to continue in the program.

Admission to Candidacy

Upon passing the comprehensive examination, the student becomes eligible for admission to candidacy. The Application for Candidacy and Final Program of Work must be filed in the Graduate School and approved by the Dean of Graduate Studies at least one semester prior to awarding of the degree.

Time Limit

All requirements for the doctoral degree must be completed within four years after the student passes the comprehensive examination.

Dissertation

A doctoral candidate/student must be enrolled in a nine-semester hour dissertation course (6999) in the semester in which the dissertation is defended. The dissertation represents the culmination of the student's academic efforts and so is expected to demonstrate original and independent research activity and be a significant contribution to knowledge.

Once the student is enrolled in the dissertation course, continuous enrollment is required. A student receiving advice and assistance from a faculty member in the preparation of a dissertation must register for the appropriate course even if the student is not on campus.

Registration in Doctoral Courses

1. Registration in an individual study, research or similar course implies an expected level of effort on the part of the student which is at least equivalent to that of an organized course of the same credit value.
2. A doctoral student shall not be required to register for more than nine credit hours during any long semester or summer, except that:
   a. A doctoral student who is enrolled in nine credit hours of organized courses who is also doing research related to his/her dissertation may be required to register for up to three hours of research for a total of 12 credit hours.
   b. A doctoral student supported as a graduate research or teaching assistant may be required to register for 12 credit hours (no more than 9 credit hours to be in organized courses), as determined by the student's graduate program.
3. A doctoral student who is required to register solely for the purpose of satisfying a continuous enrollment requirement shall register for no more than three credit hours during each term.
4. A doctoral student may not register for more than 12 semester hours in a semester or summer session unless such registration is approved in advance by the Dean of Graduate Studies.

Dissertation Requirements

Final copies of the doctoral dissertation must be prepared according to regulations described in the current edition of the *Thesis and Dissertation Manual of Style* available on the World Wide Web at http://www.uta.edu/etd/ and K. Turabian, A Manual for Writers of Term Papers, Theses, and Dissertations (6th ed.), available at the University Bookstore. The catalog section on Tuition and Fees provides information on dissertation binding, microfilming, and copyrighting fees.

All theses and dissertations must conform to University requirements regarding placement in the University Library, microfilming, publication of abstracts in *Master Abstracts International* or *Dissertation Abstracts International*, and access and citation for scholarly purposes. The three copies of the thesis or dissertation required to be submitted to the Dean of Graduate Studies are University property and a student may make no private agreements with employers, funding sources, or others which restrict or infringe upon University rights. Dissertation copyrights, where applicable, are held by the student author.

Each semester the Graduate School offers to all students enrolled in thesis or dissertation courses the opportunity to attend a seminar on thesis and dissertation preparation. Requirements described in the *Thesis and Dissertation Manual of Style* are explained, and general Graduate School procedures of particular importance to degree candidates are outlined.

Personnel in the Graduate School examine each dissertation and determine whether or not the dissertation meets Graduate School requirements for format and mechanical presentation. In order to reduce the number of last-minute inconveniences for the student, the student is required to submit the master copy of the final draft of the dissertation before having additional required copies prepared. ***The master copy must be received no later than 10 days before the final deadline to allow at least three days for Graduate School examination, time for the student to make necessary corrections and time to have the final required copies made.*** (See the Graduate School calendar for specific deadline dates.) After the Graduate School receives the master copy of the final draft, the student will normally be given a written format evaluation 72 hours later (excluding weekends, holidays and graduate registration periods).

Dissertation Defense

An application for the dissertation defense must be filed in the Graduate School by the student no later than three weeks before the final date for submission of approved dissertations and dissertation defense reports and at least two weeks before the scheduled defense. The dissertation supervising committee must have copies of the dissertation at least two weeks prior to the dissertation defense.

The dissertation defense will be a public oral examination open to all members (faculty, students, and invited guests) of the University community. Questioning of the candidate will be directed by the student's dissertation supervising committee, but any person attending the defense may participate.

Although the defense is concerned primarily with the dissertation research and its interpretation, the examining committee may explore the student's knowledge of areas interrelated with the core of the dissertation problem.

The dissertation defense may result in a decision that the candidate has (1) passed unconditionally; (2) passed conditionally with remedial work specified by the Committee; (3) failed, with permission to be re-examined after a specified period; or (4) failed and dismissed from the program. The dissertation must be approved unanimously by the student's dissertation supervising committee and by the Dean of Graduate Studies.

Regardless of the outcome of the defense, the dissertation defense report must be submitted to the Dean of Graduate Studies within five working days after the examination. When a scheduled defense is postponed or canceled, the Dean of Graduate Studies must receive written notice of this postponement or cancellation and a new application for the dissertation defense must be filed in the Graduate School in accordance with the Graduate School requirements specified above.

Three unbound copies of the final approved dissertation must be submitted to the Dean of Graduate Studies by the date specified in the Graduate School Calendar on the inside covers of the current Graduate Catalog. When the final three copies are deposited with the Graduate School, the student will be billed for the required fees as explained in the Tuition and Fees section of this catalog.

General Graduate School Regulations and Information

Student Responsibility

Graduate students assume full responsibility for knowledge of all Graduate School and University rules, regulations and deadlines published in the Graduate Catalog and of all departmental and program requirements concerning their degree programs.

Administration of the Advanced Degree Programs

Committees on Graduate Studies

Each graduate program is governed by a Committee on Graduate Studies. The committee is composed of all Full Members of the graduate faculty in that program. Graduate faculty from allied fields may serve on the committee, when appropriate. In an interdepartmental program, the Committee on Graduate Studies is appointed by the Dean of Graduate Studies.

Graduate Advisors

Each graduate program has a Graduate Advisor. The Graduate Advisor represents the Dean of Graduate Studies and the Committee on Graduate Studies in matters pertaining to advising graduate students in their academic areas. The Graduate Advisor's functions include: registering graduate students and acting upon requests for drops, adds, section changes and special examinations; keeping graduate student records; and advising graduate students about their degree plans and programs of work. The name, office location and telephone number of each Graduate Advisor is listed at the beginning of each departmental or program description in this catalog.

Observance of Religious Holy Days

A student who misses an examination, work assignment, or other project because of an observance of a religious holy day will be given the opportunity to complete work missed within a reasonable time, provided that the student has properly notified the instructor. To meet notification requirements, the student must notify each instructor in writing of classes scheduled on dates he/she will be absent in observance of a religious holy day. Notification must be made within the first 15 class days and either personally delivered, acknowledged, and dated by the instructor or sent by certified mail, return receipt requested. The student may not be penalized for these excused absences, but the instructor may respond appropriately if the student fails to complete satisfactorily the missed assignment or examination within a reasonable time after the excused absence.

A " religious holy day" means a holy day observed by a religion whose places of worship are exempt from property taxation under Section 11.20 of the Tax Code.

Course Grades

Grades of Scholarship

Subject to the following conditions, graduate credit will be given for grades of A, B or C (as well as P) for work done at The University of Texas at Arlington:

1. The student must maintain a B average in all work in the major.
2. The student must maintain a B average in all work in the minor or minors.
3. The student must maintain a B average in all advanced work.

With the exception of research, thesis and dissertation courses, only those courses so designated in this catalog are offered on a pass-fail (P/F) basis. The grade P is not included but the grade F is included in calculation of grade-point average.

No student will be allowed to repeat a course in order to change a passing grade. A student may repeat a course only if that course is specifically designated in this catalog as one that can be repeated for credit. A student who fails to receive credit (grade of D or F) may repeat a course in order to obtain credit, in which case the grades for both courses will count in computing the student's average.

Personal improvement courses including, but not limited to, individual or group music or art lessons and exercise and sports studies activities courses will not be used for the following: (1) to satisfy graduate degree requirements; (2) in computation of graduate grade point averages or determination of academic probation or academic good standing in Graduate School; or (3) in calculation of grade point averages for the purpose of admission to a Graduate Program or certification for graduation from a Graduate Program.

For work completed at other institutions, graduate credit may be granted only for grades of A or B. Courses taken on a pass/fail basis, or for which a grade lower than B was assigned, may not be considered for transfer to a graduate degree program at The University of Texas at Arlington. Courses with grades of A or B from other institutions may be submitted for transfer according to the procedure described in this catalog under the section entitled " Transfer Credit." Grades received in transfer courses are not included in calculation of the graduate grade point average.

Valid Grades and "N" Designation

Types of grades (Valid Grades) which may be assigned in a course are generally determined by policies outlined in the paragraphs above. However, Valid Grades for independent study, conference, seminar and readings courses vary widely among departments; therefore, a statement on Valid Grades and special grading policies, if any, is given at the beginning of the course descriptions for each program in this catalog. If the student is uncertain about Valid Grades for a course in which he/she is registered, he/she should consult the instructor **at the beginning of the semester** for that information. The Valid Grades for a course are printed on the instructor's copy of the class roll issued at the beginning of the semester and on the form on which the instructor reports students' grades at the end of the semester.

If an instructor assigns a grade that does not correlate with one of the Valid Grades for the course, the student's grade report from the Registrar will show a designation of N, meaning that no Valid Grade was received from the instructor. Because N grades are automatically converted to F at midsemester of the next regular semester, a student receiving an N designation on a grade report should contact the instructor **immediately** and request that a change from N to a valid grade be initiated by the instructor.

Incomplete Grade

A graduate student who has been unable to complete all class or laboratory assignments in a regular semester or summer session may, at the discretion of the instructor, receive an X designating a temporary grade. The following deadlines for completing an incomplete grade X apply to all graduate students regardless of the level of the course in which the incomplete grade was received: An X must be removed no later than the official midsemester deadline of the following regular semester; an X received in Fall semester must be removed by the following Spring midsemester deadline; an X received in Spring semester or Summer session must be removed no later than the following Fall midsemester deadline. See the official Graduate School Calendar printed inside the covers of this catalog for midsemester deadlines. An incomplete grade not removed by the specified deadline will be automatically changed to an F. All incomplete grades must be removed from the student's record before a graduate degree will be awarded.

Credit for Research, Internship, Thesis or Dissertation Courses

All research, internship, dissertation, and thesis courses will be graded on a pass-fail basis. If a student undertakes a research, internship, thesis or dissertation course and does not complete the course in the semester for which the student is registered in the course, a grade designation of R (research in progress) will be given instead of an X. A student who receives a grade of R in a research, internship, thesis, or dissertation course must re-register for the course and complete it with a grade of P in order to obtain academic credit (see paragraph below on " R" Grade). The only Valid Grades for three-hour thesis and three- and six-hour dissertation courses are R, F, and W. The grade of P can be given only in six-hour thesis courses and nine-hour dissertation courses and, accordingly, the student must be enrolled in a six-hour thesis course or a nine-hour dissertation course the semester in which the student defends the thesis or dissertation and applies for graduation.

"R" Grade

The grade of R (research in progress) is a permanent grade, but it is not included in any academic evaluation and does not carry credit value. This grade may be issued only for research, internship, thesis, dissertation or other specifically designated courses. For courses which carry R as the Valid Grade for incomplete progress (rather than the temporary grade of X), the student may receive a final grade only if the work is completed within a semester in which the student is enrolled in the course. To receive academic credit in an R-graded course, a student must re-register for the course and successfully complete the course with a grade of P or a letter grade, whichever is the designated Valid Passing Grade for the course. Grading policy in some courses may change during the period covered by this catalog. Grading policy for each course each semester is printed on the instructor's class roll. Students should verify grading policy with the instructor **at the beginning of each semester.**

Grievances Related to Grades

It is the obligation of the student, in attempting to resolve any student grievance regarding grades, first to make a serious effort to resolve the matter with the individual with whom the grievance originated. Individual course instructors retain primary responsibility for assigning grades. The instructor's judgment is final unless compelling evidence shows discrimination or preferential treatment or procedural irregularities. If students wish to appeal, their requests must be submitted in writing on an appeal form which is available in departmental or program offices. The normal academic channels are: department chair or program director, and academic Dean. However, before considering a grievance, the department chair or program director will refer the issue to a departmental or program committee of graduate faculty. If the committee cannot reach a decision acceptable to the parties involved, the matter will follow the remaining academic channels. If students are dissatisfied with the chair or director's decision, they may appeal the case to the academic Dean. (For grievances other than those related to grades, see the catalog entry titled Grievances Other Than Grades.)

Grade Requirements

Good Standing and Satisfactory Scholastic Progress (SSP)

A graduate student is considered to be in good academic standing and making satisfactory progress in a degree program if he/she (1) is absolving any admission conditions within the time required and (2) maintains a 3.0 grade-point average on all course work undertaken while in Graduate School. In addition, for financial aid purposes, a student must complete the following minimum number of hours in the last semester in which the student enrolled for six or more hours:

Enrollment as of Census Date	Minimum Completion
9+	6
6-8	3
0-5	0

Academic Probation

If graduate students fail to maintain an overall 3.0 grade-point average on their first six hours of graduate course work taken as graduate students, they must during the subsequent six semester hours of graduate course work raise their grade-point average to a 3.0 on all graduate work taken as a graduate student. During the period following the first six hours of graduate course work in which the student failed to meet the 3.0 grade-point average, the student will be placed on *academic probation.* The student's record will be evaluated at the completion of each semester while on probation. Failure to meet the grade-point requirement at the completion of the first 12 hours of graduate course work taken as a graduate student will result in automatic dismissal from the Graduate School.

If a student's overall grade-point average falls below 3.0 at any time after the completion of the first 12 hours of graduate work, the student will be placed on *academic probation* and must achieve an overall 3.0 GPA at the end of the following semester. Failure to meet

the 3.0 grade-point average at that point will result in automatic dismissal from the Graduate School. A student who has been dismissed from the Graduate School for failure to meet the 3.0 grade-point average requirement may be readmitted for further graduate study in the same or in a different program only if a petition (accompanied by a complete record of all college or university work previously taken) has been approved by the appropriate Committee on Graduate Studies and the Dean of Graduate Studies.

Personal improvement courses including, but not limited to, individual or group music or art lessons and exercise and sports studies activities courses will not be used for the following: (1) to satisfy graduate degree requirements; (2) in the computation of graduate grade point averages or in the determination of academic probation or academic good standing in Graduate School; (3) or in the calculation of grade point averages for the purpose of admission to a Graduate Program or certification for graduation from a Graduate Program.

Graduation

A student must meet all requirements specified under Grades of Scholarship in this catalog to receive a graduate degree from The University of Texas at Arlington.

Course Auditing, Changes and Load

Auditing

Any person who has credit in a particular course or who has a demonstrated need for the course content may be eligible for auditing that course if space is available. An auditor has the privilege of hearing and observing only; no University credit is granted for auditing. Audit applications may be secured from the Admissions Office. A student may audit a graduate course only with permission of the instructor and approval of the Director of Admissions. When the form has been completed and approved, the applicant, if currently enrolled, pays a fee of $20 per course; if not enrolled, the applicant pays $100 per course.

Adding and Dropping Courses

Graduate students who wish to change a schedule by either dropping or adding a course must first consult with their Graduate Advisor. The following regulations pertain to adds and drops:

1. A student may not add a course after the end of late registration.
2. A graduate student dropping a course after the Census Date but on or before the midsemester date will receive a grade of W only if at the time of dropping the student is passing the course (has a grade of A, B, or C); otherwise an F will be recorded.
3. A graduate student who desires to drop all courses for which the student is enrolled is reminded that such action constitutes a withdrawal from the University. The student should indicate intention to withdraw and drop all courses by filing a resignation form in the Office of the Registrar.
4. In most cases, a graduate student may not drop a course or withdraw from the University after midsemester. Under extreme circumstances, the Dean of Graduate Studies may consider a petition to withdraw after midsemester, but in no case may a graduate student selectively drop a course after midsemester and remain enrolled in any other course.

Withdrawal

A student who wishes to withdraw (resign) voluntarily from the University before the midsemester deadline must file a resignation form in the Office of the Registrar. After midsemester, a graduate student or undergraduate student enrolled in a graduate course is not permitted to withdraw or to selectively drop courses; in exceptional cases, however, a graduate student may submit to the Dean of Graduate Studies a Petition to Withdraw after midsemester. (Students should use the special Petition to Withdraw for this purpose.) If the petition is not approved, the student remains responsible for all course work requirements. Therefore, a student should not discontinue class attendance or course assignments unless he/she has been notified in writing that the Dean of Graduate Studies has approved the petition to withdraw.

Course Load

The maximum course load for full-time graduate students is 15 semester hours in a regular semester and 12 hours in a summer session. Registration in excess of this maximum will be approved by the Dean of Graduate Studies only in exceptional circumstances. International students must be enrolled for a minimum of nine semester hours to maintain their visa status.

Course Designation System

The example below provides an explanation of the designation system of graduate courses at The University of Texas at Arlington.

5313 CARBONATE PETROLOGY (3-2)

1. The four digit number (5313) is the departmental unique numerical designation for the specific course listed.
   a. The first digit (5) in the above example denotes the level of the course. Graduate courses are designated 5 or 6.
   b. The second digit (3) denotes the semester hour credit of the course.
   c. The third and fourth digits (1 and 3) are departmental designations and might or might not have sequential significance.
2. The first number in parentheses following the course title indicates the class hours per week devoted to lecture. The second number indicates the class hours per week devoted to laboratory, practice or field work for the fall or spring semester.

Each department or program has been assigned a unique two-, three-, or four-character prefix for use in course designations on registration documents, transcripts and other University records. For example, the Carbonate Petrology 5313 course described above is taught in the Department of Geology and appears on student records as GEOL 5313. The two-, three- or four-character prefix is given in parentheses after the department or program name in the catalog section describing academic departments and programs.

Reservation of Courses for Graduate Credit

Students previously dismissed from or denied admission to the Graduate School may not enroll in graduate courses or reserve courses for graduate credit.

An undergraduate student may not use graduate courses (numbered 5000 and above) to fulfill undergraduate degree requirements. However, an undergraduate at The University of Texas at Arlington who needs no more than 12 hours in one semester (six semester hours in one summer session) to complete all the requirements for a bachelor's degree may register for graduate courses for graduate credit if the following conditions are met:

1. All work for undergraduate credit must be completed during that semester or summer session.
2. Total registration for all work may not exceed 15 semester hours in a semester (or 12 semester hours in the summer sessions).
3. The student must submit to the Graduate Advisor a "Reservation of Courses for Graduate Credit by Undergraduate Students" form (available from Graduate Advisors). The reservation must be approved by the Graduate Advisor and the Dean of Graduate Studies, and the Registrar must certify that the reserved credit will not be applied to the student's undergraduate degree requirements. This form must be submitted in accordance with deadlines printed in the Graduate School calendars on the inside covers of this catalog.
4. The student must have at least a 3.0 undergraduate GPA to be eligible to enroll in a graduate course and to reserve it for graduate degree credit.
5. Only courses in which the student earns grades of A or B may be applied to a master's degree, but all courses reserved for graduate credit will be calculated in the graduate grade point average.
6. Credit is officially accepted for application to a graduate program only upon achievement of unconditional admission to graduate school.

Enrollment in Graduate Courses by an Undergraduate Student Holding a Bachelor's Degree

Students previously dismissed from or denied admission to the Graduate School may not enroll in graduate courses.

A student who is enrolled as an undergraduate but who holds a bachelor's degree may, with the approval of the Graduate Advisor, enroll in graduate level courses (courses numbered at the 5000 level or above).

Upon unconditional admission to the Graduate School, a maximum of 12 semester hours of graduate level courses, excluding deficiency courses, may be applied to a master's degree program under the following conditions:

1. All courses so applied must have been completed no more than five years before enrollment in a graduate program at The University of Texas at Arlington.
2. Only courses in which the student earned grades of A and B may be so applied.
3. If the student has completed more than 12 semester hours of graduate courses in undergraduate status, all graduate courses completed no more than five years before enrollment in a graduate program at The University of Texas at Arlington will become part of the graduate record and will be considered in computing the student's grade point average.
4. The 12 semester hours that may be applied for credit toward a master's degree must be approved by the Graduate Advisor, the Committee on Graduate Studies, and the Dean of Graduate Studies. Approval is obtained by submitting a complete Tentative Program of Work that includes the courses taken in undergraduate status and all other courses to be used for credit toward the degree.
5. A student may elect not to apply any courses taken in degreed undergraduate status to a master's degree. In this case, no graduate courses taken in undergraduate status are applied to the student's graduate record. Selective application of courses is not permitted. If any courses are applied for credit toward a master's degree, all courses completed within the last five years will become part of the graduate record.

Courses taken in undergraduate status may not be applied directly to a doctoral program.

The student should consult with the appropriate Graduate Advisor before registering for graduate courses.

Some departments and colleges (i.e., the College of Business Administration) do not permit students to enroll in graduate courses unless they have been admitted to Graduate School.

Course and Transfer Credit

Maximum Undergraduate Credit

No more than nine hours of advanced baccalaureate course work may be used for graduate degree credit. Such work may be applied to a graduate degree program only with approval of the appropriate Committee on Graduate Studies and the Dean of Graduate Studies.

Applicability of Courses to More Than One Degree

No course that has been applied to any one degree, graduate or undergraduate, may be applied to any other degree, either directly or by substitution.

Transfer Credit

No more than nine hours of equivalent course work completed at other institutions of recognized standing may be transferred to a master's degree program, and then only after evaluation and approval by the appropriate Committee on Graduate Studies and the Dean of Graduate Studies. Transfer credit will be accepted only for organized courses in which the student received a grade of B or higher; however, transfer course grades are not included in calculating a student's U.T. Arlington graduate grade point average. Courses completed prior to a student's admission into a U.T. Arlington master's degree program will be reviewed in terms of applicability to that program by the Committee on Graduate Studies and the Dean of Graduate Studies at the time the student submits a program of work.

Courses from other universities taken after a student has been admitted into a master's program at U.T. Arlington must be approved in advance by the appropriate Committee on Graduate Studies and the Dean of Graduate Studies. Before enrolling in transfer courses,

the graduate student must file an approved Program of Work listing the proposed transfer work or a Request to Change Program of Work if the transfer work represents an amendment to the approved Program of Work on file with the Dean of Graduate Studies.

All work submitted for transfer credit must have been completed no more than five years before enrollment in a graduate program at The University of Texas at Arlington.

Transfer work is not accepted in doctoral programs; however, formal graduate-level course work completed in the student's major area of doctoral study at other institutions granting doctoral degrees in the student's major may serve to establish the student's competency in those subject areas and may provide a basis for waiving some U.T. Arlington course requirements. Such waivers must be shown on the Program of Work, recommended by the student's advisory committee, and approved by the Committee on Graduate Studies of the student's major and by the Dean of Graduate Studies.

Extension Work, Correspondence Courses and Credit by Examination

Extension—Work done in extension classes may be applied toward an advanced degree under the same conditions that apply to transfer work, except that credit for extension work is limited to six credit hours.

Correspondence courses—Correspondence courses are **not** accepted for graduate credit.

Credit by Examination—Credit by examination may **not** be used for graduate credit and no such credit, graduate or undergraduate, may appear on graduate student transcripts.

Registration and Orientation for International Students

International graduate students are required to purchase The University of Texas at Arlington Student Health Insurance Plan. After the initial semester of enrollment, the insurance premium will be added automatically during the registration process. However, a student may be waived from this requirement if the student has health insurance coverage through (1) employment of the student, spouse or parents or (2) government-sponsored insurance, either the U.S. or home country sponsorship. If an outside health insurance policy is used to waive the purchase of the Student Health Insurance Plan, the coverage must provide benefits of repatriation and medical evacuation or a supplemental policy must be purchased to provide these benefits. If students wish to apply for the waiver, they must come to the International Office prior to registration to show proof of outside coverage with documentation regarding benefits provided by the outside coverage.

All entering international graduate students are required to attend an orientation at the beginning of their initial semester at The University of Texas at Arlington. Those who do not attend the International Student Orientation on the Monday before registration will not be allowed to register during the regular registration period and must attend a make-up orientation before registering during late registration.

Registration Requirements and Credit for Thesis and Dissertation

Students may not register for dissertation or thesis if they are not in good standing academically. After initial enrollment in the thesis or dissertation course, a student must maintain continuous enrollment in thesis or dissertation courses (summers excluded unless summer enrollment in thesis/dissertation is required by student's program) until the thesis or dissertation has been accepted by the Dean of Graduate Studies. Failure to maintain continuous enrollment may invalidate previous thesis or dissertation work.

A student receiving advice and assistance from a faculty member in preparation of a thesis or dissertation must register for the appropriate course even if the student is not on campus. Each semester after consulting with their Graduate Advisor, students must register for the amount of thesis or dissertation credit commensurate with the effort to be expended by the student and the thesis or dissertation advisor in preparation of the thesis or dissertation.

Thesis and dissertation courses will be graded on a Pass/Fail basis. A grade of R (Research in Progress) will be given for thesis or dissertation courses prior to the semester in which the thesis or dissertation is accepted by the Dean of Graduate Studies. The grade of R is a permanent grade which does not carry any credit value; therefore, since all master's programs require six credit hours of thesis and doctoral programs require nine credit hours of dissertation, the student must register for a six-semester hour course in thesis or a nine-semester hour course in dissertation for the semester in which the student expects to submit and defend the thesis or dissertation. (See Credit for Research, Internship, Thesis, or Dissertation Courses.)

Graduation Procedures

Graduation

Each graduate student must complete degree requirements in accordance with the Graduate Catalog in force at the time the student entered the graduate program in which the degree will be awarded or, at the student's option, the catalog of any subsequent year in which the student was in residence. If a student chooses to complete degree requirements in accordance with the catalog of a year subsequent to that in which he/she entered the graduate program, the student must indicate that intention by filing a petition with the Dean of Graduate Studies before the beginning of registration for the semester in which the student expects to receive the degree. A special petition form is available in the Graduate School Office and should be used for this purpose.

Changes in Graduate School regulations and policies become effective for all enrolled students in the year for which the catalog is in force, regardless of the year of initial enrollment. Therefore, each candidate for graduation must observe Graduate School regulations and follow graduation procedures prescribed in the Graduate Catalog in force in the intended semester of graduation.

Degrees are awarded at the end of Fall semester (December), Spring semester (May), and Summer session (August). Formal commencement ceremonies are held within the college or school in which the degree is earned. Candidates should contact the office of the dean of the appropriate unit for instructions concerning participation in the commencement ceremonies.

No honorary degree will be conferred by U.T. Arlington.

Final Semester Requirements

Students must be enrolled in the Graduate School for the semester in which they complete all graduate degree requirements and apply for graduation. Enrollment in courses outside the major and minor fields will not satisfy final semester enrollment requirements. In addition, the following items must be filed in the Graduate School **and the required fees paid by the deadlines given in the Graduate School calendars** published on the inside covers of this catalog:

1. **All** graduating students must file an Application for Graduation by the deadline specified in the Graduate School Calendar for the semester of graduation. The application is not transferable to a subsequent semester; therefore, if a student does not graduate in the semester indicated in the initial application, that application will be canceled and a new one must be filed for the semester of graduation.

   Students who fail to apply for graduation by the deadline specified in the Graduate School Calendar may apply late by completing the Application for Graduation and paying both the Diploma Fee and the late fee. Applications for Graduation will be accepted with a late fee for 30 calendar days after the deadline for applying for graduation. (If this date falls on a weekend, the deadline for applying late will be the Friday before the date.) After that date, no applications will be accepted and students must apply for graduation for a subsequent semester.

   Applicants for graduation will be billed for the Diploma Fee and, as appropriate, for thesis and dissertation fees and the late fee. The Diploma Fee and the late fee are non-transferable and non-refundable. See the section titled Tuition and Fees in this catalog for information on specific fees.

2. **Each Master's program student must:**

   Enroll in

   a. the six-hour thesis course if a thesis plan student
   b. the master's comprehensive course or equivalent if required by the student's program
   c. at least one graduate course in the student's program if not enrolled in a or b above

   File

   d. the Application for Graduation
   e. the Application for Candidacy and Final Program of Work
   f. three unbound copies of the final approved thesis and a completed Thesis and Dissertation Data Sheet (not applicable for non-thesis degree plan)
   g. a request for the final master's examination
   h. the Final Master's Examination Report
   i. the University Microfilm agreement (thesis only)
   j. the copyright authorization (optional) (thesis only)

   Pay

   k. the thesis binding, microfilming, and (optional) copyright fees (thesis only)
   l. the diploma fee

3. **Each Doctoral degree candidate must:**

   Enroll in

   a. the nine-hour dissertation course

   File

   b. the Application for Graduation
   c. the Application for Candidacy and Final Program of Work
   d. three unbound copies of the final approved dissertation and a completed Thesis and Dissertation Data Sheet
   e. a request for the dissertation defense
   f. the Dissertation Defense Report
   g. the University Microfilm agreement
   h. the Copyright authorization (optional)
   i. the National Research Council Survey of Earned Doctorates form

   Pay

   j. the dissertation binding, microfilming, and (optional) copyright fees
   k. the diploma fee

For more information about the submission of theses and dissertations, consult the *Thesis and Dissertation Manual of Style* available on the World Wide Web at http://www.uta.edu/edt/ and K. Turabian, A Manual for Writers of Term Papers, Theses, and Dissertations (6th ed.), available at the University Bookstore.

Graduate School Deadlines

All Graduate School deadlines, as indicated on the calendar or in the explanation of policies and procedures, unless otherwise stated, are final at 5 p.m. of the date specified. By this time all transactions must be completed and documents received in the Office of the Dean of Graduate Studies. Transactions and documents requiring action or approval of Graduate Advisors, committees, instructors, department chairmen, academic deans or others prior to receipt by the Graduate School should be initiated by the appropriate person (student, instructor, Graduate Advisor or other) sufficiently in advance of the Graduate School deadline for the required actions to be taken and approvals received.

In Absentia Registration

Candidates for a degree who have completed all requirements for graduation by the last date to qualify for in absentia registration (see Graduate School calendars on the inside covers of this catalog) and who need to register at the University for the sole purpose of having a degree conferred may be qualified to register in absentia in the semester or summer session consecutive to their last enrollment in course work and/or thesis/dissertation. Students registered in absentia may not enroll for courses. No refund is made for cancellation of in absentia registration. In addition to paying the cost of in absentia registration, candidates must file an application for graduation and pay the diploma fee for the semester of graduation. In Absentia registration requires permission of the Graduate Advisor and the Dean of Graduate Studies. Students may obtain the Request to Register in Absentia Form from the Graduate School.

Change of Graduate Major or Program

Students wishing to change graduate majors or programs from the one in which they are enrolled currently or in which they were enrolled during their most recent semester at U.T. Arlington must initiate the change by completing the appropriate form available in the Office of the Dean of Graduate Studies. Students are encouraged to consult the Graduate Advisor of the new program regarding program admission and degree requirements before requesting a program change.

Petitions

Students may request exceptions to published rules by filing a petition with the Dean of Graduate Studies. Limited exceptions to some rules may be approved if the facts presented by the petitioner fully justify an exception, as regarded by the Committee on Graduate Studies and the Dean of Graduate Studies. All petitions must be submitted on petition forms available in the Graduate School Office. Special forms for withdrawal and in absentia registration are available in the Graduate School and must be used by students petitioning for withdrawal or requesting in absentia registration.

Grievances Other Than Grades

In attempting to resolve graduate student grievances, the student must first make a serious effort to resolve the matter with the individual with whom the grievance originated. Grievances involving matters other than grades are appealed to the department chair, or office director, then to the Dean of Graduate Studies (except in personnel matters, in which cases the appeal is to the Provost unless questions regarding a graduate assistant or graduate associate are involved), Vice President for Business Affairs, or Vice President for Undergraduate Academic and Student Affairs, as determined by the nature of the grievance. If the matter remains unresolved at this level, the student may appeal to the Provost. The decision of the Provost is final. For grievances involving grades, see the Catalog entry titled Grievances Related to Grades.

Academic Dishonesty

All students are expected to pursue their academic careers with honesty and integrity. Academic dishonesty includes, but is not limited to, cheating on a test or other course work, plagiarism (offering the work of another as one's own), and unauthorized collaboration with another person. Students found guilty of dishonesty in their academic pursuits are subject to penalties which may include expulsion from the University.

In accordance with the **Rules and Regulations of the Board of Regents of The University of Texas System** (Part One, Chapter VI), institutional procedures regarding charges of academic dishonesty are outlined in Part Two, Chapter 2, of the *Handbook of Operating Procedures* of The University of Texas at Arlington. Copies of the Handbook are available at over 75 locations on campus including the Student Congress office, the Library, and departmental offices.

Graduate Assistantship/Associateship Policy

Graduate teaching and research assistantships and associateships are funded through state appropriations and federal, state, local and private grants for at least three principal reasons. First, employment of graduate students in teaching and in research positions during their graduate education encourages and supports their participation in these two major functions of a university and thereby strengthens the quality of students' educational experience. Second, assistantships and associateships provide direct financial support to outstanding students who are essential to the development of high quality graduate programs. Third, graduate students provide valuable and necessary services to the University in their roles as teaching and research assistants and associates. It must be kept in mind, however, that graduate assistants and associates are first and foremost students. As such, their most important task is to complete their degree requirements in a timely fashion; this is the primary expectation of the University as well.

The University of Texas at Arlington supports the "Resolution Regarding Graduate Scholars, Fellows, Trainees, and Assistants" of The Council of Graduate Schools in the United States. A copy of the resolution and list of signatory institutions is available in the Office of Research and Graduate Studies.

To assure the appointment of the most highly qualified students available and to best realize the principal objectives for which graduate assistants are employed, The University of Texas at Arlington has adopted the following policies and regulations, all provisions of which apply to both graduate assistantships and graduate associateships.

Admission Status

A student must have an unconditional admission status to be eligible to hold a graduate assistantship.

English Proficiency

Before being appointed to an assistantship at U.T. Arlington, a student whose native language is not English must submit an acceptable score on the Test of Spoken English (TSE-A). An applicant who is a non-native speaker of English and who wishes to be considered for an assistantship should take the TSE-A before arriving in the United States and have the score sent to U.T. Arlington. Score reports submitted directly by the student or those marked "Student Copy" or "Applicant's Copy" are not considered official and will not be accepted by the University. Holding of a degree(s) from a U.S. college or university does **not** exempt from this requirement assistantship applicants who are non-native speakers of English. The TSE-A is administered at TOEFL test centers around the world. See the catalog entry titled Documentation and Application Evaluation Charges Required for further information.

Developmental English Program

Students who do not achieve scores on the TSE-A or SPEAK (an institutional version of the TSE which is administered in Counseling and Career Development) sufficiently high enough to satisfy the English proficiency requirements for graduate teaching assistants must enroll in the Developmental English Program and be certified for English proficiency before becoming eligible to hold a teaching assistantship. This 10-week program, offered by the U.T. Arlington English Language Institute, emphasizes oral presentation skills and accent reduction. Registration is in 402 Hammond Hall, and the charge at present is $330, payable at the time of registration. Contact the English Language Institute at 817-272-2730 for details, including the current class schedule and charges.

Continuation or Renewal of Appointment

Although a student may be appointed initially to a graduate assistantship for a full academic year, continuation of the appointment beyond the first semester is subject to the following conditions:

1. The student must be in good standing in the University. A student on academic probation is not in good standing and, therefore, is not eligible to hold an assistantship.
2. The student must be making satisfactory progress toward an advanced degree.
3. The student must have performed assigned assistantship duties satisfactorily in the preceding semester(s) as determined by the department in which the assistantship is held.

A department may limit the number of semesters during which a graduate student may hold an assistantship.

Tuition Rates

Graduate teaching and research assistants employed at least 20 hours per week in positions related to their degree programs are entitled to Texas resident tuition rates. **Eligibility for the resident rate must be certified by the dean of the college in which the assistantship is held prior to registration; otherwise, full tuition will be assessed.**

Non-resident or international students holding less than full assistantships (full = 20 hours employment per week) are not eligible for Texas resident rates.

Course Load

Graduate assistants may register for and must complete no more than 12 semester hours and no fewer than nine semester hours per semester. They may register for no more than 12 semester hours and no fewer than six semester hours for the three summer sessions. Upon written recommendation of the department and approval of the Dean of Graduate Studies, the minimum registration limit may be reduced to six semester hours for students who have completed all coursework, are registered for thesis or dissertation only, and have filed an approved program of work. A load of more than 12 semester hours must be approved in advance by the Dean of Graduate Studies.

Additional Employment

In accepting a graduate assistantship, students agree to devote their efforts to graduate studies and assistantship responsibilities and, therefore, agree to hold no employment above and beyond the assistantship.

In rare circumstances, however, additional employment may be justified. Any graduate assistant wishing to hold employment in an off-campus job or in any University position outside the assistantship appointment is required to file a Request for Approval of Outside Employment, available in the Office of the Dean of Graduate Studies.

A graduate student cannot hold an assistantship or a combination of assistantships or other University positions in excess of one-half time employment (20 hours per week) without permission of the department or program in which the student is enrolled and written approval of the Dean of Graduate Studies.

Assignment of Duties

Graduate assistants are under the direction of the department chair with regard to assistantship responsibilities and assignments.

Student Educational Records Policy

Students may have access to their own educational records during regular office hours by contacting the person or the office that maintains these records. A student may appear in person or make a written request for a copy of the record to be mailed. Another person may not see a student's educational records unless written permission has been given by that student. One exception to that rule allows a parent or guardian who is providing one-half or more of the student's financial support to obtain the educational record. Faculty and staff members of the University have access to student educational records

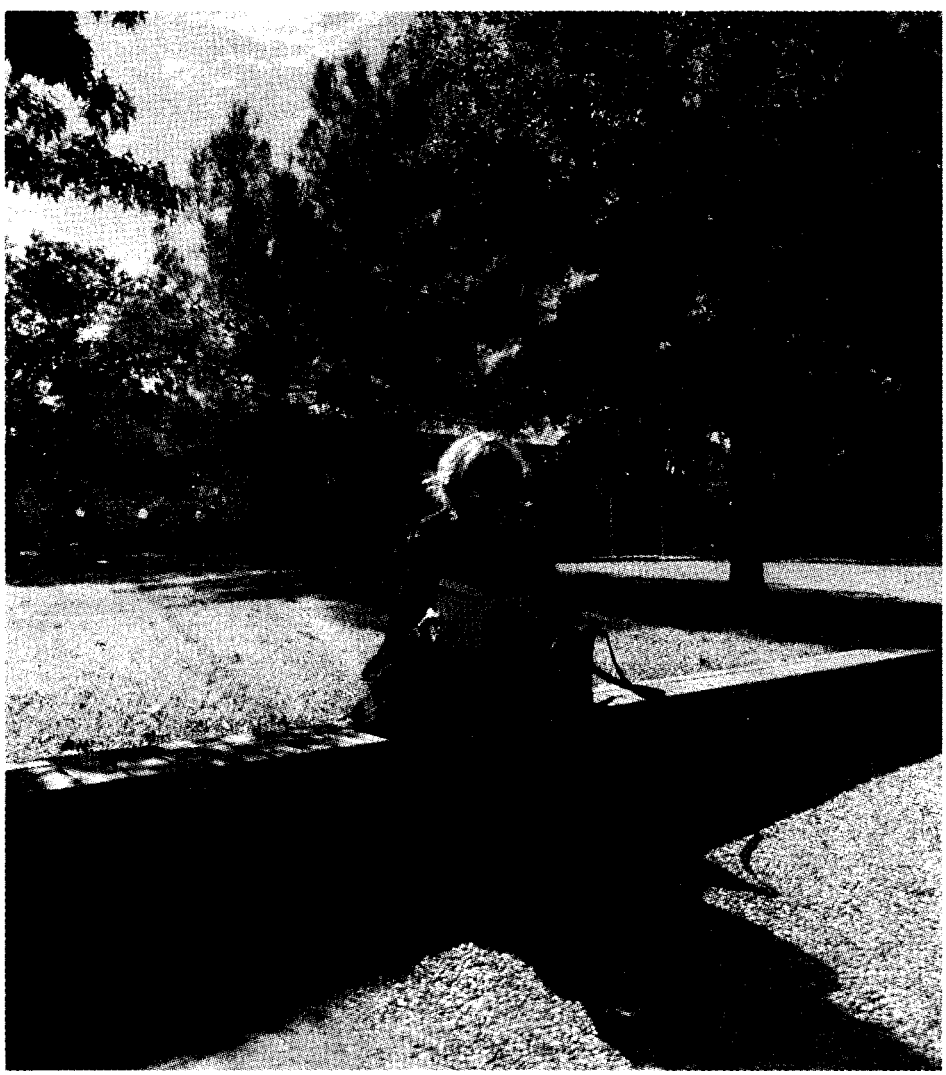
in performance of regular duties. If an educational record contains information on more than one student, then a student desiring access may review only parts pertaining to that student.

Students may have official copies of their U.T. Arlington transcripts mailed to other institutions or may obtain copies for their own use. A student must sign a request form in the Registrar's Office or mail a signed, written request to release the transcript. Requests will not be accepted by telephone or from persons other than the student without that student's written permission.

The "Family Educational Rights and Privacy Act of 1974" provides that a university may release directory-type information about students. The information released may include the following items: the student's name, address, telephone number, date and place of birth, major field of study, participation in officially recognized activities and sports, weight and height if a member of an athletic team, dates of attendance, degrees and awards received, and the last educational institution attended. Each year U.T. Arlington publishes a Student Directory which contains the following information: the student's name, major field of study, address, and telephone number. The Act states that a student has the right to withhold this information from the public and other students. A form requesting the withholding of this information is available in the Registrar's Office; unless this form is completed before the Census Date of the fall semester, these data will be released as public information.

Students have the right to challenge the content of their educational records to insure that their records are not inaccurate, misleading, or in violation of other rights of the students. This allows students an opportunity to correct inaccurate or misleading information, and permits written explanation from students concerning the content of the records. Any evidence regarding an inaccurate or misleading record should be presented to the individual in charge of the office where the record is maintained.

For admission, applicants must submit their Social Security number which serves as the basis for identification of various University records. Usage will vary according to requirements of the office in which the record is located.



Admission Requirements and Procedures

The requirements set forth in the following pages are minimal for admission to the Graduate School. Meeting them does not guarantee acceptance into a departmental degree program because most departments have admission standards more stringent than the minimum. Applications for admission must be made on official forms available upon request from the Office of the Dean of Graduate Studies in Room 333, Davis Hall, or by calling 817-272-2688 or by e-mail to graduate.school@uta.edu. In addition to the minimum requirements, most departments recommend that potential applicants arrange a personal interview with the appropriate Graduate Advisor before applying to the Graduate School.

Official notification of the admission decision is issued by the Office of the Dean of Graduate Studies and is sent by the Graduate School directly to the applicant. While information received from the graduate program to which an individual has applied may be important and useful, such information does not constitute official notice of admission into Graduate School or into a graduate program at The University of Texas at Arlington.

This catalog is a general information publication only. It is not intended to nor does it contain all regulations that relate to students. The provisions of this catalog do not constitute a contract, express or implied, between any applicant, student, or faculty member and The University of Texas at Arlington Graduate School or The University of Texas System. The University reserves the right to withdraw courses at any time, change fees, rules, calendar, curriculum, degree programs, degree requirements, graduation procedures, and any other requirements affecting students. Changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

Students are held individually responsible for complying with all requirements of the rules and regulations of the University and the Board of Regents of The University of Texas System. Failure to read and comply with policies, regulations, and procedures will not exempt a student from whatever penalties the student may incur.

Admission of United States Students

Admission into the Graduate School requires: (1) A bachelor's degree from an accredited college or university with a satisfactory grade-point average; (2) satisfactory academic standing at the last institution attended; (3) an acceptable and current score on the aptitude tests of the Graduate Record Examination or the Graduate Management Admission Test, as specified by the department or program to which application is being made; (4) demonstration through previous academic performance of the potential for graduate work in the chosen field; (5) acceptance into a departmental program. Some departments may have additional requirements such as a minimum score on the subject portion of the Graduate Record Examination or an additional examination such as the Miller Analogies Test; see the departmental requirements for this information.

An applicant holding a degree or degrees from a university in the U.S. should file an application form (available from the Graduate School) and the following credentials at least 90 days prior to the beginning of the semester or summer session in which the student plans to register: (1) Official transcripts (as defined in the section entitled "Official Transcripts, Records and Test Scores") of all undergraduate and graduate college work previously taken (an applicant who has attended U.T. Arlington previously within five years as an undergraduate or special student must submit in person or by mail a request to the U.T. Arlington Registrar to forward to the Graduate School copies of all previous college transcripts on file in the Registrar's Office); (2) scores on the aptitude tests of the Graduate Record Examination, or Graduate Management Admission Test if required in place of the GRE; (3) three letters of recommendation completed according to the instructions accompanying the official application form; and (4) a nonrefundable application evaluation fee of $25 submitted with the original application. *Without exception, this fee must be received before processing of admission materials can begin.

Some graduate programs may set deadlines for admission or consideration of applicants for graduate assistantships that are earlier than general deadlines established by the Graduate School. In particular, the School of Social Work has set March 15 as the deadline for considering new applicants for the following fall semester. New applicants to Social Work are considered only for admission to fall semesters. For any other potential deadlines, individual graduate programs should be consulted.

* U.S. applicants who have enrolled in academic institutions outside the United States are required to pay the international application evaluation charge of $50 (U.S.).

Calculation of the Grade Point Average for Admission Purposes

The grade point average for admission to the Graduate School at The University of Texas at Arlington will be calculated according to Texas state law and the policies and procedures of the Graduate School. Calculation of the grade point average for admission purposes will be based on the last two years of courses used to satisfy bachelor's degree requirements, on a 4.0 scale. This means that the last (approximately) 60 hours of the bachelor's degree will be used in the grade point calculation.

The following will **not** be included in grade point calculation:

1. Courses completed at junior or community colleges
2. Courses completed by examination or correspondence
3. Incomplete grades or withdrawals
4. Pluses and minuses
5. Personal improvement courses such as private music lessons or activity courses in physical education
6. Graduate courses or any courses completed in graduate student status
7. Courses in which the grade is a P, Pass, Credit, Satisfactory or other such designation

Quarter hours will be converted to semester hours. Ninety quarter hours equal 60 semester hours.

In cases in which an applicant has repeated courses, the grade point calculation will include all grades earned in the course.

An applicant may have undergraduate courses taken subsequent

to completion of the bachelor's degree considered in the grade point calculation by making a written request to the Graduate School at the time the application for admission is submitted.

For an applicant who applies pending receipt of the bachelor's degree, the grade point calculation will include all senior college and university work completed to date. The grade point average will not be recalculated upon receipt of the degree.

International applicants and others with degrees earned outside the United States should see the grade point calculation information under Admission of International Students and Resident Aliens.

Admission of International Students and Resident Aliens

An applicant who is not a U.S. citizen or who does not hold a bachelor's degree from an accredited U.S. college or university must provide at least 120 days prior to the beginning of the semester or summer session in which he/she plans to register the following: (1) A complete and accurate listing in chronological order of all previous college-level work; (2) authorized school or university records including transcripts, rating sheets, and certificates of degrees or diplomas showing all courses taken and all grades received; (3) a degree equivalent to a U.S. bachelor's degree from an accredited college or university, with a satisfactory grade-point average; (4) an acceptable and current score on the aptitude tests of the Graduate Record Examination or Graduate Management Admission Test, as specified by the department or program to which application is being made; (5) if a student's native language is not English and the student does not hold a bachelor's or master's degree from an accredited U.S. institution, an acceptable score (at least 550) on the Test of English as a Foreign Language (TOEFL) or an acceptable score on the Test of Spoken English (TSE-A); (The University of Texas at Arlington subscribes to the TOEFL Examinee Identification Service); (6) acceptance into a department or program; (7) certification on an official Graduate School Financial Statement form (available from Graduate School Admissions) that students have adequate funds to finance their graduate studies; (8) an affidavit supporting the Financial Statement completed by parents, guardian, financial sponsor or bank and submitted with the Financial Statement; and (9) an application evaluation charge of $50 (U.S.) submitted with the original application. The application evaluation charge must be in the form of an International Money Order made payable in U.S. dollars to The University of Texas at Arlington. This evaluation charge is required and is not refundable.

International applicants should consult the section on "Registration and Orientation for International Students" in this catalog and the International Student Advisor in the U.T. Arlington International Office for registration regulations.

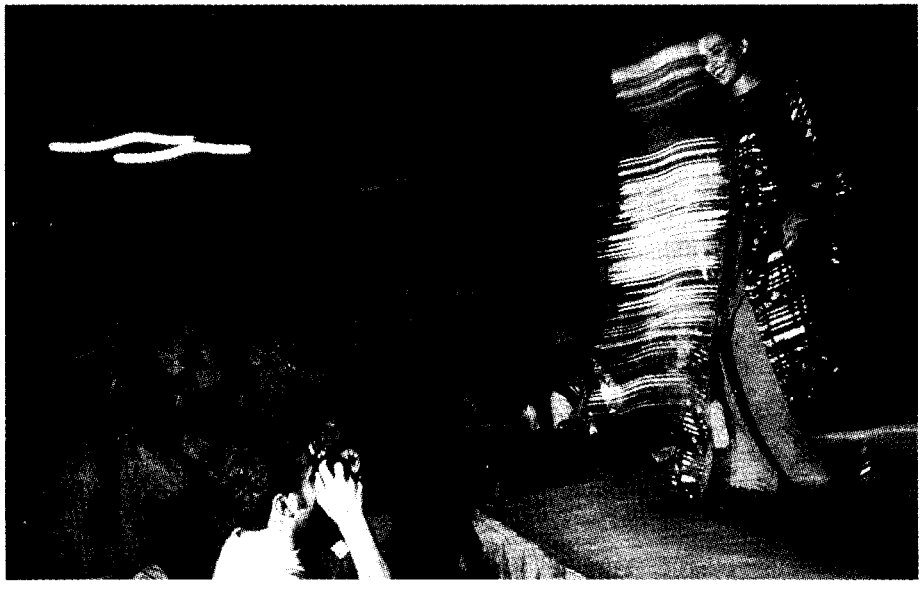
Calculation of the Grade Point Average for Admission Purposes

The calculation of the grade point average for international applicants and resident aliens with degrees earned from U.S. colleges and universities will follow the policies and procedures for U.S. applicants described earlier in this session.

The diversity of transcripts, marksheets and other educational records from foreign universities requires flexibility in calculating equivalent U.S. grade point averages. Generally, however, the grade point average for most applicants with degrees from outside the U.S. will be an estimated comprehensive calculation based on all college or university courses used to satisfy a U.S. bachelor's degree equivalency, based on a 4.0 scale. When an applicant has repeated courses, the estimated comprehensive grade point calculation will include all grades earned in the courses.

The following will **not** be included in the estimated comprehensive grade point calculation:

1. Pluses and minuses
2. Personal improvement courses such as activity courses in physical education
3. Graduate courses



Readmission

A student previously enrolled in The University of Texas at Arlington Graduate School who wishes to resume graduate work after an absence of a Fall or Spring semester or longer (summer excluded) should file in the Graduate School an application for readmission at least 40 days before the beginning of registration for the semester in which he/she wishes to resume graduate work. If the student has taken any courses at another institution during concurrent enrollment at The University of Texas at Arlington or during the time the student was not enrolled in the Graduate School, official transcripts showing all such courses must be submitted to the Graduate School. Former students wishing to change their graduate major or program upon readmission should consult the section entitled "Change of Graduate Major or Program" in this catalog.

Documentation and Application Evaluation Charges Required

Graduate Record Examination (GRE)

An applicant for admission to The University of Texas at Arlington Graduate School is required to submit scores on the aptitude tests of the Graduate Record Examination unless the Graduate Management Admission Test is required in place of or as a substitution for the GRE (see below). Some programs also may require a score on the GRE subject test in the major field; this requirement, if applicable, is stated under the individual departmental or program requirements included in this catalog.

Information bulletins and test application forms can be obtained from Educational Testing Service, Box 955, Princeton, New Jersey 08541 U.S.A. or from the Office of Counseling and Career Development of The University of Texas at Arlington. The GRE General Test may be taken in paper-and-pencil administrations or computer-based administrations. The paper-and-pencil version, which is being phased out, is administered two times a year in April and December. The GRE Subject Tests are administered three times a year in October, December, and April. Year-round computer-based testing is available in Arlington and at over 200 test centers in the U.S. The University of Texas at Arlington is an approved paper-and-pencil version testing center. Applications must be received by Educational Testing Service approximately one month in advance of each test; therefore, an applicant should secure the information bulletin and application form at least six weeks in advance. A minimum of six weeks should be allowed for examination results to reach the University. ETS retains GRE scores through September 30 following the fifth anniversary of the test date. Although scores up to five years old may be available, some programs may not accept scores more than two years old.

By 1999, the GRE is expected to be available in computer-based administrations only.

Graduate Management Admission Test (GMAT)

The Graduate Management Admission Test score is required for admission to graduate work in the College of Business Administration. An exception to this requirement is the graduate program in Economics, which accepts the GRE as well as the GMAT. Information bulletins and test application forms can be obtained from Educational Testing Service, Box 966, Princeton, New Jersey 08541 U.S.A. or from the Office of Counseling and Career Development at The University of Texas at Arlington.

Applicants must take the Computer-Adaptive Graduate Management Admission Test (GMAT CAT) unless they are testing on one of the countries where the computer-based testing site network is incomplete. In the United States, U.S. Territories, Puerto Rico and Canada, the GMAT CAT must be taken. The GMAT CAT is offered three weeks per month, six days per week throughout the year at one of approximately 400 computer-based testing centers in North America and selected international cities. Students registering in the United States, U.S. Territories, Puerto Rico or Canada may register by telephone (1-800-GMAT-NOW) if using a credit card. If paying by check or money order, students may register by mail by completing sections I and III of the Registration/CBT Voucher Request Form in the GMAT Information Bulletin.

For more information on the GMAT CAT, access the GMAT web site at www.gmat.org.

Test of English as a Foreign Language (TOEFL) and Test of Spoken English (TSE)

An applicant whose native language is not English must submit a score of at least 550 on the Test of English as a Foreign Language (TOEFL) or an equivalent score on the computer-based test, or an acceptable score on the Test of Spoken English (TSE-A). The graduate program in Biology requires a minimum score of 40 on the TSE. Official TOEFL scores more than two years old are not released by the Educational Testing Service; therefore, an applicant who has taken the TOEFL more than two years before the semester for which the applicant is applying must retake it. TOEFL score reports bearing the designation "Applicant's Copy" are not considered official scores for admission purposes. An applicant holding either a bachelor's or a master's degree from an accredited U.S. college or university is not required to submit a TOEFL score. Any other waivers of the TOEFL score requirement must be recommended by the applicant's Graduate Advisor and approved by the Dean of Graduate Studies. The Test of Spoken English (TSE-A) can be substituted for the TOEFL. The TOEFL and the TSE-A are administered at various centers in the United States and abroad several times each year.

In July 1998, Educational Testing Service will introduce computerized testing for TOEFL examinees in the United States, Canada, Latin America, Europe, the Middle East, Africa, Australia and selected countries in Asia. Additional countries will be phased in during the next three years. The computerized test will completely replace the current paper test by the year 2001.

Before being appointed to an assistantship at U.T. Arlington, a student whose native language is not English must submit an acceptable score (45 or higher) on the Test of Spoken English-A (TSE-A). An applicant who is a non-native speaker of English and who may wish to be considered for an assistantship should take the TSE-A before arriving in the United States and have the score sent to U.T. Arlington. Score reports submitted directly by the student or those marked "Student Copy" or "Applicant's Copy" are not considered official and will not be accepted by the University. The holding of a degree(s) from a U.S. college or university does NOT exempt from this requirement assistantship applicants who are non-native speakers of English. The TSE is administered at TOEFL test centers around the world. Applicants should register for TSE-A (for teaching and research assistant applicants). Note: If the TSE-A is taken and an acceptable score is achieved, the TOEFL is not required.

The SPEAK examination is offered on the U.T. Arlington campus at various times during the year. A satisfactory score on this examination may be used for the Test of Spoken English-A (TSE-A) requirement. This examination may be taken in cases in which the student has come to U.T. Arlington without having taken the TSE-A and subsequently wishes to be considered for a graduate assistantship. Cost and time necessary for scoring the SPEAK examination are comparable to those for the TSE-A. The Office of Counseling and Career Development should be contacted for administration dates and other details.

Application forms and information bulletins for the TOEFL and the TSE-A may be obtained from the Educational Testing Service, Box 899, Princeton, New Jersey 08541 U.S.A., from American embassies and consulates and offices of the United States Information Service, and from the Office of Counseling and Career Development at The University of Texas at Arlington. The application procedure is similar to that previously described for the GRE.

Developmental English Program

Students who do not achieve scores on the TSE-A or SPEAK sufficiently high enough to satisfy the English proficiency requirements for graduate teaching assistants must enroll in the Developmental English Program and be certified for English proficiency. This 10-week program offered by the U.T. Arlington English Language Institute emphasizes accent reduction and oral presentation skills needed by teaching assistants. Registration is in 402 Hammond Hall, and the charge at present is $330, payable at the time of registration. Contact the English Language Institute at 817-272-2730 for details including current class schedule and charges.

Other Admission Tests

Other tests, such as the Miller Analogies Test (MAT) and the Test of Spoken English (TSE), may be required in addition to the GRE, GMAT, or TOEFL for admission to certain graduate programs. Individual departmental and program descriptions should be consulted for this information.

Official Transcripts, Records and Test Scores

A Graduate School admission decision cannot be rendered until official transcripts and/or university marksheets of all previous college work are received. U.S. transcripts, transcripts from outside the U.S. or university marksheets that meet the criteria described below will be considered official by the Graduate School for admission purposes. Documents that do not meet the criteria described below will be considered unofficial and may prevent or cause delays in processing.

1. **U.S. Transcripts**—Official transcripts from U.S. institutions are those mailed directly to the Graduate School by the Registrar or responsible head of the institution at which the work was attempted or completed. Uncertified or notarized copies of transcripts or hand-delivered transcripts or copies received from a third party, regardless of the origin, are not official.
2. **Transcripts from Outside the U.S.**—Transcripts from institutions outside the U.S. are considered official when bearing the original seal of the institution and the original signature of the Registrar or responsible head of the institution. Uncertified or notarized copies of transcripts or copies received from a third party, regardless of the origin, are not acceptable.
3. **University Marksheets from Outside the U.S.**—A complete educational record detailing all post-high school level work must be received. This record must be in the form of consolidated marksheets specifying the number of attempts required to pass each course or individual semester, annual and supplemental marksheets. Each consolidated or individual marksheet must contain the following information: (a) name of each course attempted and/or passed; (b) semester date or year date each course was attempted and/or passed; (c) grades/marks received for each course attempted and/or passed.

   Documentation verifying the award of each degree received is required. This verification must be in the form of a diploma or degree certificate stating date degree was awarded, exact title of degree awarded and name of university conferring the degree. This diploma or degree certificate must be imprinted with the university/college seal and be signed by the Registrar, Controller of Exams or other similarly designated official at the institution at which the work was completed.

   All marksheets, diploma and degree certificates must be official documents. To be considered official, each marksheet, diploma and degree certificate must be an original document or a photocopy bearing the university/college seal and the signature of the Registrar, Controller of Exams or other similarly designated official of the institution at which the work or degree was completed. Notarized copies, fax copies or copies attested by institutions other than the one at which the work or degree was attempted or completed are not official.
4. **Test Score Reports**—Official test score reports for the Graduate Record Examination, Graduate Management Admission Test, Test of English as a Foreign Language and Test of Spoken English are those issued by the Educational Testing Service (ETS) and sent by ETS directly to the Graduate School.

   Uncertified or notarized copies of academic records, including test scores, and copies of records or test scores bearing the designation "student copy," "issued to student," "applicant's copy," "unofficial copy" or similar designations are not official.

Retention of Application Records

All application materials become property of The University of Texas at Arlington and cannot be returned. Completed applications, transcripts, test scores, and all application records for applicants who do not register in the semester for which they applied are retained by the Graduate School for one year. An applicant failing to enroll in the semester for which the applicant applied may request an "update" form from the Graduate School entitled "Request to Change Admission Date" for use within one calendar year from the registration date for which the applicant initially applied. Please see the section below on the "International Application Evaluation Charge" for information on charges for re-evaluation of records of international students.

U.S. Application Evaluation Charge

A non-refundable evaluation charge of $25 is required of all applicants eligible to be considered as U.S. applicants. This payment must be received before processing of admission materials can begin. **There are no exceptions to this policy.** An applicant failing to enroll in the semester for which the applicant applied may request without

additional charge to change the admission date as previously described within one calendar year from the registration date for which the applicant originally applied.

International Application Evaluation Charge

All international applicants and all applicants who have attended graduate or undergraduate academic institutions outside the United States are required to pay a non-refundable International Application Evaluation Charge of $50 (U.S.).

After applicants have received an initial evaluation, their applications can be re-evaluated one additional time for the purpose of changing the admission date or program. Request for further changes in admission date or program will require payment of a second non-refundable Evaluation Charge of $50 (U.S.). Each repayment of the Evaluation Charge entitles the applicant to two application re-evaluations.

Academic Fresh Start

Undergraduate Programs

Applicants for undergraduate admission who are Texas residents may seek to enter U.T. Arlington under provisions of the "academic fresh start" statute, Section 51.931 of the *Texas Education Code*. When applicants inform U.T. Arlington admissions officials in writing of their decision, U.T. Arlington will not consider in the admissions decision any academic course credits or grades earned by the applicant 10 or more years prior to the starting date of the semester in which the applicant seeks to enroll. Applicants who decide to apply under this statute may not receive any course credit for courses taken 10 or more years prior to enrollment under academic fresh start.

Postgraduate/Professional Programs

Applicants who have earned baccalaureate degrees under the "academic fresh start" statute, Section 51.931 of the *Texas Education Code*, and apply for admission to a postgraduate or professional program will be evaluated on only the grade point average of the course of work completed for that baccalaureate degree and the other criteria stated herein for admission to the postgraduate or professional program.

Types of Admission

After an applicant's credentials have been evaluated by the Graduate Advisor in the applicant's major area and by the Dean of Graduate Studies, the applicant will be notified by letter from the Dean of Graduate Studies of: (1) Acceptance under one of the categories of admission listed below; (2) denial of application; or (3) deferral for reasons listed in the notice. An acceptance letter will be issued by the Dean of Graduate Studies stating conditions for admission and period of validity of the acceptance. Applicants who have not received an admission notification one week prior to the beginning of classes for the semester for which admission is sought should contact the Graduate School for information concerning the status of their application.

Unconditional Admission

An applicant who meets all requirements is normally granted unconditional admission.

Probationary Admission

An applicant who does not meet all admission requirements nevertheless may show promise for successful graduate study and, upon the recommendation of the appropriate Committee on Graduate Studies and approval of the Dean of Graduate Studies may be granted probationary admission. Special course requirements or other conditions may be imposed by the Committee on Graduate Studies in the student's major area and/or the Dean of Graduate Studies. A student in probationary status may not hold an assistantship or be admitted to candidacy for any graduate degree.

Provisional Admission

An applicant unable to supply all required documentation prior to the admission deadline, but who otherwise appears to meet admission requirements may, upon the recommendation of the appropriate Committee on Graduate Studies and approval of the Dean of Graduate Studies, be granted provisional admission. Complete and satisfactory credentials must be received by the Graduate School before the end of the semester in which the student has registered in a provisional status. **A student will not be permitted to enroll in the Graduate School with a provisional status for more than one semester.** Provisional admission does not guarantee subsequent admission on an unconditional basis. A student admitted on a provisional basis may not hold an assistantship until unconditional admission status has been achieved. International applicants residing outside of the United States at the time of application may not be admitted on a provisional basis.

Special Students

A person who wishes to take graduate courses at The University of Texas at Arlington but who does not plan to pursue a graduate degree program may be admitted as a special student with approval of the Dean of Graduate Studies and concurrence of the Committee on Graduate Studies in the area in which the applicant wishes to study. In most cases, admission as a special student will be granted only for the purpose of participating in special graduate course offerings, or for taking courses to be transferred to another institution. Under normal circumstances, a student who has been denied admission to, or dismissed from the Graduate School will not be permitted to enroll as a special student.

An applicant for special student admission must submit a completed "Special Student Application" form, available from the Graduate School, and official transcripts of previous college work showing evidence of an undergraduate degree and, if applicable, a graduate degree. Special student admission status is granted for the semester for which the application is submitted. Further enrollment as a special student must be approved on a semester-by-semester basis. Special students may not hold graduate assistantships or enroll in research, thesis, internship, or dissertation courses.

A former or currently enrolled special student who wants to apply for admission to a graduate degree program must submit a regular Graduate School Application for Admission form and all supporting documents as listed in this catalog under the section "Admission Procedures, New Students." Admission as a special student in no way guarantees subsequent unconditional admission into a graduate program or into the Graduate School. Credit earned as a special student may be applied to a degree program only with approval of

the appropriate Committee on Graduate Studies and the Dean of Graduate Studies; however, no more than nine semester hours of work earned as a special student may be applied to a graduate degree at The University of Texas at Arlington, and only grades of A and B may be so applied, although a grade in any course taken as a special student will be considered in computing a student's graduate grade-point average.

Deferred Admission

If an applicant does not present adequate evidence of meeting admission requirements, the admission decision may be deferred until records are complete. The applicant will be sent an Admission Deferral Notice specifying the data that must be provided or the work that must be completed before the application will be reconsidered. The application may be reactivated within one calendar year from the date for which the original application was submitted by returning the Request to Reactivate Application that accompanied the Admission Deferral Notice. International students should consult the section on International Application Evaluation Charge for charges for re-evaluation of application records.

Denied Admission

Applicants denied admission to Graduate School may not take or reserve graduate courses for graduate credit. Applicants may re-apply for admission if the deficiencies in credentials which led to denial are remedied satisfactorily. Applicants denied admission may ask the Graduate Advisor in the program to which they applied or ask the Graduate School about the deficiencies that led to the denial.

Graduate English Skills Program

The Graduate English Skills Program comprises an intensive English course designed for international students who have been accepted to the U.T. Arlington Graduate School **provisionally** because of low verbal admission scores.

The program focuses on improving English language skills in the areas of academic writing, reading/research skills, note taking from academic lectures, accent reduction and oral presentations. Instruction includes technological support materials and the access and use of e-mail and the Internet in all skill areas.

International students must receive a provisional admission from the Graduate School at U.T. Arlington and permission from their graduate departments to enroll in the Graduate English Skills Program to remove their English deficiencies.

Students who receive permission to enroll in the program are tested in writing, reading, speaking and listening. Based on the outcome of placement tests, the English Language Institute will recommend to the graduate departments the areas where each student needs improvement. A student may be required to take no further English or as little as one skill area up to a maximum of three skill areas (four hours) per day. Students studying less than four hours of English per day may be allowed by their department to enroll in some graduate courses as well.

At the end of a semester, students take exit exams. Based on the outcome of the exam and the student's work during the semester, the program coordinator will recommend to the graduate department that the student enroll for all graduate courses or continue studying English. Most students complete their English requirements in a semester. A full tuition for the Graduate English Skills Program is $2,200 per semester ($1,500 in summer). Tuition also may be scaled to two-thirds or one-third if less than a full program is taken.

For more information, contact Deborah Johnson-Evans, Program Coordinator at the English Language Institute, Box 19560, Arlington, TX 76019. Phone: 817-272-6014. Fax: 817-272-2731. E-mail: djohnson@eli.uta.edu.

Graduate Student Advisement

After being admitted, students should confer (preferably in person) with the Graduate Advisor of their major area to become familiar with specific departmental regulations, particularly those that require additional examinations upon entrance. After receiving registration materials, students should consult with the Graduate Advisor in the major area at the time and place indicated in the registration instructions regarding details of registration, course program and other procedures. It is important that a student wishing to take courses for graduate credit consult the appropriate Graduate Advisor before registering, as each student's program of work must be approved by the Graduate Advisor, the Committee on Graduate Studies, the student's supervising committee and the Dean of Graduate Studies. Failure to consult with the Graduate Advisor could result in the student's enrolling for courses which are not applicable toward meeting graduate degree requirements.

Registration Schedule

Students should be familiar with all dates on the Graduate School calendars printed on the inside covers of this catalog. Specific registration instructions are published by the Registrar several times each year and should be consulted for procedures, dates and deadlines.

Restrictions on Admission

General Restriction

U.T. Arlington may limit the number of students accepted in some programs if the number of applicants exceeds capacity of available facilities.

Faculty Members

Members of the U.T. Arlington faculty holding an appointment at the rank of instructor or above may not pursue a graduate degree at the University.

Tuition and Fees

Tuition and fees are subject to change by legislative action. Changes in tuition or fees will be effective upon date of enactment and will be reflected in fees and tuition charged.

Regular Sessions and 11-Week Summer Session (estimated fees)

The tuition and mandatory fees given below include the following "per credit hour" fees: $72 per hour Tuition in 1998-99 ($120 minimum tuition, plus $36 per semester credit hour designated tuition), Non-Resident Tuition of $285 per hour in 1998-99, Graduate Tuition Differential of $36 per hour Resident and $46 per hour Non-Resident for 1998-99, $12.13 per hour Student Service Fee ($145.56 maximum), $3 per hour Library Service Fee, $6 per hour Computer and Information Technology Fee, and the following "per semester" fees: $39 Student Union Fee, $28 Medical Service Fee, $8 MavExpress Card Fee, $5 Registration Fee, $1 International Studies Fee.

Semester Hours	Texas Residents (Valid 98-99)	Non-Texas Residents (Valid 98-99)
1	$ 258.13	$ 433.13
2	339.26	785.26
3	468.39	1137.39
4	597.52	1489.52
5	726.65	1841.65
6	855.78	2193.78
7	984.91	2545.91
8	1114.04	2898.04
9	1243.17	3250.17
10	1372.30	3602.30
11	1501.43	3954.43
12	1630.56	4306.56
13	1747.56	4646.56
14	1864.56	4986.56
15	1981.56	5326.56
16	2098.56	5666.56
17	2215.56	6006.56
18	2332.56	6346.56
19	2449.56	6686.56
20	2566.56	7026.56
21	2683.56	7366.56
Each Additional Hour	117.00	340.00

5-Week Summer Sessions (estimated fees)

The tuition and mandatory fees given below include the following "per credit hour" fees: $72 per hour Tuition in 1998-99 ($60 minimum tuition, plus $36 per semester credit hour designated tuition), Non-Resident Tuition of $285 per hour in 1998-99, Graduate Tuition Differential of $36 per hour Resident and $46 per hour Non-Resident for 1998-99, $12.13 per hour Student Service Fee ($72.78 maximum), $3 per hour Library Service Fee, $6 per hour Computer and Information Technology Fee, and the following "per semester" fees: $19.50 Student Union Fee, $14 Medical Service Fee, $4 MavExpress Card Fee, $5 Registration Fee, $1 International Studies Fee.

Semester Hours	Texas Residents (Valid 98-99)	Non-Texas Residents (Valid 98-99)
1	$ 172.63	$ 395.63
2	301.76	747.76
3	430.89	1099.89
4	560.02	1452.02
5	689.15	1804.15
6	818.28	2156.28
7	935.28	2496.28
8	1052.28	2836.28
9	1169.28	3176.28
Each Additional Hour	117.00	340.00

Tuition Exceptions

State law provides for several exceptions to tuition rates. Students qualified for a reduced rate in any of the following categories must have that eligibility certified prior to registration.

1. Professors employed at least one-half time and teaching/research assistants and associates employed at least one-half time in positions which relate to their degree programs, as well as their spouses and children, will be charged the same rate as a Texas resident.
2. Holders of certain competitive scholarships in the amount of $1,000 per year or more awarded through The University of Texas at Arlington scholarship committee will be charged the same rate as a Texas resident.
3. Non-Texas residents may be eligible for tuition exception as described under the Academic Common Market entry in this Tuition and Fees section.
4. Section 54.203 of the *Texas Education Code* provides an exemption from tuition and some fees. Texas veterans may qualify for this exemption provided they:
   a. Had Texas resident status at the time they entered the service and are currently on Texas resident status for tuition assessment
   b. Had active military duty (excluding training) for more than 180 days during specified periods of the Cold War; the Vietnam, Grenada, Lebanon and Panama eras; and the Persian Gulf War
   c. Are honorably discharged from active service
   d. Are not eligible for Pell Grant, SEOG (Supplemental Education Opportunity Grant), or Veterans Educational Benefits under federal legislation which exceed the value of the exemption
5. Section 54.204 of the *Texas Education Code* provides an exemption from tuition for children of certain disabled firefighters and peace officers. To qualify for this exemption, the applicant must:
   a. Be a child of a disabled (1) full-paid or volunteer firefighter; or (2) full-paid municipal, county, or state peace officer or custodian of the Department of Corrections or game warden
   b. Be under 21 years of age
6. An exemption from tuition and some fees is provided for Texas residents who are blind or whose sense of hearing is nonfunctional as provided under Section 54.205 of the *Texas Education Code.*
7. Students under 25 years of age who receive a majority of support from a parent who has been classified by the Defense Department as a prisoner of war or missing in action at the time of their registration may be exempt from tuition and some fees as provided by Section 54.209 of the *Texas Education Code.*
8. Individuals or a member of a family who have located to Texas as an employee of a business or organization that became established in this state as part of the program of state economic development and diversification will be charged the same tuition rate as a Texas student if such individual meets the terms and conditions set forth in Section 54.052(h) of the *Texas Education Code.*
9. Children of members of the armed forces who were killed in action, who died while in service, who are missing in action, and whose death is documented to be directly caused by illness or injury in connection with service in the armed forces in World War II, the Korean Conflict, or the Cold War, and orphans of the Texas National Guard killed since January 1, 1946, while on active duty may be exempt from tuition and some fees.
10. Certain students who were in foster or other residential care or who were dependent children receiving AFDC during their last year of public high school in Texas may be exempt from payment of tuition and fees if they meet the terms and conditions set forth under Sections 54.211 and 54.212 of the *Texas Education Code.*
11. Senior citizens (persons age 65 or older) may enroll on a space available basis for up to six credit hours per semester without payment of tuition as provided in Section 54.210 of the *Texas Education Code.*
12. Eligible educational aides may be exempt from payment of tuition and fees, other than class or laboratory fees, if they meet the terms and conditions set forth under Section 54.214 of the *Texas Education Code.*
13. Disabled peace officers may be exempt from payment of tuition and required fees for courses for which space is available if they meet the terms and conditions set forth under Section 54.2041 of the *Texas Education Code.*
14. An officer, enlisted person, selectee or draftee of the Army Reserve, Army National Guard, Air National Guard, Air Force, Air Force Reserve, Navy, Navy Reserve, Marine Corps, Marine Corps Reserve, Coast Guard or Coast Guard Reserve of the United States, who is assigned to active duty in Texas, and the spouse and children of such an officer, enlisted person, selectee or draftee, may be eligible to pay tuition and fees required of Texas residents if they meet the terms and conditions set forth under Section 54.058 of the *Texas Education Code.*

In Absentia Registration Fee

A candidate for a degree who has completed all requirements for graduation by the last date to qualify for in absentia registration (see Graduate School calendars inside covers) and who needs to register in the University for the sole purpose of having a degree conferred may register in absentia with permission of the Graduate Advisor and the Dean of Graduate Studies. To obtain permission, the student should file a Request to Register In Absentia. A student registered in absentia may not enroll for courses. The in absentia registration fee is $15; no refund is made for the cancellation of an in absentia registration. In addition to paying the cost of in absentia registration, the candidate must file an application for graduation and pay the diploma fee for the semester of graduation.

Installment Tuition and Fee Program

For fall and spring terms, students may elect to use the Installment Tuition and Fee Program to pay for part of their tuition and fees. A $10 service charge which covers the cost of handling will be assessed each student who makes this choice. All scholarships, grants and other loans will be applied to tuition and fees due before an installment tuition payment is calculated. Students can choose this option at time of registration.

An initial payment of 1/2 of all registration fees must be paid prior to the first class day. One-half of the remaining balance will be due October 1 (Fall)/March 1 (Spring) and the final payment will be

due November 1 (Fall)/April 1 (Spring). **A student who fails to make full payment of tuition and fees, including any incidental fees, by the due date may be prohibited from registering for classes until full payment is made. A student who fails to make payment prior to the end of the semester may be denied credit for the work done that semester.** For further information, contact Bursar Services, Box 19649, Arlington, TX 76019, 817-272-2172, in Room 130, Davis Hall.

Concurrent Enrollment

University of Texas Components

A student concurrently enrolling at two or more of the three University of Texas North Texas components (U.T. Arlington, U.T. Dallas, and U.T. Southwestern) may register and pay tuition and fees for all courses through the student's home campus. Detailed procedures may be obtained from the Registrar of the student's home campus. The concurrent enrollment agreement and waiver of specified fees applies only to students following the concurrent enrollment procedures specified by the Registrar of the home campus.

The charges for the following will be assessed and collected at the home institution for the other institution:

1. Tuition at an appropriate rate
2. Applicable laboratory fees
3. General Use Fee at the appropriate rate for courses taken at U.T. Arlington and U.T. Dallas
4. Any other fees that are required at the host institution that are not charged at the home institution

Student services at the second institution will be made available to concurrently enrolled students paying the appropriate student services fees at the second institution.

The three North Texas institutions have a reciprocal agreement for honoring parking permits. Details may be obtained from the police office of the home campus.

Concurrently enrolled students should report any problems concerning registration, payment of fees, or other matters related to concurrent enrollment procedures to the Registrar of the home institution.

Other Public Institutions of Higher Education

When a student registers at more than one public institution in Texas, the student shall pay the full tuition charges to the first institution at which the student is registered. A student who is first registered at another institution must present a copy of the fee receipt from that institution when registering at U.T. Arlington. Any reduction in tuition per the schedule below will be refunded to the student approximately one month after the beginning of the semester.

1. If the minimum tuition at the first institution is the same as or greater than the U.T. Arlington minimum, the amount charged for tuition will be at the U.T. Arlington hourly rate.
2. If the minimum tuition at the first institution is lower than the U.T. Arlington minimum, the amount charged for tuition will include the difference in the minimum charges; in no case will the amount charged for tuition be less than the U.T. Arlington hourly rate.
3. All other applicable fees will be charged.

Required Fees

Required fees are charged to all students and may be based on semester credit hours or a set charge per semester.

1. Graduate Resident Tuition: $108 combined tuition ($72/sch) and designated tuition ($36/sch)
2. Graduate Non-Resident Tuition: $331 combined tuition ($295/sch) and designated tuition ($36/sch). Includes $10 Graduate Programs Enhancement Fee paid by all non-resident graduate students.
3. Registration Fee: $5 per semester to offset the cost of registration
4. Student Services Fee: $12.13 per semester credit hour ($145.56 maximum) to fund student-related services such as recreational activities, student government and organizations, transportation services, student publications, intercollegiate athletics and others
5. Student Union Fee: $39 per semester for finance, construction, operation and maintenance of the student union building and its programs
6. Medical Services Fee: $28 per semester for providing medical services to students
7. International Education Fee: $1 per semester for an international education financial aid fund
8. Computer Information and Technology Fee: $6 per semester credit hour to provide for the development of campus computer and network facilities for academic programs
9. ID Card Fee: $8 per semester for activation of a University ID card
10. Library Service Fee: $3 per semester credit hour for the enhancement of library collections and services

Incidental Fees

Incidental fees are charged for specific services such as late registration and library fines and may include special course fees, application processing fees and others as approved by the governing board.

1. Audit Fee: $20 for enrolled U.T. Arlington Students, $100 for non-enrolled students to defray administrative costs incurred in registering non-credit participants in scheduled classes
2. Course Fees: variable per course to defray costs of course materials in various departments
   a. Architecture Course Fee: $20
   b. Art Course Fees
      - Video Fee: $75
      - Slide Library Fee: $8
      - Studio Art Fee: $25-$75
   c. Communication Course Fee: $25
   d. Field Placement Insurance Fee
      - School of Social Work: $15.50/course
      - School of Nursing: $61/year
   e. Field Trip Fee: varies based on actual cost
   f. Instrument Users Fee: $10-$55
   g. Multimedia Fee (College of Business Administration): $3
3. Delinquent Accounts Receivable Fee: $10 per month (maximum $30 per semester on balances greater than $50) to defray costs of maintaining a unified delinquent accounts system for installment tuition, housing and fines, including mailings and referral to collection agencies

4. Diploma Fee: $15 to defray costs of diploma, diploma cover
5. Distance Learning Fee: $20-$200 per course to defray costs of providing distance learning courses
   a. TAGER Fee: $75 per semester credit hour to defray costs of materials and operation related to courses taught in TAGER network
   b. Video Tape Fee: $142 per semester credit hour to defray costs of vide tape delivery of graduate engineering courses
   c. Dallas Education Center: $15 per semester credit hour to defray costs associated with the Dallas Education Center
6. Graduate Application Fee: $25 to defray additional costs incurred in processing applications for graduate admissions
7. Graduate Services Fee (College of Business Administration): $24 per student to defray costs related to orientation, mailings, advising and registration services provided to the college's graduate students
8. Graduate Fees for Doctoral and Master's Candidates: $6.50-$50
   a. In Absentia: $15 to defray administrative costs of processing graduation applications for students not currently enrolled
   b. Dissertation and Thesis Binding: $30 maximum (actual cost will be charged)
   c. Microfilming (Dissertation): $50
   d. Microfilming (Thesis): $40
   e. Copyright Registration (optional): $35
   f. Mailing: $8-$45
   g. Personal Copies (optional): $6.50
   h. Late Application Fee: $50 to defray costs associated with application for graduation after published deadline
9. Health Insurance Fee: variable (to match premium for approved U.T. System student insurance plan) to defray costs of mandatory insurance for international students holding non-immigrant visas and living in the United States
10. Installment Tuition Handling Fee: $10 per academic item (included in Delinquent Accounts Receivable Fee) to cover costs related to providing installment payment option
11. International Student Application Fee: $50 to defray costs of the individualized credential evaluations required in international student admission decisions
12. Late Registration Fee: $25 per registrant to defray costs associated with keeping registration open after published times
13. Library Fees: variable (see below) to defray handling costs associated with computer searches, processing lost books and books returned after the due date
    a. Overdue Charges
       • Recalled books: $2 per day ($24 maximum)
       • Regular check-out: $0.25 per day ($25 maximum)
       • Reserve books: $1.20 per hour ($50 maximum)
    b. Lost Books: $35 processing fee plus any fines accrued and actual cost of book
    c. Inter-Library Loan Late Charge: $2 per day ($50 maximum)
    d. Dissertation/Thesis Handling: $15
    e. Preservation on Photo Print Orders: $2 per print
    f. Special Collections Fee: $50 for 1-25 images; $100 for 26+ images
    g. Special Collections Photography Fee: $0.15 per image for books and bound materials; $0.25 per page for manuscripts; $0.35 per page for clippings
14. Math Clinic Fee: $15 per course to defray costs of providing a tutorial clinic for students enrolled in math courses
15. Music Instrument Fee: $25 per student to defray costs of replacement and maintenance of musical instruments
16. Reinstatement Fee: $150 to defray processing costs and lost revenue associated with reinstatement of a student due to failure to complete necessary financial aspects of registration prior to the census date
17. Sponsored Student Fee: $200 per semester to defray costs associated with sponsored international student advising, registration and monitoring
18. Teacher Certification Deficiency Plan: $25 per plan for U.T. Arlington graduates and $35 per plan for non-U.T. Arlington graduates to defray costs associated with the preparation and issuance of the plans
19. Telephone Registration Facsimile Fee: $2 to defray costs associated with providing long distance fax service within the U.S.

Laboratory Fees

Certain laboratory courses require mandatory charges. These charges may not be less than $2 per course nor more than $30 per course and must not exceed the cost of actual materials and supplies used by the student. See the individual course descriptions in this catalog for the exact amount of laboratory fees.

Supplemental Fees

Supplemental fees are charges in addition to regular tuition for students registered in art, architecture, drama, speech or music where individual coaching or instruction is the usual method of instruction. See the individual course descriptions in this catalog for the exact amount of supplemental fees.

Voluntary Fees

The following voluntary fees are paid by students who desire these specific services.

1. Campus and Community Involvement Records Fee: $1-$5 to defray costs of establishing and maintaining a Student Development Transcript
2. Career Services Fees: $1-$25 to defray costs of placement registration, materials, software and software license fees and services
3. Catalog Fee: $6 to defray costs of printing and mailing catalogs
4. Check Cashing Fee: $0.25 per check or 1 percent of check amount (whichever is greater) to defray costs associated with providing check cashing
5. Returned Check Fee: $15 per check to defray administrative costs for reprocessing or collecting checks written on insufficient funds
6. Credit by Examination Fee: $20-$100 per course challenged to defray costs of course materials and supplies, printing and collating the examination
7. Duplicate Diploma Fee: $20 to defray costs of diploma and diploma cover
8. Locker Rental Fee: $3-$25 to defray administrative lock and key costs
9. Orientation Fee: $20-$25 per student to defray costs associated with new student advising and preregistration

10. Student ID Card Replacement Fee: $10 to defray administrative costs of reissuing student ID cards
11. Test Fees: $25-$48 to defray costs associated with administering and scoring Advanced Standing Exams and other institutional academic tests
12. Transcript Fees: $5 to defray costs of retrieving, duplicating and mailing transcripts

Graduation Fees

Graduation fees are paid in the semester in which the student graduates and include those listed below. Deadlines for paying these fees are listed in the Graduate School calendars printed on the inside covers of this catalog. See item No. 8 (p. 46) under Incidental Fees for the exact amounts of these fees.

1. Diploma Fee
2. Thesis or Dissertation Binding Fee
3. Dissertation or Thesis Microfilming Fee
4. Library Processing Fee
5. Dissertation or Thesis Copyright Fee (optional)

Mav Express Card Fee

As noted under Required Fees on p. 45, each student at U.T. Arlington is required to pay an $8 MAV EXPRESS Card Activation Fee for the spring and fall semesters. Each summer session is $4. The MAV EXPRESS Card is used for checking books from the Library, cashing checks at the University Bookstore, University Center or Bursar Services, as well as for admission to various University activities such as athletic events and for other situations in which personal identification is required. As an option, a student may choose to deposit money on the MAV EXPRESS Card. This debit feature is called MAV M$NEY. Students may use MAV M$NEY at Dining Services, Bursar Services, University Center, University Bookstore, Vending Machines and many other locations on the campus. The MAV EXPRESS Card is a permanent card. As a student registers for a semester, the card is automatically validated. It is not necessary to obtain any additional MAV EXPRESS Cards unless the student loses or destroys the card. The replacement charge for a lost or destroyed card is $10.

Other Fees and Expenses

General Property Deposit

Every student registering at The University of Texas at Arlington will be required to make and maintain a property deposit of $10. The records will be reviewed periodically, and if charges have been made against the deposit, the student will be required to bring the deposit up to $10.

The deposit is refundable when the student withdraws from school or graduates. The refund will be mailed as soon as possible. Property deposits dormant for four years are forfeited into the Student Deposit Endowment Fund.

Parking Fee

All students who drive to campus need a permit to park legally on campus. When registering, students need to indicate which type of permit they want for their vehicle. If students early register by telephone or during regular registration periods, a permit will be mailed to their University mailing address. Students who register by telephone during the week before school begins or during late registration need to pick up their permit at the Parking Office, located at 700 S. Davis Drive. To obtain a residence hall or rental property permit, students must show proof of residency in the residence hall or rental property.

If students drop at any time before classes begin or before the census date, they must bring their parking permit to the Parking Office to receive a full/partial refund. **If the permit is not returned, a refund cannot be given.** If students lose or misplace their permit, they will be charged full price for a replacement. Students should pick up a copy of the Rules and Regulations booklet to comply with all parking policies on campus. The University Police Department is located at 700 S. Davis Drive. Hours of business are 7:30 a.m.-7 p.m., Monday-Thursday, and 7:30 a.m.-5 p.m. on Fridays. For additional information on parking, call 817-272-3907. For information on the Parking Garage, call 817-272-2370.

The following fees are effective for the 1998-99 academic year and will be charged for autos at the initial period of registration:

	Regular	Remote
Fall Semester	$48.00	$12.00
Spring Semester	32.00	10.00
First Summer Session	20.00	8.00
Second Summer Session	12.00	6.00

International Student Service Fee

A $50 per semester fee is charged any student classified as a "foreign" or international student. Proceeds from this fee fund the International Office which provides such services as international student record keeping, travel I-20s, assisting in changes of educational level, and providing practical training.

International Student Health Insurance

International graduate students are required to purchase The University of Texas at Arlington Student Health Insurance Plan or show proof of owning equal or better insurance coverage.

The Academic Common Market

The Academic Common Market is an interstate agreement for sharing academic programs through an exchange of students across state lines. There are 14 southern states that take part in the Academic Common Market. Texas and Florida participate at the graduate level only. Selected out-of-state programs which are not offered in a student's home state can be accessed through the Academic Common Market at in-state tuition rates.

For information on the graduate programs at The University of Texas at Arlington which are available through the Academic Common Market and the states that have access to those programs, contact the Office of Research and Graduate Studies or the Academic Common Market coordinator in the home state.

Further information on the Academic Common Market may be obtained from the Texas State Coordinator for the Academic Common Market: Texas Higher Education Coordinating Board, P.O. Box 12788, Austin, Texas, 78711. Phone: (512) 483-6525

Residency Regulations

Resident classifications are determined in accordance with Subchapter B, Chapter 54, *Texas Education Code* and the rules of the Texas Higher Education Coordinating Board for determining residence status. Except as specifically provided by law, an individual classified as a nonresident student must pay tuition and fees required of nonresident students.

An independent individual 18 years of age or over who moves to Texas and is gainfully employed in Texas for a period of 12 months prior to enrolling in an institution of higher education is entitled to classification as a resident student unless the individual is in Texas for some purpose other than establishing residence in the state. A student enrolling in an institution of higher education prior to having resided in Texas for 12 months immediately preceding the time of enrollment will be classified as a nonresident student.

The residence of a dependent who is under 18 years old is generally the residence of the parent with whom the individual lives. The residence of a dependent 18 years of age or older is the residence of the parent who claims the individual as a dependent for federal income tax purposes.

After living in Texas for at least 12 months, a nonresident student may be reclassified as a resident student if business and personal facts or actions are unequivocally indicative of a fixed intention to reside permanently in Texas. A nonresident student classification is presumed to be correct as long as the residence of the individual in Texas is primarily for the purpose of attending an educational institution.

Each student claiming resident status must provide documentation to confirm that the student has a legal right to be classified as a resident student. Each student must also affirm under oath that the individual is entitled to be classified as a resident for purposes of tuition. Foreign students living in the United States under a visa permitting permanent residence and aliens who are permitted by Congress to adopt the United States as their domicile while they are in this country, have the same privilege of qualifying for Texas resident status for tuition purposes as do citizens of the United States.

Generally, a student attending The University of Texas at Arlington who is not classified as a resident student will be charged non-resident tuition. Certain nonresident students, however, are entitled to pay tuition and other fees required of Texas residents. For example, military personnel assigned to duty in Texas, and their spouses and dependent children, are entitled to pay the same tuition as a Texas resident if certain documentation is provided. Similarly, students who hold a competitive academic scholarship in the amount of $1,000 per year or more awarded through The University of Texas at Arlington are entitled to pay resident fees and charges. Other exceptions to the requirement that nonresident students pay nonresident tuition and fees are included in the Texas Higher Education Coordinating Board rules for determining residence status.

The responsibility of registering under and maintaining the proper residence classification rests on the student. If there is any question concerning the student's classification at the time of registration, or any time thereafter, it is the student's obligation to consult with the residence advisor in the Graduate School and have the student's classification officially determined. All requests for reclassification should be submitted to the Graduate School at least 30 days prior to the registration period in question.

Residency appeals are to the Residency Appeals Committee. Appeals of the Committee are final.

Audit of Student's Schedule

A computerized audit is made approximately six weeks into the semester which compares a student's schedule and the tuition and fees associated with that schedule to original tuition and fees charged. Residency status and any applicable tuition exceptions are also input items to the audit. Any resulting charges or credits will be added to the student's accounts receivable account. Statements are mailed on the fifth of the month with charges typically due the first of the following month. Accounts receivable refunds are mailed weekly. Students can mail their remittance to a designated address or place it in a secured "drop box" near Bursar Services on the first floor of Davis Hall or the lower level of the University Center. Students wishing to pay by credit card may do so by telephone at 817-272-2726 (SAM). Cash transactions must be made in person at Bursar Services. **Please do not mail cash.**

Refunds

Total Withdrawal from School

A student who officially withdraws through the Student Administration section of the Registrar's Office will receive a refund according to the schedule below.

1. A student who withdraws prior to the first class day will receive a 100% refund.
2. If the foregoing condition is not met, then the refund shall be as shown below.*

Fall and Spring Semesters	
During class days 1 through 5	80%
During class days 6 through 10	70%
During class days 11 through 15	50%
During class days 16 through 20	25%
After 20th class day	no refund
Summer Sessions	
During class days 1 through 3	80%
During class days 4 through 6	50%
After sixth class day	no refund

*** Class days noted are official University class days. They are not the individual student's class meeting days.**

3. Parking Refunds must be applied for separately at the Parking Office, 106 University Police Building.

In accordance with the *Higher Education Act of 1965* as amended, all or part of any refund produced for continuing U.T. Arlington students who received financial aid will be returned to the source programs. The portion to be returned will be the lesser of:

a. The total amount of Title IV aid received (excluding Work-Study); or

b. The amount of the refund calculated in Steps 1 or 2 above multiplied by the fraction of total Title IV aid received (excluding Work-Study) divided by total aid received (excluding Work-Study).

The following priority will be used for distribution of refund proceeds:

1. Federal Family Student Loans
   a. Federal Stafford
   b. Federal SLS
   c. Federal PLUS
2. Federal Perkins Loan
3. Federal Pell Grant
4. Federal SEOG
5. Institutional debt (including short-term loans)
6. Scholarships, grants, and sponsors
7. Student

Dropping Course(s) But Continuing Enrollment

All the additional costs that apply to courses dropped before the Census Date, when the student continues enrollment in other course(s), will be refunded.

Refunds for First-Time Enrollees Receiving Title IV Funds

As an institution participating in programs under Title IV of the *Higher Education Act of 1965* as amended, U.T. Arlington is required to refund unearned tuition, fees, room and board, and other charges to students attending the institution for the first time who have received a grant, loan, or work assistance under Title IV of the Act or whose parents have received a loan on their behalf under 20 U.S.C. Section 1087-2. The refund is required if the student does not register for, withdraws from, or otherwise fails to complete the period of enrollment for which the financial assistance was intended. No refund is required if the student withdraws after 60 percent of the period of enrollment for which the charges were assessed has passed. A student who withdraws prior to that time is entitled to a refund of tuition, fees, room and board, and other charges that is the larger of the amount provided for in Section 54.006, *Texas Education Code*, or a pro rata refund calculated pursuant to Section 484B of the Act. Accordingly, U.T. Arlington will use the pro rata method for determining refunds of tuition and fees based on the following:

Fall and Spring Semesters		Short Summer Sessions		Long Summer Session	
Week	% Refund	Week	% Refund	Week	% Refund
1	90	1	80	1	90
2	80	2	60	2	80
3	80	3	40	3	70
4	70			4	60
5	60			5	50
6	60			6	40
7	50				
8	50				
9	40				
10	30				

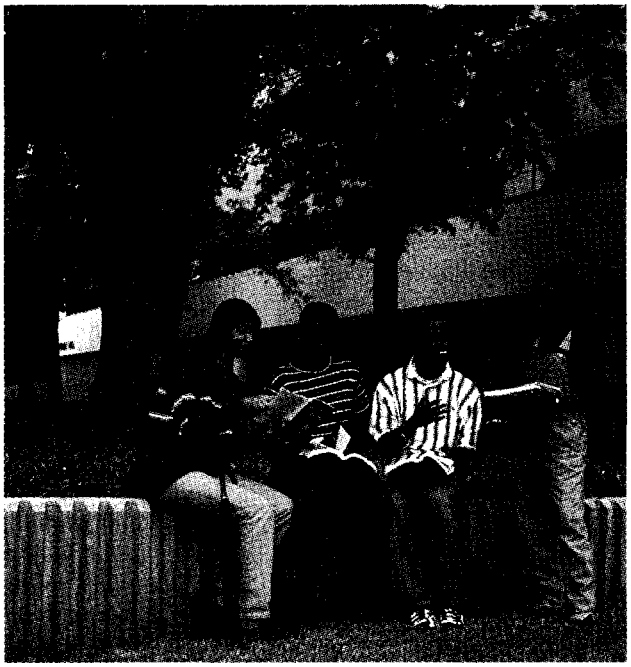
The same procedure specified for continuing students will be followed in the disposition of refunds for first-time enrollees as will the priority of distribution.

Payment of Refunds

Refunds cannot be made until a computerized audit of fees has been performed; thus, refunds normally cannot be issued until approximately six weeks after a semester begins. Refunds are credited to the student's accounts receivable account, with any residual mailed to the student's designated mailing address.

Refunds for recipients of certain types of financial aid administered through the University will be applied to the accounts from which the funds were received. In addition, refunds are applied to outstanding bills owed by the student.

Inquiries concerning refunds should be directed to Bursar Services, Room 130, Davis Hall, 817-272-2172.



Student Services and Financial Aid

Housing

The University owns and operates residence halls, apartments and houses for students. Because of the demand for housing, students should make application as early as possible. Applications and information are available at Housing/University Center Office, E.H. Hereford University Center, 817-272-2791.

Centennial Court is the newest on-campus apartment community. Call 817-436-4800 for information.

The Housing Office also has information concerning off-campus housing.

Student Health Services

Student Health Services, which is located at 605 S. West Street, 817-272-2771, is staffed and equipped to care for most routine health needs of students. Financial support is provided primarily by a Medical Services Fee. Many services are free. A reasonable fee is assessed for services such as medications, x-rays, laboratory tests, etc.

Staffing: The staff includes full-time physicians and registered nurses, registered pharmacists, registered laboratory technologists, clinical psychologists, a health educator, a substance abuse specialist, and related personnel. The Student Health Center provides medical services for the students during those times when the University is open. Services are not available during scheduled University holidays. During these periods, medical care received by students from another source will be their financial responsibility.

Services: Students are eligible to receive medical services of the staff physicians, nursing services, pharmacy services, routine laboratory procedures and diagnostic x-ray studies as ordered by staff physicians. Consultations on matters related to health and illness, psychological counseling, HIV/AIDS information, and HIV antibody testing are also available.

Services not currently available are obstetrical care, dental care, and specialized diagnostic services. In cases beyond the center's scope, referral advice will be given.

HIV Infection/AIDS and Hepatitis B: Student Health Services is the University resource center for HIV/AIDS and Hepatitis B education/prevention information. The University's written policy statement on HIV/AIDS and Hepatitis B, and the Texas Department of Health's educational HIV/AIDS pamphlet may be obtained at the Health Center. HIV/AIDS and Hepatitis B education for individuals and campus groups is available. HIV antibody testing/ counseling/referral is available to students, faculty and staff.

Substance Abuse Prevention: Student Health Services houses the Office for Substance Abuse Prevention which is available to all students, faculty and staff needing assistance in addressing alcohol and other drug-related issues. All services are free and include education, programming, support intervention, short-term counseling and referral. The University Policy Statement on Illicit Drugs and Alcohol Abuse is available at the Student Health Center.

Peer Education: Peer educators are students who become involved in helping other students by providing accurate, non-judgmental information about alcohol and other drugs and their relationship to sexual issues and health. Students are required to take a Student Health Peer Training course for three credit hours offered through the Department of Exercise, Sport and Health Studies. Peer educators develop presentations and resume-building skills.

Education: In the spirit of this educational community, U.T. Arlington hopes that students will also use Student Health Services as a resource for information on health-related issues and preventive medicine.

Report of Medical History: Prior to registration, a student should submit a Report of Medical History to the Health Center. A physical examination is required only if the student is medically unfit to participate in exercise and sport activities (EXSS). Confidentiality of medical records will be in accordance with state and federal law.

Transportation: Students are responsible for their transportation to the Health Center. For major emergencies or when the seriousness of the victim's condition is uncertain, a call to 911 should be made. This will summon city police and/or an ambulance, depending on the nature of the emergency. A second call to the University Police at 817-272-3003 should also be made. The University Police are trained in CPR and first aid and can stabilize the patient until the ambulance arrives.

Indebtedness: It is the student's responsibility to satisfy indebtedness to Student Health Services with reasonable promptness. Upon payment, receipts will be issued which can be used by the student for submitting claims to personal insurance companies.

Health Insurance: Student Health Services is an outpatient facility, and, as such, is not equipped to perform the more extensive diagnostic procedures and services offered by a general hospital. Therefore, all students are strongly urged to have adequate medical insurance coverage.

Students on non-immigrant visas enrolled at U.T. Arlington are required to carry health insurance and must show proof of coverage at the time of registration.

An optional system-wide student health insurance plan is available through an insurance carrier by contract with the University. The Health Center will direct bill this insurance company for the covered charges that are incurred by the student. In addition, the deductible is waived when treatment is received at the Student Health Center.

For more information about the Student Health Insurance Plan, contact Student Health Services at 817-272-2771. Insurance applications and claim forms are available at the Student Health Center, corner of Third and S. West Streets, and at the Office of Student Affairs, E.H. Hereford University Center.

Blood Reserve Fund Plan: The University of Texas at Arlington, in cooperation with Carter Blood Center, sponsors a blood reserve fund plan for U.T. Arlington faculty, staff, and students. To participate in the reserve fund, members are requested to donate regularly during semiannual blood drives held on campus. The release of blood units is coordinated through Student Health Services. The Office of Student Governance and Organizations arranges reserve fund drives.

Counseling and Career Development

The Office of Counseling and Career Development is located at Room 216, Davis Hall, 817-272-3671.

Counseling Services

Individual and group counseling assistance is provided in the following areas:

Personal counseling: developing new life skills and perspectives, decision-making, dealing with extraordinary life events

Academic counseling: advisement, counseling, and skill building (a full range of academic skills seminars is offered on subjects such as reading improvement, test taking, study skills and time management)

Career counseling: exploration of interests and aptitudes, decision making, career preparation, and skill-building seminars on interview, resume preparation and job search.

Testing Services

The following tests are given on national test dates: Graduate Record Examination, Graduate Management Admission Test, Law School Admission Test and the Test of English as a Foreign Language. The Miller Analogies Test is scheduled once per month. Specialized tests of aptitudes, interests and abilities are also given in conjunction with counseling.

Career Services

Approximately 300 recruiting companies and agencies schedule interviews on campus primarily during the months of October, November, February, and March. Any graduate student may take advantage of the campus interviews. After graduation the alumni have the opportunity to use the Career Classifieds service to learn about immediate job openings for experienced graduates.

Resources

A career library, career development materials, academic skills materials, and computerized guidance are some of the office resources of value to graduate students.

Student Employment Service

The Student Employment Service, located on the first floor of the University Center, assists students and their spouses in finding full- or part-time off-campus employment. Any student currently enrolled or accepted for admission at U.T. Arlington for the following semester may register for assistance from this employment service. The Student Employment Service actively develops jobs for graduate students interested in positions that offer an opportunity for quality, on-the-job, professional development and interaction.

International Office

The International Office serves the needs of the 1400 international students and scholars at The University of Texas at Arlington. The staff handles all immigration procedures and provides information, advice, and counseling on a wide variety of issues affecting international visitors. Numerous cultural events and informational workshops are sponsored by the office throughout the year, and the office publishes a newsletter each semester informing students of immigration issues, deadlines, and events of special interest. All new international students are required to attend international student orientation, hosted by the International Office, before matriculation.

The University of Texas at Arlington now offers opportunities for study in U.T. Arlington programs or exchanges in Mexico, Norway, England, Italy, Germany, Spain, France, Russia/Eastern Europe, China, Australia, Korea, Austria and Sweden. New programs are being developed every year. Any students interested in study abroad opportunities, scholarships, travel and work opportunities abroad will find information about these topics at the International Office.

The office is located in the Lower Level of the University Center. The telephone number is 817-272-2355.

Office of Multicultural Services

The Office of Multicultural Services is committed to fostering the full participation of ethnic minorities at The University of Texas at Arlington by helping to create an academic, social, and cultural atmosphere conducive to the presence and responsive to the needs of African-American, Native American Indian, Mexican American, and Pacific Island students. It is important that prospective students receive orientation to the diverse and numerous offices designed to assist students at the University. While the Office of Multicultural Services is committed to facilitating full participation of ethnic minorities in every aspect of university life, its doors are open to each and every student at The University of Texas at Arlington.

Special academic assistance services are available to promote a successful learning experience. In addition, seminars and workshops are available to provide leadership training and to enhance the social skills and positive self-concepts necessary for successfully living. Rich cultural diversity is also reflected in the number and variety of minority student organizations available on campus.

The Center for Multicultural Cooperation (CMC) is a comprehensive, campus-wide outreach initiative for attracting, orienting and retaining minority students. The CMC seeks to recruit minority students in various ways, including the utilization of volunteer students and staff recruiters.

The CMC provides an orientation program for minority students. Students are given a thorough overview on how the campus operates, who to see for a particular problem, and what is required of them if their campus experience is to be successful. The program stresses the values of good class attendance, establishing new friendships, participating in campus activities, and helping students to accept their opportunities and responsibilities.

Also, the CMC works to increase minority student retention by providing assistance with academic preparation, academic advising, cultural activities, sociocultural adjustment, financial resources and faculty/staff recruitment. The CMC views retention as a University-wide effort involving all aspects of the educational process.

In summary, the intent of the CMC is to recruit minority students with the goal of graduating minority students.

The office hours are Monday-Thursday, 9 a.m.–10 p.m.; Friday 9 a.m.–6 p.m. For further information, contact Casey Gonzales or Zeb Strong at 817-272-2099 or 817-272-2128.

The Minority Mentor Project matches freshman and sophomore students with U.T. Arlington faculty and staff to facilitate successful graduation rates. Freshman or sophomores with less than 60 hours should contact the Office of Multicultural Services to participate.

Disabled Student Services

The Office for Students with Disabilities is charged with the responsibility of ensuring full inclusion of all disabled students in all programs and activities offered at U.T. Arlington. In compliance with the Americans with Disabilities Act, all disabled students who require accommodations at U.T. Arlington should contact the director at 817-272-3364 or visit the office, located in the lower level of the E.H. Hereford University Center, at their convenience.

Bursar Services

At Bursar Services, located on the first floor of Davis Hall or the lower level of the University Center, students may:

1. Pay fees and bills due to the University
2. Confer on all problems arising in connection with fees and bills
3. Obtain information concerning repayment of loans
4. Pay residence hall room rent
5. Obtain check cashing services
6. Pay fines for U.T. Arlington parking violations
7. Purchase movie and other local amusement tickets
8. Pick up payroll or financial aid loan checks

Check Cashing and Payment Procedures

A current University I.D. is required of anyone making payment to the University by check or anyone desiring to cash a personal check. Students may cash personal checks for an amount not to exceed $25.

Returned Checks

A charge of $15 will be made for each returned check. A person who gives U.T. Arlington a bad check (one in which the bank is not at fault) will be subject to one or more of the following actions until the debt is cleared: (1) a bar against readmission of the student, (2) withholding of the student's grades and official transcript, (3) withholding of degree to which the student otherwise would be entitled.

Additionally, the University will not accept a check from anyone who has given a total of two bad checks unless the person submits a written statement from the bank stating "bank error or unusual circumstance" to be the cause of the bad checks.

Student Financial Aid

The following summaries are for informational purposes only. Current information on each program is available from the Financial Aid Office, located in Suite 252 Davis Hall, 817-272-3561.

Alumni Loan Fund

The U.T. Arlington Alumni Association and other friends of the University have established loan funds for the benefit of students who need to borrow to meet current expenses. These loans are for amounts up to $500 and are to be repaid during the semester in which the money is borrowed. To be eligible, graduate students must have completed a minimum of nine semester hours at U.T. Arlington with a grade point average of at least 3.0. First-time graduate students who have earned a baccalaureate degree from U.T. Arlington will be considered to have met minimum academic requirements for eligibility.

Assistance Based on Need

Students wishing to participate in any of the following financial aid programs should complete a Free Application for Federal Student Aid (FAFSA) as early as possible prior to their actual enrollment at the University. The funding process takes six to eight weeks for completion. Financial aid in these categories is generally limited to U.S. citizens or those in this country on other than temporary visa status.

Federal Perkins Loan and Federal Stafford Loan

These are the primary sources of long-term loans available at U.T. Arlington. Both programs include deferred repayment provisions that permit students to repay the loan after termination of at least half-time studies at the University. For those students demonstrating financial need, interest will not accrue on the loans while the borrowers are enrolled on at least a half-time basis. Information regarding loan amounts and terms can be obtained from the Financial Aid Office.

Federal Work-Study Program

A student who needs a job to help pay for college expenses may be eligible for employment through the Federal Work-Study Program. Eligibility is based on financial need as determined by the FAFSA. Most participants are employed in positions with various University departments, but limited off-campus jobs with certain approved agencies are also available.

Financial Counseling

The Financial Aid Office provides financial or budgetary counseling for any and all students regardless of whether or not they qualify for other types of financial assistance.

Out-of-State Student Assistance

Several states offer aid to their students attending schools in other states. Amounts and requirements for this assistance vary greatly. Further information can be obtained from the Financial Aid Office.

Veterans' Assistance

Contact the Registrar's Office for information concerning eligibility for and payment of VA benefits and other matters for veterans attending or planning to attend U.T. Arlington.

Assistantships

Research and teaching assistantships available in most departments can be held only by students unconditionally admitted to Graduate School. Prospective graduate students should see the appropriate department chair for further information. To be continued on a research or teaching assistantship, a student must be in good standing and have performed assigned duties satisfactorily in the preceding semesters as determined by the respective department. Consult the

catalog section on General Graduate School Regulations and Information for regulations regarding registration and responsibility of graduate assistants.

A student whose native language is not English must submit an acceptable score on the Test of Spoken English (TSE) before being appointed to an assistantship. An applicant who is a non-native speaker of English and who may wish to be considered for an assistantship should take the TSE before arriving in the United States and have the score sent to The University of Texas at Arlington. Score reports submitted directly by the student or those marked "student copy" or "applicant's copy" are not considered official and will not be accepted. The TSE is administered at TOEFL test centers around the world. Applicants should register for TSE-A (for teaching and research assistant applicants). See *Documentation and Applicant Evaluation Charges Required* for further information.

The SPEAK examination is offered on The University of Texas at Arlington campus at various times during the year. A satisfactory score on this examination may be used for the Test of Spoken English-A (TSE-A) requirement. This examination may be taken in cases when the student has come to The University of Texas at Arlington without having taken the TSE-A and subsequently wishes to be considered for a graduate assistantship. Cost and time necessary for scoring the SPEAK examination are comparable to those for the TSE-A. The Office of Counseling and Career Development should be contacted for administration dates and other details.

Student Conduct and Discipline

The University of Texas at Arlington reserves the right to impose disciplinary penalties, including permanent expulsion, against a student for disciplinary reasons. Information about the rules of conduct and due process procedures is published in the **Rules and Regulations of the Board of Regents of The University of Texas System** and the *Handbook of Operating Procedures of The University of Texas at Arlington,* copies of which are in the Office of the Dean of Graduate Studies.

Hazing

Under Texas law, individuals or organizations engaging in hazing could be subject to fines and charged with a criminal offense.

According to the law, a person can commit a hazing offense not only by engaging in a hazing activity, but also by soliciting, directing, encouraging, aiding or attempting to aid another in hazing; by intentionally, knowingly or recklessly allowing hazing to occur; or by failing to report firsthand information that a hazing incident is planned or has occurred in writing to the Vice President for Student Affairs. The fact that a person consented to or acquiesced in a hazing activity is not a defense to prosecution for hazing under this law.

In an effort to encourage reporting of hazing incidents, the law grants immunity from civil or criminal liability to any person who reports a specific hazing event to the Office of Student Affairs and immunizes that person from participation in any judicial proceeding resulting from that report. The penalty for failure to report is a fine of up to $1,000, up to 180 days in jail, or both. Penalties for other hazing offenses vary according to the severity of the injury which results and range from $500 to $10,000 in fines and up to two years confinement.

The law defines hazing as an intentional, knowing or reckless act, occurring on or off the campus of an educational institution, by one person alone or acting with others, directed against a student, that endangers the mental or physical health or safety of a student for the purpose of pledging, being initiated into, affiliating with, holding office in, or maintaining membership in any organization whose members are or include students at an educational institution. Hazing includes but is not limited to:

- Any type of physical brutality, such as whipping, beating, striking, branding, electronic shocking, placing of a harmful substance on the body or similar activity
- Any type of physical activity, such as sleep deprivation, exposure to the elements, confinement in a small space, calisthenics or other activity that subjects the student to an unreasonable risk of harm or that adversely affects the mental or physical health or safety of the student
- Any activity involving consumption of food, liquid, alcoholic beverage, liquor, drug or other substance which subjects the student to an unreasonable risk of harm or which adversely affects the mental or physical health of the student

Campus Solicitations

"Solicitation," as defined by the **Rules and Regulations of the Board of Regents of The University of Texas System,** means the sale, lease, rental or offer for sale, lease, rental of any property, product, merchandise, publication or service, whether for immediate or future delivery; an oral statement or the distribution or display of printed material, merchandise or products that is designed to encourage the purchase, use or rental of any property, product, merchandise, publication or service; the oral or written appeal or request to support or join an organization other than a registered student, faculty or staff organization; the receipt of or request for any gift or contribution; and the request to support or oppose or to vote for or against a candidate, issue or proposition appearing on the ballot at any election held pursuant to state or federal law or local ordinances. All solicitations on the U.T. Arlington campus must conform to the **Regents' Rules,** copies of which are available in the offices of the president, vice presidents, academic deans, numerous other administrative offices and the Central Library.

Student Right-to-Know Act

Graduation rates: In 1996-1997 the graduation rate was 28.4% for students who entered The University of Texas at Arlington in 1991 on a full-time basis as first-time, degree-seeking freshmen. The projected 1997-1998 graduation rate for full-time, degree-seeking freshmen who entered U.T. Arlington in 1992 is 30.8%.

Campus security: In compliance with the federal Student Right-To-Know and Campus Security Act (P.L. 101-542, as amended), The University of Texas at Arlington publishes specified campus crime statistics and campus security policies through the Office of the Chief of the University Police.

The School of Architecture

Dean: Edward M. Baum, M.Arch.
203 Architecture Bldg. • Box 19108 • 817-272-2801

Mission and Philosophy

The mission of the graduate Architecture and Landscape Architecture programs is to prepare students for sustained contributions and leadership in the design professions. This mission occurs in partnership with the larger University. Together the programs and the University share the aim of educating broadly to the demands of a complex society and, more specifically, to the demands of sophisticated and changing professions.

History and Overview

Architecture was first taught at what is now The University of Texas at Arlington in the early 1940s as a two-year, non-degree program within the School of Engineering. In 1968, with the support of professional architects in the Dallas/Fort Worth area, architecture became a department of the College of Liberal Arts, granting the degree of Bachelor of Science in Architecture. The department prospered, and by 1973 a decision was made to establish a separate school of architecture based on a four-year undergraduate program with a two-year master of architecture program as the professional degree.

By 1978, the School of Architecture and Environmental Design (as it was named in 1974) had an enrollment of more than 1,000 students with 31 full-time faculty. Four programs were included at that time: architecture, interior design, landscape architecture, and city and regional planning. Subsequently, planning moved to the Institute of Urban Studies. In 1989, the school was renamed the School of Architecture.

Architecture and landscape architecture are seen as both the means and the goal of the education we offer. As *means*, our fields provide a ready path to the larger domain of ideas, history and the human condition. Architecture was seen, after all, as one of the essential liberal arts during the Renaissance. As *goals*, our fields call upon us to learn specific professional knowledge and skills—they focus our attitudes and abilities to produce tangible, concrete things. This demand that we alternately widen and narrow our vision is one of the great strengths of the fields and is one source of their effectiveness as courses of study.

Within a broad curriculum, design as a discipline and a process is emphasized. Students are encouraged to give rich visual and material substance to both theoretical and pragmatic ideas. The context for design at U.T. Arlington centers on the contemporary urban condition, an approach appropriate for a school at the heart of a diverse, expanding and internationally oriented region like Dallas/Fort Worth.

The school's location at the center of the Dallas/Fort Worth area is especially important for students of architecture and landscape architecture. Almost every cultural, social and professional opportunity is nearby. The urban setting serves as a laboratory to observe the issues that confront current design and to test the proposals put forward. Built work by many of the foremost contemporary architects and landscape architects may be experienced and studied firsthand. Kahn, Pei, Wright, Johnson, Meier, Legoretta, Rudolph, Giurgola, Barnes, Predock, Holl, KPF, Kiley and Walker all have major projects here.

The School of Architecture offers large and up-to-date facilities for research and study. Constructed in 1986, the Architecture Building houses studios, classrooms and offices in addition to a CAD laboratory, a photography studio, a materials shop, a slide library and the Architecture and Fine Arts Library, with 40,000 books and 190 periodicals. The U.T. Arlington Libraries contains more than 1 million volumes, and students have access to The University of Texas System Library, which house 12 million volumes.

The School of Architecture has an enrollment of approximately 600 students, of whom about 120 are graduate students. They come from all parts of the United States and the world; more than 20 percent are international students. About one-third of the graduate students are women.

In terms of recognition of quality, 134 School of Architecture students have received awards in 63 major design or research competitions over the last 10 years, most at the national or international level. This unsurpassed record of competitive accomplishment reflects the education focus of the school. Developed student abilities, along with a tradition of integrating work and academic experience, give U.T. Arlington graduates ready entry and advancement in the professional world.

Accreditation

The school offers the Master of Architecture and the Master of Landscape Architecture as first professional degrees in the respective programs. The former is accredited by the National Architecture Accrediting Board and the latter by the Landscape Architecture Accrediting Board. The M.Arch and the M.L.A. taken as second, or post-professional degrees, do not carry accreditation.

Scholastic Activity and Research Interests of the Faculty

The faculty–full-time, adjunct and part-time–are involved in their areas of academic and professional interest. This takes many forms: built projects, design studies and competitions, scholarly writing and applied research. This work enriches the teaching mission and provides contributions to the larger community. For a detailed listing of faculty activity, see the *Faculty Catalog*, available from the School of Architecture.

Special Programs and Opportunities

Visiting faculty members are an integral part of the graduate program at U.T. Arlington. Noted teachers from other schools in the United States and abroad as well as distinguished practicing designers offer advanced studios and courses each year. Thus, students have access to both a core of permanent faculty members and to a changing spectrum of approaches and values. In addition to on-campus coursework, graduate students may study and travel abroad as an integrated part of the curriculum. The school maintains semester-long, full-credit student exchanges during the academic year with architecture schools at the Universities of Barcelona (Spain), Lund (Sweden) and Innsbruck (Austria). During the summer, there are full-credit travel programs to Rome, Florence and Verona, Italy; New York, Boston and Japan.

Programs

Master of Architecture
Master of Landscape Architecture

Program in Architecture

Area of Study and Degree
Architecture
M.Arch.

Master's Degree Plans
Thesis, Thesis Substitute (Design Thesis) and Non-Thesis (Advanced Studio)

Dean, School of Architecture and Director of Architecture
Edward M. Baum
203 ED Architecture, 817-272-2801

Graduate Advisor
George Gintole
203 EA Architecture, 817-272-2801

Graduate Faculty
Professors
Baum, Duncan, Ferrier, Hamilton, Henry, McDermott, Mehta, Price

Associate Professors
Gintole, Guy, Maruszczak, Pinno, C. Wright, Yardley

Dean Emeritus
G. Wright

Objective

The purpose of the Master of Architecture program is to educate for ultimate leadership positions within the architecture profession.

Design is emphasized as central to the discipline--design deeply informed by history, theory, technology, and the broader cultural setting. Design studios, lecture courses, seminars, and workshops develop the critical mind as well as the visual sensibility.

Architecture and its practice exist within the social fabric. Thus discourse and communication are a vital part of the educational process. Through case studies in studios and courses, the student learns to present ideas, and to use and give commentary. Visiting faculty--leading practitioners and teachers from other schools--provide a rich connection to the world of building and to a variety of views. In addition, international student exchange programs, study-travel courses, and numerous internship opportunities in the Dallas-Fort Worth area connect the learning of architecture with the wider world.

The professional program leading to the Master of Architecture degree consists of a sequence of coordinated core courses that introduce and develop architectural knowledge; this is followed by a flexible array of more advanced and speculative course options. The preparation each student brings determines where, in this progression from introductory to advanced work, the program is entered. Path A is for those with a baccalaureate degree but no specific background in architecture; this sequence normally takes 3.5 years to the M.Arch. Path B is for those with a four-year undergraduate baccalaureate degree with a major in architecture; this sequence assumes satisfactory core studies and consists of about two years of more advanced professional studies. Path C is for those who already hold an accredited professional degree in architecture and who wish for a second professional degree; at least one year of advanced work is required.

Degree Requirements

Students earning the Master of Architecture degree must have a prior undergraduate degree and make a satisfactory record of progress and accomplishment in completing the required sequences of graduate-level work. For Path A the total course load is 104 credit hours; for Path B, 57; and for Path C, 33. Advanced standing and/or waiver of required courses may be granted after consultation with the Graduate Advisor and relevant faculty.

Admission to the Master of Architecture program requires a transcript of previous work, GRE scores, recommendations and a portfolio of design work. Prospective students are strongly encouraged to contact the Graduate Advisor and discuss their options, the admission process, and how the M.Arch. program may fit in their professional plans. Students are also invited to visit the School, sit in on classes, and meet faculty and students at the School of Architecture.

Professional Degree Program: Path A (3.5 years)

For applicants holding a baccalaureate (B.A., B.S.) degree in a subject outside architecture, such as liberal arts, sciences, business, or another profession.

A minimum of 104 credit hours in architectural design, theory, and practice is required of Path A candidates for the professional degree in architecture (M.Arch). Due to the rigor of the program (not unlike any other professional school—law or medicine), students entering this program are advised to discontinue outside employment.

Advancement in Professional Degree Program Path A is predicated upon successful and timely completion of required coursework as well as an annual review of the student's portfolio of design work by the Graduate Studies Committee of the Architecture Program.

In addition to completing an introductory curriculum beginning in the summer of the first semester of enrollment, students must also complete the Path B core curriculum of 39 credit hours. The core curriculum of this course of study is ARCH 5325, 5326, 5329, 5331, 5333, and 24 hours of advanced studio. Students approved by the Committee on Graduate Studies to substitute a design thesis for the last semester of the required studio sequence must also take ARCH 5363 prior to enrollment in ARCH 5693.

Electives must include at least one course from each of the following categories of courses offered by the school: (a) history and theory (b) technology and practice, and (c) allied disciplines (landscape architecture, urban design, housing, and interior design).

Suggested Course Sequence: Path A

First Year

Summer Semester
5591 Design Studio I
5301 Principles of Architecture
5342 Architectural Graphics I

Fall Semester
5592 Design Studio II
5323 Construction I
5343 Architectural Graphics II
5303 History of Architecture I

Spring Semester
5593 Design Studio III
5324 Architectural Structures I
5304 History of Architecture II
Elective 3 hours

Second Year

Summer Semester
5594 Design Studio IV
5329 Architectural Computer Graphics

Fall Semester
Advanced Studio 6 hours
5327 Architectural Structures II
5325 Environmental Controls I
Elective 6 hours

Spring Semester
Advanced Studio 6 hours
5328 Architectural Structures III
5326 Environmental Controls II
Elective 3 hours

Third Year

Fall Semester
Advanced Studio 6 hours
5331 Professional Practice
5363 Design Research
(for design thesis option)
5333 Construction II
Elective 3 hours
(Thesis or advanced studio options)

Spring Semester
Advanced Studio 6 hours
or
5693 Design Thesis
or
5698 Thesis
Electives 6 hours

Professional Degree Program: Path B (2 years)

For applicants holding a baccalaureate degree with a major in architecture. Placement in the graduate curriculum may be adjusted on the basis of previous academic and professional work.

A minimum of 54 credit hours is required for the thesis option or 57 for the design thesis and advanced studio options.

The core curriculum for this course of study is ARCH 5325, 5326, 5329, 5331, 5333, 18 hours of advanced studio, and 5693 or 5698 or advanced studio. Students in design thesis option must take ARCH 5363 prior to enrollment in ARCH 5693.

Electives must include at least one course from each of the following categories of courses offered by the School of Architecture: (a) history and theory (b) technology and practice and (c) allied disciplines (landscape architecture, urban design, housing and interior design).

Suggested Course Sequence: Path B

First Year

Fall Semester
Advanced Studio 6 hours
5325 Environmental Controls I
5333 Construction II

Elective: 3 hours

Spring Semester
Advanced Studio 6 hours
5326 Environmental Controls II
5329 Architectural Computer Graphics
Elective: 3 hours

Second Year

Fall Semester
Advanced Studio 6 hours
5331 Professional Practice
5363 Design Research
(for design thesis option)
Elective: 3 hours
6 hours (advanced studio option)

Spring Semester
5698 Thesis
or
5693 Design Thesis
or
Advanced Studio 6 hours
Electives: 6 hours

Post-Professional Degree Program: Path C (1 year)

For applicants holding a previous professional degree in Architecture (B.Arch) from an accredited program. The M.Arch, as a second rather than a first professional degree, does not receive NAAB accreditation.

Thirty credit hours are required of students in Path C with thesis while 33 hours will be required of students with design thesis or advanced studio options.

A minimum of 18 hours is required in architectural program courses including six hours of history/theory as well as thesis, design thesis, or advanced studio. Students are also required to take an advanced studio which may be waived by student request if design proficiency or equivalent experience has been demonstrated. The remainder of the work will be arranged with and approved by the Graduate Advisor to suit the interests of the student. Courses of study provide for an area of specialization or for advanced general studies.

Suggested Course Sequence: Path C

Fall Semester
History/Theory: 3 hours
Advanced Studio: 6 hours
5363 Design Research
(for design thesis option)
Elective: 3 hours

Spring Semester
History/Theory: 3 hours
Advanced Studio 6 hours
or
5693 Design Thesis
or
5698 Thesis
Electives: 9 hours (for design thesis or Advanced studio options)
6 hours (for thesis option)

The School of Architecture offers international study programs in Rome, Barcelona, Innsbruck, and Lund. The Rome Program, conducted for five weeks each summer by U.T. Arlington faculty, is open to upper division and graduate students and may be used to satisfy history and elective requirements. The Barcelona, Innsbruck and Lund programs are semester-long exchange programs with universities in these cities, with the normal expectation of both studio and elective credit.

M.C.R.P. and M.Arch. Dual Degree Program

Students in this dual program may earn both the Master of City and Regional Planning and the Master of Architecture degrees in a curriculum of 87 semester credit hours. Applicants must meet the admission requirements of both the MCRP and the M.Arch programs. City and Regional Planning students wishing to earn the M.Arch degree will be required to take Path A in the Architecture Program unless they have earned an undergraduate degree in architecture which will allow CIRP applicants to take Path B. Programs of study will follow both master's programs, with all of the 15 credit hours of electives in the M.Arch program to be taken in the MCRP program. In addition to the 36 credit hours of architectural core courses, the remainder of coursework will be in the City and Regional Planning program with a required thesis proposal and programs of work to be jointly approved by the City and Regional Planning Program and the Architecture Program. A thesis supervisor should be selected from CIRP or the School of Architecture, and committee members should be selected from both faculties.

Course selection and programs of study should be designed with the assistance of the Graduate Advisors in both programs. Only in special instances may students select the thesis substitute plan of the MCRP program. The successful candidate will be awarded both degrees rather than one joint degree.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Architecture (ARCH)

5301. PRINCIPLES OF ARCHITECTURE (3-0). A survey study of the interrelationships between society, culture and architecture. Concurrent enrollment in ARCH 5591 and 5342 required. Course Specific Fee: $20.

5302. LYRICISM IN ARCHITECTURE (3-0). Concepts and models of architecture that express a philosophy concerning feelings, intuition, and creative spontaneity, emphasizing flowing rhythms and nature-inspired forms. Course Specific Fee: $20.

5303. HISTORY OF ARCHITECTURE I (3-0). History of architecture from pre-history through the Middle Ages. Prerequisite: permission of instructor. Course Specific Fee: $20.

5304. HISTORY OF ARCHITECTURE II (3-0). History of Architecture from the Renaissance to the present. Prerequisites: ARCH 5303 and permission of instructor. Course Specific Fee: $20.

5305. THE CITY OF ROME (3-0). History, topography, and monuments of Rome and its environs from its legendary founding in 753 B.C. until the 20th Century, with special emphasis on imperial and papal Rome. Course Specific Fee: $20.

5306. URBAN DESIGN (3-0). Urban design theory, method, and implementation using contemporary and historic examples.

5307. THEORY OF CITY PLANNING (3-0). The physical aspects of city planning as it relates to the social, economic, and political aspects of planning as a discipline.

5308. HISTORY OF URBAN FORM (3-0). History of urban form, considered as the product of political, economic and social forces. Prerequisite: permission of instructor.

5309. THE CITY OF LONDON (3-0). History, topography, and monuments of Greater London from before the Roman colonization until the 20th Century, emphasizing London's growth into a world capital since the Great Fire of 1666. Course Specific Fee: $20.

5310. AMERICAN ARCHITECTURE TO 1917 (3-0). Detailed consideration of the architecture of the United States from the 17th Century until World War I, with special attention to the great and little masters of the field. Prerequisites: ARCH 2303 and 2304.

5311. ARCHITECTURAL THEORY (3-0). A review and analysis of the concepts, philosophy, ideology, and models that promulgated 20th Century architectural design. May be repeated for credit as topics change. Prerequisite: permission of instructor. Course Specific Fee: $20.

5312. ARCHITECTURE OF TEXAS (3-0). The architecture of Texas broadly considered, including the vernacular built environment and the urban context, from the 18th century Spanish Colonial period until the 1960s, with reference to regional tendencies and national/international modes of expression. $20 lab fee. $20 course specific fee.

5313. HISTORIC RESTORATION AND ADAPTIVE RE-USE (3-0). Investigation of methods and procedures used in restoration of buildings, including building diagnostics, re-fabrication of architectural details, cleaning and waterproofing, structural investigation and reinforcement; examination of office procedures and practice, production of measured drawings, photogrammetry, code investigation, working drawing techniques and problems of aesthetic integrity/design retrofit.

5314. HISTORIC PRESERVATION (3-0). Concepts of historic preservation as expressed in legislation, institutions and actual projects. Lectures and case studies designed to familiarize the student with methods of architectural and bibliographic research, preservation legislation, historic certification procedures, economic strategies, and current problems in adaptive use of historic landmarks. Course Specific Fee: $20.

5315. TOPICS IN ARCHITECTURAL HISTORY (3-0). Courses to explore and present selected topics in architecture and related fields of the Ancient Mediterranean, the Classical World, the Middle Ages, the 19th Century, and the Non-Western Traditions. May be repeated for credit as topics change. Prerequisite: permission of instructor. Course Specific Fee: $20.

5316. MODERN ARCHITECTURE I: 1890 TO 1945 (3-0). Origins and development of Modern Architecture in Europe from 1890 to World War II, and its further evolution in Europe and America from 1918 to 1945. Prerequisites: ARCH 2303 and 2304. Course Specific Fee: $20.

5317. MODERN ARCHITECTURE II: 1945 TO PRESENT (3-0). Architectural developments in Europe, Asia, and America since World War II. Prerequisites: ARCH 2303 and 2304. Course Specific Fee: $20.

5318. RENAISSANCE ARCHITECTURE (3-0). Detailed consideration of Renaissance and Mannerist architecture in Europe of the 15th and 16th centuries. Prerequisite: ARCH 2304 or equivalent. Course Specific Fee: $20.

5319. HOUSING DESIGN (3-0). Evolution of housing from the end of the 19th Century to the present with particular emphasis on contemporary design methods, techniques and solutions. Course Specific Fee: $20.

5320. BAROQUE ARCHITECTURE (3-0). Detailed consideration of Baroque architecture in Europe from 1600 until about 1750. Prerequisite: ARCH 2304 or equivalent. Course Specific Fee: $20.

5321. ADVANCED COMPUTER APPLICATIONS (3-0). The study and application of specialized computer programs in environmental design. Prerequisites: ARCH 4329 or 5329 or the equivalent, and permission of the instructor.

5323. CONSTRUCTION I (3-0). Construction materials and structural concepts as used in buildings. Prerequisite: permission of instructor.

5324. ARCHITECTURAL STRUCTURES I (3-0). Statics, strength of materials and simple structural systems in buildings. Prerequisite: permission of instructor.

5325. ENVIRONMENTAL CONTROL SYSTEMS (3-0). Illumination, acoustics, climate controls, mechanical and electrical systems, and their significance in the total design.

5326. ENVIRONMENTAL CONTROL SYSTEMS (3-0). Continuation of ARCH 5325.

5327. ARCHITECTURAL STRUCTURES II (3-0). Continuation of ARCH 5324 with emphasis on structural theory and systems in wood and steel. Prerequisite: ARCH 5324.

5328. ARCHITECTURAL STRUCTURES III (3-0). Continuation of ARCH 5327 with emphasis on structural theory and systems in masonry and reinforced concrete. Prerequisite: ARCH 5327.

5329. ARCHITECTURAL COMPUTER GRAPHICS (3-0). Computer aided design, drafting and graphic techniques as applied to architecture. Prerequisite: permission of the instructor. $10 lab fee.

5330. COMPARATIVE STRUCTURES (3-0). Comparative analysis and design of structural systems and construction techniques, including architectural and economic determinants. Prerequisite: ARCH 5328 or permission of the instructor.

5331. PROFESSIONAL PRACTICE (3-0). Survey of the administrative functions, and the ethical and legal responsibilities of the architect.

5332. ENERGY USE AND CONSERVATION IN ARCHITECTURE (3-0). Concepts of the efficient use and conservation of energy and their embodiment in the built environment. Prerequisite: permission of the instructor.

5333. CONSTRUCTION II (3-0). Advanced construction assemblies and methods, including the principles of cost control. Prerequisites: ARCH 5323 and 5328.

5335. ADVANCED PROFESSIONAL PRACTICE II: MARKETING DESIGN SERVICES (3-0). A study of the strategies and methods for marketing professional services. Presented as case studies of architecture, interior design, and landscape architecture firms.

5336. ADVANCED PROFESSIONAL PRACTICE III: PROJECT MANAGEMENT OF LARGE BUILDINGS (3-0). A study of how large buildings are realized through architectural offices, from preliminary design through construction.

5337. SOILS AND FOUNDATIONS (3-0). Soil classifications, field and laboratory identification, physical properties and load-bearing characteristics, retaining walls and foundations. Prerequisite: ARCH 5328 or permission of the instructor.

5338. MASONRY STRUCTURES AND CONSTRUCTION (3-0). Materials, construction, and structural aspects of loadbearing masonry. Masonry in non-loadbearing and veneer applications.

5342. ARCHITECTURAL GRAPHICS I (2-4). Architectural drawing, perception, projections, and three dimensional representation. Concurrent enrollment in ARCH 5591 is required.

5343. ARCHITECTURAL GRAPHICS II (2-4). A continuation of ARCH 5342 with emphasis on more advanced techniques: composition, tone, shades and shadows, and color. $2 lab fee.

5344. CONCEPTUAL DRAWING (3-0). Seminar to explore aspects of conceptual drawing for the architect and the relationship of design ideas in the drawing process.

5346. CONSTRUCTION DRAWINGS I (2-4). 3 hours credit. The techniques of building construction, the communication of technical information, and the process of preparing contract drawings for construction. $20 lab fee.

5348. PRINCIPLES OF ARCHITECTURAL PHOTOGRAPHY (2-4). The use of photography as an investigative and presentation medium in architecture. Emphasis on composition in black and white technique. $30 lab fee.

5349. ADVANCED ARCHITECTURAL PHOTOGRAPHY (2-4). Advanced techniques in photography, including use of the view camera and lighting techniques, and their use in photographing architecture and architectural models.

5350. VESSELS (3-0). The design of objects for the post-Industrial Age, including vehicles, furniture, jewelry, household objects, and clothing.

5351. WILDERNESS: A CONDITION OF MIND (3-0). Changing conceptions of wilderness in Western thought, from ancestral prejudices to recent, revolutionary appreciation. Literary and visual documentation.

5352. PAINTERS AS ARCHITECTS (3-0). A study of artists' rendering of architectural forms and urban spaces in the pictorial arts. Examples of fictive architecture from several cultures are explored chronologically.

5353. PERSPECTIVAL SPACE (2-1). Issues concerning the aspects and potential of perspectival space will be presented in a lecture and discussion format. Readings and the making of perspective drawings will be used to explore the medium of perspectival vision for its cultural implications as well as depiction.

5363. DESIGN RESEARCH (3-0). Seminar directed toward the understanding of research methods and the programming of an independent design project, leading to the thesis substitute. Graded R.

5370. ADVANCED DESIGN STUDIO (2-4). Studio course in the generation and development of architectural ideas in formal and environmental contexts. May be repeated for credit. Two of these courses are equivalent to ARCH 5670.

5591. DESIGN STUDIO I (3-6). An intensive studio course in architectonic theory and operations. Emphasis on analytic, conceptual, and manipulation procedures. $2 lab fee.

5592. DESIGN STUDIO II (3-6). Continuation of ARCH 5591. Studio course emphasizing the interrelationship of formal/spatial ideas, use, and the building fabric. Prerequisite: ARCH 5591. $2 lab fee.

5593. DESIGN STUDIO III (3-6). Continuation of ARCH 5592. Studio course emphasizing the interrelationship of formal/spatial ideas, use, and the building fabric with special attention to the urban context. Prerequisite: ARCH 5592. $2 lab fee.

5594. DESIGN STUDIO IV (3-6). Continuation of ARCH 5593. Emphasis on complex building designs in urban environments. Off campus study may be substituted. $2 lab fee.

5670. ADVANCED DESIGN STUDIO: URBAN DESIGN (3-9). Studio course emphasizing the analysis and design of building aggregations within the urban context. May be repeated for credit.

5671. ADVANCED DESIGN STUDIO: ARCHITECTURAL PROJECTS (3-9). Studio course in the generation and subsequent development of architectural ideas in buildings. May be repeated for credit. $2 lab fee.

5693. DESIGN THESIS. Individual study project conducted by a supervising committee, with program and statement of intent to be filed with the Graduate Advisor during the previous semester. Graded R. Prerequisite: ARCH 5363.

5381, 5681. PRACTICUM (0-16). Internship program including work done through an approved architect's office, designed to give practical experience leading to a broader knowledge of the profession. Placement in offices must be approved, and in some cases may also be arranged by the school. Students may enroll in 5381 for half-time employment or 5681 for full-time employment. Students enrolled in Practicum may also participate in the Intern Development Program of the American Institute of Architects. No more than six total credit hours in Practicum are allowed for degree. Graded P/F/R.

5191, 5291, 5391. CONFERENCE COURSE. Special subjects and issues as arranged with individual students and faculty members. May be repeated for credit. Graded P/F/R.

5195-5695. TOPICS IN ARCHITECTURE. Studio, lecture or seminar courses to explore and present special topics in architecture and environmental design. May be repeated for credit as topics change.

5698. RES THESIS. Independent research and presentation of findings under direction of a supervising committee. May be repeated, but only six hours may be counted toward degree. Graded P/F/R.

Program in Landscape Architecture

Area of Study and Degree
Landscape Architecture
M.L.A.

Master's Degree Plan
Thesis

Dean of Architecture
Edward M. Baum
203 ED Architecture, 817-272-2801

Director, Landscape Architecture
Pat D. Taylor
203B Architecture, 817-272-2801

Graduate Advisor
Richard C. Rome
420 Architecture, 817-272-2801

Graduate Faculty
Professor
Baum

Associate Professors
Robinette, Rome, Taylor

Adjunct Assistant Professors
Bass, Bounds, Dunn-Kiper
Appropriate members of the graduate faculty from Architecture

Objective

The mission of the Landscape Architecture Program is to educate for ultimate leadership in the landscape architecture profession. This mission requires the development and exercise of both intellect and sensibility.

The Master's of Landscape Architecture Program has the dual objectives of providing students with a core of design and technical skills in combination with experiences in pure and applied research. This duality prepares students for problem solving in the profession through design and research, and it is a program focus. The Landscape Architecture Program enables students to enter practice as landscape architects in private, public, academic, and research organizations.

Student preparation is enhanced by specialized coursework taken inside and outside of landscape architecture and by the topic of one's thesis. Students are directed to select thesis committee members early-on and to select specialized courses which reinforce students' areas of primary interest in landscape architecture.

The Landscape Architecture Program is fully accredited by the Landscape Architectural Accreditation Board of the American Society of Landscape Architects. Graduates from the program are qualified to sit for the Landscape Architecture Registration Exam which, when successfully passed, qualifies individuals to practice as landscape architects in the State of Texas.

Degree Requirements

The applicant must meet the general requirements of the Graduate School. A personal interview is recommended and letters of reference are required. All students in the Landscape Architecture Program are required to consult the Graduate Advisor to obtain course and schedule approval each semester prior to registration.

Students are evaluated for admission to the graduate program using three criteria: a) grade point average from previous degree(s) and coursework; b) Graduate Record Examination results; and c) a portfolio/interview. The minimum requirements are a GPA of 3.0 or better, a GRE score of 1000 or better on the first two components of the GRE, and a minimum portfolio/interview score of 1000 or better. The maximum score for each category of evaluation criteria is as follows: a) GPA = 4000 points maximum; b) GRE = 1600 points maximum; and c) portfolio/interview = 1600 points maximum. The maximum total admissions score is 7200.

A student whose native language is not English must have a demonstrated speaking ability in English in addition to meeting the program's minimum score of 575 on the Test of English as a Foreign Language.

First Professional Degree Program

For students holding a college degree in a field other than design, some prerequisite courses usually are required such as design, plant materials, technology, drawing, theory, and history. The extent and number of such courses depends upon the student's previous college experience and demonstrated skills.

The core curriculum in the Landscape Architecture Program prepares students holding a college degree in a field other than landscape architecture or a related design discipline for the program's specializations. The core curriculum also provides students with the basic equivalent of a bachelor's degree in landscape architecture. For

full-time students with degrees from other non-design disciplines, the core usually takes three semesters to complete. For all students, electives must be concentrated in a specialization or interest area which supports the student's thesis and/or the student's professional objectives.

The following coursework is a suggestion to meet the program mission. Each student will be counseled, based upon interests and background, to develop an appropriate degree plan.

All students are required to consult their Graduate Advisor to obtain course and schedule approval each semester prior to enrollment and registration. An approved degree plan must be submitted no later than the start of the student's second semester of graduate work.

The Core Curriculum

Semester 1
LARC 5661 Design Studio I
LARC 5320 Communications for Landscape Architects
LARC 5341 Landscape Technology I
LARC 5330 Plant Identification and Ecology
Total Credit Hours: 15

Semester 2
LARC 5662 Design II
LARC 5342 Landscape Technology II
LARC 5312 History and Theory of Landscape Architecture I
LARC 5332 Planting Design
Total Credit Hours: 15

Semester 3
LARC 5663 Design III: Site Planning
LARC 5343 Landscape Technology III
LARC 5313 History and Theory of Landscape Architecture II
LARC 5321 Advanced Communications
Total Credit Hours: 15

After completing 45 credit hours, the first professional degree student is evaluated by means of an academic review and portfolio review by the Graduate Studies Committee. The committee identifies areas of strength and weakness in the student's performance and recommends appropriate action.

Upon completion of the three core semesters, the student is required to develop an area of specialization or primary interest. The student must consult with faculty advisors to complete this step, which includes a preliminary agreement between student and faculty advisors regarding the specialization or primary interest and the appropriate research method to support it. If a student is interested in Advanced Landscape Architecture, for example, a probable program of study could look like this:

Advanced Landscape Architecture

Semester 4
LARC 5664 Design IV
LARC 5340 Professional Practice
LARC 5380 Research Methods in Landscape Architecture
LARC 5302 Land Development Planning
Total Credit Hours: 15

Semester Between Academic Year 2 and 3
LARC 5681 Professional Practicum or
LARC 5695 Independent Study Abroad or
LARC 5683 Independent Study Area of Specialization or Controlled Electives
LARC 5660 Enrichment Design Studio Enrichment (if necessary)
Total Credit Hours: 6

Semester 5
LARC 5665 Design V
Advanced or Independent Study in Landscape Architecture (9 hours)
Total Credit Hours: 15

Semester 6
LARC 5698 Thesis
LARC 5294 Master's Comprehensive Examination
Advanced or Independent Study in Landscape Architecture (3 hours)
Total Credit Hours: 11

Minimum Credit Hours Required for Graduation: 92

Students pursuing other specializations or areas of interest also must consult with faculty advisors for approval.

Advanced Standing

Students from backgrounds other than landscape architecture or its related fields must complete the 92 credits required in the curriculum. Students with degrees and/or professional experience in fields related to landscape architecture (such as architecture, engineering, environmental design, horticulture, interior design, planning and the like) may apply for advanced standing, allowing them to enter the academic phase (second year) of the curriculum. Advanced standing in these cases requires a minimum of 62 total credit hours for graduation.

Students with first professional degrees in landscape architecture also may apply for advanced standing, allowing them to enter the research (third year) phase of the curriculum. Advanced standing in these cases requires a minimum of 30 total credit hours for graduation.

Minimum Program for Advanced Standing

(Students from Fields of Study Related to Landscape Architecture)

Semester 1
LARC 5663 Design III
LARC 5330 Plant Identification and Ecology
LARC 5321 Advanced Communications
LARC 5313 History and Theory of Landscape Architecture II
Total Credit Hours: 15

Semester 2
LARC 5664 Design IV
LARC 5342 Landscape Technology II
LARC 5332 Planting Design
LARC 5302 Land Development Planning
Total Credit Hours: 15

Semester Between Academic Year 1 and 2
LARC 5681 Professional Practicum or
LARC 5695 Independent Study Abroad or
LARC 5683 Independent Study Specialization
Total Credit Hours: 6

Semester 3
LARC 5665 Design V
LARC 5340 Professional Practice
LARC 5380 Research Methods in Landscape Architecture
Study in specialization (3 hours)
Total Credit Hours: 15

Semester 4
LARC 5698 Thesis
LARC 5294 Master's Comprehensive Examination
Study in specialization (3 hours)
Total Credit Hours: 11

Minimum Credit Hours Required for Graduation: 62

Minimum Program for Advanced Standing

(Students with First Professional Degrees in Landscape Architecture)

Semester 1
LARC 5665 Design V
LARC 5380 Research Methods in Landscape Architecture
Specialization Option Courses (6 hours)
Total Credit Hours: 15

Semester 2
LARC 5698 Thesis
LARC 5294 Master's Comprehensive Examination
LARC 5302 Land Development Planning
Specialization Option Courses, Independent Study (4 hours)
Total Credit Hours: 15

Minimum Credit Hours Required for Graduation: 30

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Landscape Architecture (LARC)

5294. MASTER'S COMPREHENSIVE EXAMINATION. Must be taken concurrently with Thesis. Directed study, consultation, and comprehensive examination of coursework, leading to and including the thesis. Oral presentation required. Required of all Master of Landscape Architecture students in the semester in which they plan to graduate. Graded P/F/R.

5301. SITE PLANNING AND DEVELOPMENT PROCESSES (3-0). (Previously LARC 5337) Presents the processes and practices of site planning and development. Site inventory, analysis, and assessment of potential building sites. Students examine the natural, cultural, and social systems that affect design decisions.

5302. LAND DEVELOPMENT PLANNING (3-0). (Formerly LARC 5353) The process of land development planning for landscape architects. Detailed expansion of LARC 5301. Uses case studies in land development planning to instruct students in the environmental, economic, legal, and visual issues associated with the land planning process. Prerequisites: LARC 5301, 5663.

5312. HISTORY AND THEORY OF LANDSCAPE ARCHITECTURE I (3-0). Traces landscape planning and design from pre-history through Egyptian, Roman, Islamic, and Medieval gardens to Renaissance, Italian, French, and English landscape approaches, culminating in the mid-19th Century. Relates landscape design to the societal, cultural, technological, and belief systems of the period. Course Specific Fee: $20.

5313. HISTORY AND THEORY OF LANDSCAPE ARCHITECTURE II (3-0). The contemporary history of the profession from Andrew Jackson Downing to present day. The growth and development of the ASLA, professional education, the environmental movement, large scale regional planning, and significant 20th Century landscape architectural projects. Prerequisite: LARC 5312. Course Specific Fee: $20.

5320. COMMUNICATIONS FOR LANDSCAPE ARCHITECTS (2-4). Primary class for the development of graphic and communication skills in landscape architecture. Provides a method for transferring conceptual ideas into legible graphic presentations. Should be taken concurrently with LARC 5661 Design I. $2 lab fee. $22 Course Specific Fee.

5321. ADVANCED COMMUNICATIONS (2-4). Presentation techniques; expansion on graphic thinking and communication presented in LARC 5320. Prerequisite: LARC 5320 or permission of the instructor. $2 lab fee. $22 Course Specific Fee.

5324. LANDSCAPE ARCHITECTURE AND ENVIRONMENTAL ART SEMINAR (2-2). Siting and creating works of art; analysis of the creative processes of the two different-yet-related disciplines; case studies of built works. Communication of ideas through environmental media. Prerequisites: completion of landscape architecture core, permission of the instructor. $2 lab fee. $22 Course Specific Fee.

5325. COLLABORATIVE WORKS SEMINAR (2-2). Examines the professional roles of each of the associated disciplines in the specialization tracks. Case studies, internship presentations, and guest lecturers from each area serve as the basis for discussion, analysis, and discovery of the workings of collaborative processes. Investigates the communication processes of successful collaborative works. Prerequisites: completion of landscape architecture core, permission of the instructor. Course Specific Fee: $22.

5330. PLANT IDENTIFICATION AND ECOLOGY (2-4). Examines the ecology, growth characteristics, and design applications of plant materials. Local field trips are required. Prerequisite: LARC 5301 or permission of instructor. Course Specific Fee: $20.

5331. PLANTING DESIGN (2-4). Design applications of plant material. Students apply the design problem-solving approach to the detailed aspects of planting design and complete a progressively-more-difficult series of problems to practice techniques and methods of plant manipulation that encompass both the aesthetic and functional purposes of planting design. Prerequisites: LARC 5663, 5330, and 5341, or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5340. PROFESSIONAL PRACTICE (3-0). Ethical, legal, and administrative aspects of the public, private, and academic spectrums of practice in landscape architecture.

5341. LANDSCAPE TECHNOLOGY I (2-4). Surveying, site grading, storm water management, vertical and horizontal curves and an overview of the construction documentation process employed by landscape architects. Prerequisite: LARC 5301 or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5342. LANDSCAPE TECHNOLOGY II (2-4). Materials and techniques employed in the construction process. Materials are examined through completion of design details that specify how they may be used as part of a landscape construction. Detailed methods of design evaluation such as drawings, scale models, and actual constructions will be used. Prerequisite: LARC 5341 or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5343. LANDSCAPE TECHNOLOGY III (2-4). Preparation of a set of construction drawings for a design project from a previous studio. Layout, grading, irrigation, utilities, planting, construction, detailing, specifications, and cost estimating. Prerequisite: LARC 5342 or permission of the instructor. $2 lab fee.

5344. PARK AND RECREATION DESIGN AND PLANNING (2-2). History, data collection, program formulation, and design principles for public and private park and recreation systems and sites. Includes management objectives, operations and maintenance, and public input as planning components. Prerequisites: LARC 5320, 5661. $2 lab fee. $22 Course Specific Fee.

5346. IRRIGATION TECHNIQUES (2-4). The structural and technical aspects of irrigation design and application, including effective use and care of native plant materials and designing for native environments. Prerequisites: completion of landscape architecture core, permission of the instructor.

5350. LANDSCAPE ARCHITECTURE COMPUTER APPLICATIONS (2-4). Computer applications currently used in office practice. Computer applications used for office management, site analysis, design development, construction documentation, and cost estimating. Introduction to computer aided design applications and the underlying theories of application. $2 lab fee. $22 Course Specific Fee.

5351. ADVANCED COMPUTER-AIDED DESIGN (2-4). Expansion of LARC 5350. Students complete a typical design problem utilizing computer-aided methods; students examine the differences between traditional manual methods of design and computer-aided techniques. Instruction in data standards, methods of translation, layering of design information, and connections between the phases of the design process. Prerequisite: LARC 5350, or permission of the instructor. $2 lab fee. $22 Course Specific Fee.

5352. GIS: APPLICATIONS IN ENVIRONMENTAL PLANNING (2-4). Geographic Information System technology as a tool for environmental planning problems. Instruction in software for use in environmental inventory and in analysis and assessment of various design and planning alternatives. Prerequisite: LARC 5350, or permission of the instructor. $2 lab fee. $22 Course Specific Fee.

5353. THE FUTURE OF COMPUTING IN LANDSCAPE ARCHITECTURE (2-4). Current models for increased levels of computer-aided decision-making in landscape architecture and affiliated disciplines. Formal and informal processes of design are investigated to determine the potential for expanding the computer-aided design and planning process. Prerequisite: LARC 5351 or permission of instructor.

5380. RESEARCH METHODS IN LANDSCAPE ARCHITECTURE (3-0). Theories of practical research and methods of achieving them as they relate to landscape architecture. Includes research program development, data collection and analysis, proposal writing, research techniques and tools, and research reporting methods. Prerequisite: LARC 5663 or permission of instructor.

5382. SEMINAR IN URBAN DESIGN (3-0). Advanced presentation and discussion of issues related to contemporary and historic urban design. Students present and lead informed discussions on topics such as population density, environmental management, waterfront development, allocation of open space, public art, urban form, and cultural determination. Prerequisite: LARC 5663 or permission of instructor. Course Specific Fee: $20.

5383. SEMINAR IN LANDSCAPE AESTHETICS (3-0). Advanced presentation and discussion of issues related to contemporary and historic aspects of landscape aesthetics. Students present and lead informed discussions and debate on topics such as landscape beauty, values, and perception in exterior space, aesthetics versus function, and philosophic interpretations of beauty applied to the landscape. Prerequisites: LARC 5663 and 5313, or permission of instructor.

5623. STUDIO TEACHING PRACTICUM (0-9). Students spend one semester as a teaching assistant in the studio sequence under the supervision of the assigned faculty member. They will observe the methods employed in the studio and prepare a comprehensive

evaluation of the studio in conjunction with the instructor. The students will oversee one short studio project and evaluate its success or failure based on the criteria learned in LARC 5322 and the goals and objectives of the test project. Prerequisites: LARC 5322, completion of landscape architecture core, or permission of the instructor. $2 lab fee. $22 Course Specific Fee.

5660. ENRICHMENT DESIGN STUDIO (3-9). Review of the principles and processes of design presented in Design Studios I, II, and III. Provides an opportunity for students with weak design and graphic skills to improve those skills to meet requirements for Design IV. $2 lab fee. $22 Course Specific Fee.

5661. DESIGN STUDIO I (3-9). A design course for students with no background in landscape architecture or design. Outlines the site planning and site design decision-making process. Focuses on providing students with the verbal, intellectual, and graphic tools necessary to successfully tackle a design problem and bring it to a schematic level of completion. It is highly recommended that this course be taken concurrently with LARC 5320. Course Specific Fee: $24.

5662. DESIGN STUDIO II (3-9). A continuation of 5661. Basic design principles and their application to three-dimensional spaces. Examines how humans occupy exterior space and combines this information with the principles of design to create garden scale models. Models as a media for design expression. Landscape character, design simulation, landscape media, landscape context, and human spatial experience. Prerequisites: LARC 5320 and 5661, or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5663. DESIGN STUDIO III: SITE PLANNING (3-9). Features the process of solving complicated site planning and site design problems. Each phase of the site planning process will be examined in detail by undertaking one or more studio problems that involve resolution of issues related to existing site conditions, program development, conceptual design, design development, and design detailing. Prerequisites: LARC 5661, 5662, 5320, 5301, 5340, 5312, 5329, and portfolio review, or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5664. DESIGN STUDIO IV: ENVIRONMENTAL PLANNING (3-9). Expands the student's concept of the environment as a large scale ecologic unit independent of political boundaries. Presents a process of solving large scale planning problems through data gathering and information processing techniques commonly used by landscape architects employed in environmental planning. Prerequisite: LARC 5663 or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5665. DESIGN STUDIO V: THE URBAN LANDSCAPE (3-9). The summary studio of the design sequence. Basic design principles are reiterated and problems are introduced which require interaction with architects, planners, urban designers, developers, or administrators, on complex urban projects. Prerequisite: LARC 5664 or permission of instructor. $2 lab fee. $22 Course Specific Fee.

5666. DESIGN STUDIO IV: SPECIALIZATION OPTION TOPICS (3-9). In each specialization option, a section of Studio IV is offered to address specific design issues within the given area of study. Landscape architectural problems utilizing skills from the landscape architectural core to bring unique, specialized skills to the problem-solving process. May be repeated for credit. Prerequisite: LARC 5663, or permission of instructor.

5667. DESIGN STUDIO V: SPECIALIZATION OPTION TOPICS (3-9). In each specialization option, a section of Studio V is offered to address specific design issues within the given area of study. Landscape architectural problems utilizing skills from the landscape architectural core to bring unique, specialized skills to the problem-solving process. Prerequisite: LARC 5664 or LARC 5666 or permission of the instructor.

5668. DESIGN PRACTICUM. An internship program which includes approved work done in a landscape architect's office or one of the related design fields. The purpose of the practicum is to provide students with practical design experience. Grades P/F.

5191, 5391, 5691. SPECIAL TOPICS IN LANDSCAPE ARCHITECTURE. Special subjects and issues in landscape architecture that may be studied independently under faculty supervision. Prerequisite: LARC 5663 or permission of instructor.

5195, 5295, 5395, 5695. SELECTED TOPICS IN LANDSCAPE ARCHITECTURE. Selected studio or lecture course offerings in specific areas of expertise or interest. Course allows the program the flexibility to address the ever-changing needs of students and the profession by offering courses beyond the scope of the core curriculum and specializations. Prerequisite: LARC 5380 or permission of instructor. Graded P/F/R.

5698. THESIS. Independent research and presentation of findings under the direction of a supervising committee. The findings of the thesis should extend the boundaries of the professional discipline by either presenting new and unique ideas or information, or by interpreting existing knowledge from a different perspective. Prerequisites: LARC 5380, 5665, and must be taken concurrently with LARC 5294. Graded P/F/R.

The College of Business Administration

Dean: Lawrence L. Schkade, Ph.D.
334 Business Bldg. • Box 19377 • 817-272-2881

Mission and Philosophy

The College of Business Administration strives to be a recognized contributor in the field of business education and research. It is our mission to build and maintain a quality educational environment, creating value for our constituencies.

Our achievement-focused programs produce quality graduates at all degree levels. These programs respond to changing needs and opportunities, generate and communicate new knowledge and ideas to benefit the scholarly, public and private sectors, and provide a wide range of intellectual and professional services locally, regionally, nationally and internationally.

Our philosophy can be summarized in the following objectives:

1. To discover and disseminate knowledge that, through its relevance and rigor, benefits our students, practitioners and other constituencies.
2. To continue to develop and provide instructional programs that meet the needs of our students: part-time, full-time, employed and international.
3. To maintain a rigorous and effective client-focused environment that capitalizes on our urban setting.
4. To continually improve all our academic programs, with special emphasis on master's programs, to effectively address the diversified needs of the Dallas/Fort Worth Metroplex.
5. To further our community interaction by offering off-campus courses, distance education and professional development seminars.
6. To enhance the visibility of the college and improve its financial strength through increased external funding.
7. To provide advisory services to academic, professional and other organizations.

History and Overview

Since its origination in 1959, the College of Business Administration has been one of the fastest growing business schools in the nation. This growth has mirrored the dynamic growth of the D/FW Metroplex as the college has worked hard to provide high quality educational programs. The college is organized into six academic departments: Accounting, Economics, Finance and Real Estate, Information Systems and Management Sciences, Management, and Marketing. A total of 129 full-time equivalent faculty organize and conduct classes, including 95 with doctoral degrees from some of the top schools in the nation. The college currently enrolls approximately 4,600 students, of which 853 are enrolled in our 10 graduate business programs.

Accreditation

The College of Business Administration is fully accredited in business and accounting at both the undergraduate and graduate levels by the AACSB–The International Association for Management Education.

Scholastic Activity and Research Interests of the Faculty

Many of the faculty have professional certifications and years of experience in the business world, including serving as consultants, expert witnesses, and in other professional capacities. They actively engage in research that enables them to be at the forefront of the discovery of new knowledge in their fields. All these activities allow them to bring professional experiences and new ideas into the classroom.

Special Programs and Opportunities

The Business Advanced Studies Program

This is a certificate program open to those holding a graduate degree in a business field. Applicants must meet normal MBA admissions requirements and complete 12-21 semester hours of graduate courses in a specified area. This is an excellent way for business professionals to update their business skills in advanced areas.

Dual Degree Programs

The college offers a rich array of dual degree opportunities that build synergistic skill sets that prepare students for more advanced career opportunities. While most dual degree programs include two graduate business degrees, the Professional Management Option in the MBA program allows professionals with undergraduate degrees in engineering, architecture, nursing, education, and urban affairs to complete a master's degree in that field along with the MBA. Dual degree programs allow students to earn two degrees with a substantial reduction in course requirements. The MBA Program also offers a special dual degree with Thunderbird's Master of International Management.

Careers Program

An optional four-part Careers Program is open to all graduate students. This program provides excellent support for students in identifying and preparing for the career of their choice. The program begins with a comprehensive careers class (BUS4 5338) that provides extensive individual assessments, a study of analytical models of career choice, an exploration of the opportunities available in the marketplace, and mentoring and networking opportunities. The second part is a graduate internship program that is available to students of all graduate programs to assist them in gaining experience integral to their careers. Study abroad and exchange programs comprise the third part of the program. The final component is advice from faculty members on how to best build a program of study that focuses upon a particular career track. The MBA program supports 65 different career tracks, while the other master's programs are designed for specialized study.

Internship Program

Graduate students are encouraged to participate in internships to supplement and complement classroom education by providing valuable experience and training in their chosen area of expertise. Internships allow students to meet and interact with professionals in the work setting, identify and develop critical professional skills, clarify their own career goals and interests, and develop important contacts for future development. This paid internship program is open to all graduate students who have completed nine hours of graduate courses, are in good academic standing (GPA => 3.0), and have secured their advisor's approval for up to three hours of graduate credit. Interested students should ask for a fact sheet and an application in the Graduate Studies Office. After gaining the advisor's approval, students will complete an application and meet with the appropriate departmental internship coordinator. Once an internship is obtained, the coordinator will monitor progress and assign an appropriate grade.

Study Abroad/Exchange Programs

The leaders for the 21st century will be deeply involved in business opportunities around the world. Many study abroad/exchange programs are available to help students prepare in both curricular and extra-curricular ways for these future international leadership roles. Students wishing to study abroad are encouraged to review the many opportunities contained in the Study Abroad Library in the International Office. Once a specific program is identified, students discuss the available courses with their advisor to ensure they will help meet degree requirements. Depending on their terms, study abroad/exchange programs may allow students to complete courses as resident credit or as transfer credit.

Programs

Graduate programs include the Ph.D. in Business Administration and the Master of Business Administration at the college level and eight master's level specialized programs in the departments. All programs are listed below.

Graduate Programs at the College Level
Master of Business Administration
Ph.D. in Business Administration

Specialized Programs at the Department Level
Master of Professional Accounting
Master of Science in Accounting
Master of Science in Taxation
Master of Arts in Economics
Master of Science in Information Systems
Master of Science in Marketing Research
Master of Science in Personnel and Human Resource Management
Master of Science in Real Estate

Department of Accounting

Areas of Study and Degrees
Accounting
M.P.A., M.S.
Taxation
M.S.
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)

Master's Degree Plans
Thesis and Non-Thesis

Acting Chair
Larry Walther
409 Business, 817-272-3481

Graduate Advisor
Contact Accounting Department
433 Business, 817-272-3028

Graduate Faculty
Professors
Courtney, Dunn,
T. Hall, Hill, Petersen,
Solomon, Taylor

Associate Professors
Beehler, B. Hall, Ho,
Johnson, Mark, McConnell,
Tsay, Walther

Assistant Professor
Jones

Objective

The objective of the Master of Professional Accounting, the Master of Science in Accounting, and the Master of Science in Taxation degree programs is to prepare students for careers as professional accountants in public, private, or government accounting. As a part of this objective, the programs are designed to provide the educational background to become Certified Public Accountants or to attain other appropriate professional certification*. The MPA program, appropriate for students without significant prior study in accounting, is also designed to provide a sound understanding in selected fields such as management, finance, behavioral sciences, management sciences, and economics. The MS in Accounting and MS in Taxation are more specialized degrees which build on the candidate's prior background in accounting and business related subjects. Thus, the programs seek to insure that the student attains a broad perspective, which is a requisite to success both as a professional accountant and as a top-level financial or business executive.

*Beginning in 1997, the Public Accountancy Act of 1991, as amended, will require completion of at least 150 semester hours of which 30 (excluding elementary accounting) must be in accounting for individuals to be licensed as Certified Public Accountants.

Accreditation

The Master of Professional Accounting, the Master of Business Administration, and the Master of Science in Accounting are accredited by the AACSB–The International Association for Management Education.

Degree Requirements

Admission to an accounting graduate degree program is based upon the general admission requirements of the Graduate School. Both a satisfactory score on the Graduate Management Admission Test and other evidence (such as a suitable GPA in previous study) are required for admission to the program.

The programs, which can be completed by part-time students who attend classes during the evening hours, are designed to accommodate students with divergent educational backgrounds and career interests. Each student's program of work must be approved by the Accounting Graduate Advisor and it must include a minimum of 15 semester hours in advanced graduate accounting courses taken at The University of Texas at Arlington. It should be noted that courses which are not considered suitable to a student's program will not be approved. Any and all MBA-designated foundation courses are not acceptable as advanced hours in any accounting programs. During the final semester, students who have written a thesis must defend the thesis in an oral examination. The following requirements for the Accounting Graduate Degrees are in addition to the general regulations and requirements given in the introductory sections of this catalog.

Grade and Graduation Requirements

Students enrolled in accounting degree programs (MPA, MS-Accounting, MS-Tax) are subject to the grade requirements for academic probation and graduation as specified under the general regulations of the Graduate School (stated elsewhere in this catalog). In addition to regulations of the Graduate School, regulations of the Department of Accounting specify that a student's program of work will not be approved if the student has earned a grade of C in more courses, which are applied to the program of work, than allowed per the schedule below.

Number of Courses (U.T. Arlington coursework only)	Allowable Number of Grades of C
12 courses	2
13 and above	3

Courses in which the student has earned a grade of D or F may not be applied to the program of work.

Integrated Five-Year Program (Professional Program in Accounting)

The Public Accountancy Act of 1991, as amended, requires, beginning in 1997, the completion of at least 150 semester hours, of which 30 must be in accounting (excluding elementary accounting), for individuals to be licensed as Certified Public Accountants. A professional program satisfying these requirements is offered by The University of Texas at Arlington. The program will allow a student to earn both the Bachelor of Business Administration and Master of Science in Accounting or Taxation upon completion of an integrated five-year program. The proposed integrated program can be completed in approximately one less semester than required to earn separate bachelor's and master's degrees in accounting.

Master of Professional Accounting Background Category I

Students who have had no prior academic work in business administration are included in this category. These students will take the courses in the Foundation Program (27 semester hours as shown below); in addition, they must complete the requirements of the Category I MPA Program which totals 39 semester hours of work.

Foundation Program

Semester I	Semester II
Accounting Analysis I (ACCT 5301)	Accounting Analysis II (ACCT 5302)
Economic Analysis I (ECON 5309)	Economic Analysis II (ECON 5311)
Statistics (BUSA 5301)	Finance (FINA 5311)
Behavioral Science in Management (MANA 5311)	Marketing (MARK 5311)
or	Management (MANA 5312)
Social Science Equivalent	

Category I MPA Program

Financial Accounting I (ACCT 5311)
Financial Accounting II (ACCT 5312)
Financial Accounting III (ACCT 5319)
Accounting Systems Analysis (ACCT 5315)
Accounting for Management Planning and Control (ACCT 5322)
Study of Federal Income Tax Law Relative to Individuals (ACCT 5314)
Contemporary Issues in Accounting Theory (ACCT 5327)
Auditing Concepts and Practices (ACCT 5316)
Law I (BLAW 3311)
Business Policy (BUSA 5333)

In addition to the courses listed above (or their equivalents), the student will select two graduate level accounting courses and one appropriate graduate level course in statistics, management science, or information systems.

Master of Professional Accounting Background Category II

Students who have some prior academic work in business administration but who do not have the equivalent of a major in accounting are included in this category. Students in Category II must meet the same foundation requirements as Category I students, and they must complete the coursework of the Category I MPA Program. However, courses equivalent to those taken in a student's previous academic work will be waived; such courses cannot be repeated for credit. For example, a student with an undergraduate major in business administration typically would not be required to complete any of the courses in the Foundation Program.

In addition to any needed foundation courses and regardless of the number of courses waived, a student in Category II who chooses to write a thesis is required to complete a minimum of 33 semester hours; a student who chooses not to write a thesis is required to complete a minimum of 39 semester hours (including 30 hours of accounting coursework).

Master of Science in Accounting

This program is designed for students who have an undergraduate degree in accounting or a degree in business administration with a major in accounting who wish to specialize in an area of accounting other than taxation. The student, with the assistance and consent of the Graduate Advisor, will develop a course of study designed to meet his or her educational needs in light of previous academic work and career objectives. Specialization tracks are available in accounting systems, auditing, and financial accounting.

A minimum of 30 semester hours (including 18 semester hours of accounting coursework) is required if the student chooses to write a thesis. If the student chooses not to write a thesis, a minimum of 36 semester hours (including 24 semester hours of accounting coursework) is required. The student must have previously studied or include in his or her program courses covering the following areas of accounting: financial accounting and accounting theory, cost/managerial accounting, management information and computer systems, financial and operational auditing, and taxation. At least 12 semester hours of non-accounting graduate level courses offered by the College of Business Administration are required, including BUSA 5333 and an appropriate graduate course in statistics, management science, or information systems. BUSA 5333 is not required if the

student has had a similar course before admission to the Master of Science in Accounting program.

Background Requirements

Students in the MS in Accounting program must have completed the following courses in addition to the Program Requirements (below) for the MS in Accounting degree:

1. Courses equivalent to the Foundation Program for the Master of Professional Accounting degree (see above); and
2. Courses equivalent to U.T. Arlington accounting courses ACCT 5311, 5312, 5314, 5315, 5316, and 5322. These courses typically will have been completed as a part of a candidate's undergraduate program in accounting.

Program Requirements

The required program for an MS in Accounting consists of the following:

Eighteen semester hours: Graduate level accounting courses beyond those stipulated in Background Requirements above. ACCT 5319, 5321, and 5327 must be included if equivalent courses have not been completed previously. The courses selected must include at least 12 semester hours of non-tax graduate level accounting courses.
Three semester hours: BUSA 5333 (Business Policy), or an elective non-accounting graduate level course offered by the College of Business Administration if the student completed a course similar to BUSA 5333 before admission to the MS in Accounting Program.
Three semester hours: Appropriate graduate level course in Statistics, Management Science, or Information Systems.
Six semester hours: Graduate level courses offered by the College of Business Administration.

Thesis Option (Total program of 36 semester hours)
Six semester hours: Thesis on accounting (non-tax) topic.

Non-Thesis Option (Total program of 36 semester hours)
Six semester hours: Graduate level accounting courses (other than taxation courses) offered by the College of Business Administration.

Master of Science in Taxation

This program is designed for students who have an undergraduate degree in accounting or a degree in business administration with a major in accounting who wish to specialize in taxation. The student, with the assistance and consent of the Graduate Advisor, will develop a course of study designed to meet his or her educational needs in light of previous academic work and career objectives.

A minimum of 36 semester hours, including a minimum of 18 semester hours in taxation courses beyond ACCT 5314, is required. The student may choose to write a thesis that will count as six semester hours toward the 36-hour requirement. The student must have previously studied or include in his or her program courses covering the following areas of accounting: financial accounting and accounting theory, cost/managerial accounting, management information and computer systems, financial and operational auditing, and taxation. Also required is BUSA 5333. BUSA 5333 is not required if the student has had a similar course before admission to the Master of Science in Taxation program.

Background Requirements

Students in the MS in Taxation program must have completed the following courses in addition to the Program Requirements (below) for the MS in Taxation degree:

1. Courses equivalent to the Foundation Program for the Master of Professional Accounting degree (see above); and
2. Courses equivalent to U.T. Arlington accounting courses: ACCT 5311, 5312, 5314, 5315, 5316, and 5322.

These courses typically will have been completed as a part of a candidate's undergraduate program in accounting.

Program Requirements

The required program for an MS in Taxation consists of the following:

Eighteen semester hours: Graduate level taxation courses beyond ACCT 5314. Taxation courses required of all candidates are ACCT 5339, 5341, 5342, and 5347.
Three semester hours: BUSA 5333 (Business Policy) or an elective graduate level course offered by the College of Business Administration if the student completed a course similar to BUSA 5333 before admission to the MS in Taxation program.
Nine semester hours: Elective graduate level course offered by the College of Business Administration.

Thesis Option (Total program of 36 semester hours)
Six semester hours: Thesis on taxation topic.

Non-Thesis Option (Total program of 36 semester hours)
Six semester hours: Graduate level accounting courses offered by the College of Business Administration.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Accounting (ACCT)

5301. ACCOUNTING ANALYSIS I (3-0). Introduction to concepts, purposes, problems, methodology, and terminology of financial accounting.

5302. ACCOUNTING ANALYSIS II (3-0). Introduction to concepts, purposes, problems, methodology, and terminology of managerial accounting. Prerequisite: ACCT 5301 or equivalent.

5311. FINANCIAL ACCOUNTING I (3-0). Examination of financial accounting process, problems encountered in preparation of financial statements, and concepts and principles used to resolve these problems. Prerequisite: ACCT 5301 or equivalent.

5312. FINANCIAL ACCOUNTING II (3-0). Study of additional problems encountered in preparation of financial statements. Prerequisite: ACCT 5311 or equivalent.

5313. SOFTWARE TOOLS FOR ACCOUNTANTS (3-0). A study of software programs which are commonly useful to accountants in both private and public practice. Topics include spreadsheets, graphics, communications, word processing, and other computer software tools. Prerequisite: ACCT 5302 or equivalent.

5314. STUDY OF FEDERAL INCOME TAX LAW RELATIVE TO INDIVIDUALS (3-0). Comprehensive analysis of the federal income tax consequences applicable to individuals. Emphasizes the analysis of concepts relating to passive and earned income, deductible expenses, and tax credits. May not be taken for credit by students who have credit for any course in federal income taxation. Prerequisite: ACCT 5301 or equivalent.

5315. ACCOUNTING SYSTEMS ANALYSIS (3-0). A study of manual and computerized accounting systems. Emphasis on the functionality of systems and their support of controls and audit trails. Prerequisite: ACCT 5302 or equivalent.

5316. AUDITING CONCEPTS AND PRACTICES (3-0). Concentrates on practice of professional accounting and auditing. Emphasizes decision making in a variety of unstructured situations where decisions demand a grasp of purpose, method, and judgment for their resolution. May not be taken for credit by students who have received credit for a course in auditing. Prerequisites: ACCT 5312 and 5315 or equivalent and BUSA 5301 or equivalent.

5317. COST ACCOUNTING (3-0). Uses and classification of costs incurred in manufacturing. Emphasis on concepts involved in assignment and reporting of costs under job order, process, standard and direct costing systems. Prerequisite: ACCT 5302 or equivalent.

5318. STUDIES IN AUDITING (3-0). A critical analysis of advanced topics in both auditing theory and professional practice. Emphasis on: development of auditing theory, generally accepted auditing standards, professional responsibilities, auditing EDP, SEC practice and reporting, cases in audit decision making, and analyses of emerging issues and contemporary problems in auditing. Prerequisite: ACCT 5316 or equivalent.

5319. FINANCIAL ACCOUNTING III (3-0). Accounting for business combinations, preparation of consolidated financial statements, multinational operations, partnerships, and estates and trusts. Prerequisite: ACCT 5312 or equivalent.

5320. GOVERNMENTAL AND NONPROFIT ACCOUNTING (3-0). Budgeting, accounting and financial reporting, managerial control, and auditing considerations of governmental and nonprofit entities (e.g. hospitals, universities, and voluntary health and welfare organizations). Prerequisite: ACCT 5301 or equivalent or permission of the instructor.

5321. RESEARCH IN ACCOUNTING ISSUES (3-0). Designed to improve student's ability to research complex areas in accounting and to sharpen understanding and application of accounting concepts and principles. Case studies and problems considered and analyzed. Prerequisite: ACCT 5312 or equivalent.

5322. ACCOUNTING FOR MANAGEMENT PLANNING AND CONTROL (3-0). Concentrates on information needs of management for planning and control of operations. Topics include setting corporate objectives, behavioral problems, capital budgeting and profit-planning, the use of quantitative tools, divisional performance evaluation, and transfer pricing. May not be taken for credit by students who previously received credit for ACCT 4302 or equivalent. Prerequisite: ACCT 5302.

5323. CORPORATE MODELING (3-0). Aggregative approach to modeling corporate activities with emphasis on financial modeling. Problem definition, design choices, and validation problems considered. Computer models developed. Prerequisite: ACCT 5322 or equivalent and consent of instructor.

5327. CONTEMPORARY ISSUES IN ACCOUNTING THEORY (3-0). Designed to familiarize students with significant problems currently facing the accounting profession, to examine in depth various solutions proposed by accounting scholars and others, and to strengthen student understanding of today's critical issues in accounting theory. Prerequisite: ACCT 5312 or equivalent.

5329. SURVEY OF ACCOUNTING SYSTEMS (3-0). A survey and design critique of typical commercial, horizontal, accounting software systems. Functional areas include general ledger, receivables, payables, payroll, and inventory. Evaluation criteria include data capture, processing features, internal control, audit trails, and reporting capabilities. Prerequisite: ACCT 5315.

5330. INTERNATIONAL ACCOUNTING AND FINANCIAL REPORTING (3-0). Financial accounting and reporting principles and practices in various countries, the role of accounting in economic development, as well as the accounting considerations in international business operations—e.g. foreign currency translation, auditing, accounting systems, taxation, and sensitive payments. Prerequisite: ACCT 5302.

5332. OPERATIONAL AUDITING (3-0). A study of operational audit methodology for management audits. Audits of administrative and support functions, and other special areas such as fraud audits. Prerequisite: Graduate standing and six hours of accounting.

5335. DESIGN OF ACCOUNTING SYSTEMS (3-0). A detailed study of the data entry, storage (file design), internal control, and reporting requirements of accounting systems, followed by the development of a significant accounting sub-system using a software development tool. Prerequisite: ACCT 5315 or equivalent.

5336. SELECTED TOPICS IN ACCOUNTING SYSTEMS (3-0). The study of theoretical and practical aspects of selected issues in accounting systems; issues for study include contemporary topics such as design techniques, management and development of accounting systems, and factors affecting choice of an accounting system. Prerequisite: ACCT 5329 or equivalent.

5339. TAX PLANNING AND RESEARCH (3-0). A study of the use of various techniques and procedures available in evaluating issues arising under federal income tax law. Emphasizes research into individual and business tax problems and planning alternatives. Prerequisite: ACCT 5314 or equivalent.

5340. STUDY OF FEDERAL INCOME TAX FOR ENTITIES OTHER THAN INDIVIDUALS (3-0). Comprehensive analysis of the federal income tax consequences applicable to entities other than individuals. Analysis of the relevant tax principles of corporations, partnerships, trusts and estates will be undertaken. Cannot be taken for credit within the 36-hour program requirements for Master of Science in Taxation program. Prerequisite: ACCT 5314 or equivalent.

5341. TAX PROBLEMS OF PARTNERSHIPS AND PARTNERS (3-0). Analysis of the federal income tax rules governing partners and partnerships. Prerequisite: ACCT 5314 or equivalent.

5342. TAX PROBLEMS OF CORPORATIONS AND SHAREHOLDERS (3-0). Analysis of the federal income tax rules governing corporations and shareholders. Subjects include corporate formations, corporate capital structure, administrative requirements affecting corporations, the corporate alternative minimum tax, special tax provisions (such as the personal holding company and accumulated earnings taxes and the collapsible corporation rules), nonliquidating distributions, stock dividends, redemptions and partial liquidations, liquidating distributions, corporate reorganizations, and Subchapter S corporations. Prerequisite: ACCT 5314 or equivalent.

5343. TAX PROBLEMS OF TRANSACTIONS IN REAL ESTATE (3-0). Problems and elections relating to the acquisition, holding, and disposition of real property. Subjects include means of acquisition and disposition, capital gains and losses, deferred payment sales, organization of syndicates, sale and lease-back, dissolutions, and general tax-saving methods. Prerequisite: ACCT 5314 or equivalent.

5345. CONTEMPORARY ISSUES IN FEDERAL TAXATION (3-0). Analysis of current federal taxation problems. Subjects include recent changes in federal tax legislation, minimization of tax liability through certain investments, analysis of tax liabilities. May be repeated for credit. Prerequisites: ACCT 5314 or equivalent and approval of Graduate Advisor.

5346. SEMINAR IN FEDERAL TAXATION (3-0). In-depth study of current topics in the operations of the federal taxation system. Material to be covered will vary based on the semester offered and the topics considered by the instructor to be of current interest. Topics may include tax procedure and administration; tax accounting methods, procedures and elections available to taxable entities; accounting periods; installment sales; inventory methods; and uniform capitalization rules. May be repeated for credit. Prerequisites: ACCT 5314 or equivalent and the approval of the Graduate Advisor.

5347. FEDERAL TAXATION OF GIFTS AND ESTATES (3-0). A comprehensive survey of the principles and procedures involved in determining the federal estate tax and the supplementary federal gift tax including taxability and valuation of property and the determination of deductions and credits. Prerequisite: ACCT 5314 or equivalent.

5348. FEDERAL TAXATION OF INTERNATIONAL TRANSACTIONS (3-0). Introduction to United States taxation of multinational and foreign corporations. Subjects include sourcing of income and expenses, the U.S. foreign tax credit, controlled foreign corporations, U.S. taxation of foreign persons and export incentive provisions. Prerequisites: ACCT 5342.

5352. AUDIT AND CONTROL OF EDP SYSTEMS (3-0). A study of controls needed in EDP systems, related audit problems, and approaches to using the computer as an audit tool. Prerequisites: ACCT 5315 and 5316 or equivalents.

5353. STATISTICAL TECHNIQUES USED IN ACCOUNTING (3-0). A study of statistical techniques used in accounting. Topics include alternative sample selection methods, attribute methods, mean-per-unit estimation, ratio and difference estimation, monetary unit sampling, and regression analysis. Prerequisite: BUSA 5301 or an introductory course in statistics.

5382. INDEPENDENT STUDIES IN ACCOUNTING. Extensive analysis of an accounting topic. Prerequisite: consent of faculty member and department chair.

5392. SELECTED TOPICS IN ACCOUNTING. In-depth study of selected topics in accounting. May be repeated when topics vary. Prerequisite: consent of instructor.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisite: permission of Graduate Advisor.

6101. ACCOUNTING RESEARCH COLLOQUIUM (1-0). A forum in which visiting scholars and U.T. Arlington faculty members present and discuss results of their contemporary research. Doctoral students participate by meeting with visiting scholars, reading the research papers, providing written critiques, and discussing the papers. Doctoral students are required to enroll and attend the colloquia presentations each fall and spring semester until the students pass all their comprehensive examinations. May be repeated for credit. Graded P/F. Prerequisite: consent of Ph.D. advisor.

6309. SEMINAR IN ACCOUNTING RESEARCH I (3-0). Analysis of the theoretical and empirical literature in accounting. Prerequisite: consent of Graduate Advisor.

6310. SEMINAR IN ACCOUNTING RESEARCH II (3-0). Continuation of analysis of the theoretical and empirical literature in accounting. Prerequisites: ACCT 6309 and consent of the Graduate Advisor.

6311. SEMINAR IN ACCOUNTING RESEARCH III (3-0). Continuation of analysis of the theoretical and empirical literature in accounting. Prerequisites: ACCT 6310 and consent of the Graduate Advisor.

Program in Business Administration

Area of Study and Degrees
Business Administration
M.B.A., Ph.D.

Master's Degree Plan
Thesis and Non-Thesis

Director of Graduate Programs and M.B.A. Graduate Advisor
James E. Walther
434 Business, 817-272-3004

Director of Doctoral Program and Ph.D. Advisor
R.C. Baker
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Graduate Faculty
Professors
Amacher, Apilado, R. Baker, Courtney, Dickinson, Diltz, Dunn, Gates, Gerloff, T. Hall, Hayashi, Hill, Himarios, McDaniel, Meiners, Mullendore, Mykytyn, Panton, Petersen, Quick, Raja, Schkade, Sircar, Solomon, Swanson, Taylor, Whiteside, Wofford, Worrell

Associate Professors
Beehler, Bordoloi, Eakin, Gray, B. Hall, Harrison, Huq, Iyer, Jarboe, Johnson, Mark, McConnell, Munch, Pinney, Price, Priem, Rasheed, Slinkman, Swidler, Tsay, Walther, Wheeler

Assistant Professors
J. Baker, Bell, Boze, Buttimer, Crowder, Depken, Farnsworth, Flessig, Frazier, Grossman, Hensler, Ho, Hyland, Jones, Kleiser, McGee, McMahan, Mosley-Matchett, Peterson, Sarkar, Smythe, Wagner

Master of Business Administration (MBA) Program Objective

The Master of Business Administration program disseminates knowledge and offers enhanced learning experiences that address the leadership and management of organizations in the global village. The faculty's research and consulting rigor creates new knowledge for industry use and classroom excellence. This community of shared knowledge leads to strategic growth alliances that significantly advance the nature of business education. Faculty strive to generate enhanced learning experiences that provide students with vision, environmental awareness, foresight to embrace new technologies, courage to pursue innovation and risk taking, and the belief that lifelong learning is a partnership that generates value-added to career outcomes. We offer a variety of MBA degrees and certificates that focus on furthering the desired outcomes for different segments of the global village.

Graduates from our programs are competent in the leadership of organizations and the cross-functional management of vital resources. Their competence is based in educational experiences that foster creative thinking, awareness of global opportunities, sound analytic decision making, strategic awareness, excellence in functional disciplines, and the internalized values of effective teamwork and leadership. Our dedicated faculty and high quality career services assist each student, from entry in our program through retirement, in achieving their lifelong educational and career goals.

Accreditation

The Master of Business Administration program is accredited by the AACSB–The International Association for Management Education.

Admissions

Admission to the MBA program is based upon the completion of the general admission requirements of the Graduate School. For admission to the Business Administration program a satisfactory score on the Graduate Management Admission Test is required. There is no foreign language requirement for the MBA program. International applicants that need to improve their English proficiency (GMAT verbal 15-25 percentile) may be required to pass a pre-test or complete U.T. Arlington's Graduate English Skills Program prior to beginning graduate coursework. Applicants are encouraged to submit with their application a résumé that highlights professional and personal accomplishments, linguistic abilities, computer expertise and leadership experience. Applicants with two to five years of experience are preferred.

Non-Thesis Degree Requirements

The program is designed to accommodate both full-time and part-time students from widely divergent backgrounds. It is not necessary to have completed prior academic work in business administration.

Core courses are designed to prepare the student for advanced coursework. These graduate courses are an integral part of the MBA program. Many people in business seek to enhance their career opportunities by broadening their knowledge and understanding of the overall management field. Since it is impossible for them to leave their responsibilities and return to academic work on a full-time basis, the College of Business Administration offers a complete program in the evening and on Saturday as a service to the community. Most evening or Saturday classes are taught by full-time faculty members and the same academic standards required of full-time students are maintained. It is expected that the student will progress through the program at a pace that is commensurate with the time available.

Waivers and Transfer Credit

There are three types of required courses: deficiency, core and advanced. Programs of work will normally vary in length from 36 to 48 hours (plus deficiency courses), depending upon waivers granted. The first two waivers of core courses will be used to expand the number of electives in the advanced program rather than shorten the overall program. Additional waivers may reduce the program to a minimum of 36 hours. Applicants may have both deficiency and core courses waived without substitution if they have completed, during the last 10 years, a similar course at a recognized college or university and received a "B" or better grade. Extensions to this 10 year limit may be granted for managers and executives who have completed educational activities to remain current or have extensive related experience. Additionally, a maximum of 9 hours of advanced coursework may be transferred in from other AACSB/IAME accredited schools if approved by the Dean of Graduate Studies. Transfer of graduate classes from other universities will be considered on a case by case basis.

Deficiency Courses

Applicants are encouraged to complete deficiency requirements prior to applying or at the beginning of their studies. College courses in business math (including probability and set theory, linear equations, matrix algebra, compound interest, annuities, and differential and integral calculus), business statistics (see BUSA 5301), and computers (including general topics, spreadsheets and word processing) may be taken prior to entry in the program. Deficiency requirements in intensive English, ENGL 1301 or SPCH 1301, may be required and taken only at U.T. Arlington after enrollment in the program.

Core Courses

These courses should be taken upon entering the MBA program and prior to taking courses in the advanced MBA program. They may not be used as electives in the advanced program.

Accounting Analysis I (ACCT 5301)
Macroeconomic Analysis (ECON 5311)
Introduction to Production and Operations Management (POMA 5361)
Marketing (MARK 5311)
Finance (FINA 5311)
Management (MANA 5312)

With approval of the MBA Advisor, a student may enroll in advanced courses when schedule conflicts prevent completion of all the core courses. A student may not apply to the MBA degree more than nine semester hours of advanced work completed prior to the completion of all core courses.

Advanced Program

The advanced program provides each student the opportunity to tailor their studies to those areas they believe will best enhance their career. The careers program outlined below provides excellent support and advice to both choose a specialty and select those electives that will build requisite career skills. Available specialties include accounting, economics, finance, information systems, management, management sciences (includes production and operations management courses), marketing, and real estate. Requirements for the advanced program include the following:

Required Breadth Courses (4)
BUS6 5325 Advanced Statistics (first advanced course)
BUS3 5330/BUS4 5337 Legal Environment/Business & Society
ECON 5313 Managerial Economics*
ACCT 5302 Managerial Accounting*

* If relevant academic background is extensive enough in this subject area, the graduate advisor may allow the student to correspondingly expand the number of electives in the specialty or breadth area.

Specialty Electives

Students may expand the number of electives in their specialty from three (3) to six (6) if they meet the following requirement: The advanced program must have six courses (18 semester hours) outside of their specialty

Breadth Electives and Capstone

Students with **no specialty** may have up to nine (9) electives if they are provided maximum waivers and substitutes. In such cases, students may not have more than two (2) courses in any one academic area (e.g., ACCT, FINA, etc.). Students with a **specialty** may choose as many breadth electives as they desire as long as they meet the minimum of six courses (18 semester hours) of advanced courses outside their specialty.

BUSA 5333 Business Policy (Capstone course must be taken in last semester)

Selection of Electives (Specialty or Breadth)

Students should tailor their program of work to develop skills and perspectives essential for business in the 21st century (see Planning a Program of Work). This should normally include approved electives in the following areas: international, technology and leadership/behavioral. Individuals with strong backgrounds in these areas may choose other electives. At least one elective should be on the approved list of research courses. Some breadth electives may be taken outside the Business College when the student has an academic background in that area or the electives are appropriate to the student's career goal.

Thesis Degree Requirements

Requirements for the MBA thesis degree are the same as those for a non-thesis program with the following change. A six-hour thesis must be added to the normal 36 hour advanced MBA program. All candidates for this type degree shall defend the thesis at a final oral examination.

Grade and Graduation Requirements

The MBA program follows the grade requirements for probation as specified under the general regulations of the Graduate School. In addition, to graduate, students must have at least a 3.0 grade point average in all coursework and area of specialty. Students will be dismissed from the MBA program if they accumulate grade deficiency points greater than allowed. Any grade of C is worth one deficiency point, any grade of D is worth two deficiency points and any grade of F is worth three deficiency points. Deficiency points may not be removed from a student's record by additional coursework.

The maximum allowable deficiency points will be computed by the advisor when the degree plan is prepared or adjusted using the following guidelines:

Program Length (U.T. Arlington coursework only)	Allowable Deficiency Points
12 courses	2
13-16 courses	3
17 courses or more	4

Planning a Program of Work

All students are encouraged to plan an advanced program of work early in their studies. The process begins with a five-minute "mini-workshop" conducted on a walk-in basis in the Graduate Studies Office. The workshop provides important reference materials to assist students in preparing a preliminary advanced program of work and also provides an outline of the process for finalizing that program with the advisor. After approval, the program of work is loaded on the College's Cyber Advising system, allowing students to register by phone each semester for any approved course.

When planning a program of work, students may consider including several opportunities to enhance their career outcomes. Full-time students are encouraged to take advantage of the careers program outlined in the College portion of this catalog. The Careers and Managing in a Changing Environment (BUS4 5338) course provides opportunities for students to discover their own talents and abilities, identify appropriate careers, and explore the best opportunities in the marketplace. Such early career positioning allows students to focus their studies on those courses which will provide the most important skill sets. Additionally, students may select research topics and case presentations that will develop a strong industry awareness. Study abroad and internship opportunities also expand students' educational experiences on both a curricular and extracurricular basis. These special programs must be approved by a graduate advisor and included in the student's program of work.

Part-time students who are fully employed are encouraged to explore opportunities available in their organizations. Regular application of classroom information to the daily challenges faced in any business organization will expand students' education and career outcomes. The career class (BUS4 5338) will assist working students in seeking greater opportunities in their organizations.

Requirements for Electives

The following areas have some special requirements for electives:

A specialty in accounting requires a minimum of 15 semester hours of advanced graduate accounting courses. The student selecting a specialty in accounting must have previously studied or include in his or her program courses covering the following areas of accounting: financial accounting and accounting theory, management information and computer systems, financial and operational auditing, and taxation. An individual with no accounting background will be required to complete an advanced program of up to 42 semester hours, including 21 hours of accounting courses and an accounting research course.

The required 21 hours of accounting courses include:
ACCT 5311 Financial Accounting I
ACCT 5312 Financial Accounting II
ACCT 5319 Financial Accounting III
ACCT 5314 Study of Federal Income Tax Law Relative to Individuals
ACCT 5315 Accounting Systems Analysis
ACCT 5316 Auditing Concepts and Practices
ACCT 5322 Accounting for Planning Management and Control

Students who elect a specialty in information systems are advised to take six semester hours in accounting and may select up to six hours of graduate electives in computer science or management science, subject to the approval of the MBA Graduate Advisor.

Students may take breadth electives in any of the curriculum areas of the MBA Program. He or she may take no more than six semester hours in advanced courses in an area outside their specialty. Students may take up to six semester hours in non-business coursework as a part of their breadth electives, subject to the approval of the MBA Graduate Advisor.

International Business Option

The international business option (INBO) attracts students from every continent by providing a comprehensive program of challenging study in international business administration. In this option, students may have a traditional MBA specialty (see above) or a broad program of study with no specialty. Generally a student must complete a minimum of 3-4 courses from the international courses listed below in order to be considered in this option.

Students are encouraged to enrich their international education by participating for graduate credit in established foreign exchange programs in Australia, England, France, Germany, Korea, Mexico, and Norway, or by gaining approval to participate in unique study abroad programs offered by other AACSB accredited schools. Appropriate foreign language proficiency must be demonstrated before attending programs in France, Germany and Mexico or when required by study abroad programs. Students are encouraged to

participate for academic credit in international business internships available in the Metroplex or oversees as part of an established exchange or study abroad program.

MBA students may further enhance their international skills by participating in the dual degree program with Thunderbird University. Under this program, students may earn both an MBA (UTA) and the Master of International Management (Thunderbird) degrees. This program normally allows students to apply 12 hours of advanced coursework and all core requirements towards both programs. Students wishing to participate may obtain detailed information about the program from the Graduate Studies Office in the College of Business Administration. Students must independently apply and gain admission to both programs.

Students planning a career in the international field are encouraged to pursue internationally related research topics while taking approved research courses. Research topics may include conducting an area study (Latin American, African, Asian, European, etc.). Students should also recognize the importance of those graduate courses in political science and history, or additional courses in undergraduate foreign languages, which would embellish their graduate studies.

ACCT 5330 INTERNATIONAL ACCOUNTING AND FINANCIAL REPORTING
ACCT 5348 INTERNATIONAL TAX
BUSA 5331 LAW OF INTERNATIONAL BUSINESS
ECON 5315 INSTITUTIONAL ANALYSIS AND COMPARATIVE ECONOMIC SYSTEMS
ECON 5319 ECONOMIC ANALYSIS OF INTERNATIONAL BUSINESS
ECON 5321 INTERNATIONAL TRADE AND THE GLOBAL MARKETPLACE
ECON 5327 INTERNATIONAL FINANCE
FINA 5331 MULTINATIONAL FINANCIAL MANAGEMENT
FINA 5332 SEMINAR IN INTERNATIONAL FINANCIAL MARKETS
INSY 5347 GLOBAL INFORMATION SYSTEMS
MANA 5331 MANAGEMENT OF INTERNATIONAL OPERATIONS
MARK 5331 INTERNATIONAL MARKETING

Professional Management Electives

Students holding bachelor's or master's degrees in professional fields such as architecture, education, engineering, nursing, social work, and urban studies have the option of taking up to 12 hours of breadth electives in their professional area as part of their MBA degree requirements. With these electives, professionals can develop advanced management skill in a functional area by declaring a 9-12 hour specialty, or pursue a more general management approach by declaring "no specialty." If an accounting concentration is desired, the advanced program may require up to 45 semester hours to provide required accounting skills. A full 36-hour advanced program is required for all other specialties.

Technology and Innovation Management Electives

Several course sets have been designed for students wishing to achieve a greater understanding of technology and how it is developed. The courses in these sets include coverage of the economic role of innovation and the management of the firm's technological base to shape and accomplish the organization's operational, strategic, and competitive objectives. Separate course sets attempt to focus on the following specific areas of interest: energy technology, environmental technology, financial innovations, health technology management, information systems management, manufacturing management, marketing and technology, and production and operations management. These course sets are included in the course set listings available in the Graduate Studies office.

Graduate Certificate Programs

Graduate Advanced Studies Certificate

Individuals who hold a graduate degree in business and wish to pursue additional graduate studies in business solely for the purpose of professional development may apply to the Master of Business Administration Program as a special student. Applicants should outline their professional development objectives in their written essay that accompanies their application. Additionally, they must meet all requirements for admission to the MBA program. Coursework in this program must meet the grade requirements of the Graduate School and be completed within a three year time-limit. A certificate will be granted upon successful completion of 12-21 hours of approved coursework in an area of business. Executives completing courses from two or more areas will be awarded a certificate in the area of **executive development**. Managers or functional specialists completing courses in one area of study will be awarded a certificate for their **professional development** area. Some courses taken under this program may not be applied in the future toward another graduate degree at this University.

Environmental Graduate Certificate in Hazardous Materials Management

The MBA program and the Environmental Institute for Technology Transfer (EITT) offer an advanced yet practical approach for managers and executives in environmentally sensitive industries. A student can now earn both an MBA and a graduate certificate in Hazardous Material Management. Generally students should have a strong natural science background to enroll in this program. All students pursuing this certificate must take Environmental Economics (ECON 5306), the capstone course Project Planning (CIRP 5333), and the following course selections:

One of the following:
Hazardous Waste (CE 6323)
Environmental Toxicology (CE 5326)

One of the following:
Environmental Geochemistry and Geology (GEOL 5301)
Dispersion Modeling (CE 6324

One of the following:
Urban Environmental Management and Policy (URBA 5317)
Environmental Regulations: Laws and Planning (CIRP 5341)

Objective: Ph.D. in Business Administration

The objective, as stated in the September 1995 Self-Evaluation Report, of the Doctor of Philosophy in Business Administration degree is primarily to develop scholars with an ability to teach and conduct independent research in various areas of business administration. The program prepares students for careers as creative teachers and researchers by providing thorough preparation in both the theory and practice of business administration. The curriculum emphasizes and develops the rigorous analytical skills needed to make significant contributions in fields of business. Graduates of the program will assume significant roles in the world's educational and research institutions.

Coursework is offered in the following areas: accounting, banking and finance, business economics, business policy/strategic management, business statistics, personnel/human resource management, insurance and risk management, international business management, investments and securities, labor/industrial relations, management information systems, management sciences, marketing management and research, organizational behavior, organizational theory, production/operations management, real estate, small business management and ownership, and taxation. Coursework in these areas of study supports the following major fields: Accounting, Economics, Finance, Information Systems, Management, Management Sciences, and Marketing.

Admission

Admission is competitive and the attainment of a specific set of minimum qualifications does not assure admission. Instead, admission is granted to the candidate deemed to be most qualified to achieve success. In general, all applicants must:

1. Meet the admission criteria established by the Graduate School.
2. Have completed at least 30 hours of master's level graduate work in an appropriate field with a grade point average of 3.4 or higher.
3. Have achieved a satisfactory score on the Graduate Management Admissions Test and satisfactory scores on both the verbal and quantitative portions of the examination.

In addition, students for whom English is a second language must submit satisfactory scores on the Test of Spoken English (TSE-A) and the Test of English as a Foreign Language (TOEFL).

Degree Requirements

All students must complete work in three fields: a major (dissertation) field, a minor field, and a research field. A minor field may be external to the College of Business Administration. Examples are industrial engineering, mathematics, computer science, sociology, and psychology. The student must petition for approval of an external minor field.

The following minimum semester hours must be included in the student's Program of Study.

	Minimum Semester Hours
Business Foundation	*
Major Field	18**
Minor Field	12**
Research Field	15**
Doctoral Research Colloquium	4
Dissertation	18

*From 0-30 hours depending upon the student's background at the time of admission to the doctoral program.

**Previous equivalent advanced coursework may be accepted.

Residence Requirements

Each student enrolled in the doctoral program must enroll for and successfully complete a minimum of 15 hours in one 12-month period prior to completion of the comprehensive examinations. Each student must enroll for at least 12 hours every year. All students enrolled in the program must successfully complete all coursework and comprehensive examinations within a maximum of 60 months from initial enrollment in the program. A minimum of 24 graduate hours in residence, excluding dissertation, are required for all candidates.

Diagnostic Evaluation

A diagnostic evaluation is required in the student's first year of coursework. The diagnostic evaluation must be completed before registration for the third semester of coursework. The Supervisory Committee Chair will conduct the diagnostic evaluation in consultation with other committee members. Upon completion of the evaluation, the Supervisory Committee will recommend either continuation or discontinuation in the program. If the student is continued in the program, the Supervisory Committee will prescribe curricula to prepare the student for comprehensive examinations.

Comprehensive Examinations

Students must demonstrate competence in their major, minor, and research fields by the successful completion of written examinations. Written comprehensive examinations in each field will be given at the start of each fall and spring semester of each year and may be given during the summer term. A student is eligible for a written comprehensive examination when that student has completed (1) the Business Foundation with a GPA of at least 3.25 and (2) prescribed coursework in the field.

If a student fails a written comprehensive examination and continues in that field, the examination must be retaken within a period of not more than 13 months. If a student fails a second comprehensive examination in a major or research field, that student

will not be permitted to continue in the program. If a student twice fails a written comprehensive examination in a minor field, that student will not be permitted to continue in that field.

A student must complete all written examinations within 25 months or retake any examinations which fall outside the 25-month period.

When a student successfully completes all the written examinations, that student is scheduled for a comprehensive oral examination which is administered by the student's Supervisory Committee. A student who fails the comprehensive oral examination will be given a second oral examination within 12 months of the date of the first examination. If a student fails the second comprehensive oral examination, that student will not be permitted to continue in the program.

Upon successful completion of written and oral comprehensive examinations, the student is admitted to candidacy.

Dissertation

The Dissertation Committee consists of a minimum of five members: two from the student's major field, one each from the minor and research fields, and one other member. The chair of the Dissertation Committee must be from the major field.

Following completion of the comprehensive examinations, students will be required to enroll for at least nine hours of dissertation each regular semester and at least six hours each summer until completion of the dissertation. See Doctoral Requirements for Dissertations at the front of this catalog for exceptions. Students must register for a minimum total of 18 semester hours of dissertation and must be enrolled for a minimum of nine hours of dissertation in the semester in which they defend the dissertation.

The dissertation must be completed within four years of the oral comprehensive examination.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Business Administration (BUSA)

5301. STATISTICS (3-0). Introduction to statistics, designed to prepare the student for quantitative analysis of business problems. Topics include probability, random variables, sampling distributions, confidence intervals, tests of hypotheses, multiple regression, analysis of variance, Bayesian inference, and nonparametric methods. May not be counted as an MBA foundation course or elective. Prerequisite: MATH 1315.

5303. QUANTITATIVE ANALYSIS FOR BUSINESS ADMINISTRATION (3-0). Study of the methods of quantitative analysis used in business administration. Topics include matrix algebra, systems of linear equations, differential and integral calculus, linear programming, classical optimization, and a survey of management science models. Prerequisite: MATH 1315.

5325. ADVANCED STATISTICAL METHODS IN BUSINESS ADMINISTRATION (3-0). Advanced topics in regression, correlation, experimental design, sampling methods, and other statistical methods with emphasis on their application to problems in the administration of operations. Prerequisite: BUSA 5301 or equivalent.

5330. LEGAL ENVIRONMENT OF BUSINESS (3-0). Study, in a conceptual framework, of the ideas and social and political forces that have led to changes in the business legal environment and legal institutions including current and historical developments affecting the business corporation. Legal framework and ethical problems of managers in serving diverse interests studied in connection with modern social legislation affecting business.

5331. LAW OF INTERNATIONAL BUSINESS (3-0). General principles of law applicable to international business including case law, statutory law, treaties, administrative law, and international agreements.

5332. ENTREPRENEURSHIP AND ENTERPRISE DEVELOPMENT (3-0). Venture formation and development process. Student-chosen entrepreneurial activities are planned including the preparation of a business plan for a proposed enterprise and, to the extent possible, execution of the business plan. Additional course activities will include guest speakers, "live" cases, entrepreneurial simulation and testing and selective case presentations by student teams. Prerequisite: Permission of the instructor and Graduate Advisor.

5333. BUSINESS POLICY (3-0). Integration of the MBA curriculum into a cohesive whole. Treats the several elements of business administration by use of business policy cases and decision simulation methods. Satisfactory completion of this course fulfills the Comprehensive Examination requirement for MBA students. Prerequisite: must be taken in last semester or with permission of the Graduate Advisor.

5334. REAL PROPERTY LAW (3-0). Legal property theory underlying real estate transactions and relationships including estates and interests in land, conveyances, and mortgages.

5337. BUSINESS AND SOCIETY (3-0). Examination of the organizations of industry and commerce, government, labor, and other institutions within our society. Emphasis is on the total environment, and the social/political/legal/ethical implications of the interface.

5338. CAREERS AND MANAGING IN A CHANGING ENVIRONMENT (3-0). Presents practical and theoretical perspectives on careers and managing in a changing work environment. Includes self assessment, career plan development, informational interviews, readings and exercises designed to lead to a better understanding of managing self and others.

5375. ADVANCED BUSINESS COMMUNICATION THEORY AND PRACTICE (3-0). Examines theory of effective oral and written communication. Discusses techniques for improved research, report writing and presentation. Also stresses presentation media and computer graphics for reports and presentations.

5389, 5689, 5989. INDEPENDENT STUDIES IN MILITARY ACQUISITION. This course is reserved for military officers in the Training with Industry or I-Grad programs at U.T. Arlington. Studies consist of an acquisition practicum with training at an assigned agency and a required seminar at U.T. Arlington.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisites: BUSA 5325 and approval of Graduate Advisor.

5199, 5299, 5399. GRADUATE INTERNSHIP. Practical training in business and industry. Analysis of theory applied to real life situations. Course counts as an elective and has a pass/fail grade. No credit will be given for previous experience or activities. Prerequisites: Minimum nine graduate semester hours completed.

Doctoral Courses (BSAD)

6292. DOCTORAL RESEARCH AND TEACHING COLLOQUIUM (2-0). Review of the research process and contemporary developments in the methodology and design of empirical research in the major fields of study represented in the doctoral program. Review of teaching methods for effective classroom instruction. May be repeated for credit.

6399, 6699, 6999. DISSERTATION. 6399, 6699 graded R/F; 6999 graded P/F/R.

For all other graduate courses, see course listings for the following departments: Accounting, Economics, Finance and Real Estate, Information Systems and Management Sciences, Management, and Marketing. If a course is not approved for the MBA program, a statement to that effect is included in its course description. 6000-level courses may not be taken without the permission of the Graduate Advisor and/or instructor.

Department of Economics

Areas of Study and Degrees
Economics
M.A.
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)

Master's Degree Plans
Thesis and Non-Thesis

Chair
Daniel Himarios
309-C Business, 817-272-3061

Graduate Advisor
P.M. Hayashi
319 Business, 817-272-3257

Graduate Faculty
Professors
Amacher, Hayashi, Himarios, Meiners, Mullendore

Assistant Professors
Crowder, Depken, Grossman

Objective

The Master of Arts is an applied economics program. As a "terminal" degree program, it teaches marketable skills for employment in business or government. The program consists of a solid analytical core in economics and quantitative methods, supplemented with courses in special fields. Potential specialization areas currently emphasized are forecasting/quantitative techniques, international business economics and applied financial economics. The program is also recognized nationally for preparing students who want to pursue the Ph.D. degree in economics.

Economics is one of the areas a student may choose to study in the Doctor of Philosophy in Business Administration program. Additional information concerning the doctoral program is presented in the catalog under the heading Business Administration.

Degree Requirements

Applicants meeting the general admission requirements of the Graduate School, including a satisfactory score on either the Graduate Record Examination or the Graduate Management Admission Test, may be admitted unconditionally to the program. Other applicants may be admitted if approved by the Graduate Advisor in economics and the Graduate Dean. Applicants admitted but not having 12 semester hours of advanced courses in economics or not meeting prerequisite requirements for core courses are admitted subject to conditions assessed by the Graduate Advisor in economics.

Master's Degree with Thesis: A minimum of 30 semester hours is required. The core requirement is ECON 5301 or 5316, 5310, 5312, 5336, and the thesis (for which a six hour credit is received). Six hours of electives in economics must be chosen. The remaining six hours of electives may be a combination of courses in economics or in a minor field. A maximum of nine hours of advanced undergraduate courses may be taken for graduate credit, with the approval of the Graduate Advisor. Not more than six hours of such courses may be in either the major or the minor field.

Master's Degree, Non-thesis: The non-thesis degree option is designed for students who will enter the job market upon completion of the MA degree in economics. This degree plan requires a minimum of 36 semester hours, including a core of ECON 5301 or 5316, 5310, 5312, 5336 and 5329. The total may include up to 12 semester hours in supporting subjects with the approval of the Graduate Advisor. A maximum of nine semester hours of advanced undergraduate work may be taken for graduate credit, with the approval of the Graduate Advisor. Successful completion of ECON 5329 satisfies the Graduate School requirement of a final master's examination.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Economics (ECON)

5301. MATHEMATICS FOR ECONOMISTS (3-0). Designed to upgrade mathematical skills for graduate work in economics and business. Prerequisite: college algebra or equivalent.

5305. ENVIRONMENTAL LAW & POLICY (3-0). Evolution of environmental law and policy; reviews primary environmental laws; Clean Air Act, Clean Water Act, Superfund, RCRA, and Endangered Species Act and their impact on the economy and environment.

5306. ENVIRONMENTAL ECONOMICS (3-0). This course examines economic theory and practice as it applies to environmental regulation, policy, and management. Prerequisite: ECON 5309 or equivalent.

5309. ECONOMIC ANALYSIS I (3-0). Accelerated course in fundamental economic analysis for students enrolled in graduate programs other than the Master of Arts in economics. Basic analytical concepts of price theory and application to managerial decisions developed. Includes the theory of consumer behavior, theory of the firm, and market structure. Non-credit for MA in Economics.

5310. MICROECONOMIC THEORY (3-0). Theories of consumer choice and of the firm; marginal productivity and functional distribution; general equilibrium of production, consumption, and exchange.

5311. ECONOMIC ANALYSIS II (3-0). Develops understanding of macroeconomic environment within which each person must earn a living. Integration of business, government, monetary, international factors within context of inflation, productivity, growth. Non-credit for MA in Economics.

5312. MACROECONOMIC THEORY (3-0). Study of the aggregate approach to the economy and the tools of analysis used for the solving of national economic problems.

5313. MANAGERIAL ECONOMICS (3-0). Application of economic analysis in formulating business decisions, drawing upon the theoretical foundations of the concepts of demand, cost, production, profits, and competition, with special emphasis on case studies. Prerequisite: consent of instructor.

5314. INDUSTRIAL ORGANIZATION (3-0). Economic theories of firm and industry behavior, include the organization of the firm, oligopoly behavior, strategic entry deterrence, mergers and acquisitions, and technological competition. Prerequisite: ECON 5309 or equivalent.

5315. INSTITUTIONAL ANALYSIS & COMPARATIVE ECONOMIC SYSTEMS (3-0). Economic systems using New Institutional Economics. Attention to performance and efficiency of alternative systems; explains failure of socialist institutions; identifies obstacles confronting former communist countries; and projects the possible economic forms for emerging nations. Prerequisite: ECON 5309 or equivalent.

5316. MATHEMATICAL ECONOMICS I (3-0). Mathematical methods useful in economic analysis; topics include constrained and unconstrained optimization problems, comparative statics and application to economic models. Prerequisites: ECON 5301, 5309, and 5311 or the equivalent.

5317. MATHEMATICAL ECONOMICS II (3-0). Mathematical methods for economic dynamics and other advanced topics, including difference and differential equations, introduction to control theory, and their application to dynamic modeling. Prerequisite: ECON 5316 or equivalent.

5319. ECONOMIC ANALYSIS OF INTERNATIONAL BUSINESS (3-0). Application of economic theory to the conduct of international business. Topics include emergence and operation of international business and the multinational corporation; analysis of the economic, financial, and political environment in which international business is conducted; political economy of the regulation of international business.

5320. ECONOMICS OF ORGANIZATION AND MANAGEMENT STRATEGY (3-0). Economic perspective for business decisions concerning organization and management strategy, transaction costs, organization theory, joint ventures, strategic alliances, game theory, entry deterrence, and R&D rivalry. Prerequisite: ECON 5309 or equivalent.

5321. INTERNATIONAL TRADE AND THE GLOBAL MARKETPLACE (3-0). Examines the theory and policy of international trade and investment. The theory part seeks to explain the causal factors that determine the size, composition, and direction of international economic transactions. Special attention is paid to the theory of economic integration and its direct application to the EEC, NAFTA, and other economic blocs. The policy part studies the role of governments in their efforts to regulate, restrict, promote, or influence the conduct of international trade and investment. Prerequisite: ECON 5309 or 5311 or consent of instructor.

5327. INTERNATIONAL FINANCE AND OPEN ECONOMY MACROECONOMICS (3-0). Study of international money and capital markets. Determination of output, balance-of-payments and exchange rates under different monetary and exchange rate regimes. Exchange rate intervention by central banks and exchange rate systems in developing countries are also discussed. Prerequisite: ECON 5311 or equivalent.

5328. INSTITUTIONAL ORGANIZATION AND BEHAVIOR (3-0). Systematic study of the effects of institutional arrangements on economic behavior, property-rights/transactions-cost analysis applied to selected problems; consideration of the role of contractual obligations in business, principal-agent theory, alternative concepts of economic efficiency. Prerequisite: ECON 5309 or equivalent.

5329. RESEARCH METHODS IN APPLIED ECONOMICS (3-0). Research problems and methods most commonly encountered by economists in industry and government; specific research projects required in applied areas such as corporate planning, utility rate

analysis, manpower planning, micro and macro forecasting, etc.; emphasis on practical research methods and on the presentation of results in coherent written reports. Prerequisites: ECON 5310, 5312, and 5336.

5330. ADVANCED LABOR ECONOMICS (3-0). Economic analysis of the supply of labor, the allocation of labor among alternative uses, investment in human capital, the extent and incidence of unemployment, and the determination of wages. Prerequisite: ECON 5309 or equivalent.

5331. URBAN ECONOMICS (3-0). Analysis of urban problems and goals with special attention given to those factors that influence the economic development of urban communities and the quality of urban life. Attention is given to policy formulation as a means for urban problem solving. Prerequisite: ECON 5309 or equivalent.

5332. TRANSPORT ECONOMICS (3-0). Surveys economic impacts of space and time upon organization and behavior of profit-seeking organizations. Evolving economics of deregulated and privatized international transport is analyzed as a component of the rapidly-growing integration of third-party logistics in design of production and marketing supply chains. Urban and intercity passenger transport issues are included. Prerequisite: ECON 5309 or equivalent or prior consent of instructor.

5333. ECONOMICS OF HEALTH (3-0). Employment of economic theory to analyze the health sector and consider problems such as rising prices and maldistribution of resources. Topics include: methods of policy evaluation, impact of prospective payment and managed care, productivity, determinants of health. Prerequisite: ECON 5309 or equivalent.

5335. GOVERNMENT REGULATION OF BUSINESS (3-0). Theory and practice of government regulation, including the rationale for government intervention, antitrust law and competition policy, regulation of natural monopolies, and effects of the deregulation movement. Prerequisite: ECON 5309 or equivalent.

5336. ECONOMETRICS (3-0). Statistical methods applied to business and economic problems; topics include multiple regression, generalized linear regression, systems estimation. Prerequisites: ECON 5301, BUSA 5301, or equivalent.

5337. BUSINESS & ECONOMIC FORECASTING (3-0). Econometric model-building and forecasting with applications to business and economics. Single equation models, multiple equation models, and time-series models are covered with emphasis on practical problems in analysis and forecasting. Prerequisite: BUSA 5301 or equivalent.

5338. MODERN APPLIED TIME SERIES (3-0). Univariate and multivariate time series; analysis of economic and financial data; out-of-sample forecasting using computer software. Autoregressive-moving average models, vector autoregression, unit roots, cointegration, ARCH and GARCH. Prerequisite: BUSA 5301 or equivalent.

5339. ECONOMICS OF INFORMATION AND UNCERTAINTY (3-0). Pure theory of risk and uncertainty, attitudes toward risk, measures of risk aversion and stochastic dominance. Applications in the theory of the firm, consumer theory, search models, adverse selection, moral hazard, and contract theory. The foundations of game theory. Prerequisite: ECON 5310.

5350. ECONOMIC FOUNDATIONS FOR THE SOCIAL SCIENCES I (3-0). Accelerated course in microeconomic analysis designed for those who are seeking master's degrees in other social sciences. Emphasizes the application of microeconomic theory to the study of current social problems, i.e., pollution, poverty, energy systems, etc. Non-credit for MA in Economics or MBA. Prerequisite: consent of the instructor.

5351. ECONOMIC FOUNDATIONS FOR THE SOCIAL SCIENCES II (3-0). Accelerated course in macroeconomic analysis designed for those seeking master's degrees in other social sciences. Emphasizes the application of macroeconomic theory to the solution of aggregate problems of the economic system, i.e., unemployment, inflation, growth, etc. Noncredit for M.A. in Economics or MBA. Prerequisite: consent of the instructor.

5382. INDEPENDENT STUDIES IN ECONOMICS. Extensive analysis of an economic topic. Prerequisite: consent of instructor and department chair.

5391. SPECIAL TOPICS IN ECONOMICS (3-0). In-depth study of selected topics in economics. May be repeated when topics vary. Prerequisite: consent of instructor.

5398, 5698, or 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of Graduate Advisor in economics.

6310. APPLIED MICROECONOMIC THEORY (3-0). The advanced neoclassical theory of microeconomics. Contains formal static models of consumer behavior, market structure, general equilibrium, and welfare. The objective of the course is to acquaint students with the analytical tools necessary to evaluate the formal literature in economics and to conduct scientific, hypothesis driven statistical studies. Prerequisites: ECON 5310 and 5316 or consent of instructor.

6312. APPLIED MACROECONOMIC THEORY (3-0). Applications of advanced economic theory that explain and predict the aggregate behavior of households, business firms, government, and markets, the use of which improves managerial decision-making in business and government; specific applications such as monetary and fiscal policy stimulation, forecasting, and estimation of the employment-inflation trade-off. Prerequisites: ECON 5312 and 5316 or consent of instructor.

6327. SEMINAR IN INTERNATIONAL FINANCE (3-0). In-depth analysis of balance of payments theories; asset-market approach models; portfolio balance, the current account and exchange rate models; foreign exchange market efficiency and exchange rate intervention; the role of relative prices and the international adjustment problem; international coordination of policies, problems of development countries. Prerequisite: ECON 5327 or consent of instructor.

6336. ADVANCED ECONOMETRICS I (3-0). Computer estimation of systems with restrictions, time-series analysis, non-linear regression, and other special problems. Applications to economics, finance, and international trade. Prerequisite: ECON 5336 or equivalent.

6337. ADVANCED ECONOMETRICS II (3-0). Statistical properties of estimators, large sample theory, Monte Carlo analysis, bootstrapping, systems of equations, time-series analysis, nonlinear regression, nonparametrics. Applications to finance, macro and micro economics finance. Prerequisite: ECON 6336.

6392. RESEARCH IN ECONOMICS. Independent research under supervision of a faculty member. Prerequisite: consent of instructor.

Objective

The Department of Finance and Real Estate participates in several graduate degree programs including the Ph.D. in Business Administration, the Master of Business Administration and the Master of Science in Real Estate. In the Ph.D. in Business Administration courses in finance and real estate prepare students for careers in teaching, research, business, and government. Concentrations in both finance and real estate are offered in the M.B.A. program (see Interdepartmental and Intercampus Programs for degree requirements). The M.S. in Real Estate provides students in-depth training in real estate decision making.

The general purpose of the Master of Science in Real Estate degree program is to provide students an opportunity to obtain a better understanding of the mechanics of real estate decision making in modern society and a greater depth of training in the discipline of real estate decision making than is possible at the baccalaureate level. The specific objectives of the program are to prepare students for careers in business, government, research, and teaching and for further graduate study. In this program, students are exposed to the theory, research, and practical applications of numerous real estate content areas, including investment analysis, appraisal, real estate development, primary and secondary mortgage markets, and mortgage backed securities. The Master of Science in Real Estate degree program is a specialized degree program designed to build upon the candidate's prior background.

Accreditation: M.S. in Real Estate

The Master of Science in Real Estate is accredited by the AACSB–The International Association for Management Education.

Degree Requirements M.S. In Real Estate

Applicants meeting the general admission requirements of the Graduate School, including a satisfactory score on the Graduate Management Admission Test (GMAT), may be admitted unconditionally to the program. Other applicants may be admitted if approved by the Graduate Advisor in Real Estate and the Dean of the Graduate School.

The program, which can be completed by part-time students who attend classes during the late afternoon and evening hours, is designed to accommodate students with divergent educational backgrounds and career interests. Each student's program of work must be approved by the Real Estate Graduate Advisor and it must contain a minimum of 15 semester hours in approved advanced graduate real estate courses taken at The University of Texas at Arlington.

A minimum of 30 semester hours is required if the student chooses to write a thesis. If the student chooses not to write a thesis, a minimum of 36 semester hours is required. All classes must be approved by the Graduate Advisor in Real Estate. Students who do not have a bachelor's degree in business administration may have to take additional coursework (up to 30 semester hours) to acquire a sufficient general business foundation. Students may have foundation courses waived by the Graduate Advisor if they have completed equivalent courses.

Department of Finance and Real Estate

Areas of Study and Degrees

Real Estate
M.S.
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)

Master's Degree Plans

Thesis and Non-Thesis

Chair

Peggy E. Swanson
107 Business, 817-272-3705

Graduate Advisor

Richard Buttimer
434 Business, 817-272-3004

Ph.D. Advisor

Richard Buttimer

Graduate Faculty

Professors
Apilado, Diltz, Panton, Swanson

Associate Professors
Cantwell, Swidler

Assistant Professors
Buttimer, Hyland, Sarkar

For the students who choose to write a thesis, the six hours of thesis will involve working closely with one or more members of the graduate faculty from the Department of Finance and Real Estate on a research project in a specialized area of interest in real estate.

The required foundation courses include:

ACCT 5301 Accounting Analysis I
ECON 5309 Economic Analysis I
MARK 5311 Marketing
FINA 5311 Business Financial Management
INSY 5310 Introduction to Computer and Information Systems
BUSA 5303 Quantitative Analysis for Business Administration
MANA 5312 Management
REAE 5311 Real Estate Analysis

The required advanced courses include:

REAE 5321 Seminar in Real Estate Investment
REAE 5334 Seminar in Real Estate Appraisal
REAE 5319 Seminar in Real Estate Finance (integrated project course)

Thesis Option
REAE 5698 Thesis

Non-Thesis Option (Two of the following courses)
REAE 5314 Seminar in Real Estate Development
REAE 5336 Seminar in Real Estate Securities
REAE 5392 Selected Topics in Real Estate

Examples of advanced elective courses:
(Nine semester hours are required for the thesis option and 15 semester hours are required for the non-thesis option.)

FINA 5330 Seminar in Capital Budgeting
FINA 5326 Commercial Banking
FINA 5325 Management of Financial Institutions
FINA 5323 Investment Management Problems
FINA 5328 Seminar in Portfolio Theory
BUSA 5334 Real Property Law
INSY 5335 Applied Database Management
REAE 5336 Seminar in Real Estate Securities

Examples of courses in supporting fields (six semester hours):

CIRP 5305 Land Use, Management, and Development
CIRP 5322 Urban and Regional Economic Development
URBA 5330 Urban and Regional Planning
URBA 5331 Urban Design
ARCH 5333 Construction Methods and Estimating
ARCH 5334 Construction Management
MASI 5330 Nonparametric Statistics
MASI 6302 Applied Linear Statistical Models I
ECON 5312 Macroeconomic Theory
ECON 5337 Business and Economic Forecasting

The six hours of thesis work must be conducted under the supervision of one of the members of the Graduate Studies Committee for the Master of Science in Real Estate Program.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Finance (FINA)

5311. BUSINESS FINANCIAL MANAGEMENT (3-0). Study of providing the organization with funds necessary for its operation and of achieving effective utilization of funds. Primary emphasis on financial decision-making within organizations, and techniques of financial analysis and forecasting. Prerequisite: ACCT 5301.

5315. HEALTH CARE FINANCIAL MANAGEMENT (3-0). Analysis of financial problems with an emphasis on the application of financial management principles and concepts to health care organizations. Prerequisite: FINA 5311 or equivalent.

5320. ENTREPRENEURIAL FINANCE AND PRIVATE EQUITY (3-0). Study of the concepts and institutions involved in entrepreneurial finance and private equity markets. This course will explore private equity from a variety of perspectives, beginning with the entrepreneur/issuer, moving to the private equity partnership, and finishing with investors in private equity partnerships.

5321. SEMINAR IN FINANCE AND REAL ESTATE MODELING (3-0). Study of common financial modeling techniques are explored in this course. The primary focus is on models used for pricing and analyzing derivative stock options and fixed income securities, although most of these techniques have other applications. Students are provided with the opportunity to develop the skills needed to build sophisticated financial models of their own.

5322. ADVANCED BUSINESS FINANCIAL PROBLEMS (3-0). Analysis of financial problems of business concerns, presented in case materials. Considers determination of capital needs, choosing among alternative capital investments, planning methods of financing new capital expenditures, and planning recapitalizations, mergers, and reorganizations. Prerequisite: FINA 5311 or equivalent.

5323. INVESTMENT MANAGEMENT PROBLEMS (3-0). Application of principles and techniques of investment management in solving investment problems of individuals and financial institutions. Considers apportionment of investment funds among alternatives, analysis of risk, valuation timing of security acquisitions. Prerequisite: FINA 5311 or equivalent.

5324. SEMINAR IN FINANCIAL THEORIES (3-0). Intensive research in selected areas of business finance, investment analysis and management, financial markets, commercial banking, and non-bank financial institutions. Prerequisite: FINA 5311 or equivalent.

5325. MANAGEMENT OF FINANCIAL INSTITUTIONS (3-0). General management problems and policies of financial institutions, emphasizing the role of the major financial institutions. Use of analytical techniques through case method of instruction as an aid to the solution of significant financial problems. Prerequisite: FINA 5311 or equivalent.

5326. COMMERCIAL BANKING (3-0). Overview of the management process and the operations in many areas of the modern commercial bank. Emphasizes the economic significance of the industry and its contribution to business development. Prerequisite: FINA 5311 or equivalent.

5327. RISK MANAGEMENT AND SPECULATIVE MARKETS (3-0). Nature and functions of the various futures and options markets; hedging for risk reduction, speculative trading for profit; the role of futures and options in overall portfolio strategy, along with fundamental concepts such as basis, spreading, normal and inverted markets and money management. Prerequisite: FINA 5311 or equivalent.

5328. SEMINAR IN PORTFOLIO THEORY (3-0). The theory and practice of optimally combining securities into portfolios. Problems in the management of institutional portfolios. Prerequisite: FINA 5311 or equivalent.

5329. SEMINAR IN SECURITY ANALYSIS (3-0). The use of economic and accounting data in the selection of securities. Examination of current and traditional techniques used by investment practitioners. Prerequisite: FINA 5311 or equivalent.

5330. SEMINAR IN CAPITAL BUDGETING (3-0). Approaches to evaluating firm capital budgeting decisions including cost of capital and risk. Techniques for making investment decisions involving physical assets of nonfinancial firms. Prerequisite: FINA 5311 or equivalent.

5331. MULTINATIONAL FINANCIAL MANAGEMENT (3-0). Examines ways in which financial decision-making processes are altered by operation in a multinational environment. Includes the effects of devaluation expectations, foreign exchange and investment controls. Also, case study materials related to actual decisions by multinational firms. Prerequisite: FINA 5311 or equivalent.

5332. SEMINAR IN INTERNATIONAL FINANCIAL MARKETS (3-0). An in-depth analysis of operations of international markets as viewed by multinational financial managers. Foreign exchange risk, capital market integration, and new innovations in off-shore financial markets. Prerequisite: FINA 5311 or equivalent.

5333. ADVANCED FINANCIAL ANALYSIS (3-0). An examination of analytical techniques useful in financial analysis and planning. Credit scoring models, bankruptcy prediction, bond ratings, and risk-return measurement and evaluation. Prerequisite: FINA 5311 or equivalent.

5334. SEMINAR IN FINANCIAL INSTITUTIONS AND MARKETS (3-0). An examination of major financial institutions and markets with emphasis on trends affecting the current operations, competitive position, and overall future of the primary financial intermediaries and the financial markets. Prerequisite: FINA 5311 or equivalent.

5335. SEMINAR IN INSURANCE AND RISK MANAGEMENT (3-0). Nature and function of various insurance products as they apply to the individual, business, or industry. The risk management process as it applies to preserving assets and preventing losses along with environmental pollution problems. Prerequisite: consent of instructor and graduate advisor.

5182, 5282, 5382. INDEPENDENT STUDIES IN FINANCE. Extensive analysis of a finance topic. Prerequisite: consent of faculty member and department chair.

5392. SELECTED TOPICS IN FINANCE. In depth study of selected topics in finance. May be repeated when topics vary. Prerequisite: consent of instructor and Graduate Advisor.

6311. SEMINAR IN THE THEORY OF CORPORATE FINANCE (3-0). Advanced theory of corporate finance. Capital budgeting, dividend policy, and capital structure. Prerequisite: FINA 5311 or equivalent or consent of instructor.

6312. SEMINAR IN THE THEORY OF INVESTMENTS (3-0). Advanced theory of investments. Modern portfolio theory and the efficiency of capital markets. Prerequisite: FINA 5311 or equivalent or consent of instructor.

6313. ADVANCED RESEARCH IN FINANCE (3-0). Analytical methods commonly applied in the academic finance literature. Topics such as factor analysis in arbitrage pricing models and techniques for identification of nonstationarities in risk. Prerequisites: FINA 5311 and BUSA 5301 or consent of instructor.

6314. ADVANCED RESEARCH IN FINANCE II (3-0). Specialized and evolving techniques in financial research; topics such as identification of efficient markets, linear programming in capital budgeting, and multiple discriminant analysis in bankruptcy prediction and bond rating models. Prerequisites: FINA 5311 and BUSA 5301 or consent of instructor.

6390. SEMINAR IN SPECIAL TOPICS IN FINANCE (3-0). Doctoral level coverage of advanced topics in finance. May be repeated for credit when topics vary. Prerequisite: FINA 5311 or equivalent or consent of instructor.

6192, 6292, 6392. RESEARCH IN FINANCE (3-0). Independent study of advanced topics in finance under the direction of graduate faculty. May be repeated for credit when topics vary. Graded P/F/R. Prerequisite: FINA 5311 or equivalent or consent of instructor.

Real Estate (REAE)

5311. REAL ESTATE ANALYSIS (3-0). Survey of real estate investment, appraisal and valuation, finance, market analysis, and other phases of the real estate development/management process.

5314. SEMINAR IN REAL ESTATE DEVELOPMENT (3-0). Topics relating to site selection, design, market analysis, financial feasibility, and management in the real estate development process. Prerequisite: FINA 5311 or REAE 5311 or equivalent.

5319. SEMINAR IN REAL ESTATE FINANCE (3-0). Study of real property financing methods; analysis of cost of borrowing, sources of funds, and mortgage terms; emphasis on construction and permanent financing of commercial and industrial properties. Prerequisite: FINA 5311 or REAE 5311 or equivalent.

5321. SEMINAR IN REAL ESTATE INVESTMENT (3-0). Introduction to analytical techniques, sources of financing, and other

factors related to real estate investment. Stresses current developments and topics. Prerequisite: FINA 5311 or REAE 5311 or equivalent.

5334. SEMINAR IN REAL ESTATE APPRAISAL (3-0). Market, cost, and income approaches with stress on income forecasting and capitalization. Prerequisite: FINA 5311 or REAE 5311 or equivalent.

5336. SEMINAR IN REAL ESTATE SECURITIES (3-0). An in-depth analysis of the operations of secondary mortgage markets as viewed by individual and institutional investors. Mortgage pass-through securities, mortgage backed bonds, estimation of prepayment rates for mortgage securities, price and interest-rate risk, lending strategies, credit rating, and taxation. Prerequisite: FINA 5311 or REAE 5311 or equivalent.

5182, 5282, 5382. INDEPENDENT STUDIES IN REAL ESTATE. Extensive analysis of a real estate topic. Prerequisite: consent of faculty member and department chair.

5392. SELECTED TOPICS IN REAL ESTATE (3-0). In-depth study of selected topics in real estate. May be repeated when topics vary. Prerequisite: REAE 5311 or equivalent or consent of instructor.

5398, 5698. THESIS. Prerequisite: permission of the Graduate Advisor in Real Estate.

6390. SEMINAR IN SPECIAL TOPICS IN REAL ESTATE (3-0). Doctoral level coverage of advanced topics in real estate. May be repeated for credit when topics vary. Prerequisite: REAE 5311 or equivalent or consent of instructor.

6192, 6292, 6392. RESEARCH IN REAL ESTATE (3-0). Independent study of advanced topics in real estate under the direction of graduate faculty. May be repeated for credit when topics vary. Graded P/F/R. Prerequisite: REAE 5311 or equivalent or consent of instructor.

Objective: M.B.A. Program

Information Systems emphasizes the preparation required for developing and managing computer-based information systems. The comprehensive curriculum includes the study of applicable computer hardware, software, and database technology; the design of information systems; and management and control of information technologies and applications.

Management Sciences emphasize the development of quantitatively-based decision-making, including problem recognition and definition, system modeling capabilities, and the determination of optimal courses of action from various decision alternatives. Management Science exposes the student to a variety of decision-making frameworks and an extensive array of quantitative modeling tools.

Objective: Master of Science in Information Systems

The objective of the Master of Science degree in Information Systems is to provide qualified students with both a general knowledge of business and a specialized knowledge of information systems. Students are exposed to the theory, research, and practical applications of numerous information systems areas including management information systems, database management systems, systems analysis and design, and data communications; and may take electives in distributed systems, information resource management, general system concepts, expert systems, decision support systems, problem formulation, computer science, management sciences, research, and other related fields. The program is designed to prepare students for information systems careers in government and nonprofit organizations as well as in business and industry.

Objective: Ph.D. in Business Administration Program

The objective of the Ph.D. degree in Business Administration with a major field in either information systems or management sciences is primarily to develop scholars with an ability to teach and conduct independent research. The program is designed to provide the student with fundamental knowledge in the various areas of information systems or management sciences. Within management sciences, students can concentrate in one of the following: 1) production operations management, 2) business statistics, and 3) management science.

Accreditation

The Master of Science degree in Information Systems is accredited by the AACSB–The International Association for Management Education.

Department of Information Systems and Management Sciences

Areas of Study and Degrees
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)
Information Systems
M.S.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs)

Master's Degree Plans
Thesis or Thesis Substitute

Chair
Mary M. Whiteside
132 Business, 817-272-3502

M.B.A. Graduate Advisor
Jim Walther
434 Business, 817-272-3004

M.S.I.S. Graduate Advisor
Bijoy Bordoloi
123 Business, 817-272-3559

Ph.D. Graduate Advisor
R.C. Baker
434 Business, 817-272-3004

Graduate Faculty
Professors
Baker, Mykytyn, Raja,
Schkade, Sircar, Whiteside

Associate Professors
Bordoloi, Eakin, Huq,
Iyer, Pinney, Slinkman

Assistant Professor
Bose, Frazier

Degree Requirements

Along with meeting the admission requirements of the Graduate School, applicants must obtain a satisfactory score on the Graduate Management Admission Test (GMAT) and provide evidence of exceptional academic performance at the undergraduate level.

For students who have earned a Bachelor of Business Administration (BBA) degree (or equivalent), the program consists of a minimum of 30 semester hours, including six hours of thesis work. Nine semester hours of advanced electives approved by the Graduate Advisor can be substituted for the thesis, in which case the advanced program will be 33 semester hours. Students who do not have a BBA may have to take additional coursework (up to 27 semester hours) to acquire sufficient general business knowledge for effective performance as an information systems professional. Foundation courses may be waived if equivalent coursework has been completed.

The minimum advanced program of 30 semester hours contains six hours of required work in research and statistical methods; 12 hours of required work in management information systems (MIS), database management systems, systems analysis and design, and distributed information systems and data communications; six hours of electives (to be selected from an approved list of elective courses, or to be approved upon selection by the Graduate Advisor); and six hours of thesis demonstrating acceptable performance on a major systems project or an approved nine-semester-hour thesis substitute.

The required curriculum is as follows:

1. Foundation Courses (27 semester hours)
   ACCT 5301 Accounting Analysis I
   ACCT 5302 Accounting Analysis II
   ECON 5309 Economic Analysis I
   INSY 5310 Introduction to Computer and Information Systems
   BUSA 5303 Quantitative Analysis for Business Administration
   MASI 5321 Introduction to Management Science
   MARK 5311 Marketing
   FINA 5311 Finance
   MANA 5312 Management
2. Advanced Courses (24 semester hours)
   (a.) Required Research courses (6 semester hours)
   BUSA 5325 Advanced Statistical Methods in Business
   Approved Research Elective (3 hours)
   (b.) Required Information Systems courses (12 semester hours)*
   INSY 5330 Information Systems
   INSY 5335 Data Base Management
   INSY 5341 Information Systems Analysis and Design
   INSY 5343 Distributed Information Systems and Data Communications
   (c.) Approved Electives (6 semester hours)
   Approved elective courses may be selected from areas such as accounting, computer science, finance, industrial engineering, information systems, management, management science, marketing, mathematical sciences, and psychology.
3. Thesis (BUSA 5698) or Thesis Substitute (nine approved semester hours)

*Courses may be substituted if equivalent courses have been taken.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Information Systems (INSY)

5310. INTRODUCTION TO COMPUTERS AND INFORMATION SYSTEMS (3-0). Introduction to the terminology and use of computers in organizations, including hardware and software technology, business data processing, distributed processing and networking, management information systems, database management systems, decision support systems, expert systems, and office information systems. Major software packages for business are presented and selectively utilized.

5320. INFORMATION TECHNOLOGY AND SOCIETY (3-0). An examination of the societal aspects of computing and emerging information technologies. Topics include personal, organizational, ethical, legal, and economic issues. Prerequisite: INSY 5310 or equivalent.

5330. INFORMATION AND DECISION SYSTEMS CONCEPTS (3-0). Concepts, frameworks, research, and practice covering the entire spectrum of the field of information systems: structure, development, and implementation of information systems; computer-based applications; management and control of corporate information systems; decision-support systems and expert systems; current trends, including electronic commerce and outsourcing. Prerequisite: INSY 5310 or equivalent.

5331. GENERAL CONCEPTS OF SYSTEMS (3-0). Conceptual foundations of system modeling and development. Methodologies for analysis and design, optimization, control and decision making. Prerequisite: INSY 5330 or MASI 5321 or consent of instructor.

5335. APPLIED DATABASE MANAGEMENT (3-0). The objectives and methods of database approach to Information Processing are presented. Topics include data models (with emphasis on E/R the model and the Relational model), database design and implementation, SQL, distributed databases and DBMS evaluation. Use of a commercial mainframe DBMS is required. Prerequisite: Working knowledge of a procedural language (3GL) and INSY 5330 or concurrent enrollment.

5341. ANALYSIS AND DESIGN (3-0). Analysis and design phase of systems development life cycle. Topics include systems survey, functional specification, interface specification, data design, program

design, system testing, and implementation. Prerequisites: programming language and INSY 5335.

5342. RAPID APPLICATION DEVELOPMENT [RAD] (3-0). The use of RAD for systems development. Selection and implementation of RAD, evaluation of RAD tools for system development and use of commercial RAD tools. Topics include project management estimation and cost control. Prerequisite: INSY 5341.

5343. COMPUTER COMMUNICATIONS (3-0). Technological and managerial issues related to design, operation and maintenance of computer networks, communication architecture and protocols, LANs and WANs, ATM and Frame Relay, cellular and satellite communication, WWW and Internet, communication policy and pricing, international communication and transborder information flow issues and electronic commerce. Prerequisite: INSY 5330.

5344. AUTOMATED SOFTWARE DEVELOPMENT (3-0). Development of information systems using model based tools using various application development methodologies such as rapid application development, information engineering and object-orientation. Technologies stressed are model encyclopedias, objects and software components, and model-based application development tools. Prerequisites: INSY 5335, INSY 5342 or consent of instructor.

5346. ECONOMIC ISSUES IN INFORMATION TECHNOLOGY (3-0). Applications of economic concepts, technology selection, business value of computing, outsourcing, risk management, and disaster recovery decisions. Prerequisite: INSY 5330.

5347. GLOBAL INFORMATION SYSTEMS ISSUES (3-0). Information, computers, and communication technologies in multinational businesses and strategic management of transborder information flows to optimize worldwide operations and profitability. Prerequisite: INSY 5330.

5350. HEALTH CARE INFORMATION SYSTEMS (3-0). Addresses issues in the development, integration, and management of health care information systems. Specifically, topics in financial information systems, patient care systems, and health care delivery applications will be discussed. Both case studies and real life applications will be studied. Prerequisite: INSY 5310 or consent of instructor.

5351. OBJECT-ORIENTED BUSINESS PROGRAMMING (3-0). Development of information systems using object-oriented languages. Topics include classes, objects, user-interfaces, client server computing, web-hosted applications, distributed objects and persistent objects. Prerequisite: Two prior computer programming courses and INSY 5335 or consent of instructor.

5352. OBJECT-ORIENTED DEVELOPMENT METHODOLOGIES (3-0). Discussion of various object-oriented systems development methodologies. The focus is on developing and deploying information systems using the object-oriented approach. Prerequisite: JAVA or an object-oriented language or INSY 5351.

5354. ARTIFICIAL INTELLIGENCE IN BUSINESS (3-0). An examination of the theory and development of application of artificial intelligence to task performance and decision making in business. Includes knowledge based/expert systems, neural networks, use of system building shells/justification. Prerequisite: INSY 5330 or equivalent.

5355. DECISION SUPPORT TECHNOLOGIES (3-0). Conceptual foundations and technology for decision support systems involving groups, organizations and the integration of expert systems. Includes design and implementation of a major decision support system case-based project. Prerequisites: INSY 5330, BUSA 5325.

5356. CLIENT/SERVER SYSTEM DEVELOPMENT (3-0). Presentation of information system infrastructure and client/server computing principles. Focus on information system development and deployment using client/server architecture. Prerequisite: INSY 5341.

5357. ENTERPRISE RESOURCE PLANNING [ERP] (3-0). Concepts, frameworks and practical implementation of ERP for effective deployment of information and communication technology resources. The course aims to provide working knowledge of theory and practice of ERP for evaluation, planning, development and implementation of enterprise resource planning. The course will include a review of current tools available including SAP/R3, BAAN, Oracle, and PeopleSoft, and other software packages. Prerequisite: INSY 5335, INSY 5341 and INSY 5343 or consent of instructor.

5358. HUMAN ASPECTS OF INFORMATION TECHNOLOGIES (3-0). Human issues in information systems. Task performance, decision styles, ergonomics, information acquisition, group dynamics, information technology, and organizations. Prerequisite: INSY 5330.

5375. MANAGEMENT OF INFORMATION SYSTEMS (3-0). Issues related to the administration of computer-based systems including planning and development; control and evaluation; organization and personnel. Societal and technological issues are also addressed from a managerial viewpoint. Prerequisite: INSY 5310.

5182, 5282, 5382. INDEPENDENT STUDIES IN INFORMATION SYSTEMS. Extensive analysis of an information systems topic. Graded P/F/R. Prerequisite: consent of faculty member and department chair.

5192, 5292, 5392. SELECTED TOPICS IN INFORMATION SYSTEMS. In-depth study of selected topics in information systems. May be repeated when topics vary. Prerequisite: consent of instructor and Graduate Advisor.

5398, 5698. THESIS. Prerequisite: permission of Graduate Advisor in Information Systems. 5398 graded R/F; 5698 graded P/F/R.

6301. SEMINAR IN GENERAL CONCEPTS OF SYSTEMS (3-0). Intellectual foundations, primary concepts, theoretical frameworks for systems applied to fields such as system development, system management, and decision making. Prerequisite: INSY 5330 or consent of instructor.

6302. SEMINAR IN ADVANCED SYSTEMS DEVELOPMENT (3-0). Research issues and current topics in object-oriented systems development and object-oriented databases. Development of object-oriented systems, metrice, reuse and design patterns in distributed object-oriented applications. Prerequisite: JAVA or other object-oriented language

6304. SEMINAR IN ARTIFICIAL INTELLIGENCE IN BUSINESS (3-0). Advanced topics on artificial intelligence in business. Topics include artificial intelligence architectures, artificial intelligence systems development, knowledge acquisition and representation, decision models and applications, and emerging decision support technologies. Prerequisite: INSY 5330 or equivalent.

6305. DECISION SUPPORT SYSTEMS (3-0). An examination of the managerial decision making process and the contributions of information systems and management science models linked together in a comprehensive and evolving DSS framework and technology. Prerequisites: proficiency in one programming language, INSY 5330, MASI 5321, BUSA 5325.

6306. SEMINAR IN ADVANCED INFORMATION TECHNOLOGIES (3-0). Research issues and future trends in client/server computing. Emphasis on development and deployment of systems in a client/server environment. Prerequisites: INSY 5341.

6307. INFORMATION RESOURCE MANAGEMENT (3-0). Impact of information technology on organizational structure/strategy. MIS resources such as data, personnel, hardware/software. Management issues: computer center operations/administration, project management. Prerequisite: INSY 5345.

6308. SEMINAR IN HUMAN ASPECTS OF INFORMATION TECHNOLOGIES (3-0). Advanced study of human issues including human-computer interaction, group dynamics, ergonomics, cognitive functioning, and information acquisition and evaluation. Prerequisite: INSY 5330.

6311. INFORMATION SYSTEMS RESEARCH SEMINAR (3-0). Integrative analysis of research in information systems, including research philosophies and methodologies, contemporary research topics, dissertation research and future directions for information systems research. Prerequisite: INSY 6301.

6380. RESEARCH IN INFORMATION SYSTEMS (3-0). Independent research under the supervision of a faculty member; may be repeated when topic varies. Graded P/F/R. Prerequisite: consent of instructor.

DISSERTATION—See Business Administration entry for students in the Ph.D. Program in Business Administration; see Mathematical Science entry for students in the Ph.D. Program in Mathematical Sciences.

Management Science (MASI)

5321. INTRODUCTION TO MANAGEMENT SCIENCES (3-0). Introduction to the scientific approach to management problems. Special topics with applications taken from the areas of probability theory, linear programming, game theory, simulation, queuing theory, inventory theory, Markov chains, network analysis and other areas of management sciences and operations research. Prerequisites: BUSA 5301 and 5302 or equivalents.

5323. APPLIED DECISION THEORY (3-0). Investigation of the analysis of decisions under risk and uncertainty. Concepts of both classical and Bayesian statistics will be integrated and applied to the decision-making process. Includes a treatment of subjective probability, utility theory, risk analysis, and the value of information. Prerequisites: BUSA 5301 and 5302, or equivalents.

5324. APPLICATIONS OF COMPUTER MODELS IN MANAGEMENT SCIENCES (3-0). Examines the use of computer software packages for the solution of management science problems. Focuses on problem recognition and formulation and post optimality analysis, utilizing commercially available main frame and personal computer based software packages for solution of problems. Prerequisite: MASI 5321 or equivalent.

5326. SIMULATION AND BUSINESS MODELS (3-0). Theory and practices in the simulation of stochastic and mathematical models of business and industrial processes. Application of mathematical models to problems of resource allocation, economic analysis, inventory systems, management planning models, queuing systems. Emphasis on the formulation, construction and simulation of realistic business problems. Prerequisite: MASI 5321.

5327. APPLIED MATHEMATICAL PROGRAMMING (3-0). Optimization techniques including linear, quadratic, non-linear, dynamic integer, and geometric programming. Emphasis on problem identification, technique association, and solution formulation. Investigates applications of game theory. Prerequisite: MASI 5321.

5330. NONPARAMETRIC STATISTICS (3-0). A survey of statistical techniques which may be used when the normal assumptions of parametric statistics cannot be made; inclusion of procedures for cross-classified data, methods involving ranks, and Kolmogorov-Smirnov type techniques. Prerequisite: BUSA 5301 or equivalent.

5331. STATISTICAL GRAPHICS AND GRAPHICAL PERCEPTION (3-0). Graphical depiction and analysis of data structure, graphical software, and graphical perception. Statistical topics would include exploratory analysis of univariate and multivariate data using graphical software, e.g., Lowess Smoothing and Sunflower Plots. Graphical perception topics include mental imaging theory, Weber's and Steven's Laws, decision support, and review and critiques of current literature. Prerequisite: MASI 5325 or equivalent.

5332. ADVANCED DATA COLLECTION (3-0). Surveys, audits, samples and experimental designs contrasted and compared as a basis for statistical inference. Emphasis is on the integration of techniques common to differing areas of business research.

5182, 5282, 5382. INDEPENDENT STUDIES IN MANAGEMENT SCIENCE. Extensive analysis of a management science topic. Graded P/F/R. Prerequisite: consent of faculty member and department chair.

5392. SELECTED TOPICS IN MANAGEMENT SCIENCE. In-depth study of selected topics in management science. May be repeated when topics vary. Prerequisite: consent of instructor and Graduate Advisor.

6301. SEMINAR IN GENERAL CONCEPTS OF SYSTEMS (3-0). Intellectual foundations, primary concepts, theoretical frameworks for systems applied to fields such as system development, system management, and decision making. Prerequisite: INSY 5330 or consent of instructor.

6302. APPLIED LINEAR STATISTICAL MODELS I (3-0). The theoretical and practical aspects of regression analysis. Topics include simple and multiple linear regression, the matrix formulation of regression models, regression diagnostics and remedial measures, collinearity and ridge regression, normal correlation models, and nonlinear least squares. Practical applications of statistical software packages are emphasized. Prerequisite: BUSA 5325 or equivalent.

6303. APPLIED LINEAR STATISTICAL MODELS II (3-0). Experimental design and data analysis, especially as related to business and economic research. Topics include completely randomized designs; complete and incomplete blocks; nested designs; estimation and testing of fixed, random and mixed effects. Prerequisites: BUSA 5325 and MANA 5329 or equivalents.

6305. DECISION SUPPORT SYSTEMS (3-0). An examination of the managerial decision making process and the contributions of information systems and management science models linked together in a comprehensive DSS framework. Prerequisites: proficiency in one programming language, INSY 5330, MASI 5321, BUSA 5325.

6306. PROBLEM FORMULATION AND DECISION STRUCTURING (3-0). Explores the concepts of formulating and structuring problems arising in relatively unstructured decision environments. Techniques used for problem identification,

formulation and decision structuring and the uses of computer-based models and algorithms in problem solutions emphasized. Prerequisites: INSY 5330 and MASI 5321.

6309. MULTIVARIATE STATISTICAL METHODS (3-0). Focuses on methods of analyzing mean and covariance structures. Topics include commonly applied multivariate methods such as multiple analysis of variance, repeated measures, discriminant analysis, profile analysis, canonical correlations, and factor analytic methods. The use of matrix algebra and available computer packages will be stressed. Prerequisite: BUSA 5325.

6370. SEMINAR IN MANAGEMENT SCIENCES (3-0). Comprehensive and integrative study of management sciences, including epistemology, theoretical structures, and considerations for application of models and methods of analysis.

6380. RESEARCH IN MANAGEMENT SCIENCE (3-0). Independent research under the supervision of a faculty member; may be repeated for credit. Prerequisite: consent of instructor.

Production and Operations Management (POMA)

5361. INTRODUCTION TO PRODUCTION AND OPERATIONS MANAGEMENT (3-0). Design and control of systems for the use of raw materials, personnel, equipment and facilities in manufacturing products and providing services. Mathematical models are applied to decisions in a manufacturing setting. Prerequisite: MASI 5321.

5363. MATERIAL RESOURCES PLANNING (3-0). The issues facing managers who are involved with the production and inventory control systems of a manufacturing firm. Practical and theoretical models examined. Prerequisite: POMA 5361.

5365. MANUFACTURING TECHNOLOGY MANAGEMENT (3-0). Current technologies and their managerial implications. Strategic issues such as justification, adoption, implementation/integration of manufacturing technologies including CIM, FMS, MRP, OPT, and JIT. Prerequisite: POMA 5361.

5367. QUALITY PLANNING, ANALYSIS, AND MANAGEMENT (3-0). An investigation of qualitative and quantitative tools employed in the control, planning, and analysis of quality in manufacturing and service industries. These tools, with supporting management information and decision systems, are covered, along with current issues related to quality standards and applications.

5369. LOGISTICS MODELING AND TECHNOLOGY (3-0). Analytical and technological aspects of logistics and distribution systems for firms engaged in the production and service functions. The issues of logistics management including procurement, inventory control, warehousing, and transportation are discussed from a modeling and management perspective. Technological advances within these functional areas are covered, including the use of various automated manufacturing and control technology, and information and communications technology. Prerequisite: POMA 5361.

6371. INTEGRATED MANUFACTURING STRATEGY AND RESEARCH (3-0). Linkages between the manufacturing and strategy development functions. Research issues within production/operations management. Current techniques/designs for achieving effective research. Prerequisite: POMA 5361.

DISSERTATION—See Mathematical Sciences entry for students in the Ph.D. Program in Mathematical Sciences; see Business Administration entry for students in the Ph.D. Program in Business Administration.

Department of Management

Areas of Study and Degrees
Human Resource Management
M.S.
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)

Master's Degree Plans
Thesis and Non-Thesis

Chair
Jerry C. Wofford
209 Business, 817-272-3166

Graduate Advisor
David A. Gray
206 Business, 817-272-3852

Graduate Faculty
Professors
Gerloff, Quick,
Wofford, Worrell

Associate Professors
Gray, Harrison,
Price, Priem,
Rasheed, Wheeler

Assistant Professors
Bell, Farnsworth,
McGee, McMahan

Objective

The basic purpose of the Master of Science degree in Human Resource Management is to provide students with both a general knowledge of business and a specialized knowledge in human resource management. Students are exposed to the theory, research and practical applications of numerous content areas, including human resource strategy and policy, human resource planning, human resource information systems, career planning and development, employee relations law, organization change and development, employee selection, compensation, training and development and employee diversity in organizations. The program is designed to prepare students for human resource management careers in business and industrial firms, as well as government and nonprofit organizations.

Accreditation

The Master of Science in Human Resource Management is accredited by the AACSB–The International Association for Management Education.

Degree Requirements

Along with meeting the admission requirements of the Graduate School, applicants must obtain a satisfactory score on the Graduate Management Admission Test (GMAT) and provide evidence of exceptional academic performance at the undergraduate level.

The program is designed primarily for the student who has a bachelor's degree in business administration. A minimum of 30 semester hours is required if the student chooses to write a thesis. If the student chooses not to write a thesis, a minimum of 36 semester hours is required. Students who do not have bachelor's degrees in business administration may have to take additional coursework (up to 24 semester hours) to acquire sufficient general business knowledge for effective performance as a human resource executive.

Coursework for the program includes six hours of required work in research and statistical methods, 15 hours of required work in human resources and policy, and thesis or elective hours in related management courses to complete the 30- or 36-hour requirements. For the students who choose to write a thesis, the six hours of thesis will involve working closely with one or more members of the graduate faculty from the Department of Management on a research project in a specialized area of interest in human resource management.

The curriculum is as follows:

1. Foundation Courses (24 semester hours)
   ACCT 5301 Accounting Analysis I
   ECON 5309 Economic Analysis I
   INSY 5310 Introduction to Computers and Information Systems
   BUSA 5303 Quantitative Analysis for Business Administration
   MARK 5311 Marketing
   FINA 5311 Business Finance
   MANA 5311 Behavioral Sciences in Management
   MANA 5312 Management

2. Advanced Courses (21 semester hours, thesis and non-thesis)
   A. Required human resource and policy courses (15 semester hours)
      MANA 5340 Strategic Human Resource Management
      MANA 5341 Staffing and Performance Management
      MANA 5322 Compensation and Benefits
      MANA 5323 Training and Development
      BUSA 5333 Business Policy
   B. Required research courses (six semester hours)
      BUSA 5325 Advanced Statistical Methods in Business
      MANA 5390 Applied Organizational Research
      or
      MANA 5329 Methods of Organizational Research
3. Thesis (MANA 5698) and three elective semester hours.
4. Non-thesis option requires 15 elective semester hours.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Management (MANA)

5311. BEHAVIORAL SCIENCES IN MANAGEMENT (3-0). Examination of basic and applied concepts and research findings in the individual behavior areas including perception, attitudes, learning and motivation and the group behavior areas including small group behavior, leadership, conformity, and intergroup behavior.

5312. MANAGEMENT (3-0). Basic exploration of organizations in their environments. The elementary tools of management, which include: organizational objectives, social responsibility and ethics, policies, plans, and decision making; the design of organizations and jobs; the production and technology aspects of organization; the elements of leadership, behavior, and communication; and the elements of control and performance evaluation.

5320. ORGANIZATIONAL BEHAVIOR (3-0). Systematic study of behavioral problems in the complex organization. Analyzes the interaction of environmental and internal factors and their effects upon organizational behavior. The course is placed within the context of the organization process. Prerequisite: MANA 5312 or equivalent.

5321. COMPLEX ORGANIZATIONS (3-0). Provides the foundation for an in-depth knowledge of several important theories of management and organization. Attention to study of organizations, organizational effectiveness, comparative analysis of organizations, and the organization and its environment. Relates empirical findings and theoretical hypotheses with applied management concepts. Prerequisite: MANA 5312 or equivalent.

5322. COMPENSATION AND BENEFITS (3-0). Administration of compensation systems in business and other organizations; concepts, models and practices related to wage and salary levels and structures; perceived equitable pay; individual performance appraisal, rewards and satisfaction; benefits and employee services.

5323. TRAINING AND DEVELOPMENT (3-0). Examines the components of training systems. Topics include assessing training needs and establishing objectives, developing training programs, selecting appropriate training techniques, and evaluating training outcomes.

5324. TEAM AND GROUP BEHAVIOR (3-0). A study in team and group dynamics, critical processes and practices. Topics include team composition and development, problem solving strategies and performance, conflict management, leadership process and work team strategies.

5325. INDUSTRIAL RELATIONS (3-0). Examines union-management relations and considers the structure and functioning of the economic and social forces of importance at the policy level within both the firm and the union. Also considers non-union employee relationships. Prerequisite: MANA 5312 or equivalent.

5326. ORGANIZATION DEVELOPMENT AND CHANGE (3-0). Examines the process of organization development, change, and renewal at the individual, group, and organization level; central topics including diagnostic and intervention procedures at the three levels of analysis. Prerequisite: MANA 5312 or equivalent.

5327. HUMAN RESOURCE LAW (3-0). Coverage of statutory and case law in the employment setting. Emphasis placed on employment discrimination, compensation and benefits law; government agencies which administer and enforce employment laws are also reviewed. Prerequisite: MANA 5340.

5328. OPERATIONS MANAGEMENT (3-0). Analysis of managerial decisions in the production function with consideration of the planning and design of systems and processes. Prerequisites: BUSA 5301 and 5302 or equivalents and MANA 5312 or equivalent.

5329. METHODS OF ORGANIZATIONAL RESEARCH (3-0). Experimental methodology and its application to organizational problems. Research design, data collection, test construction and an awareness of experimental methods as applied to organizational problems.

5330. ALTERNATIVE DISPUTE RESOLUTION (3-0). In depth review and analysis of dispute settlement procedures with special emphasis placed on arbitration of labor-management and employment disputes. Causes and consequences of workplace conflict are examined along with approaches to encouraging workplace cooperation. Prerequisite: MANA 5312 or equivalent.

5331. MANAGEMENT OF INTERNATIONAL OPERATIONS (3-0). Managerial implications of conducting business in foreign countries. Provides a framework for analyzing and dealing with the management of foreign and multinational organizations as influenced by cultural, political, and economic constraints. Prerequisite: MANA 5312 or equivalent.

5332. EMPLOYEE DIVERSITY IN ORGANIZATIONS (3-0). Examines implications of diversity in organizations. Human resource and organizational behavior issues related to aspects of diversity in the workplace are presented. Emphasis is placed on the need to effectively address diversity in organizations.

5333. MANAGEMENT OF TECHNOLOGY (3-0). Problems of managing research and development and other similar technologies which involve one-of-a-kind products and substantial numbers of professional skills. Explores what is known about the management of professionals and professional enterprises. Prerequisite: MANA 5312 or equivalent or consent of instructor.

5334. ORGANIZATION CONSULTING (3-0). Explores internal and external consulting to business organizations. Emphasis on the management of the change process through the stages of data gathering, diagnosis, analysis and recommendation. Prerequisite: MANA 5312.

5340. STRATEGIC HUMAN RESOURCE MANAGEMENT (3-0). Emphasizes strategic perspective of modern human resource management theory and practice. Topics include human resource planning, staffing, training and development, compensation, performance appraisal, and labor and employee relations. Prerequisite: MANA 5312 or equivalent.

5341. STAFFING AND PERFORMANCE MANAGEMENT (3-0). This course covers employee recruitment, selection and performance appraisal. Topics include: recruitment strategies and methods, methods of employee selection, performance planning, development and validation of appraisal instruments, implementation and conduct of performance appraisal, and performance feedback and counseling.

5342. PREVENTIVE STRESS MANAGEMENT (3-0). Examines the organizational demands that cause stress. Identifies the psychophysiology of the stress response and the individual/organizational costs of distress. Emphasis is placed on the principles and methods of preventive stress management, such as social support, exercise, and the relaxation response. Prerequisite: MANA 5312 or equivalent or consent of instructor.

5182, 5282, 5382. INDEPENDENT STUDIES IN MANAGEMENT. Extensive analysis of a management topic. Graded R. Prerequisite: consent of faculty member and department chair.

5390. APPLIED ORGANIZATIONAL RESEARCH (3-0). Experiential approach to methods and topics in organizational research, highlighting practical constraints and problems. Students work in teams on chosen research projects. Satisfies MBA research requirement. Prerequisites: BUSA 5325 and consent of instructor.

5192, 5292, 5392. SELECTED TOPICS IN MANAGEMENT. In-depth study of selected topics in management. May be repeated when topics vary. Prerequisite: consent of instructor and Graduate Advisor.

5698. THESIS. Prerequisite: permission of Graduate Advisor in Personnel and Human Resources Management. Graded P/F/R.

6318. SEMINAR IN ORGANIZATIONAL THEORY (3-0). Advanced study in the theory and research of organizations.

6328. SEMINAR IN BUSINESS POLICY (3-0). Advanced study in the theory and research bases of business policy and strategic management.

6329. ADVANCED RESEARCH METHODS (3-0). In-depth coverage of selected topics in the design of research and analysis of data; topics include philosophy of science, theory of measurement, complex experimental and quasi-experimental designs.

6338. SEMINAR IN ORGANIZATIONAL BEHAVIOR (3-0). Advanced study in the theory and research of organizational behavior.

6348. SEMINAR IN PERSONNEL/HUMAN RESOURCE MANAGEMENT (3-0). Advanced study in employee selection, performance appraisal, compensation, training and development, human resource policy and strategy, and other areas of human resource management.

6182, 6282, 6382. INDEPENDENT STUDIES IN MANAGEMENT. Extensive analysis of a management topic. Prerequisite: consent of faculty member and department chair.

6390. ADVANCED TOPICS IN MANAGEMENT (3-0). In-depth study of selected topics in management. May be repeated when topics vary. Prerequisite: consent of instructor.

6392. RESEARCH IN ADMINISTRATION (3-0). Independent research under supervision of a faculty member. Graded P/F/R. Prerequisite: consent of instructor.

Objective: M.B.A. Program

The comprehensive marketing curriculum allows specialization in product management, retailing, and promotion. A capstone course provides preparation for strategic marketing planning and decision making.

Objective: M.S. Program

The objective of the Master of Science in Marketing Research is to prepare qualified students for careers as managers in marketing research, marketing planning, product/brand management, and related fields. Students are exposed to a range of coursework related to the theory and practice of marketing research. In addition, courses in information systems and management science focus on the latest theory and practice in those areas relevant to marketing research. Students are required to participate in an internship program.

Accreditation

The Master of Science degree in Marketing Research is accredited by the AACSB–The International Association for Management Education.

Degree Requirements

Along with meeting the admission requirements of the Graduate School, applicants must obtain a satisfactory score on the Graduate Management Admission Test (GMAT) and provide evidence of exceptional academic performance at the undergraduate level.

The program is designed primarily for students who have earned a Bachelor of Business Administration (BBA) degree (or equivalent). For this student, the program consists of a minimum of 36 semester hours. Students who do not have a BBA may have to take additional coursework (up to 30 semester hours) to acquire sufficient general business knowledge for effective performance as a marketing research professional. Foundation courses may be waived if equivalent coursework has been completed.

The minimum advanced program of 36 semester hours contains 30 hours of marketing courses including six hours of actual marketing research field work; three hours of applied database management; and three hours of nonparametric statistics.

The required curriculum is as follows:

1. Foundation Courses (30 semester hours)
   ACCT 5301 (Financial) Accounting Analysis I
   ACCT 5302 (Managerial) Accounting Analysis II
   ECON 5309 (Micro) Economic Analysis I
   ECON 5311 (Macro) Economic Analysis II
   MARK 5311 Marketing
   FINA 5311 Business Finance
   INSY 5310 Introduction to Computers
   BUSA 5303 Quantitative Analysis
   BUSA 5325 Advanced Statistical Methods
   MANA 5312 Management

Department of Marketing

Areas of Study and Degrees
Marketing Research
M.S.
Business Administration
M.B.A., Ph.D.
(See Program in Business Administration)

Master's Degree Plans
Non-Thesis

Chair
Carl McDaniel
234 Business, 817-272-2876

Graduate Advisor
James Munch
219 Business, 817-272-2258

MSMR Advisor
Jim Ellis
516 Business, 817-272-2340

Graduate Faculty
Professors
Dickinson, Gates, McDaniel

Associate Professors
Baker, Jarboe, Munch

Assistant Professors
Kleiser, Mosley-Matchett, Peterson, Wagner

2. Advanced Courses (36 semester hours)
   MARK 5320 Buyer Behavior
   MARK 5327 Research for Marketing Decisions
   MARK 5328 Product Management
   MARK 5336 Advanced Marketing Research
   MARK 5337 Marketing Information Management
   MARK 5338 Qualitative Research
   MARK 5340 Marketing Strategy
   MARK 5345 Creative Problem Solving
   MARK 5396 Marketing Research Internship I
   MARK 5397 Marketing Research Internship II
   MARK 6305 Marketing Models
   BUSA 5375 Advanced Business Communication and Practice

Marketing Research Internship

The Marketing Research Internship (MARK 5396 and MARK 5397) provides five to six months of paid, full-time work experience in either a marketing research company or a corporate marketing research department. Sponsoring companies will be approved by the marketing research program advisor. During the internship, the student will have primary responsibility for at least one marketing research study. At the completion of the internship, the student will present a paper to the graduate faculty summarizing his or her internship experiences and the results of the research study. In special situations, and with the approval of the program advisor, a one-year, part-time internship may be substituted for the full-time internship.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Marketing (MARK)

5311. MARKETING (3-0). Survey of activities involved in marketing. Emphasis is on developing a managerial point of view in planning and evaluating marketing decisions of the firm. Analyzes decisions with respect to products, price, channel, and promotional variables and considers questions relating to cost efficiency, demand, social responsibility and regulations.

5320. BUYER BEHAVIOR (3-0). Examines the theoretical and empirical material on the individual and group behavior of people performing in the consumer role. Topics covered include perception, learning, attitude formation and change, personality, culture, social class, and reference groups. Behavioral science data provides a basis for the explanation of consumer behavior and the integration of these findings into current marketing practices. Prerequisite: MARK 5311 or equivalent.

5326. INTEGRATED MARKETING COMMUNICATION (3-0). A managerial approach to coordinating all promotional activities, including direct marketing, advertising, sales promotion, personal selling, public relations, publicity and packaging to produce a unified market-focused message. Message development, placement and timing are examined within the context of the role each type of promotion plays in marketing strategy development. Additional topics examined include media definition and analysis, the communication process, legal and ethical considerations, and budgeting. Prerequisite: MARK 5311 or equivalent.

5327. RESEARCH FOR MARKETING DECISIONS (3-0). Overview of information needs of the marketing decision-maker. Emphasis on methods and techniques that may be employed for the collection and analysis of primary data. Major topics include design of research projects, generating primary data, questionnaire design, samplings for survey research, experimental design, controlling data collection, and data analysis. Prerequisites: MARK 5311 and BUSA 5301 or equivalents.

5328. PRODUCT MANAGEMENT (3-0). Management of the firm's product or service offerings. Topics include new product development, new product screening, evaluation of existing products, product line and mix analysis, product abandonment decisions, the brand manager's role, the new product planning department, and others. Emphasis on the development of meaningful criteria for decision-making in the product area and on the development of information systems to suggest, screen, and monitor products. Prerequisite: MARK 5327 or equivalent.

5329. SALES AND SALES MANAGEMENT (3-0). Examines the unique characteristics of both the industrial and consumer markets from the personal selling viewpoint, with emphasis upon industrial selling. Covers personal selling fundamentals as well as vital sales management topics. Uses role playing and case analysis. Prerequisite: MARK 5311 or equivalent.

5330. SERVICE MARKETING MANAGEMENT (3-0). Addresses marketing theory and applications in health care, financial, and other service industries. Focus is on solving marketing problems unique to service organizations. Prerequisite: MARK 5311.

5331. INTERNATIONAL MARKETING (3-0). Management of marketing in international business. Includes marketing research, pricing, promotion, and distribution in the international environment. Examines marketing problems arising from various degrees of foreign involvement (exports, licensing, foreign subsidiaries). Prerequisite: MARK 5311 or equivalent.

5332. INDUSTRIAL MARKETING (3-0). Marketing strategy examined from the standpoint of a firm's transactions with intermediate customers and industrial users. Included are frameworks for analysis of marketing opportunities. Student challenged to develop marketing programs directed toward professional buyers. Prerequisite: MARK 5311 or equivalent.

5335. RETAILING, FRANCHISING, AND ENTREPRENEURSHIP (3-0). Course offers exposure to elements of retail management, franchising, and entrepreneurship, including planning, promotion, pricing, and merchandising. Prerequisite: MARK 5311 or equivalent.

5336. ADVANCED RESEARCH ANALYSIS (3-0). Focuses on problems of data analysis in marketing research. Considers application of multivariate statistics, including multiple regression, discriminant analysis and factor analysis to marketing research problems. Considerable time also devoted to multi-attribute preference models such as conjoint analyses. Prerequisite: MARK 5327 or equivalent.

5337. MARKETING INFORMATION MANAGEMENT (3-0). Course focuses on various types of marketing data bases and computer-based research systems designed for the collection, storage, usage, and reporting of disaggregated data. Topics include single-source data, geodemographics, and micro-merchandising systems. Case studies and data analysis projects are utilized. Prerequisite: MARK 5327 and consent of program advisor.

5338. QUALITATIVE RESEARCH (3-0). Examines the nature of qualitative research and its growing value to the marketing research community. The role of focus group interviewing, types of focus groups and their conduct are extensively explored. Other topics include depth interviewing, projective techniques, observational research, the delphi method, environmental forecasting and futuring. Prerequisite: MARK 5327 and consent of program advisor.

5340. MARKETING STRATEGY (3-0). A case course designed to give the student an opportunity to utilize the managerial and analytical tools that he or she has acquired. Uses case studies which require a realistic diagnosis of company problems, development of alternative courses of action, and the formulation of specific recommendations. Prerequisite: MARK 5311 and six hours of advanced marketing or consent of instructor.

5345. CREATIVE PROBLEM SOLVING (3-0). Discusses the relationship between the creative process and marketing decisions. Students develop a repertoire of techniques to expand their creativity and learn to enhance their flexibility in generating divergent, dramatic solutions to problems.

5182, 5282, 5382. INDEPENDENT STUDIES IN MARKETING. Extensive analysis of a marketing topic. Graded P/F/R. Prerequisite: consent of faculty member and department chair.

5395. FIELD RESEARCH I (3-0). Students will execute research design for client as developed by students in MARK 5398. Involves survey, experiment, observation-based research, and research based on secondary data analysis. Students develop skills in sampling, questionnaire/data collection form design, working with data collection contractors, data processing and analysis, and report preparation. Prerequisite: consent of MSMR Advisor.

5396. MARKETING RESEARCH INTERNSHIP I (3-0). The internship involves part-time or full-time training and work experience in a company approved by the MSMR program advisor. A grade of R may be assigned at the completion of the course. Credit may not be granted for the internship and MARK 5395.

5397. MARKETING RESEARCH INTERNSHIP II (3-0). This is a continuation of Internship I and involves part-time or full-time work experience in a company approved by the MSMR program advisor. The student will be assigned primary responsibility for at least one marketing research project during Internship I or II. At the completion of the course, the student will present a research paper to the MSMR faculty. Course is graded on a pass/fail basis. Credit will not be granted for the internship and MARK 5398.

5398. FIELD RESEARCH II (3-0). Capstone course focuses on research design, management of marketing research, client relations, the relationship between research findings and marketing strategy, and the presentation of research findings. Students will work with corporate clients to translate client needs into an appropriate research design, supervise team of students in MARK 5395 Field Research I. Prerequisite: consent of MSMR Advisor.

6301. MARKETING THEORY (3-0). Study of the history of marketing thought, evolution of marketing theory and latest theoretical developments.

6302. ADVANCED CONSUMER BEHAVIOR (3-0). Advanced study of current research underlying individual and group behavior of consumers and industrial buyers. Theories from the behavioral sciences will be applied to consumer behavior from descriptive, predictive, and normative perspectives.

6305. MARKETING MODELS I (3-0). Study of basic models of market and consumer behavior with particular attention to the use of classical statistical methods such as ordinary and generalized least squares, factor analysis, discriminant analysis and correspondence analysis, cluster analysis, and canonical correlation. Applications include perceptual mapping, multiattribute modeling, conjoint analysis, and product planning models. Prerequisite: BUSA 5325 or consent of instructor.

6306. MARKETING MODELS II (3-0). Study of advanced models of market and consumer behavior with particular attention to methods such as structural equation modeling, logit and probit. Applications emphasize large-systems models of customer and organizational behavior and the modeling of attitudes, preference, and choice. Prerequisite: BUSA 5325 or consent of instructor.

6310. MARKETING STRATEGY AND MANAGEMENT (3-0). Examination of latest theories in corporate and marketing strategies. In-depth review and analysis of latest theories and research in product/service development, pricing, promotion, and distribution.

6390. TOPICS IN MARKETING (3-0). Advanced doctoral level work in special topics in marketing. May be repeated when topics vary.

6192, 6292, 6392. INDEPENDENT STUDY IN MARKETING (3-0). Doctoral level analysis of marketing topic. Graded P/F/R. Prerequisite: consent of faculty member. May be repeated when topic changes.

The Center for Professional Teacher Education

Director: Jeanne M. Gerlach, Ph.D., Ed.D.
5th Floor, Hammond Hall • Box 19227 • 817-272-2591

Mission and Philosophy

The mission of the Center for Professional Teacher Education is to provide quality programs for the preparation of professional school personnel, engage in scholarship and dissemination of knowledge related to the increased effectiveness of professional programs and/or teaching and learning in the school setting, and provide leadership and service to the University, the practicing profession, the profession at large and the community.

History and Overview

Planning for a graduate degree in professional education began at The University of Texas at Arlington in 1979-80. A growing population of teachers wanted the opportunity to extend their knowledge base in education and related fields with graduate coursework. In response to this need, the Center for Professional Teacher Education developed a unique master's degree, the Master of Education in Teaching (M.E.T.). This program has enabled students to combine graduate coursework in education with study in an academic discipline related to the their teaching fields. Its success led to the expansion of education offerings to include further professional certifications in reading and mid-management. The Master of Education (M.E.T.) degree is a broad-based program which provides an opportunity for elementary and secondary in-service teachers to continue developing effective teaching and administrative skills that are congruent with an expanding theoretical knowledge base. The degree is appropriate for teachers who seek to advance their careers in school administration, reading and other areas.

Scholastic Activity and Research Interests of the Faculty

The faculty in the Center for Professional Teacher Education strives to model the characteristics of the most competent professional educators for all students aspiring to membership in the education profession. Education faculty members have consistently been recognized for their excellence in teaching, within the unit, in the University and beyond. They have received The University of Texas System Chancellor's Council Teaching Award, election to UTA's Academy of Distinguished Teachers, and the Piper Professor award at the state level. They have served as Fulbright Scholars abroad and as guest lecturers at universities across the country. In addition, numerous faculty have received recognition for their published scholarship and contributions to the expanding knowledge base of the education profession.

Faculty scholarship is also valued by the CPTE for its potential for impact on the increased effectiveness of teaching and learning in professional education preparation programs and in the public school setting. Scholarly and research activities cover a variety of areas represented by the expertise of each individual faculty member. Research interests and publications include the areas of multicultural education, current issues in curriculum and instruction, innovations in science education, stress management in learning, gender issues in the classroom and reducing math anxiety, among other topics. Grants for expanding the knowledge base of middle school science teachers have been repeatedly funded. In the literacy field, faculty have published books, articles and book chapters on emergent literacy in young children, reading and writing across the curriculum, and on the use of literature in teaching children. Funded study on the use of literature with second language learners is currently underway.

In educational administration, research activities and publications have focused on school leadership trends, developing collaboratives between university, public, private and charter schools, fostering creativity in learning organizations, and studying school policy issues, particularly regarding the new charter school movement. A graduate level field-based educational administrator preparation program is currently under way and has received funding from multiple well-known sources. The faculty of the Center for Professional Teacher Education values scholarship and the dissemination of knowledge as a crucial variable in successful and informed university teaching.

Evidence of service to the center, the University, the community and the practicing profession is also expected of the faculty. This includes service to local constituencies such as school districts, education service centers, parent-teacher groups, professional associations, and/or other agencies and organizations dedicated to the improvement of teaching and learning, as well as involvement in outreach programs, community events, civic leadership, and the promotion of alumni support and involvement. The extensive service activities of the faculty in the Center for Professional Teacher Education have garnered additional awards for outstanding service from the university, the community, the state and a variety of professional organizations.

Special Programs and Opportunities

The Center for Professional Teacher Education offers a variety of special opportunities for learning and professional growth for graduate students. The annual Educational Symposium, an educational technology center, field experiences, visiting authors and experts, and specialized library resources are some of the resources and events which add to the richness of the student's university experience.

- Each fall, the center organizes the Education Symposium, an opportunity for educators, publishers and others involved in the business of teaching and learning to come together and learn from each other. Graduate students may even gain formal presentation experience at this event, if they so desire.
- A special technology lab designed particularly for education students offers access to computer use and training in a variety of writing, publishing and multimedia arenas.

- Several graduate courses offer links with field experiences which greatly enrich the course content. This includes regular observation and participation in early childhood education, an administrative internship for mid-management certification individualized for students and their school districts, and annual summer literacy clinics which bring children to the UTA campus to work with graduate students completing their reading specialist certificate.
- Graduate courses also routinely host authors and experts in various areas to share their experiences and insights with the class. This includes outstanding professors from other area universities, published children's authors, professional storytellers, award winning educators, etc.
- Numerous student organizations also offer graduate students leadership opportunities, such as the Student Reading Association affiliate of the International Reading Association, Kappa Delta Pi, and the Association for Childhood Education International, among others.
- Student awards, scholarships and graduate assistantships are offered within the Center for Professional Teacher Education to graduate students who qualify.
- In support of the programs of the Center for Professional Teacher Education, the UTA Library houses a Curriculum Collection and a Juvenile Collection for student use in conjunction with their education coursework.
- The Center for Professional Teacher Education also offers creative and flexible scheduling of graduate coursework to meet the needs of professional educators, including Saturday, weekend, interim and evening classes year-round.

Programs

The Center for Professional Teacher Education currently offers the Master of Education in Teaching (M.E.T.), with coursework in school administration (mid-management) and reading. Additional endorsement, certification and specialty areas also are offered, such as English as a Second Language (ESL), Early Childhood Education (ECE), and Gifted and Talented (G/T).

Teacher Education

Area of Study and Degree
Education
M.E.T.

Master's Degree Plans
Non-Thesis

Director
Jeanne M. Gerlach
500 Hammond, 817-272-2591

Graduate Advisor
John E. Jacobson
500 Hammond Hall, 817-272-3346

Graduate Faculty
Professors
Crow, Funkhouser, Reinhartz

Associate Professors
Duke, Hadaway, Jacobson, Jenkins, Leffingwell, Vardell

Assistant Professors
Canaday, Jackson, Johnson, Marshall, McNeil, Morgan, Wilmore

Graduate Faculty of the Center for Professional Teacher Education

Objective

The Master of Education in Teaching (MET) degree is a broad-based program which provides an opportunity for elementary and secondary in-service teachers to continue developing effective teaching and administrative skills that are congruent with an expanding theoretical knowledge base and to specialize in related professional careers in school administration, reading and other areas. The graduate program is designed to assist in-service teachers or those working on certification to implement effective practices and become leaders within their school settings. The MET prepares the graduate to self-evaluate and to better understand the linkage between the theory and practice of teaching. Each student's program of study is planned individually and provides academic specialization within the context of teaching.

The program leading to the Master of Education in Teaching (MET) focuses on developing effective elementary and secondary teachers and professional leaders in the schools. The program of instruction includes professional and academic components. A flexible curriculum is offered and provides courses that support the teaching and administrative assignments of teachers in the elementary or secondary schools.

Graduate faculty in the Center for Professional Teacher Education and those in departments in the Colleges of Liberal Arts, Science, and Business Administration work closely with students to formulate programs of work that meet the students' professional objectives and goals of professional growth.

The applicant for the Master of Education in Teaching degree must meet the general requirements of the Graduate School, have a bachelor's degree, and generally have a teaching certificate or be simultaneously working toward certification. With the assistance of the Graduate Advisor, students are required to complete a tentative program of work during the second semester following admission to Graduate School. This program of work is filed in the Graduate School and may be modified as needed. The MET is comprised of a minimum of 36 semester hours and is a non-thesis degree. Candidates for the MET are required to pass a comprehensive examination during their final semester of coursework.

Professional Level Certification

The Center for Professional Teacher Education also offers graduate level programs leading to the Professional School Administration (or Mid Management) Certificate and Reading Specialist Certification. The English as a Second Language, Gifted and Talented, and Early Childhood Endorsements also are available with graduate level coursework.

Initial Certification

Initial teacher certification in Texas requires a baccalaureate degree and passing the appropriate professional and teaching field ExCET. After meeting certain undergraduate prerequisites, post-baccalaureate candidates may opt for appropriate graduate level coursework for some of their initial certification requirements, in consultation with the Graduate Advisor. Students who wish to apply this coursework toward a Master's degree must go through the usual procedures for admission to the Graduate School.

School Administration (Mid Management)

Requirements for the School Administration Certificate include a valid Texas teacher certificate, three years of acceptable teaching experience, a master's degree, minimum nine hours above the master's, passing the ExCET in school administration, and coursework including:

Common core area	9 hours
Administration area	18 hours
Support area	6 hours
Elective area	3 hours
Beyond master's	9 hours
Minimum Total	45 semester hours

A review of the candidate's transcripts by the graduate advisor will identify specific courses required.

Reading Specialist Certification

Reading Specialist Certification requires a master's degree, a valid Texas teacher certificate, three years of acceptable classroom teaching experience, and passing the Reading Specialist ExCET. Course requirements for the Master of Education in Teaching with Reading Specialist Certification include:

Reading	18 hours
Professional Education	9 hours
Resource	6 hours
Elective	3 hours
Minimum Total	36 semester hours

English as a Second Language Endorsement (ESL)

For completion of an Endorsement Program, an individual must have a baccalaureate degree and a valid Texas teacher certificate. For coursework, see the Graduate Advisor.

Candidates must also complete student teaching in the ESL classroom or one year of successful teaching experience in an ESL or Bilingual Education Program approved by the Texas Education Agency.

Candidates also must pass the ExCET in ESL.

Gifted and Talented Endorsement (G/T)

The all-level Gifted and Talented Endorsement may be added to any valid teacher certificate. The Gifted and Talented ExCET, when developed, will be required. The endorsement requires 15 hours of coursework including the following:

EDUC 5370 Introduction to Gifted and Talented Children
EDUC 5371 Measurement and Assessment of Gifted and Talented Children
EDUC 5372 Methods, Materials and Curriculum for the Gifted and Talented Student
EDUC 5373 Creativity: Theories, Models and Application
EDUC 5374 Practicum (or two years of successful classroom teaching experience in a program for gifted and talented students).

Early Childhood Endorsement (ECE)

The Early Childhood Endorsement may be added to any valid teacher certificate. It is a 12-hour program which includes the following courses:

EDUC 5317 Theories of Development and Learning in Early Childhood Education
EDUC 5318 Early Childhood Kindergarten Education: Philosophy and Curriculum
EDUC 5319 Early Childhood and Kindergarten Methods and Materials
EDUC 5390 Conference course.

Candidates also must pass the ExCET in Early Childhood Education.

Educational Leadership
U.T. Arlington

U.T. Arlington, in collaboration with Metroplex school districts, has taken a dramatic departure from traditional administrator preparation programs and designed a restructured professional development program for potential school principals leading to a master's degree and Texas mid-management certification. Graduate students who have been selected by the represented districts and who meet U.T. Arlington Graduate School admissions standards will join a cohort of interns for a full year field-based principal preparation program. During the first and second summers, the cohort will meet for daily seminars over a four week period. During the academic school year, interns will participate in weekly seminars as they concurrently experience three 12 week field-based internships and one 2 week district office experience. Interns will be paired with selected mentor principals and district office administrators as well as working directly under the supervision of University professors. Integrated and collaborative working relationships between the participating school districts and the University are essential.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

5350. FOUNDATIONS OF LEADERSHIP IN A LEARNER-CENTERED ENVIRONMENT (5-2). Introduction to basic skills and knowledge needed for school administrators including strategies and techniques involved in developing learner-centered culture, climate, sensitivity, time management, problem solving, and conflict resolution. Concurrent enrollment with EDUC 5351. $5 course specific fee.

5362. CRITICAL ISSUES IN LEARNER-CENTERED SCHOOLS (2-2). Campus or site-based discussions of critical issues as related to learner-centered campus leadership and as applied to the concurrent Practicum experience. This course may be repeated for course credit as topics change. Concurrent enrollment as specified by professor. $5 course specific fee.

5395. FUTURISTIC LEADERSHIP ROLES (5-2). Concepts and skills to prepare educational leaders for learner-centered schools and to anticipate and foster the professional development of all staff and parents in the learning community. Concurrent enrollment with EDUC 5362. $5 course specific fee.

5651. ORGANIZATIONAL DEVELOPMENT IN SCHOOL SETTINGS (10-4). The role of the principal in the leadership of schools. An analysis of the concepts, theories, philosophies, laws, and major reforms of learner-centered restructuring of the public schools. Concurrent enrollment with EDUC 5350. $5 course specific fee.

5660. CURRICULUM AND INSTRUCTION IN LEARNER-CENTERED SCHOOLS (4-12). The role of the principal in curriculum content, development, and instructional delivery systems. Such topics as instructional leadership development, assessment, the disaggregation of test data, and program evaluation methods in light of changing student, school, and community needs will be discussed. Concurrent enrollment with EDUC 5661 and EDUC 5362. $5 course specific fee.

5661. PHASE I PRACTICUM IN SCHOOL ADMINISTRATION (0-20). Development of an advanced knowledge base that applies ideal administrative theory into selected school and a school administration building. Concurrent enrollment with EDUC 5660 and EDUC 5362. $5 course specific fee.

5692. PUBLIC EDUCATION: DIVERSITY AND GOVERNANCE IN LEARNER-CENTERED SCHOOLS (4-12). The legalities and sensitivity of equity in meeting the needs and responsibilities of all learners in a diverse educated society. Concurrent enrollment with EDUC 5693 and EDUC 5362. $5 course specific fee.

5693. PHASE II PRACTICUM IN SCHOOL ADMINISTRATION (0-20). Exploration and participation in the role of applying ideal leadership concepts in planning, organizing, implementing, and analyzing educational leadership in an actual field-based learner-centered environment. Concurrent enrollment with EDUC 5692 and EDUC 5362. $5 course specific fee.

Education (EDUC)

5301. CURRENT APPLICATIONS OF TECHNOLOGY IN EDUCATION (3-0). Study of technology use in educational environments. Topics include: instructional, learning, assessment, and management applications; a review of current research on selection, evaluation, and integration of appropriate media; and computer hardware and software, multimedia, laser disk, CD-ROM, and telecommunications systems. $10 course specific fee.

5302. SCIENCE IN THE ELEMENTARY SCHOOL (3-0). The examination of instructional strategies, materials, current research, and technology pertinent to teaching science in the elementary school; the scope and sequence of science content and implementation of instructional approaches to accommodate diverse student populations. Prerequisite: EDUC 3306 and 3316. $10 course specific fee.

5303. MATHEMATICS IN THE ELEMENTARY SCHOOL (3-0). The examination of instructional strategies, materials, current research, and technology pertinent to teaching mathematics in the elementary school; the scope and math content and the selection and implementation of instructional approaches to accommodate diverse student populations. Prerequisites: EDUC 3306 and 3316. $10 course specific fee.

5304. SOCIAL STUDIES IN THE ELEMENTARY SCHOOL (3-0). An examination of content, methods, current research, and learning theory appropriate for elementary social studies education. Special attention to methods that promote analytical and evaluative abilities necessary for participatory democracy in a culturally diverse society. Prerequisites: EDUC 3306 and 3316. $10 course specific fee.

5305. CURRICULUM DESIGN, IMPLEMENTATION, AND EVALUATION (3-0). An examination of theory and research in curriculum development, implementation, and evaluation. Emphasis on current trends in the content areas. $5 course specific fee.

5309. ADVANCED INSTRUCTIONAL STRATEGIES (3-0). A study of advanced models of teaching including concept attainment, inductive thinking, inquiry, cognitive growth, non-directive group investigation, laboratory training, simulation and the training model. Research in teacher effectiveness and demonstration of various models will be required. (Credit will not be granted for both EDUC 4309 and 5309.) $5 course specific fee.

5314. EFFECTIVE CLASSROOM INSTRUCTION (3-0). Designed to provide teachers with skills and competencies based on research findings on effective teaching and instruction related to promoting student academic achievement. Includes identifying, developing, and practicing instructional variables that affect teacher performance and student learning tasks. $5 course specific fee.

5315. RESEARCH PRACTICUM. Directed practicum in student's teaching areas. The student will be assigned to a public school classroom for an extended field-based experience. This longitudinal experience will help students apply theory and research to practice. The student will be responsible for planning, instruction, and evaluation. A research project is required. Can be repeated for credit with permission.

5317. THEORIES OF DEVELOPMENT AND LEARNING IN EARLY CHILDHOOD EDUCATION (3-0). Human growth and development, including developmental anomalies, from birth through early childhood with emphasis on cognitive, social, emotional, and physical growth. Attention is given to current research regarding establishment of learning environments that foster development of the child's self-concept, cognitive competencies, oral language and literacy development, and positive social behaviors including tolerance of diversity among individuals and groups. $5 course specific fee.

5318. EARLY CHILDHOOD AND KINDERGARTEN EDUCATION: PHILOSOPHY AND CURRICULUM (3-0). An overview of the historical and philosophical influences of pre-kindergarten and kindergarten education and the current research perspectives on fostering educational environments conducive to development of the whole child. Attention is given to organization and implementation of a developmentally appropriate curriculum and formulating programs which extend and integrate learning experiences of young children, including the home-school relationship. $5 course specific fee.

5319. EARLY CHILDHOOD AND KINDERGARTEN METHODS AND MATERIALS (3-0). Examination of the content, pedagogy, and materials that are developmentally appropriate for use in a culturally diverse early childhood setting. Organization and management of the learning environment, management of student behavior, diagnosis and evaluation of the learner in the affective, cognitive, and motor areas, and effective use of a variety of teaching/learning strategies including the use of technology and an integrated curriculum (e.g., language and literacy, mathematics, natural and social sciences, fine arts, health and safety). $5 course specific fee.

5321. EDUCATIONAL RESEARCH (3-0). Examination of basic concepts and procedures necessary for empirical research investigations within classroom contexts, experimental design, data collection and interpretation, and statistical analysis. $5 course specific fee.

5329. CLASSROOM MANAGEMENT AND DISCIPLINE (3-0). Analysis of the variables that affect teacher and student behavior in the classroom. Survey of effective strategies of classroom management and discipline based on contemporary research. Particular attention to individual student differences in settings such as gifted and talented, handicapped, and learning disabled. $5 course specific fee.

5330. LEADERSHIP IN THE INSTRUCTIONAL SETTING (3-0). Examination of current research on effective instructional organizations and classroom instruction in today's schools, on characteristics of school leadership, and on the role and function of the teacher as instructional leader. Topics include the essential components of instruction, developing instructional-management systems, evaluating student and teacher performance, assisting colleagues to monitor and improve instructional skills, school climate and leadership styles as they impact on school improvement. $5 course specific fee.

5333. EXCEPTIONAL LEARNERS (3-0). Learning styles and effective teaching strategies for exceptional learners. Applications of research on identification, assessment, teaching, and technology for the full range of exceptions including handicapped and talented and gifted. $5 course specific fee.

5335. THEORIES OF TEACHING AND LEARNING (3-0). Examination of theories of teaching and learning and their applications to elementary and secondary school contexts.

5340. EDUCATIONAL EVALUATION (3-0). Various means of evaluating school systems and their communities, school personnel, and students. Includes accreditation standards, personnel appraisal, mandated testing of students, and a review of the purpose, description, special utility, standardization, reliability, validity, and strengths and weaknesses of tests commonly used in public schools. $5 course specific fee.

5342. EFFECTIVE TEACHING PRACTICES (3-0). Focus on an examination of the correlates of effective instruction/effective schools research, the restructuring movement, and technology and its role in instruction. This course is designed to provide teachers and those in supervisory roles with skills and competencies in the following areas: teacher evaluation (TTAS), site-based management, and campus plans. $5 course specific fee.

5343. PRACTICUM IN SUPERVISION (1-20). Directed practicum in supervision. The student will be assigned to a public school for field-based supervisory experience. Activities involved may include grant writing, campus planning, site-based management activities, and restructuring efforts as they relate to planning, instruction, and evaluation. $5 course specific fee.

5358. THEMATIC SCIENCE FOR ELEMENTARY AND SECONDARY TEACHERS (3-0). Professional development program for elementary and secondary science teachers who will examine a variety of instructional strategies. The course will provide a broad spectrum of content from all areas of science and provide opportunities to participate in investigations, field trips and seminars. The course will facilitate the implementation of a thematic science curriculum in elementary and secondary schools through research-based practices.

5370. INTRODUCTION TO GIFTED AND TALENTED CHILDREN (3-0). Psychological characteristics of gifted and talented children. Introduction to identification techniques, educational programs, instructional approaches, and special problems. $5 course specific fee.

5371. MEASUREMENT AND ASSESSMENT OF GIFTED AND TALENTED CHILDREN (3-0). Tests, formal and informal measures, and systems for identification and selection of the gifted and talented student. Basic test construction theory, test interpretation, and test uses. $5 course specific fee.

5372. METHODS, MATERIALS, AND CURRICULUM FOR THE GIFTED AND TALENTED (3-0). Curriculum theory and curriculum design for the gifted student. Methodology for implementing practical and theoretical objectives for gifted instruction. $5 course specific fee.

5373. CREATIVITY: THEORIES, MODELS, AND APPLICATION (3-0). The concept of and current research on creativity, the nature and assessment of creative thinking, as well as methods of fostering creativity. $5 course specific fee.

5374. PRACTICUM (1-5). Participation in a gifted and talented setting supervised by a university and/or school district representative. A wide range of practical experiences will be emphasized. Graded P/F/R. $5 course specific fee.

5380. DIVERSITY IN EDUCATIONAL SETTINGS (3-0). Effective leadership, instruction, and management strategies for work in diverse educational settings. Designed to provide increased self-awareness and insight into issues of diversity such as culture, ethnicity, exceptionality, gender, language, and socioeconomic status. Demographic issues along with urban and suburban educational settings will also be addressed. $5 course specific fee.

5381. POLITICAL AND LEGAL ASPECTS OF EDUCATION (3-0). Focus on the legal foundation of public education, political theory, and application of political skills in working with school personnel, students, parents, and community organizations. The role of the law, court rulings, and the politics of school governance at the federal, state, and local levels will be addressed. $5 course specific fee.

5382. FOUNDATIONS OF EDUCATIONAL ADMINISTRATION (3-0). Will address the various aspects of instructional leadership roles and responsibilities of central office as well as building level administrators and supervisors. Topics included will be history of educational administration, educational philosophy, the global understanding of administrative roles in urban and rural settings, and professional organizations, as well as an overview of educational reforms, site-based management, governance, instructional management, evaluation, exchanging ideas, making changes, coaching beginning teachers, mentoring of teachers and peers, and a diverse community. $5 course specific fee.

5383. THE PRINCIPALSHIP (3-0). Role of the principal in the organization and administration of schools, personnel and facility management, instructional leadership, forecasting and planning, shared decision-making, legal problems, interpersonal skills, time management, conflict resolution, program evaluation, and community relations. $5 course specific fee.

5384. RESOURCE MANAGEMENT IN EDUCATION (3-0). School finance, as well as auxiliary areas of resource management, will be addressed. The emphasis will be on the use of technology, alternative models of financing and budgeting, and sources of revenue from the federal, state, and local levels as well as from private sources. The course is designed to assist administrators in developing an understanding of the functions, operation, and evaluation of auxiliary services which support the educational program. $5 course specific fee.

5388. EDUCATIONAL POLICY ISSUES IN THE PUBLIC SCHOOLS (3-0). Examination of positions on policy issues of importance in public education. $5 course specific fee.

5389. ADMINISTRATIVE INTERNSHIP (1-15). Designed to provide prospective educational administrators job-related experiences under supervision in an appropriate educational setting. An approved professional study is designed in relationship to the intern's interest and past experiences. Can be repeated for credit with approval of advisor. $25 course specific fee.

5190, 5290, 5390. SELECTED TOPICS IN EDUCATION (3-0). An examination of different topics related to education. This seminar may be repeated for credit as the topic changes.

5191, 5291, 5391. INDEPENDENT RESEARCH. Research for thesis substitute or equivalent over topic agreed upon between student and instructor. Can be repeated for credit with permission. Graded R.

Reading (READ)

5316. PRACTICUM AND SEMINAR IN LITERACY LEARNING (2-1). Directed practicum in literacy learning. Seminar will be held with emphasis on classroom application of recent issues in literacy learning. This course should be taken as the last reading course in the sequence of graduate reading courses. $5 course specific fee.

5325. CURRENT TRENDS IN LANGUAGE ARTS (3-0). Relationships between theory and practice in the field of reading and language arts at the elementary and secondary level. Emphasis on current trends and issues such as the teaching of word identification, vocabulary, comprehension, spelling and writing. The use of thematic teaching and integrated instruction also will be explored. $5 course specific fee.

5326. TEACHING THE LANGUAGE ARTS IN SECONDARY SCHOOLS (3-0). Teaching of the processes and skills for reading/language arts (grades 7 through 12). Topics include teaching the reading and writing process, children's and adolescent literature, poetry, drama, listening/speaking, and media. The class involves a collaborative literacy based project which is developed by the class for publication during the course. $5 course specific fee.

5345. CONTENT AREA READING AND WRITING (3-0). Explores methods of teaching reading, writing, and study skills in content area subjects. Emphasis on text structure and the difference between narrative and expository text, graphic organizers for text structure, the reading/writing process as applied to informational text. Classroom adaptations for culturally and linguistically diverse populations in the content areas also will be addressed. $5 course specific fee.

5346. TEACHING THE WRITING PROCESS (3-0). Current research and theory on the writing process, how children develop as writers, the teacher's role, the learning environment, and motivation, assessment, and evaluation in writing. $5 course specific fee.

5350. LITERACY ASSESSMENT (3-0). Assessment and diagnosis, both formal and informal, of reading and language arts learning. $5 course specific fee.

5353. LITERATURE FOR CHILDREN AND YOUNG ADULTS (3-0). Selection, evaluation, and use of current literature published for children and young adults. $10 course specific fee.

5354. MULTICULTURAL LITERATURE FOR CHILDREN (3-0). Study of literature for children and young adults which reflects the culture and experiences of African-Americans, Asian-Americans, Mexican-Americans, and Native Americans, among others. Consideration of selection guidelines, evaluation of literary quality as well as cultural authenticity and teaching applications, including adaptations for culturally and linguistically diverse populations. $10 course specific fee.

5355. EMERGENT LITERACY (3-0). Examination of the natural process of early literacy development: an overview of current theory/research, designing literacy learning environments, philosophy, organization and assessment; relationship between home and school; community and parental involvement. $5 course specific fee.

5357. COMPARATIVE LITERACY PROGRAMS (3-0). An overview of diverse paradigms and instructional approaches for literacy learning from a national and international perspective; impact of sociocultural variables on literacy programs, and exploration of learning/teaching processes from a cross-cultural perspective.

5361. LANGUAGE LEARNING: EDUCATIONAL PERSPECTIVES (3-0). Deals with the relationship between first and second language acquisition and literacy, dialect, linguistics, culture; nature and definition of language; overview of linguistic science and language with pedagogical applications. $5 course specific fee.

5390. SELECTED TOPICS IN READING (3-0). An examination of different topics each semester, with a focus on subjects related to reading, writing, oral language, and literacy.

5191, 5291, 5391. INDEPENDENT RESEARCH IN READING (3-0). Individual or small group research project on a literacy-related topic agreed upon between student(s) and instructor. Can be repeated for credit with permission.

The College of Engineering

Dean: J. Ronald Bailey, Ph.D.
634 Nedderman Hall • Box 19019 • 817-272-2571

Mission and Philosophy

The primary objectives of the College of Engineering are to educate and prepare men and women for leadership in industry, government and educational institutions; to advance the knowledge base of the engineering professions; and to influence the future directions of engineering education and practice.

The educational programs in the college emphasize the understanding of fundamental principles and experimental, computational and analytical methods that prepare the individual for a lifetime of learning and professional practice.

History and Overview

The engineering program at U.T. Arlington evolved from a two-year program that was established at North Texas Agricultural College (now U.T. Arlington) during the 1930s and 1940s. This program served as a feeder to Texas A&M. North Texas Agricultural College evolved into Arlington State College, and in 1959 approval was given to begin a four-year engineering program. The first Engineering Building (later to be named Woolf Hall) was opened. In 1965, Arlington State College joined The University of Texas System as The University of Texas at Arlington, and the first master's degree program in engineering was approved. The evolution continued in 1969 with the addition of the first Ph.D. program in engineering. Construction of the Engineering Laboratory Building in 1977, the Engineering Annex in 1980, the Automation & Robotics Research Institute (ARRI) in 1987 and Nedderman Hall in 1988 provided much needed classroom and research laboratory space for the continued growth of the College of Engineering.

With more than 2,800 students, excellent classrooms and outstanding research facilities, the College of Engineering at The University of Texas at Arlington has emerged as a major research institution with comprehensive programs in a number of areas.

Scholastic Activity and Research Interests of the Faculty

Members of faculty of the College of Engineering have earned advanced degrees from some of the finest universities in the world. They excel in teaching, often using multimedia, computer-assisted instruction methods. Members of the faculty have widely varying research interests. They participate vigorously in local, national and international professional activities through membership in technical societies and engineering organizations. Faculty members also compete successfully for external research funding which generates support for graduate student assistants and special research facilities. They also publish extensively in the engineering and scientific journals associated with each engineering discipline. Many faculty members also have written textbooks and other scholarly publications which contribute to the advancement of knowledge and state-of-the-art practice of engineering.

Programs

Graduate work in engineering at U.T. Arlington may lead to the master of science or the doctor of philosophy in the following programs:

Aerospace Engineering
Biomedical Engineering
Civil Engineering
Computer Science and Engineering
Electrical Engineering
Industrial Engineering
Mechanical Engineering

Graduate work also may lead to a Master of Engineering Degree, which usually requires a design project report, internship or additional coursework. Details are given in the individual program descriptions that follow.

In addition, the College of Engineering offers interdisciplinary master's and doctoral programs with the College of Science in Materials Science and Engineering and in Environmental Science and Engineering. The entries for these programs are in the Interdepartmental and Intercampus Programs section of this catalog.

Program in Aerospace Engineering

Area of Study and Degrees
Aerospace Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis (M.S.), Thesis-Substitute (M.S.) and Non-Thesis (M.Engr.)

Program Director
D.G. Tuckness
204 Woolf Hall, 817-272-2603

Graduate Advisor
Frank K. Lu
214B Woolf Hall, 817-272-2603

Graduate Faculty
Professors
Anderson, Gaines, Joshi, Lawrence, Payne, Seath, Wilson

Associate Professors
Lu, Parpia, Tuckness

Assistant Professor
Shiakolas

Professors Emeritus
Dalley, Fairchild

Objective

The overall objective of the graduate program in aerospace engineering is to develop in a student the ability to define a technical problem, establish an appropriate mathematical or experimental model based on a firm understanding of the physical nature of the problem, analyze the problem by theoretical, numerical, or experimental techniques, and evaluate the results. Although this ability is developed in the context of aerospace problems, it is applicable to the engineering of any physical system. The program is designed for a student with any of the following specific objectives:

1. A sound foundation in advanced mathematics, science, and engineering which will equip the student well for research and development work or for further advanced study toward a doctoral degree in engineering.
2. A program of advanced study which allows specialization in one of the following areas:
   a. Fluid dynamics, aerodynamics and propulsion (theoretical and applied aerodynamics, gasdynamics, viscous fluid mechanics, turbulence, computational and experimental fluid dynamics, hypersonic flow theory, high-temperature gasdynamics, V/STOL and rotorcraft aerodynamics, air-breathing and rocket propulsion)
   b. Structural mechanics (theory of elasticity, mechanical vibrations, structural dynamics, composite structures, damage tolerance, smart structures, high-temperature structures and materials, aeroelasticity)
   c. Flight mechanics (atmospheric and space flight mechanics, orbital mechanics, guidance, navigation and control)
   d. Vehicle design (atmospheric flight vehicle design, spacecraft design)
3. A balanced but non-specialized program of advanced study in aerodynamics, astronautics, flight dynamics, structural analysis, propulsion, and fluid mechanics, with emphasis on experimental techniques and modern mathematical analysis.

Admission Requirements

Applicants for the Master's Degree in aerospace engineering must meet the general requirements of the Graduate School as stated in the catalog section entitled "Admission Requirements and Procedures" to be considered for unconditional admission.

Applicants who do not meet all of the minimum criteria but nevertheless show promise of being able to complete the Master's program successfully will be considered for probationary admission. For applicants without prior formal training in engineering, the same minimum criteria will apply, and, in addition, their prior records will be reviewed for relevance to the intended program of study. In general, a specific program of remedial work will usually be required to remove any deficiencies that would prevent successful completion of the graduate program.

Students applying for the Ph.D. program are expected to have qualifications exceeding the above-stated minimum requirements. In addition, their master's degree program will be closely reviewed for relevance to their intended program of studies for the Ph.D. degree.

Continuation

The Aerospace Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified professional engineers, has established certain policies and procedures. In addition to the requirements of the Graduate School listed elsewhere, to continue in the program each aerospace engineering graduate student must:

1. Maintain at least a B (3.0) overall GPA in all coursework major and minor, and
2. Demonstrate suitability for professional engineering practice.

At such time as questions are raised by aerospace engineering graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in Aerospace Engineering. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

Degree Requirements

All entering students must be proficient in computer programming. No graduate credit will be granted for courses that are required in the undergraduate aerospace engineering curriculum. Normally, all master's and doctoral candidates in aerospace engineering shall enroll in the Graduate Seminar (AE 5101) a minimum of three times (see course description). Repeat enrollments shall require an oral presentation of thesis/dissertation results. All candidates are required to obtain an approved program of work in the second full semester or after 12 hours are completed.

Master of Engineering

The Master of Engineering degree is an advanced program of work offered on a non-thesis basis. This degree is described in the Advanced Degrees and Requirements portion of this catalog.

Master of Science in Aerospace Engineering

The Master of Science degree in aerospace engineering is an advanced program of study consisting of a minimum of 24 credit hours of advanced coursework, and six credit hours of an acceptable thesis. The thesis may be oriented toward either research or advanced engineering analysis and design. The Graduate Advisor should be consulted for specific degree requirements.

Doctor of Philosophy

The Ph.D. degree can be tailored to satisfy the individual student's aspirations in choice of the area of specialization, while at the same time providing a broad range of knowledge in the major technical areas comprising the field of aerospace engineering. The program will generally require two to three years of full-time study beyond the Master's degree and will include a scholarly dissertation that provides an original contribution to the literature in aerospace engineering.

All entering the Ph.D. program are required to take, at the first opportunity, the Ph.D. Diagnostic Exam: this is offered once per year the first Saturday in October. Possible outcomes of this evaluation are: 1) continuation in the doctoral program, 2) approval to continue with certain specified remedial work, 3) failure with approval to retake, 4) termination in the program.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Aerospace Engineering (AE)

5101. GRADUATE SEMINAR (1-0). May be repeated as often as required. Enrollment is mandatory for first semester graduate students and for students enrolled in thesis, dissertation, or research courses. Purpose is to acquaint peers and faculty with research in progress at U.T. Arlington. During each enrollment after the first, students present progress reports on their research. The last report serves as a "dry run" for the oral defense.

5301. ADVANCED TOPICS IN AERODYNAMICS (3-0). May be repeated for credit as topics change. Topics include: hypersonic aerodynamics, transonic aerodynamics, unsteady aerodynamics and optimum aerodynamic shapes.

5302. ADVANCED FLIGHT MECHANICS (3-0). Basic dynamics of vehicles, flight path analysis and optimization. Prerequisite: permission of department.

5303. AERODYNAMICS OF WINGS AND BODIES (3-0). Application of classical potential theory to the analysis of the aerodynamics of wings and bodies. Knowledge of complex variable theory assumed.

5305. LAMINAR BOUNDARY LAYERS (3-0). Conservation laws of a viscous fluid developed from integrated viewpoints. Prandtl's boundary-layer concepts and applications. Lie group theory provides scaling laws for solutions including jet, wake, stagnation flows. Similarities include Stokes, Heimenz, Falkner-Skan, von Karman, and Pohlhausen. Singular perturbations provide "Triple deck" modeling. Emphasis upon laminar flow. Prerequisite: a course in fluid mechanics.

5306. TURBULENT BOUNDARY LAYERS (3-0). Flow stability and transition as precursors of turbulence introduced. The Reynolds' equations, eddy viscosity, "Law of the wall," and "Law of the wake" lead to calculational schemes exercised upon computer. Statistical

measurements, correlations, spectra ("PSD"), skewness and kurtosis treated from a phenomenological, not a probabilistic view point. Emphasis upon developing insights for calculation, measurement and modeling. Prerequisite: AE 5305 or approval of instructor.

5308. TURBULENCE TOPICS (3-0). Include statistical and phenomenological theories developing insights, modeling technology for simulations, experiments to validate theories and models and computing turbulence as a scientific art. May be repeated for credit as topics change. Prerequisite: Fluid or Continuum Mechanics.

5309. FLIGHT VEHICLE DESIGN (3-0). Given a set of requirements such as payload, range, speed, takeoff and landing distances, etc., a designer must conceive of a vehicle configuration that will meet or exceed the requirements. Aerodynamics, propulsion, flight performance, stability and control, structures, and vehicle systems, as they pertain to the vehicle being designed, will be introduced. Prerequisite: permission of the instructor.

5310. AEROSPACE VEHICLE DYNAMICS SIMULATION AND DESIGN (3-0). Aerospace trajectory simulation and design of aerospace vehicles; large scale simulation design; structure of large scale simulations; simulations used as analysis tools. Course will concentrate around guidance, navigation, and control simulation of a lunar and/or Mars landing vehicle. Prerequisite: AE 5302.

5311. ADVANCED ASTRONAUTICS (3-0). Topics include orbital mechanics, Keplerian mechanics, orbit determination, perturbations, numerical techniques, and applied optimal estimation.

5312. ADVANCED DYNAMICS (3-0). Principles of dynamics of particles and particle systems; Lagrangian and Hamiltonian mechanics; canonical transformations; dynamic system stability; and introduction into dynamical systems analysis using methods such as phase space analysis, surface of sections, etc.

5315. FUNDAMENTALS OF COMPOSITES (3-0). Fundamental relationships between the mechanical behavior and the composition of multiphase media; failure criteria discussed. Also offered as EM 5333, ME 5348.

5322. AEROELASTICITY I (3-0). Math models for the steady aerodynamics and structural stiffness of aircraft wings are presented and combined into a static aeroelastic math model. Loss of wing lift due to static aeroelasticity as well as the structural instability called aeroelastic divergence are covered.

5323. AERODYNAMICS OF WINGS AND BODIES II (3-0). Nonlinear phenomena in aerodynamics, including flow separation, vortex formation, vortex asymmetries, and vortex interactions with wings and bodies. Prerequisite: AE 5303 or equivalent.

5324. DYNAMIC DATA ANALYSIS (3-0). Uncertainty and error analysis, transducers, signal conditioning, analog and digital data acquisition techniques and systems, statistical analysis of random data in time and frequency domains.

5325. ANALYSIS OF COMPOSITE STRUCTURES (3-0). Anisotropic elasticity and laminate theory with thermal-hydrothermal considerations. Plates and panels of composite materials; static and dynamic analysis. Joining of composite materials structures. Fabrication and curing processes for advanced composites. Advanced topics. (Also offered as EM 5336.) Prerequisite: consent of instructor.

5326. ADVANCED PROPULSION (3-0). Development of thrust and efficiency equations, thermodynamic cycle analysis, cycle design methods of aerospace propulsion systems, component performance analysis methods, component matching and dynamic interactions, and vehicle/ propulsion-system interactions.

5327. COMPUTATIONAL AERODYNAMICS I (3-0). Solution of engineering problems by finite- difference methods, emphasis on aerodynamic problems characterized by single linear and non-linear equations, introduction to and application of major algorithms used in solving aerodynamics problems by computational methods. Prerequisite: consent of instructor.

5328. COMPUTATIONAL AERODYNAMICS II (3-0). Review of the fundamental equations of aerodynamics, development of methods for solving Euler, boundary-layer, Navier-Stokes, and parabolized Navier-Stokes equations, application to practical aerodynamic analysis and design problems. Prerequisite: AE 5327 or consent of instructor.

5329. GRID GENERATION METHODS IN AERODYNAMICS (3-0). Generation of grids for numerical solution of aerodynamic analysis and design problems, generation of grids by algebraic methods, solution to differential and integral equations, application to aerodynamic flow field analysis. Prerequisite: graduate standing or consent of instructor.

5331. INTEGRAL EQUATIONS IN ENGINEERING (3-0). Analysis of non-linear systems in engineering using integral equations. Integration of ordinary and partial differential equations with applications to fluid systems. Prerequisite: graduate or advanced senior standing.

5332. HYPERSONIC FLOW I (3-0). General features of hypersonic flow fields. Inviscid hypersonic flow: thin shock layer theory, Newtonian flow, constant density solutions, small disturbance theory, method of characteristics. Prerequisite: consent of instructor.

5333. HYPERSONIC FLOW II (3-0). Review of inviscid flow at high Mach number. Introduction to high-temperature gasdynamics. Viscous hypersonic flow: results from boundary layer theory, boundary layer transition, viscous interactions. Prerequisite: consent of instructor.

5334. LINEAR SYSTEM ANALYSIS FOR AEROSPACE ENGINEERING (3-0). Linear multivariable systems theory applied to aerospace vehicle trajectories; state transition matrix, controllability, observability, and stability; least squares optimization and properties of the Riccati equation.

5337. GUIDANCE OF AEROSPACE VEHICLES (3-0). Equilibrium glide trajectories for atmospheric flight; energy guidance methods; two point boundary value methods used in terminal landing of aerospace vehicle; optimization techniques; aerospace guidance sensitivity analysis; spacecraft attitude determination; coordinate systems. Prerequisite: AE 5302 or 5311 or permission of instructor.

5338. AEROSPACE NAVIGATION ANALYSIS (3-0). Aircraft trajectory and spacecraft orbit determination; aerospace navigation system modeling; sequential and batch processors; linear and minimum variance estimates; discrete and continuous Kalman filters; filter divergence. Prerequisites: AE 5302 or 5311 or permission of instructor.

5339. SPACECRAFT SYSTEMS DESIGN AND ENGINEERING (3-0). Spacecraft design methods and system engineering; atmospheric and vacuum environments; flight mechanics and propulsion; attitude determination and control; configuration and structural design; thermal control; power subsystems; telecommunications; mass, power, and volume estimates.

5340. EXPERIMENTAL METHODS IN TURBULENCE I (2-3). May be repeated for credit. Techniques to be presented include hot-wire and hot-film anemometers, laser-Doppler and laser-interferometer, hot-thermister, high response pressure sensors, and fluid tracers.

Student will participate actively in the selection, design, and execution of flow experiments. Prerequisite: approval of instructor. $5 lab fee. $10 course specific fee.

5342. GASDYNAMICS (3-0). Review of fundamental compressible flow theory, method of characteristics for perfect gases, the Rankine-Hugoniot conditions, linearized flow theory. Also offered as ME 5342.

5343. HIGH-TEMPERATURE GASDYNAMICS I (3-0). Surveys kinetic theory, statistical mechanics, and chemical reaction rate theory. Application to the prediction of thermodynamic properties of gases and the analysis of problems in high-temperature gasdynamics.

5344. HIGH-TEMPERATURE GASDYNAMICS II (3-0). Non-equilibrium kinetic theory, Boltzmann equation, development of Navier-Stokes and energy equations for non-equilibrium flow, thermal and chemical non-equilibrium flows. Prerequisite: consent of instructor.

5345. RADIATIVE GASDYNAMICS (3-0). Energy transfer by radiation, radiative transfer equation, radiative equilibrium, emission, and absorption of radiation, flow with radiative non-equilibrium.

5346. MOLECULAR GASDYNAMICS (3-0). Non-equilibrium kinetic theory, Boltzmann equation, collision dynamics, gas-surface interactions. Monte Carlo methods, chemical and thermal non-equilibrium, applications to flight at extreme altitude.

5347. EXPERIMENTAL METHODS IN HYPERSONIC AERODYNAMICS (3-0). Requirements and operational characteristics of hypersonic test facilities. Experimental methods for pressure, temperature, velocity, force, and heat transfer measurements. Optical diagnostics. Data acquisition methods.

5348. HYPERSONIC PROPULSION (3-0). Design and performance analysis of propulsion systems for sustained flight at hypersonic speeds, airframe/propulsion system integration, supersonic combustion, finite-rate chemistry effects, radiative cooling.

5350. HIGH TEMPERATURE COMPOSITES (3-0). Constitutive behavior of high temperature composites, manufacturing, current limitations and advances, thermal fatigue, long term stiffness and strength, damage tolerance and durability.

5353. COMPRESSIBLE TURBULENT BOUNDARY LAYERS (3-0). Introduction to the effects of compressibility on turbulent boundary layers, emphasizing phenomenological aspects. Treatment of engineering problems, compressibility transformations, turbulence modeling, shock/boundary-layer interactions. Contemporary viewpoints and advanced topics. Prerequisite: MAE 3303.

5355. DESIGN OF HYPERSONIC VEHICLE STRUCTURES (3-0). Structural design of hypersonic flight vehicles, thermal gradients, active cooling, case studies.

5191, 5291, 5391. ADVANCED STUDIES IN AEROSPACE ENGINEERING. May be repeated for credit. May be graded P/F. Graded R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: graduate standing in aerospace engineering. Co-requisite: AE 5101.

6313. AEROSPACE AVIONIC SYSTEM DESIGN (3-0). Design of guidance, navigation, and control system of spacecraft and aircraft. Selection and trade-off between various avionic components such as the IMU, sun sensor, horizon sensor, star tracker, GPS navigation sensor, terrain navigation sensor, flight computer and other avionic components. Mass, power, and volume estimates and trade-offs between avionic system and other vehicle systems.

6314. SPACECRAFT MISSION DESIGN AND ANALYSIS (3-0). Spacecraft mission design and constraints; launch windows; rendezvous analysis; design of typical mission.

6315. THEORETICAL ASTRONAUTICS (3-0). The equations of motion of the restricted problem of three bodies; Jacobian integral; motion around Lagrange points; applications to Earth-Moon systems; investigations into spacecraft station keeping at Lagrange points. Prerequisite: AE 5311.

6322. AEROELASTICITY II (3-0). Models for the unsteady aerodynamics as well as structural stiffness and mass of aircraft wings are presented and combined into a dynamic aeroelastic math model. Atmospheric turbulence response, ride quality, wing buffeting, and flutter (dynamic aeroelastic instability) are covered.

6197-6997. RESEARCH IN AEROSPACE ENGINEERING. May be repeated for credit. Graded P/F/R. Co-requisite: AE 5101.

6399, 6699, 6999. DISSERTATION. Prerequisite: admission to candidacy for the Doctor of Philosophy degree. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Co-requisite: AE 5101.

Program in Biomedical Engineering

Area of Study and Degrees
Biomedical Engineering
M.S., Ph.D.
Biomedical Engineering
Industrial Internship

Master's Degree Plans
Thesis and Non-Thesis

Graduate Advisor
Charles C.J. Chuong
220 Engineering Laboratory, 817-272-2249

Graduate Faculty
Professors
Behbehani, Chuong, Eberhart

Assistant Professors
Liu, Nelson

Adjunct Faculty
(U.T. Southwestern and U.T. Arlington)
Ahrens, Antich, Bertocci, Blomqvist, Clarke, Elsenbaumer, Finnegan, Franklin, Garner, Giller, Hagler, Horton, Jackson, Jessen, Johnson, Kondraske, Kulkarni, Laudau, Lawrence, Lucas, Manry, Markin, McColl, Nomura, Ordway, Pape, Peshock, Peterson, Petroll, Prager, Srebro, Timmons, Throckmorton, Wallace, Williams

Objectives

The Biomedical Engineering Program is jointly offered by The University of Texas at Arlington and The University of Texas Southwestern Medical Center at Dallas (U.T. Southwestern). Research and teaching efforts of various departments in the biological, engineering, mathematical, physical, and medical sciences of both institutions are coordinated through the Committee on Graduate Studies in Biomedical Engineering. The goal of the program is to prepare students as biomedical engineers for productive research, development, and teaching careers in academic, industrial, hospital, or governmental positions.

The program includes coursework and research in artificial organs, biosensors, physiological control systems, medical image processing, biomedical instrumentation, rehabilitation, orthopedics, biomaterials, biomechanics and tissue engineering. Research and training in recombinant DNA technology, genomics, cell and molecular biology, and neuro-sciences is available to selected students.

A one-semester internship in Dallas/Fort Worth industry prepares students for careers in the biomedical engineering industry.

The master's program is based upon graduate level work in one of the engineering disciplines, biomedical engineering, and life sciences.

The doctoral program is based upon graduate level work in one of the engineering disciplines and extensive graduate training in the life sciences and related physical sciences. The program is aimed at the development of professional biomedical engineers capable of independent research.

Admission

Application for admission should be made at either U.T. Arlington or U.T. Southwestern. Normally, the institution through which the student applies and is admitted is the student's home institution. Admission in the other institution is initiated during the student's first semester.

In addition to admission requirements of the Graduate School, the bachelor's degree held by applicants to the program may be in engineering, biological, physical, or mathematical sciences. Students required to take the TOEFL must achieve a score of at least 575 and a score of at least 400 on the verbal part of the GRE. Applicants to the M.S. program should have an undergraduate grade point average of 3.0 and a combined verbal and quantitative score of at least 1100 on the Graduate Record Examination. Applicants to the doctoral program normally should have a grade-point average exceeding 3.4, and a combined verbal and quantitative score of at least 1175 on the GRE. Students with unusual backgrounds and experience will be considered individually.

Continuation

The Biomedical Engineering Graduate Program has established certain policies to fulfill its responsibility to graduate highly qualified professional engineers. In addition to the requirements of the Graduate School listed elsewhere, each biomedical engineering graduate student who wants to continue in the program must:

1. Maintain at least a B (3.0) overall GPA in all coursework, and
2. Demonstrate suitability for professional engineering practice.

At such time as questions are raised by biomedical engineering graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in Biomedical Engineering. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

Degree Requirements

In degree plan descriptions, course numbers followed by a D are offered at U.T. Southwestern. Courses indicated by an asterisk (*) are to be taken only with the written consent of the Graduate Advisor.

Non-Thesis Master of Science Degree Plan

Students selecting this plan take a minimum of 37 credit hours including the courses listed below.

Life Sciences: Physiology (BME 5385); Anatomy (HCS 4408D).

One Engineering Area: Four courses* from Biological Materials, Mechanics, and Processes (BME 5335); Finite Element Applications in Biomechanics (BME 5340); Bioinstrumentation II (BME 5345); Modeling and Control of Biological Systems (BME 5350); Digital Control of Biomedical Systems (BME 5351); Design and Application of Artificial Organs (BME 5360D); Thermoregulation and Bioheat Transfer (BME 5362D); Biomaterials and Blood Compatibility (BME 5361D); Introduction to Orthopedic Mechanics (BME 5331D); Orthopedic Biomaterials (BME 5332D); Introduction to Molecular Engineering (BME 5370D). Selected Topics in BME (BME 5300) and/or courses from other engineering departments.

General Biomedical Engineering: Bioinstrumentation I (BME 5344); Laboratory Principles (BME 5382); Research Project or Directed Research (BME 5390 or 5396); Seminar (BME 5201).

Choose Two*: Clinical Engineering (BME 5320); Biological Materials, Mechanics, and Processes (BME 5335); Finite Element Biomechanics (BME 5340); Bioinstrumentation II (BME 5345); Modeling and Control of Biomedical Systems (BME 5350); Digital Control of Biomedical Systems (BME 5351); Hospital Internship (BME 6390); Special Topics in Biomedical Engineering (BME 5300 or 5096D); Thermoregulation and Bio-heat Transfer (BME 5362D); Design and Application of Artificial Organs (BME 5360); Biomaterials and Blood Compatibility (BME 5361D); Digital Processing of Medical Images (BME 5363D); Biomedical NMR Imaging (BME 5096D); Biomedical Industry Internship (BME 6095D); Introduction to Orthopedic Mechanics (BME 5331D); Orthopedic Biomaterials (BME 5332D); Introduction to Molecular Engineering (BME 5370D).

Free Elective: One three hour course from Life Science, Engineering, or BME.

Final Comprehensive Examination: The non-thesis student will be examined in all areas related to coursework taken.

Thesis Master of Science Degree Plan

Requirements of the thesis option are the same as those for the non-thesis option with the following exceptions: 1) free elective (three hours) is deleted, 2) research project or directed research (BME 5390 or BME 5396D) is replaced by thesis (BME 5698 or 5098D), and 3) an oral defense of the thesis replaces the final comprehensive examination.

Doctor of Philosophy Degree Plan

The Ph.D. degree program consists of a minimum of 58 credit hours beyond the bachelor's degree level and includes the courses listed below.

Life Sciences: Human Anatomy (HCS 4408D and 4209D), Physiology (Physiology 5680D or BME 5385D), Biochemistry (Biochemistry 5580D or HCS 3311D or CHEM 4311 and 4312). One additional life science course is required unless six hours are taken in Physiology or Biochemistry. See U.T. Southwestern graduate catalog and consult with adviser.

One Engineering Area: Six Courses* from Biological Materials, Mechanics, and Processes (BME 5335); Finite Element Applications in Biomechanics (BME 5340); Bioinstrumentation II (BME 5345); Modeling and Control of Biological Systems (BME 5350); Digital Control of Biomedical Systems (BME 5351); Design and Application of Artificial Organs (BME 5360D); Biomaterials and Blood Compatibility (BME 5361D); Thermoregulation and Bioheat Transfer (BME 5362D); Introduction to Orthopedic Mechanics (BME 5331D); Orthopedic Biomaterials (BME 5332D); Introduction to Molecular Engineering (BME 5370D). Selected Topics in BME (BME 5300) and/or courses from other engineering departments.

Mathematics, Statistics, Computer and Physical Sciences: Choose two courses*.

General Biomedical Engineering: Seminar—two years, first year (BME 5201, and two semesters of BME 5103 or 5193D); Fundamentals of Bioinstrumentation (BME 5381D); Laboratory Principles (BME 5382); Dissertation—re-enroll, approximately 30 hours (BME 6399, 6699, 6999, or 5099D).

Choose Three*: from non-thesis MS degree listing of courses entitled "Choose Two."

Although qualified applicants may be accepted into the Ph.D. program without earning the Master of Science in biomedical engineering, all students must satisfactorily pass the Diagnostic Examination (Exam I). This examination will cover all relevant coursework taken by the student. The examination may be written, oral, or both and consists of a timed, written analysis of a major problem in the student's general area of research interest, followed by an oral examination covering the same material. Elements of engineering, physical and biological science, mathematics, computer science and statistics may be included in this examination.

Proficiency in the computer sciences and experimental statistics is substituted for the foreign language requirement.

The Comprehensive Examination consists of satisfactory completion of a detailed prospectus of proposed dissertation research and an oral examination. (Exam II).

Sufficient copies of the approved thesis or dissertation must be provided to satisfy the requirements of both U.T. Arlington and U.T. Southwestern.

For additional information, applicants and students should contact the Graduate Advisor for a copy of the "Information Brochure" for related and amplified information about the graduate program.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Biomedical Engineering (BME)

5102. INTRODUCTION TO RESEARCH IN BIOMEDICAL ENGINEERING (1-0). Overview of necessary research tools, including methods of scientific research, formulation of hypothesis, design of experiments, data analysis, biostatistics, library database research, technical writing, and technical paper presentation. Graded P/F only.

5201. SEMINAR IN BIOMEDICAL ENGINEERING (2-0). University and guest lecturers speak on topics of current interest in the field of biomedical engineering. Graded P/F only.

5191, 5291, 5391. DIRECTED RESEARCH IN BIOMEDICAL ENGINEERING. Student participates in a research project under the individual instruction of a faculty supervisor. Prerequisite: permission of the instructor.

5193. MASTER'S COMPREHENSIVE EXAMINATION (1-0). Individual instruction, directed study, consultation, and comprehensive examination over coursework leading to the non-thesis Master of Science degree in biomedical engineering. Graded P/F/R only. Required of all non-thesis MS students in the semester when they plan to graduate.

5300. SELECTED TOPICS IN BIOMEDICAL ENGINEERING. Material may vary from semester to semester. May be repeated for credit if different topics are covered for each registration. Prerequisite: permission of the instructor. $15 lab fee.

5320. CLINICAL ENGINEERING (3-0). Electrical, mechanical, nuclear, radiological, and environmental hazards and safety programs in hospitals; hospital codes, standards, and regulations; setup and operation of clinical engineering programs in large, medium, and small sized hospitals; study of shared service programs. Prerequisite: BME 5344.

5335. BIOLOGICAL MATERIALS, MECHANICS AND PROCESSES (3-0). Typical functional behavior of various biological materials, flow properties of blood, bioviscoelastic fluids and solids, mass transfer in biological systems. Prerequisites: BME 5385D, ME 3313, or permission of the instructor.

5340. FINITE ELEMENT APPLICATIONS IN BIOMECHANICS (3-0). Variational and Galerkin finite element formulations, linear and Hermitian elements, accuracy and convergence, applications in field problems: elasticity (plane stress, plane strain, torsion), steady state heat transfer, seepage fluid flow, diffusion. Projects in biomechanical applications with the above engineering topics are emphasized. Prerequisites: AE 3311, ME 3342, CE 3311, working knowledge of FORTRAN.

5344. BIOINSTRUMENTATION I (3-0). Fundamental principles of bioinstrumentation, including operational amplifiers and instrumentation amplifiers; measurements of biopotentials; signals and noise in biological systems; mechanical transducers; resistive, inductive, capacitive transducers; measurement of temperature, blood pressure and flow; electrical safety.

5345. BIOINSTRUMENTATION II (3-0). Continuation of Bioinstrumentation I. Measurement of pulmonary function, light and spectrophotometry, chemical transducers, ventilators, anesthesia equipment, defibrillators, fundamentals of medical imaging, lasers, electrosurgical devices, cardiac pacemakers. Prerequisite: BME 5344.

5350. MODELING AND CONTROL OF BIOLOGICAL SYSTEMS (3-0). Introduction to fundamental methods of modeling, analysis and control of biological systems. Linear system modeling, state space modeling, stability analysis, basic control strategies and identification techniques. Examples from cardiopulmonary, visual and motor control systems.

5351. DIGITAL CONTROL OF BIOMEDICAL SYSTEMS (3-0). Design of control strategies for microprocessor-based medical equipment. Discrete and sampled data systems, Z transform, digital control design methods, stability considerations and closed loop system response.

5360. DESIGN AND APPLICATION OF ARTIFICIAL ORGANS (3-0). Fundamental principles of fluid mechanics, mass transfer and chemical reaction in engineered biological systems. Simple solutions are developed for the design of artificial ventricular assist devices, total artificial hearts, lungs and kidneys.

5364. TISSUE ENGINEERING LECTURE (3-0). Fundamentals of cell/extracellular matrix interactions in terms of cell spreading, migration, proliferation and function. Soft and hard tissue wound healing and nerve regeneration. Polymer scaffolding materials and fabrication methods. Cell-polymer interactions. In vitro and in vivo tissue culture and organ replacement.

5365. TISSUE ENGINEERING LAB (0-3). Polymer extrusion, polymer drug loading, and degradation with drug release kinetics. Each student will be given the opportunity to perform these experiments and to culture cells and test their culture for cell growth, proliferation and function under several different substrate and media conditions.

5382. LABORATORY PRINCIPLES (0-9). Introduction to fundamental biomedical engineering laboratory procedures including human studies and animal surgery; includes clinical laboratory projects; data collection, analysis, and interpretation. Prerequisite: permission of the instructor. $10 lab fee.

5390. RESEARCH PROJECT (0-9). Taken by students enrolled in the non-thesis option for the MS degree. Individual instruction in research and/or instrumentation development and evaluation conducted under supervision of the instructor. A final report required. Graded P/F/R. Prerequisite: permission of the instructor. $5 lab fee.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: graduate standing in biomedical engineering.

6103. Ph.D. SEMINAR IN BIOMEDICAL ENGINEERING (1-0). Students will be assigned to participate in the journal clubs and medical grand rounds relevant to their areas of research in Biomedical Engineering. Graded P/F only. Prerequisite: Ph.D. student status.

6194. DOCTORAL DIAGNOSTIC EXAMINATION (1-0). Individual instruction, directed study, consultation, and diagnostic examination. Graded P/F/R only. Required of all doctoral students in the semester when they take any portion of the diagnostic examination. (Exam I).

6195. DOCTORAL COMPREHENSIVE EXAMINATION (1-0). Individual instruction, directed study, consultation, and comprehensive examination. Graded P/F/R only. Required of all doctoral students in the semester when they take the comprehensive examination. (Exam II).

6197, 6297, 6397, 6697, 6997. RESEARCH IN BIOMEDICAL ENGINEERING. Individually approved research projects leading to a doctoral dissertation in the area of biomedical engineering. Graded P/F/R.

6390, 6690, 6990. HOSPITAL INTERNSHIP FOR BIOMEDICAL ENGINEERS. Each student interns at local hospitals under the individual supervision of the course instructor and a hospital staff member. During the semester, the student rotates through areas such as cardiac, pulmonary, laparoscopic and neuro surgery, anesthesiology, radiology, catheterization and emergency care. Graded P/F/R. Prerequisites: BME 5344, 5345 and permission of the instructor.

6399, 6699, 6999. DISSERTATION. Preparation and submission of a doctoral dissertation in an area of biomedical engineering. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: admission to candidacy for the Ph.D. in Biomedical Engineering.

Courses offered at The University of Texas Southwestern Medical Center at Dallas (U.T. Southwestern):

BME 5201D. Biomedical Engineering Seminar
BME 5094D. Research in Biomedical Engineering
BME 5300D. Special Topics in Biomedical Engineering
BME 5396D. Individual Laboratory Projects
BME 5361D. Biomaterials and Blood Compatibility
BME 5362D. Thermoregulation and Bio-Heat Transfer
BME 5363D. Digital Processing of Medical Images
BME 6395D. Industry Internship
BME 6695D. Industry Internship
BME 6995D. Industry Internship
BME 5306D. Biochemistry
BME 5308D. Human Anatomy Laboratory
BME 5307D. Human Anatomy Lectures
BME 5309D. Human Physiology
BME 5331D. Introduction to Orthopedic Mechanics
BME 5332D. Orthopedic Biomaterials.
BME 5370D. Introduction to Molecular Engineering
BME 5680D. Mammalian Physiology

See the U.T. Southwestern Graduate Catalog for course descriptions.

Department of Civil and Environmental Engineering

Area of Study and Degrees
Civil Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis (M.S.) and Non-Thesis (M.Engr.)

Chair
Clinton E. Parker
425 Nedderman Hall, 817-272-5055

Graduate Advisor
Ernest C. Crosby
417 Nedderman Hall, 817-272-2201

Graduate Faculty
Professors
Ardekani, Huang, Matthys, Parker, Qasim, Yuan

Professor and President Emeritus
Nedderman

Associate Professors
Argento, Crosby, Kruzic, Spindler, Williams

Assistant Professors
Govind, Puppala

Professor Emeritus
Everard

Objective

The objective of the graduate program in civil engineering is to prepare students for continued professional and scholarly development consistent with their technical interests. Students, with the assistance of a faculty advisor in their area of interest, plan their programs of study in one of the technical areas in civil engineering. Typical program and research areas are:

1. Environmental (water and air quality control, and solid and hazardous materials control);
2. Geotechnical (soil mechanics and foundations);
3. Infrastructure Systems;
4. Structures and Applied Mechanics;
5. Transportation (traffic planning, highways, airports and transit); and
6. Water Resources (hydrology and hydraulics).

Research and continuing education opportunities in the environmental and construction areas are offered through three centers within the department. Information relative to the Advanced Transportation Research and Applications Center of Texas, the Center for Environmental Research and Training, and the Construction Research Center can be found in the front portion of this catalog (see catalog index).

The department provides the student an opportunity to study advanced and special topics that are on the forefront of technology. These courses carry CE 5300 or CE 6300 numbers and are identified on a student's academic record by both number and course title. Examples of topics offered in the typical program areas are:

Environmental—Advanced Dispersion Modeling, Analysis of Pollutant Characteristics, Hazardous Waste Remediation;
Geotechnical—Expansive Clays, Soil Chemical Stability;
Infrastructure Systems — Civil Engineering systems to transport people, goods, water, waste disposal, energy and information.
Structures and Applied Mechanics—Plate Structures, Earthquake Engineering, Non-linear Finite Element Methods, Analysis of Structural Plastic Systems;
Transportation—Intelligent Transportation Systems, Network Modeling, Urban Operations Research, Vehicular Energy Consumption and Emissions, Transit and Paratransit, Intermodal Systems;
Water Resources—Groundwater, Kinematic Wave Theory, Urban Hydrology, Contaminant Transport, Stormwater, Detention Design.

Admission

Applicants admitted to the graduate program who hold a baccalaureate degree in civil engineering must meet the general requirements of the Graduate School as stated under the section entitled "Admission Requirements and Procedures" and those established by the Civil and Environmental Engineering Graduate Faculty.

Admission to the Ph.D. program requires a master's degree or its equivalent and a GPA of 3.5 or greater in all advanced graduate work. The applicant shall also demonstrate through previous academic preparation the potential to carry out independent research in civil

engineering. During the first year in the doctoral program the student's potential for pursuing the doctoral degree will be assessed by a diagnostic evaluation.

Applicants not meeting all criteria may be admitted on a provisional or probationary basis only under exceptional circumstances. Applicants with degrees in other disciplines may qualify for graduate study in civil engineering after a review of their area of technical interest and after completion of an approved program of leveling courses.

Grade Requirements and Continuation

The Civil Engineering Graduate Program has established rules, regulations, policies, and procedures for continuation in the graduate program and fulfilling graduation requirements. These can be found in the Civil Engineering Graduate Handbook available in the Civil and Environmental Engineering Office. In addition to the requirements of the Graduate School listed elsewhere, to continue in the program each civil engineering graduate student must:

1. Maintain an overall GPA of 3.0 or higher for the Master's program and 3.5 or higher for the Ph.D. program in all coursework undertaken and all coursework on his/her approved program of study.
2. Accumulate no more than three deficiency points as defined below.

A student will be declared ineligible for further graduate study in civil engineering and will be dismissed from the civil engineering graduate program if he/she accumulates grade deficiency points greater than three. Any grade of C is one deficiency point, any grade of D is two deficiency points, and any grade of F is three deficiency points. Deficiency points may not be removed from the student's record by repeating a course or by completing additional coursework. No organized course in which a grade of P is received can be used to satisfy course requirements for a graduate degree in civil engineering.

Degree Requirements

The responsibility rests with each student for knowing the rules, regulations, and filing deadlines of the Graduate School and the Civil Engineering Committee on Graduate Studies (see Civil Engineering Graduate Handbook available in Civil and Environmental Engineering Office). Requirements of the Graduate School and the Civil Engineering Committee on Graduate Studies must be met. The degrees offered and minimum course requirements are identified in the following paragraphs.

The Master of Science degree is a research-oriented program in which completion of a thesis is mandatory. The program consists of a minimum of 24 credit hours of coursework and an acceptable thesis (six credit hours). The Master of Engineering degree is an engineering practice-oriented program requiring a minimum of 36 credit hours. A maximum of six hours may be a special project. A final program examination is required of all master's degree candidates. Thesis degree candidates will be required to present an oral defense of the thesis. Non-thesis degree candidates will fulfill the program examination requirement upon the successful completion of CE 5193, Master's Comprehensive Examination. Candidates must enroll in CE 5193 in the semester they intend to graduate.

The Ph.D. degree is a research degree and, as such, requires the candidate to successfully carry out original, independent research in an area acceptable to the civil engineering faculty. Normally, a minimum of one year of advanced coursework beyond the master's degree is required.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Civil Engineering (CE)

5344. CONSTRUCTION METHODS: FIELD OPERATIONS (3-0). Introduction to the methods, equipment, and management techniques used in the construction industry. Topics include equipment operating characteristics, job site safety, and field management. Prerequisites: consent of instructor and IE 3312 or equivalent.

5345. INFRASTRUCTURE EVALUATION, MAINTENANCE AND REHABILITATION (3-0). This course is designed for engineers and managers involved in infrastructure development, sustainability, and replacement. Topics include inspection, evaluation, maintenance and rehabilitation alternatives for water distribution, waste and water collection, surface and sub-surface drainage, pavements, bridges and culverts.

Environmental and Water Resources

5316. WATER SUPPLY AND TREATMENT PLANT DESIGN (3-0). Theory and design of community water supply systems. Design of treatment facilities, equipment selection and distribution network, and cost estimates. Credit not granted for both CE 4356 and CE 5316. Prerequisites: CE 3131 and 3334.

5317. WASTEWATER TREATMENT PLANT DESIGN (3-0). Effluent quality standards, and theory and design of wastewater treatment plants. Design and layout of wastewater treatment systems using manufacturers' catalogs, and cost estimates. Credit not granted for both CE 4357 and CE 5317. Prerequisites: CE 3131 and 3334.

5318. PHYSICAL-CHEMICAL PROCESSES I (3-0). Principles of unit process modeling using reactor and kinetic theory, and theory and design of mixing, flocculation, sedimentation, filtration, gas transfer, adsorption, ion exchange, and disinfection. Prerequisites: CE 3131 and 3334 or consent of instructor.

5319. PHYSICAL-CHEMICAL PROCESSES II (3-0). Principles of water chemistry applied to the theory and design of unit processes including coagulation, precipitation, corrosion, oxidation-reduction, and membrane processes. Prerequisite: CE 3131 and CE 3334 or consent of instructor.

5320. SOLID WASTE MANAGEMENT (3-0). Technical aspects of current practices and new developments in the management of solid waste facilities. Theory and design of solid waste collection, transfer, disposal and recovery, and reuse systems. Prerequisite: CE 3131 and CE 3334 or consent of instructor.

5325. BIOLOGICAL PROCESSES (3-0). Biological processes used in water quality control. Includes principles from microbiology and biochemistry applied to suspended and attached growth systems. Prerequisite: CE 5318.

5328. AIR POLLUTION CONTROL—PARTICULATES (3-0). Air pollution law, federal and state regulations. Particle dynamics. Types, sources and effects of air pollutants. Design of particulate collection, transport and removal systems. Introduction to air pollutant dispersion modeling. Prerequisite: CE 3131 and CE 3334 or consent of instructor.

5329. ENVIRONMENTAL RISK BASED CORRECTIVE ACTION (3-0). Process for the assessment and response to contamination; integrating risk and exposure practices to ensure protection of human health and environment. Includes characterization, EPA tier approach, general aspects of toxicology, dose exposure, pathways, receptors, migration and risk assessment. Prerequisite: Consent of instructor.

5346. OPEN CHANNEL FLOW (3-0). Open channel hydraulic principles, flow classification, backwater curves, transitions, obstructions, bends, flood flow computations, and urban watershed applications. Credit not granted for both CE 4358 and 5346. Prerequisite: CE 3305 or consent of instructor.

5347. SURFACE WATER HYDROLOGY (3-0). Elements of hydrometeorology, infiltration, soil moisture, hydrographs, rainfall runoff relationships, and effects of these factors with regard to water resources, urban watersheds, flood control, and environmental issues. Prerequisite: CE 4331 or consent of instructor.

5348. GROUNDWATER HYDROLOGY (3-0). Hydrology and hydrogeology of groundwater to include aquifer and vadose properties and measurements, basic flow systems and solutions, well systems, elementary contaminate transport, water quality, recharge, subsidence, flow system analysis, flow nets, and leaky aquifers. Prerequisite: CE 4331 or consent of instructor.

5351. DETENTION AND APPURTENANCE DESIGN (3-0). Hydraulic principles of retention and detention structures and appurtenances for urban drainage, flood control, wetland enhancement and groundwater recharge areas. Prerequisites: CE 5346 or consent of instructor.

5352. WATER RESOURCES INFRASTRUCTURE DESIGN (3-0). Water supply, distribution and drainage infrastructure design for urban, transportation, airport and agricultural uses. Topics include inlet/outlet structures, culverts, retention and detention storage, soil loss, pump stations, etc. Credit not granted for both CE 4359 and CE 5352. Prerequisites: CE 4331 or consent of instructor.

6314. STORMWATER MODELING (3-0). Hydrologic modeling methods and issues, urban watershed modeling, methods of system analysis; analysis of hydrologic components as linear and nonlinear systems, watershed response, kinematic wave; and model parameters optimization. Prerequisites: CE 5346 and 5347.

6323. HAZARDOUS WASTE MANAGEMENT (3-0). Sources, chemistry, monitoring, and classifications of hazardous wastes. Discussion of environmental hazards, legal aspects, transportation, detoxification, storage, and disposal and incineration. Prerequisite: consent of instructor.

6324. DISPERSION MODELING (3-0). Review of air pollution meteorology; pollutant dispersion calculations; utilizing Gaussian dispersion models; point, line, and area source dispersion calculations; multipoint source dispersion models utilizing computerized models; modeling results application to federal and state regulations. Prerequisite: CE 5328 or consent of instructor.

6325. AIR POLLUTION CONTROL—GASES (3-0). Ideal gas laws, properties of gases and vapors. Calculation of gaseous emission rates, determination of required efficiency and selection of appropriate gas pollutant control devices. Design considerations for incinerators, scrubbers, adsorption and absorption systems. Prerequisite: CE 5328 or consent of instructor.

6326. INDUSTRIAL AND HAZARDOUS WASTE (3-0). Specialized physical, chemical, and biological treatment schemes required to treat specific industrial and hazardous wastes. Pretreatment regulations, individual industries, and combined municipal and industrial waste treatment. Prerequisites: CE 5325 **and** consent of instructor.

6328. MODELING OF NATURAL WATER SYSTEMS (3-0). **Ecological** response of lakes, reservoirs, streams, estuaries, and wetlands from point and nonpoint discharges. Mathematical models for water quality prediction and planning examined and developed. Prerequisite: CE 5319 unless waived by instructor, and CE 5325.

6329. ADVANCED ENVIRONMENTAL ENGINEERING CONTROL PROCESSES (2-3). Standard laboratory techniques for unit operations and processes in environmental engineering. Advanced environmental engineering theories and practices, research topics, and methods. Prerequisites: CE 5325 **and** consent of instructor. $5 lab fee. $20 course specific fee.

6381. TECHNICAL ADVANCES IN ENVIRONMENTAL (3-0). Subject title listed in class schedule and in student's record. May be repeated for credit when subject changes. Examples include: Hazardous Remediation; Bio-Solid Residuals; Natural Treatment Systems; Waste & Water Management System Special Applications; and Desertification. Prerequisite: consent of instructor.

6385. TECHNICAL ADVANCES IN WATER RESOURCES (3-0). Subject title listed in class schedule and in student's record. May be repeated for credit when subject changes. Examples include: Water Resources Systems; Groundwater Mechanics; Contaminate Migration and Treatment; Detention and Retention Design; Statistical Hydrology; Advanced Hydraulics; & Numerical Methods Applications. Prerequisite: consent of instructor.

Geotechnical

5362. STRUCTURE-SOIL INTERACTION (3-0). Considers methods of analysis of structure-soil interaction behavior including numerical techniques. Physical problems reviewed include beams, slabs, flexible retaining walls, and laterally loaded piles interacting with elastic and inelastic soils. Prerequisite: CE 4321 or 5364.

5364. FOUNDATION ANALYSIS AND DESIGN (3-0). The design, construction, and performance of footings, rafts, and piles founded on or in sands, clays, silts, stratified soils, and weak rock. Includes the influence of various geologic terrain on selecting foundation type and constructability, in-situ investigations to determine material design parameters, bearing capacity, and settlement of foundations. Prerequisite: CE 3343 or consent of instructor.

5365. THEORETICAL SOIL MECHANICS I (3-0). Theory of consolidation, magnitude, time rate, pore pressure dissipation with variable construction rate and layered soils. Secondary compression, preconsolidation, and preloading. Shear strength of soil. Critical state soil mechanics, dilation and strain-softening in drained shear, pore pressure response in undrained shear, including static liquefaction. Prerequisite: CE 3343 or consent of instructor.

5367. DESIGN OF EARTH STRUCTURES (3-0). Engineering reports as concern subsurface investigations discussed as well as the design of subsurface investigations. Case histories discussed showing the reasoning for the types of foundations recommended. Students will be placed in the position of the consulting engineer and engineering reports will be written for several projects. Prerequisite: CE 5365 or consent of instructor.

5370. EXPERIMENTAL SOIL MECHANICS (2-3). Experimental studies of soil behavior, soil properties and their test methods which include consolidation, direct shear, static triaxial, and other advanced geotechnical laboratory tests, instrumentation and measurement techniques, design of laboratory experiments and introduction to in situ test methods. Prerequisites: CE 3343 or consent of instructor. $5 lab fee. $20 course specific fee.

5371. SOIL BEHAVIOR (3-0). Fundamental aspects of soil behavior, bonding, crystal structure, surface characteristics, clay mineralogy, soil-water movement, fabric, effective stress concepts, conduction phenomena, consolidation, and shear strength. Prerequisites: CE 3343 or consent of instructor.

5372. GEOSYNTHETICS (3-0). Geosynthetics properties and testing, design of geotextiles, geogrids, geonets, and geomembranes for applications in separation, pavement, embankment and retaining wall reinforcement, soil stabilization, filtration, drainage and liquid barrier, construction guidelines and case histories. Prerequisites: CE 3343 or consent of instructor.

5373. ENVIRONMENTAL GEOTECHNOLOGY (3-0). Physical and chemical principles of clays, clay mineralogy, coupled flow, hydraulic conductivity, in situ and laboratory tests, chemical transport, adsorption of chemicals, compacted soil liners, geomembrane liners, leachate collection and removal systems, cover systems, other soil remediation methods. Prerequisites: CE 5371 or consent of instructor.

5374. EXPANSIVE SOILS (3-0). Study of expansive soils, classification, site characterization, identification tests, soil classification methods, heave prediction, shallow and deep foundations design on expansive soils, treatment methods, remedial measures. Prerequisites: CE 5365 or consent of instructor.

6312. IN-SITU TESTING (3-0). Site characterization, in-situ testing procedures and soil property interpretation methods for standard penetration tests, cone penetration tests utilizing friction cone, piezocone, and seismic cone, dilatometer, vane shear, pressure meter, and bore hole shear tests, non-destructive tests for pavement subgrade characterization. Prerequisite: consent of instructor.

6382. TECHNICAL ADVANCES IN GEOTECHNICAL (3-0). Subject title listed in class schedule and in student's record. May be repeated for credit when subject changes. Examples include: Geosynthetics; Soil Chemistry; Physiochemical Soil Reactions; Geophysical Site Characterization; Soil Subgrade Modification. Prerequisite: consent of instructor.

Structures and Applied Mechanics

5301. ENERGY METHODS IN APPLIED MECHANICS (3-0). Minimum potential energy, principle of complementary energy. Castigliano's Theorem, and variational principles. Also Hamilton's principles and Lagrange's equations. Credit not granted for both CE 5301 and EM 5324. Prerequisite: consent of instructor.

5302. THEORY OF STRUCTURES I (3-0). Analysis of statically indeterminate elastic structures. Maxwell's law of reciprocal displacements, Castigliano's theorems, real work, virtual work, method of consistent deformations, column analogy, elastic center, influence lines, three-moment theorem, approximate analysis of structural frames. Prerequisite: CE 3341.

5303. MATRIX METHODS FOR STRUCTURES (3-0). Stiffness and flexibility methods of structural analysis by using matrix algebra. Credit not granted for both CE 4308 and CE 5303. Prerequisite: CE 3341.

5304. STRUCTURAL DESIGN IN LIGHT GAGE STEEL (3-0). Design course for cold formed steel structures. Includes post buckling, plate behavior of stiffened and unstiffened elements, columns, braced and unbraced beams, connectors, and shear diaphragms. Building Codes and related recommended practice documents. Prerequisite: CE 4348.

5305. COMPOSITE STRUCTURES IN CIVIL ENGINEERING (3-0). A design synthesis course for fiber reinforced plastics in civil engineering structures. Topics include types of plastics and composites, structural behavior, analysis and design of flat sandwich structures, axially loaded members, beam-columns, and building connections. Building codes and related recommended practice documents. Prerequisite: CE 3341.

5307. STRUCTURAL TIMBER DESIGN (3-0). Covers grade and design properties of structural lumber; design criteria using timber; design of bending and compression members; connectors design; design of glued laminated timber, box beams, stressed-skin panels, shear walls, and trusses. Prerequisite: CE 3341.

5308. MASONRY STRUCTURES (3-0). Includes masonry unit types and grades, mortar types, reinforcing and connectors, and beam, column, arch, bearing wall design. Structural behavior and standard construction practices. Plain and reinforced masonry, building codes and recommended practice documents. Prerequisite: CE 3341.

5309. PRESTRESSED CONCRETE (3-0). Discussions concerning materials and methods used in prestressing; design of sections for flexure, shear, anchorage, and torsion; camber, deflections and cable layouts, simple spans, continuous beams, and prestressed tanks. Prerequisite: CE 4347.

5311. STEEL DESIGN I (3-0). A design synthesis course for metal structures. Topics include beam columns, building connections, plastic design, rigid frame, and multistory building design. Building codes and related documents. Prerequisite: CE 4348.

5312. CONCRETE DESIGN I (3-0). Includes structural components such as beams, columns, slabs, footings and walls using the ultimate strength method; building code requirements for reinforced concrete; truss models for shear and torsion, development and anchorage. Prerequisite: CE 4347.

5313. CONCRETE DESIGN II (3-0). Structural systems such as continuous beams, slabs, frames, slender columns, shear walls, two-way slabs, yield-line theory and shear-friction. Prerequisite: CE 4347.

5314. STEEL DESIGN II (3-0). Covers torsional design of beams, beams with web holes, composite design of beams, lateral-torsional buckling of beams, plate buckling, column design and behavior, frame stability, bracing requirements for compression members. Prerequisite: CE 4348.

5315. ADVANCED MECHANICS OF MATERIALS (3-0). Analysis of stresses and strains at a point, stress-strain relationships, stresses due to various leading conditions, theories of failure, energy methods, shear center, unsymmetrical bending, curved beams, torsion and buckling problems. Credit not granted for both CE 5315 and CE 4324. Prerequisite: CE 3311.

6351. THEORY OF STRUCTURES II (3-0). Continuation of Theory of Structures I. Study of the theory of arches, rings, tanks, and other circular structures, cable supported systems, and long span continuous structures, classical methods, and energy methods. Prerequisite: CE 5302 or consent of instructor.

6352. FINITE ELEMENT METHOD FOR STRUCTURES (3-0). Structural stiffness, finite elements of a continuum, plane stress and strain, axi-symmetric stress analysis, element shape functions, and various applications. Prerequisite: CE 5303.

6353. BEHAVIOR OF STRUCTURES UNDER DYNAMIC LOADS (3-0). Idealization of structures for dynamic analysis, natural and forced vibrations of single and multiple degrees of freedom systems, response of structures subjected to blast, wind, and earthquakes. Prerequisite: CE 5302.

6354. THEORY OF THIN ELASTIC SHELLS (3-0). Elements of differential geometry, basic equations for shells of arbitrary shape. Specific equations for cylindrical shells, shells of revolution, etc. Credit not granted for both CE 6354 and EM 5320. Prerequisite: consent of instructor.

6355. TENSORS IN STRUCTURAL MECHANICS (3-0). Metric tensor, strain and stress tensors, constitutive equations, covariant derivative, divergence and curl, continuum mechanics, geometry of curved surfaces, plates and shells. Prerequisite: CE 5315 or consent of instructor.

6383. TECHNICAL ADVANCES IN STRUCTURES AND APPLIED MECHANICS (3-0). Subject title listed in class schedule and in student's record. May be repeated for credit when subject changes. Example: Numerical Methods in Structural Design. Prerequisite: consent of instructor.

Transportation

5330. CHARACTERISTICS OF TRAFFIC (3-0). The fundamental elements of traffic—the driver, the vehicle, and the roadway—are considered and then extended into studies of streams of traffic flow. Techniques of conducting traffic engineering studies, including methods of measuring speed, volume, and density, are covered along with methods for the determination of capacity on freeways and rural highways (uninterrupted flow facilities). Parking and accident studies are also included. Prerequisite: CE 3302.

5331. TRAFFIC ENGINEERING OPERATIONS (3-0). Methods of traffic regulation and control optimization. Traffic laws, motorist communication by means of traffic control devices, and the design and operation of both fixed time and actuated traffic signals at intersections. Analysis and design techniques for intersections using capacity and level of service concepts. Credit will not be granted for both CE 4313 and 5331. Prerequisite: CE 3302.

5332. HIGHWAY DESIGN (3-0). Geometric considerations necessary for the design of city streets, highways, and freeways such as the cross sections, vertical and horizontal alignment, sight distances and stopping distances. Includes the design of maneuver areas, channelization, ramps, intersections, and interchanges. Credit will not be granted for both CE 4312 and 5332. Prerequisite: CE 3302.

5333. TRAFFIC CONTROL SYSTEMS (3-0). Control algorithms and optimization of splits, offsets, and cycle lengths for arterial progression and traffic signals in networks; computer simulation techniques; problem solving with computer simulation and optimization packages; freeway control using ramp meters and dynamic motorist communications. Prerequisites: CE 5331.

5335. AIRPORT ENGINEERING (3-0). Airport master planning, for forecasting air travel demand, airside capacity, passenger terminal design, air traffic control, land access planning and design, landside operations, air cargo facility design. Prerequisite: CE 3302.

5336. PAVEMENT DESIGN (3-0). Principles and theoretical concepts of rigid and flexible pavements for highways and airfields; effects of traffic loads, natural forces, and material quality; current design practices (including bituminous mixture design and pavement foundation design); and pavement management systems. Prerequisites: CE 3302, 3261, and 3343.

5337. URBAN TRANSPORTATION PLANNING (3-0). Theory and application of a comprehensive urban transportation planning methodology. Basic studies of population dynamics, urban growth, land use, forecasting trip generation and distribution, traffic assignment, mode split, evaluation, simulation models, characteristics of mass transit and other non-auto modes, and system design and evaluation. Credit will not be granted for both CE 4311 and 5337. Prerequisite: CE 3302 or consent of instructor.

6306. PUBLIC TRANSIT PLANNING AND OPERATION (3-0). Theory and application of technologies used for transit demand analysis, routing, scheduling, evaluation, crew assignment, maintenance strategies, and management. Land-use impact on public transit policy and operation is also introduced. Prerequisite: consent of instructor.

6308. ANALYTICAL MODELS IN TRANSPORTATION (3-0). Development and analysis of mathematical models in transportation. Topics include travel demand, trip generation, distribution, mode choice, assignment, plan evaluation, spatial distribution, traffic control and flow models; principles of behavioral, econometric, deterministic, probabilistic, and chaotic simulation models, and their applications. Prerequisite: CE 5337 or consent of instructor.

6309. TRAFFIC FLOW THEORY (3-0). Speed, density relationships of vehicular traffic flow; statistical aspects of traffic events and queuing processes; deterministic models and simulation models of traffic flow behavior; applications of flow theory to traffic problem solutions. Prerequisite: consent of instructor.

6384. TECHNICAL ADVANCES IN TRANSPORTATION (3-0). Subject title listed in class schedule and in student's record. May be repeated for credit when subject changes. Examples include: Intermodal and Multimodal Transportation Systems; Urban Operations Research; and Intelligent Transportation Systems. Prerequisite: consent of instructor.

Directed Studies in Civil Engineering

5193. MASTER'S COMPREHENSIVE EXAMINATION (1-0). Directed study, consultation, and comprehensive examination over coursework leading to the Master of Engineering degree in civil engineering. Required of all Master of Engineering students in the semester they plan to graduate. Graded P/F/R.

5300. TOPICS IN CIVIL ENGINEERING (3-0). Topics of current interest in the field of civil engineering. The subject title is listed in the class schedule and in the student's record. Topics vary. May be repeated for credit when topic changes. Prerequisite: consent of instructor.

5191, 5391. ADVANCED STUDIES IN CIVIL ENGINEERING. Individual studies of advanced topics under the supervision of a professor or professors. Prerequisite: consent of instructor. Graded P/F/R.

5395, 5695. MASTER'S PROJECT. Non-thesis master's degree candidates with approval to include a project in their program. Graded P/F/R. Prerequisite: consent of instructor and approval of Civil Engineering Graduate Advisor.

5398, 5698, 5998. THESIS. Research and preparation pertaining to the master's thesis. 5398 graded R/F only; 5698 and 5998 graded P/F/R.

6300. ADVANCED TOPICS IN CIVIL ENGINEERING (3-0). Topics of current interest in the field of civil engineering. The subject title is listed in the class schedule and in the student's record. Topics vary. May be repeated for credit when topic changes. Prerequisite: consent of instructor.

6391,6691,6991. ADVANCED PROJECTS IN CIVIL ENGINEERING. Projects using and developing emerging technology. Prerequisite: consent of instructor and approval of Civil Engineering graduate advisor. Graded P/F/R.

6197, 6297, 6397, 6697, 6997. RESEARCH IN CIVIL ENGINEERING. Individual supervised research projects. May be repeated for credit. Prerequisites: consent of instructor and approval of Civil Engineering Graduate Advisor. Graded P/F/R.

6399,6699,6999. DISSERTATION. Preparation of a doctoral dissertation in civil engineering. Prerequisite: admission to candidacy for the Doctor of Philosophy degree. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

A limited number (not to exceed a total of nine semester hours) of the following courses may be applicable toward a graduate degree if approved in advance by the Civil Engineering Graduate Advisor.

4308. ADVANCED STRUCTURAL ANALYSIS
4311. URBAN TRANSPORTATION INFRASTRUCTURE PLANNING
4312. STREET AND HIGHWAY DESIGN
4313. TRAFFIC ENGINEERING
4321. FOUNDATION ENGINEERING
4322. SOIL STABILIZATION
4324. MECHANICS OF MATERIALS II
4350. AIR POLLUTION CONTROL
4356. DESIGN OF MUNICIPAL WATER SUPPLY SYSTEMS
4357. DESIGN OF MUNICIPAL WASTEWATER TREATMENT SYSTEMS
4358. OPEN CONDUIT SYSTEMS
4359. WATER RESOURCES DESIGN

Department of Computer Science and Engineering

Areas of Study and Degrees
Computer Science
M.S., M.C.S., Ph.D.
Computer Science and Engineering
M.S., M.C.S., M.Engr., Ph.D.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)
Software Engineering
M.SW.Engr.

Master's Degree Plans
Thesis (M.S.) and
Non-thesis (M.C.S., M.Engr., M.SW.Engr.)

Chair
Bill D. Carroll
300 Nedderman Hall, 817-272-3787

Graduate Advisor
Bob P. Weems
341 Nedderman Hall, 817-272-3785

Graduate Faculty
Professors
Carroll, Elmasri, Hsia, Kung, Peterson, Shirazi, Walker

Associate Professors
Cook, Holder, Kamangar, Weems, Welch, Youn

Assistant Professors
Bruggeman, Fegaras, Gmytrasiewicz, Shen

Objective

The purpose of the graduate programs in Computer Science and Computer Science and Engineering is to facilitate the student's continued professional and scholarly development. The Master of Science (M.S.) programs are designed to extend the student's knowledge and emphasize a particular area of concentration. The Master of Computer Science (M.C.S.), Master of Engineering (M.Engr.), and Master of Software Engineering (M.SW.Engr.) programs are designed to provide the student with the opportunity for professional development in the computer field. The Doctor of Philosophy (Ph.D.) programs are designed to prepare the student to conduct research and development in an area of concentration.

Typical areas of concentration include

1. **computer architecture:** parallel processing, dataflow systems, scheduling and load balancing for parallel and distributed systems, tools for parallel programming, performance evaluation, fault-tolerant computing, interconnection networks, VLSI-based multiprocessor systems, microprocessor systems, real-time control systems, memory system design;
2. **intelligent systems:** knowledge-based systems, knowledge representation, neural networks, knowledge acquisition, machine learning, planning, scientific visualization, pattern recognition, natural language processing, multi-agent environments, decision support;
3. **software engineering:** requirements engineering, incremental delivery, conceptual modeling, scenario-based techniques, formal specifications, object-oriented software engineering, design methodologies, software testing, software maintenance, software re-engineering, software processes, real-time systems;
4. **database:** temporal databases, object-oriented databases, database models and languages, distributed database systems, indexing and hashing techniques, conceptual modeling, data security, logic and databases, query optimization, relational design theory, user interfaces, data repositories.

Admission

Applicants for graduate study who have a baccalaureate degree in Computer Science or Computer Science and Engineering must meet the general requirements of the Graduate School as stated under the section entitled "Admission Requirements and Procedures". The Department of Computer Science and Engineering has established additional requirements that are described in the Guide to Graduate Programs published by the Department.

Applicants who have limited background in Computer Science or Computer Science and Engineering but who meet all other requirements may be admitted. Such students normally must take additional courses beyond the minimums listed below. For further information, applicants may contact the Graduate Advisor.

Continuation

To fulfill its responsibility to graduate highly qualified professionals, the Department has established certain requirements that must be met by students continuing in the graduate programs. In addition to

the requirements of the Graduate School listed elsewhere in the catalog, the Computer Science and Engineering Department has established additional requirements detailed in its Guide to Graduate Programs.

Degree Requirements

Master of Science in Computer Science

The Master of Science in Computer Science degree program is designed to develop the scholarship and research skills of the student. Thirty-one credit hours which include one orientation seminar credit and six thesis credits are required.

Master of Science in Computer Science and Engineering

The Master of Science in Computer Science and Engineering, which is intended for students with a baccalaureate degree in engineering, requires thirty-one credit hours of which one is orientation seminar and six are thesis credits, and is designed to develop the scholarship and research skills of the student.

Master of Computer Science

The Master of Computer Science (MCS) provides professional development in computer science. The MCS project option requires thirty-seven credit hours of which one is orientation seminar and six are master's project credits. The MCS structured option requires thirty-eight credit hours of which one is orientation seminar and one is terminal seminar credits.

Master of Engineering

The Master of Engineering in Computer Science and Engineering provides professional development in computer science and engineering to the student with a baccalaureate degree in engineering. The degree requires 37 credits which includes either a six-hour master's project or an approved substitute and orientation seminar.

Master of Software Engineering

The Master of Software Engineering provides professional development in software engineering principles and practices. Thirty-seven semester hours of coursework beyond the bachelor's is required which includes six hours of Software Team Project and one hour orientation seminar.

Ph.D. (Computer Science)

The Ph.D. in Computer Science continues the development of the student's research capability. Coursework selection in each student's program is designed to support the dissertation area selected by the student.

A minimum of two semesters of full-time study is required during the dissertation phase. There is no foreign language requirement.

Ph.D. (Computer Science and Engineering)

The Ph.D. in Computer Science and Engineering is available to students with a prior degree in engineering. It contains essentially the same requirements as the Ph.D. (Computer Science) degree except that it permits interdisciplinary research between Computer Science and one or more of the various engineering disciplines.

Ph.D. (Mathematical Sciences)

See program listing for Mathematical Sciences under "Interdepartmental and Intercampus Programs."

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Computer Science and Engineering (CSE)

5194. ORIENTATION SEMINAR (1-0). Presentation of computer science research by CSE faculty, students, and invited speakers. Preparation of program of work. Prerequisite: Unconditional admission status in CSE Department or consent of CSE Graduate Advisor. Graded P/F/R.

5196. MASTER'S SEMINAR (1-0). Presentation of semester project by Master of Computer Science structured option students. Prerequisite: CSE 6000-level lecture course (or concurrent enrollment) and consent of CSE Graduate Advisor. Graded P/F/R.

5306. OPERATING SYSTEMS II (3-0). Hardware and software issues in modern operating systems, distributed and networked operating systems, and real time operating systems. Topics may include multithreading, distributed systems, device drivers, object oriented operating systems, advanced file systems, parallel virtual machines, and load balancing. Examples from current popular modern systems and research operating systems will be analyzed. Prerequisite: CSE 3320 or consent of instructor.

5307. PROGRAMMING LANGUAGE CONCEPTS (3-0). Study and evaluation of concepts in programming language for modern computer systems. Programming projects are selected from string-based, symbolic, algorithmic, and object-oriented languages. Prerequisite: CSE 3302 or consent of instructor.

5311. DESIGN AND ANALYSIS OF ALGORITHMS (3-0). Techniques for analyzing upper bounds for algorithms and lower bounds for problems. Problem areas include: sorting, data structures, graphs, dynamic programming, combinatorial algorithms, organization of numerical computations, introduction to parallel models. Prerequisite: CSE 2320 and 3315, or consent of instructor.

5314. COMPUTATIONAL COMPLEXITY (3-0). Sequential and parallel complexity classes (e.g., NP-complete and P-complete) and representative problems in languages, logic and graphs. Reduction techniques. Approximate solutions. Complexity hierarchies. Prerequisite: CSE 2320 and 3315, or consent of instructor.

5315. NUMERICAL METHODS (3-0). Selected topics from the theory and practice of using automatic digital computers for approximating arithmetic operations, approximating functions, solving systems of linear and non-linear equations, and solving ordinary and partial differential equations. Prerequisite: CSE 2312 and linear algebra, or consent of instructor.

5316. MODELING, ANALYSIS, AND SIMULATION OF COMPUTER SYSTEMS (3-0). Mathematical formalism and techniques used for computer system modeling and analysis. Reviews probability, transform theory, coding theory, and Petri nets. Topics may include knowledge based modeling, validation procedures, various simulation techniques for stochastic process and real-time distributed systems. Prerequisite: CSE 2320, or consent of instructor.

5317. DESIGN AND CONSTRUCTION OF COMPILERS (3-0). Review of programming language structures, translation, and storage allocation. Introduction to context-free grammars and their description. Design and construction of compilers including lexical analysis, parsing and code generation techniques. Error analysis and simple code optimizations will be introduced. Prerequisite: CSE 3315 and 3302, or consent of instructor.

5324. SOFTWARE ENGINEERING: ANALYSIS, DESIGN, AND TESTING (3-0). Motivations, principles, and goals of software engineering; technical aspects of software projects, including: review of structured analysis and structured design, emphasis on object-oriented methods of requirements analysis and specification, design, and implementation; software testing concepts; team project. Prerequisite: CSE 2320 and 3315 (or concurrent enrollment), or consent of instructor.

5325. SOFTWARE ENGINEERING: MANAGEMENT, MAINTENANCE, AND QUALITY ASSURANCE (3-0). Issues and principles for software management; managerial and support aspects of software projects, including: processes, estimation techniques, planning and scheduling, risk analysis, metrics, and quality assurance. Other topics include: configuration management, verification and validation, and maintenance; team project. Prerequisite: CSE 5324, or consent of instructor.

5326. REAL-TIME SOFTWARE DESIGN (3-0). Specification, design, and analysis of real-time systems including real-time logics and decidability of real-time conditions; real-time scheduling approaches, and schedulability analysis, system requirement specifications and languages; procedural and object-oriented methods; specialized analysis techniques for distributed and for control applications; team project. Prerequisite: CSE 5324, or consent of instructor.

5328. SOFTWARE ENGINEERING TEAM PROJECT I (1-2). Apply the knowledge and skills gained in other software engineering courses to synthesize a solution to a significant and realistic problem. Participate in team project activities, including: proposal writing, problem analysis, software requirements specification, software project planning, and preliminary software design. Prerequisite: CSE 5325 (or concurrent enrollment). Open to Master of Software Engineering candidates only. $5 lab fee. $25 course specific fee.

5329. SOFTWARE ENGINEERING TEAM PROJECT II (1-2). Continuation of CSE 5328. Team project activities include: detailed software design, implementation, software quality assurance, software testing, integration, and demonstration. Prerequisite: CSE 5328. Open to Master of Software Engineering candidates only. $5 lab fee. $25 course specific fee.

5330. DATABASE SYSTEMS I (3-0). Database system architecture; file structures for databases, including indexing, hashing, and B+-trees; the relational model, algebra, and calculus; the SQL database language; Entity-Relationship data modeling; advanced data modeling concepts; functional dependencies and basic normalization; Relational database design theory. Prerequisite: CSE 2320 or consent of instructor.

5331. DATABASE SYSTEMS II (3-0). Object-Oriented and Object-Relational databases, database system implementation techniques, including concurrency control, recovery, atomic commitment, and query processing and optimization; database security; introduction to advanced concepts, such as active, deductive, spatial, temporal, multimedia, and distributed databases. Prerequisite: CSE 5311 and CSE 5330, or consent of instructor.

5343. REAL-TIME DATA ACQUISITION AND CONTROL SYSTEMS (2-3). Advanced course in design of microcomputer-based systems. Emphasis is on the application of state-of-the-art microprocessors, microcomputers, and other LSI and VLSI components to real-time, interactive, and/or embedded systems. Prerequisite: CSE 5442 or consent of instructor. $5 lab fee. $25 course specific fee.

5344. COMPUTER NETWORKS (3-0). Study of computer network architectures, protocols, and interfaces. The OSI reference model and the Internet architecture will be discussed. Networking techniques such as multiple access, packet/cell switching, and internetworking will be studied. Discussion will also include end-to-end protocols, congestion control, high-speed networking, and network management. Emphasis will be on Internet and ATM. Prerequisite: CSE 3320, or consent of instructor.

5345. VLSI SYSTEMS DESIGN (3-0). Analysis and design of MOS digital circuits as used in VLSI. Circuit simulation, logic simulation and timing analysis of MOS digital circuits. Use of HDL's such as VHDL as a simulation tool. Techniques for subsystem design using mask geometry manipulation systems, gate array based designs, design of testable circuits, and complexity of area time trade-offs. Prerequisite: CSE 2341, or consent of instructor.

5346. NETWORKS II (3-0). This course provides an in depth study and comparison of the two primary networking paradigms, Internet/broadcast and switched, using two technologies, IPv6 and ATM, as representative examples. The course is implementation-oriented, focusing on issues such as routing, broadcast, multicast, mobility, network configuration, and quality of service. Prerequisite: CSE 5344.

5350. COMPUTER ARCHITECTURE II (3-0). A study of advanced uniprocessor and basic multiprocessor systems. Topics may include memory management systems, pipelined processors, array and vector processors, and introduction to architecture of multiprocessor systems. Prerequisite: CSE 3322, or consent of instructor.

5351. PARALLEL PROCESSING (3-0). Covers the theory and practice of parallel processing. Theoretical topics include: abstract models and algorithms for shared memory computation (PRAM); algorithms for various topologies such as meshes and hypercubes;

efficiency and speedup analysis. Problem areas include data structures, numerical methods, graphs, combinatorics. Practical topics include synchronization, routing, scheduling, parallelizing serial computations, programming languages. Includes programming exercises using one or more concurrent programming languages, on one or more parallel computers. Prerequisite: CSE 3320, or consent of instructor.

5355. COMPUTER SYSTEM PERFORMANCE EVALUATION (3-0). Queueing network models and simulation for studying the performance of overall computer systems and each subsystem such as CPU, memory, I/O, and interconnection. Topics also include capacity planning, hardware selection and upgrade, and tuning. Prerequisite: CSE 3322, or consent of instructor.

5360. ARTIFICIAL INTELLIGENCE I (3-0). Introduction to the methods, concepts and applications of artificial intelligence, including knowledge representation, search, theorem proving, planning, natural language processing, and study of the LISP language. Prerequisite: CSE 2320 and 3315, or consent of instructor.

5361. ARTIFICIAL INTELLIGENCE II (3-0). Continuation of artificial intelligence methods and techniques, including uncertainty reasoning, machine learning, perception, and advanced topics in knowledge representation, search and planning. Emphasis on object-oriented design and implementation of AI solutions. Prerequisite: CSE 5360, or consent of instructor.

5362. EXPERT SYSTEMS (3-0). Consideration of techniques used in the construction of expert systems; examination of existing systems. Prerequisite: CSE 5360, or consent of instructor.

5363. NATURAL LANGUAGE PROCESSING (3-0). Computer techniques for processing natural language; view of current state of natural language processing as a subfield of AI. Prerequisite: CSE 5360, or consent of instructor.

5365. COMPUTER GRAPHICS (3-0). Input/output devices and programming techniques suitable for the visual representation of data and images. Prerequisite: CSE 1320, analytic geometry and linear algebra, or consent of instructor.

5366. DIGITAL SIGNAL PROCESSING (3-0). Introduction to principles and applications of digital signal processing. Topics include: analysis of signals and systems, Fourier and Z transforms, digital filter design techniques (FIR and IIR), autoregressive (AR) and autoregressive moving average (ARMA) modeling. Applications to science and engineering include: financial predictions and processing of digital music. Laboratory work includes some programming and use of high quality library routines and packages such as Mathematica, Matlab. Prerequisite: CSE 1320 and consent of Graduate Advisor.

5368. NEURAL NETWORKS (3-0). Theoretical principles of neurocomputing. Learning algorithms, information capacity, and mapping properties of feedforward and recurrent networks. Different neural network models will be implemented and their practical applications discussed. Prerequisite: CSE 1320 and calculus II, or consent of instructor.

5191, 5291, 5391. INDIVIDUAL STUDY IN COMPUTER SCIENCE. Topics dealing with special problems in Computer Science on an individual instruction basis. May be repeated for credit. Prerequisite: consent of instructor. Graded P/F/R.

5392. TOPICS IN COMPUTER SCIENCE (3-0). May be repeated for credit when the topics vary. Prerequisite: graduate standing and consent of instructor.

5393. DIRECTED STUDY IN COMPUTER SCIENCE. Topics dealing with special problems in Computer Science on an individual instruction basis. May be repeated for credit. Prerequisite: departmental approval of proposal submitted one month prior to beginning of semester.

5394. MASTER'S PROJECT I. Required for first semester of a six-hour master's project. Prerequisite: consent of instructor. Graded P/F/R.

5395. MASTER'S PROJECT II. Required for completion of project option master's degree candidates. Prerequisite: CSE 5394 and consent of instructor. Graded P/F/R.

5398 or 5698. MASTER'S THESIS. 5698 required for master of science degree candidates. Prerequisite: consent of instructor. 5398 graded R/F only; 5698 graded P/F/R.

5442. EMBEDDED COMPUTER SYSTEMS (3-3). Design of microcomputer-based systems; microcomputer programming, component and system architectures, memory interfacing, parallel and serial I/O interfacing, A/D and D/A conversion, and typical applications. Prerequisite: CSE 3322, or consent of instructor. $5 lab fee. $25 course specific fee.

6306. ADVANCED TOPICS IN OPERATING SYSTEMS (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5306, and consent of instructor.

6312. ADVANCED TOPICS IN FORMAL METHODS (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5311 and consent of instructor.

6314. ADVANCED TOPICS IN THEORETICAL COMPUTER SCIENCE (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5314 and consent of instructor.

6317. ADVANCED TOPICS IN LANGUAGES AND COMPILERS (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5317 and consent of instructor.

6323. FORMAL METHODS IN SOFTWARE ENGINEERING (3-0). Methods for modeling and reasoning that play a fundamental role in computer science. Topics include: advanced mathematical logic, formal proof methods, set theory, and formal specification languages and their applications to software engineering. Prerequisite: CSE 5324, or consent of instructor.

6324. ADVANCED TOPICS IN SOFTWARE ENGINEERING (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5325 (or concurrent enrollment) and consent of instructor.

6330. DISTRIBUTED DATABASES AND OBJECT BASES (3-0). Distributed database systems in the homogeneous, heterogeneous, and multi-database environments; distributed database architecture and design; data fragmentation, replication, and allocation; new technologies for object distribution and database connectivity, such as CORBA, ODBC, and web databases. Prerequisite: CSE 5331 and CSE 5306, or consent of instructor.

6331. ADVANCED TOPICS IN DATABASE SYSTEMS (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5331 and consent of instructor.

6344. ADVANCED TOPICS IN COMMUNICATION NETWORKS (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5346, or consent of instructor.

6350. ADVANCED TOPICS IN COMPUTER ARCHITECTURE (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5350 and consent of instructor.

6351. TOPICS IN PARALLEL AND DISTRIBUTED COMPUTING (3-0). May be repeated for credit when topics change. Prerequisite: CSE 5350, 5351, and consent of instructor.

6352. FAULT-TOLERANT COMPUTING (3-0). Topics in reliable and fault-tolerant computing. May be repeated for credit when topics change. Prerequisite: CSE 5350 and consent of instructor.

6362. ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE (3-0). May be repeated for credit when the topic changes. Prerequisite: CSE 5361 and consent of instructor.

6363. MACHINE LEARNING (3-0). A detailed investigation of current machine learning methods, including statistical, connectionist, and symbolic learning. Presents theoretical results for comparing methods and determining what is learnable. Current issues in machine learning research will also be examined. Prerequisite: CSE 5361 and consent of instructor.

6366. DIGITAL IMAGE PROCESSING (3-0). Digitization and coding of images, characterization and representation of digital images in spatial and frequency domains, picture restoration and enhancement, filtering of two-dimensional signals, image reconstruction. Prerequisite: CSE 5366 and consent of instructor.

6367. COMPUTER VISION (3-0). Advanced techniques for interpretation, analysis, and classification of digital images. Topics include methods for segmentation, feature extraction, recognition, stereo vision, 3-D modeling, and analysis of time-varying imagery. Also taught as EE 6358. Prerequisite: CSE 6366 or EE 5356 or EE 5357, and consent of instructor.

6192, 6292, 6392. SPECIAL TOPICS IN ADVANCED COMPUTER SCIENCE. May be repeated for credit when the topics vary. Prerequisite: graduate standing and consent of instructor.

6197-6997. RESEARCH IN COMPUTER SCIENCE. Individually supervised research projects. Graded P/F/R. Prerequisite: graduate standing in computer science and approval of Graduate Advisor.

6399, 6699, 6999. DISSERTATION. Preparation of dissertation in computer science or computer science and engineering. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: consent of instructor.

Objective

The course offerings provide the student with an opportunity to broaden as well as to intensify his or her knowledge in a number of areas of electrical engineering. The student, with the aid of a faculty advisor, may plan a program in any one of a number of fields of specialization within electrical engineering or from the offerings of related departments in science and engineering.

Graduate study and research are offered in the areas of:

1. Systems, Controls, Microprocessors; Nonlinear Modern Control, Robotics, Biomedical Signal Processing and Instrumentation.
2. Remote Sensing, Electromagnetic Fields, Propagation, Scattering, and Microwave Systems.
3. Optics, Electro-optics, Diffractive Optics, Nonlinear Optics, and Lasers.
4. Microelectronics and Semiconductors: Microwave, Millimeter-wave and Optoelectronic Devices and Integrated Circuits.
5. Digital Signal Processing, Digital Image Processing, Vision Systems, Neural Networks, Statistical Signal Processing, Nonlinear Image Processing, Virtual Prototyping, and Virtual Environments.
6. Information Transmission and Communication Systems.
7. Energy Systems: Efficient Operation and Planning; Generation, Transmission and Distribution; Deregulation of Power Marketing
8. Applied Physical Electronics: Pulse Electronics, High Power Optical Electronics, Laser Applications and Diagnostics.
9. Manufacturing Engineering: Robotics, Automation, Control, Data Management, Economics, and Instrumentation as applied to Manufacturing.

The program is designed to satisfy the needs of students pursuing master's and doctoral degrees and to provide for the student seeking to increase knowledge in areas of electrical engineering related to engineering practice. The courses offered will provide practicing engineers with advanced, up-to-date education in electrical engineering.

Degree Requirements

Students wishing to major in electrical engineering at the graduate level should have the Bachelor of Science degree in electrical engineering from an approved school. The minimum undergraduate grade point average for unconditional admission to the master's level graduate program in electrical engineering is 3.0 computed on a 4.0 basis. A minimum Graduate Record Examination score of 350 (verbal) and 700 (quantitative) is also required. Unconditional admission to the doctoral program requires a minimum grade point average of 3.5 on master's level work and a GRE Q score of 750. An applicant whose native language is not English must submit a score of at least 550 on the Test of English as a Foreign Language for admission to the graduate program in electrical engineering. Applicants with degrees in other closely related disciplines may qualify for graduate study in electrical engineering after completion of a faculty-approved program of leveling courses.

Degree requirements for master's degrees are described in the general catalog section titled Requirements for the Master's Degree/ Degree Plans and Hours Required. The M.S.E.E. degree options

Department of Electrical Engineering

Area of Study and Degrees
Electrical Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis, Thesis Substitute and Non-Thesis

Chair
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Graduate Faculty
Professors
Alavi, Carter, Cash,
Chen, Devarajan, Fitzer,
Fung, Kondraske, Lee, Lewis,
Magnusson, Manry, McElroy,
Prabhu, Rao, Shoults, Smith, Yeung

Associate Professors
Bredow, Chwialkowski, Davis,
Dillon, Maldonado, Tjuatja

Adjunct Professor
Agarwal, Sobol, Wang

Adjunct Associate Professors
Bu-Abbud, Liu, Trivedi

Adjunct Assistant Professor
Hoe, Pfeifer

available are thesis option, thesis substitute option and non-thesis option. Courses taken for all degrees must be distributed over four of the areas given in the following course descriptions. The M.S.E.E. program of work in electrical engineering may include up to nine graduate level semester hours of supporting courses in areas other than electrical engineering. Courses in mathematics, science or engineering that are permitted on that program's degree plans will be approved. The courses approved outside electrical engineering may be used in lieu of one of the four distribution areas. The program of work may also include up to nine semester hours of senior level mathematics, physics or engineering courses. The thesis option requires 24 semester hours plus six semester hours of thesis (EE 5698). The thesis substitute option requires 33 semester hours of which either three or six semester hours should be in thesis substitute project (EE 5392). The non-thesis option requires 37 semester hours which must include EE 5190. The M.Engr. program requires 36 semester hours distributed in the same manner as the M.S.E.E. programs except that up to 12 semester hours outside the department may be included.

The Ph.D. degree is a research degree. Degree requirements for the doctoral degree are described in the general catalog section on degree offerings/requirements. Permission to continue beyond the master's degree will be based on the grade point average and GRE scores as described above. Approval to continue in the doctoral program is given by satisfactory completion of the EE Diagnostic Examination procedure. This procedure includes 1) earning an A in at least two of the first four courses (no grade less than B will be allowed) taken from the faculty-approved list of Technical Proficiency Courses, 2) obtaining the approval of a dissertation advisor, and 3) satisfactory performance on an oral examination of research potential. The diagnostic committee will then meet to consider the application of the student to continue in the doctoral program. The status of doctoral candidate is approved for students who submit a satisfactory application for candidacy and final program of work and pass an oral Comprehensive Examination (a comprehensive dissertation proposal). The program of work is expected to include 30 semester hours of graduate level work beyond the master's degree. Upon completion of the Comprehensive Examination, the candidate should enroll in the dissertation course (EE 6399, EE 6699 or EE 6999) continuously until defense of the dissertation. This ordinarily requires at least 30 total semester hours of dissertation credit.

Candidates for the M.S., M.Engr. and Ph.D. degrees whose native language is not English must have a minimum Test of Spoken English (TSE) score of 40. Certification for graduation may be obtained via remedial work if the minimum is not met. Students whose native language is not English who have not taken the TSE must attempt the TSE prior to the end of their second semester.

Graduate Assistantships

Outstanding students who are admitted to the graduate program in electrical engineering are eligible to apply for graduate teaching and graduate research assistantships. Application for graduate teaching assistantships should be made to the Graduate Advisor. A score of 45 or better on the Test of Spoken English is required for appointment as a graduate teaching assistant for all applicants whose native language is not English. Application for graduate research assistantships should be made to the individual faculty. Graduate assistants in electrical engineering are required to take at least 12 semester hours (nine semester hours in the summer semester) each semester of their appointment.

Continuation

The Electrical Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified professional engineers, has established certain policies and procedures. In addition to the requirements of the Graduate School listed elsewhere, to continue in the program each electrical engineering graduate student must maintain at least a B (3.0) GPA in all electrical engineering coursework and at least a B (3.0) GPA in all coursework.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Electrical Engineering (EE)

Core Courses in Electrical Engineering

5301. ADVANCED ENGINEERING ANALYSIS (3-0). Analytical and numerical techniques for solving various types of engineering problems. Topics include properties, factorization and transformations of matrices; linear systems of equations; minimization of quadratic performance indexes; ordinary differential equations; nonlinear coupled algebraic equations; and complex analysis.

5302. RANDOM SIGNALS AND NOISE (3-0). Probability, random variables, and stochastic processes in physical systems. Topics include probability space, discrete and continuous random variables, density and conditional density functions, functions of random variables, mean-square estimation, random signals, system response, optimum system design, and Markov processes.

5303. APPLIED PHYSICAL ELECTRONICS (3-0). Introduction to physical electronics and space power applications. Charged particle dynamics, superconductivity, lasers and masers, power tubes, electromagnetic thrusters, conduction in the space environment, particle accelerators, and electromagnetic launchers will be studied. Prerequisite: EE 3305 or equivalent or consent of instructor.

5304. NETWORK SYNTHESIS (3-0). Introduction to network synthesis of circuits using lumped linear, passive circuit elements. Topics include realizability theory, synthesis of driving point impedances and two port circuits, and Hilbert Transforms.

5305. ADVANCED ELECTRONICS (3-0). Advanced study of solid-state devices and integrated circuits: Design, modeling, analysis and simulation techniques. Integrated circuit devices, biasing, gain stages and active loads, digital and analog design, operational amplifiers, wideband amplifiers, modulators, timers and oscillators, phase-locked loops, filters and converters.

5306. ELECTROMAGNETIC THEORY (3-0). Advanced study of electromagnetic theory, its content, methods, and applications. Topics include theorems in electromagnetic theory, cylindrical and spherical wave functions, waveguides, integral equation methods, scattering and diffraction. Prerequisite: EE 3305 or equivalent.

5307. LINEAR SYSTEMS ENGINEERING (3-0). Modern linear systems theory. Topics include state- space description of dynamic systems, similarity transformation, state feedback, state observers, and matrix fraction description of multivariable systems.

5308. POWER SYSTEM MODELING AND ANALYSIS (3-0). Fundamental concepts for modeling transmission lines, distribution lines, power system generators, power transformers and power system load. The method of symmetrical components is discussed. Simulation of power systems during normal and abnormal conditions are presented. The philosophy of deregulation regarding separation of power systems into generation (GenCo), transmission (TransCo) and distribution companies (DistCo) is introduced. Graded A/B/C/D/P/F with permission of instructor.

5309. TOPICS IN ELECTRICAL ENGINEERING (3-0). Material may vary from semester to semester. Topics are selected from current areas of electrical engineering interest. May be repeated when topic changes.

Microprocessors and Digital Systems

5310. ADVANCED LOGIC DESIGN (3-0). Mathematical foundations of switching theory; synchronous and asynchronous digital design; state machine and controller implementation; fault tolerant and fault testable hardware design. Topics include combinatorial, synchronous and asynchronous circuits, fault detection, threshold logic, and n-dimensional cubes. Prerequisite: EE 3341 or consent of instructor.

5311. DIGITAL COMPUTER DESIGN (3-0). Organization and design of digital computer and memory organization and management techniques; hardware and software interface; computer arithmetic algorithms. Topics include computer abstractions, performance measures, fixed- and floating-point arithmetic algorithms, virtual memory. Prerequisite: EE 5310.

5312. ADVANCED VLSI DESIGN (3-0). Static and dynamic circuit methodologies; characteristics of circuit families; chip layout strategies; data path and high speed algorithms; RAM and PLA's; design for testability; CAD tools. A design project which will be fabricated is required. Prerequisite: EE 4320 or consent of instructor.

5313. MICROPROCESSOR SYSTEMS (3-0). Hardware/software development techniques for the 80x86 family of microprocessors and their programmable peripherals. Special emphasis on multiprocessor systems and function-specific co-processors. Topics include: code efficiency issues, hardware-software interactions, design of specialized memory systems and hardware support for multi-tasking. Prerequisite: EE 3310 or consent of instructor.

5314. ADVANCED MICROPROCESSOR ARCHITECTURES (3-0). Study of the advanced microprocessor architectures including 32/64-bit RISC processors from leading manufacturers. The design concepts, performance and architectural limitations of RISC and CISC families of microprocessors will be compared based on detailed architectural analysis of the selected devices. Topics include: address/instruction pipelines, burst cycles, memory caching and cache coherency issues, register renaming, speculative instruction execution and other performance-oriented techniques. Prerequisite: EE 5313 or consent of instructor.

5315. DSP MICROPROCESSORS (3-0). Device architectures and various aspects of hardware/software design will be presented for dominant families of function-specific, application-specific and general-purpose digital signal processors (DSPs) from leading manufacturers. Special attention will be given to problems related to real-time acquisition and processing of analog data (audio, video, RF, etc.), including design principles for the state-of-the-art data conversion interfaces. Prerequisite: EE 5313 or 3310 or consent of instructor. $10 course specific fee.

5316. COMPUTER NETWORK APPLICATIONS (2-3). Programming techniques for developing networking applications using TCP/IP protocol. Application interfaces for network computing with focus on WinSocket interface, Visual C++ and object-oriented class libraries. Applications in distributed computing and in client-server interactions. Prerequisites: EE 5313 or EE 3310. $20 course specific fee.

5319. TOPICS IN DIGITAL SYSTEMS (3-0). Formal instruction in selected topics in digital systems and microcomputers. May be repeated when topic changes.

Systems and Controls

5320. COMPUTER METHODS IN CONTROL SYSTEM DESIGN (3-0). Design of digital and continuous control systems. Topics include discrete systems, Z-transforms theory, and optimization. Use of high level computer programs in analysis and simulation will be emphasized. Prerequisite: EE 4314 or consent of instructor.

5321. OPTIMAL CONTROL THEORY (3-0). Techniques in design of optimal control systems, including performance measures, dynamic programming, calculus of variations and Pontryagin's minimum principles. Prerequisite: EE 5307 or consent of instructor.

5322. KALMAN FILTERING AND APPLICATIONS (3-0). Optimal filtering for discrete-time and continuous-time dynamical systems with noise. Relation to Wiener filtering. Kalman filter design and implementation issues. Prerequisites: EE 5302 and 5307.

5325. ROBOTICS (3-0). Principles of kinematics, dynamics, and control of industrial robots. Inverse kinematics, velocities, and forces. Path planning and trajectory generation. Position, force, and hybrid control of robots. Also taught as ME 5337. Prerequisite: EE 4314 or consent of instructor.

5328. PRINCIPLES OF INSTRUMENTATION AND MEASUREMENTS (3-0). Design of instrumentation systems. Both digital and analog techniques are covered. Topics include signal conditioning, data acquisition, microprocessor based control, and transduction principles.

5329. TOPICS IN SYSTEMS (3-0). Formal instruction in selected topics in systems engineering, such as advanced controls, systems performance, graphics subsystems design, robotics, and computer vision. May be repeated when topic changes.

6321. ADAPTIVE CONTROL SYSTEMS (3-0). Adaptive control of systems including self tuning regulators, model reference adaptive control, and gradient methods. Methods include Lyapunov and

hyperstability applied to continuous and discrete time systems. Computer simulation is included. Prerequisite: EE 5307.

6322. NONLINEAR CONTROL (3-0). Advanced concepts of nonlinear system stability. In-depth study of Lyapunov stability techniques with LaSalle's extension, feedback linearization, sliding mode theory, and describing functions. Applications of nonlinear techniques to control systems design. Prerequisite: EE 5307.

6325. ROBOTIC CONTROL (3-0). Analysis and computer simulation of robots, properties of the nonlinear robot dynamics. Control system design using Lyapunov techniques, robust design, sliding mode. Prerequisites: EE 4314 and 5307.

Electromagnetic Fields, Microwave Systems, Optics

5331. MICROWAVE SYSTEMS ENGINEERING (3-0). Topics include design and performance analysis of transmitter and receiver circuits for communications and radar. Emphasis is on design using commercially available mixers, amplifiers, oscillators, and modulation circuits. Analysis includes receiver noise figure and path loss effects. Target and clutter scattering effects are also considered for the radar case. Prerequisite: EE 3305 or equivalent or consent of instructor.

5332. ANTENNA SYSTEM ANALYSIS (3-0). Fundamental study of antennas and antenna design techniques. Topics include numerical analysis of wire antennas; aperture antennas; geometrical theory of diffraction; horns and reflector antennas; and antenna synthesis and measurements. Prerequisite: EE 4327 or consent of instructor.

5333. WAVE PROPAGATION AND SCATTERING (3-0). The basic principles and techniques of electromagnetic wave propagation and scattering. Wave propagation problems include waves in inhomogeneous and layered media, periodic structures, and dispersive and anisotropic media. Scattering problems include scattering by simple objects such as spheres and ellipsoids. Inverse scattering problems include tomography, holography and physical optics. Prerequisite: EE 5306 or consent of instructor.

5334. OPTOELECTRONIC DEVICES FOR COMMUNICATION (3-0). Electronic and optical processes in semiconductors. Light emitting diodes. Laser diodes: structures, properties and operating principles. Photodetectors and solar cells. Noise and the photoreceiver. Optoelectronic modulators and switching devices. Systems needs and new device challenges. Prerequisite: EE 5340 or 5341 or consent of instructor.

5335. CRYSTAL OPTICS (3-0). Light propagation in various birefringent (anisotropic) optical media with particular emphasis on electro-optic, photorefractive, and acousto-optic temporal and spatial modulation. The design, analysis, and applications of birefringent and electro-optic devices for communications and signal processing. Prerequisite: EE 3305 or equivalent or consent of instructor.

5336. INTEGRATED OPTICS (3-0). Theory and techniques of integrated optics including optical waveguiding, coupling, modulation, grating diffraction, detection and integrated systems. Prerequisite: EE 3305 or equivalent or consent of instructor.

5337. FOURIER OPTICS AND HOLOGRAPHY (3-0). Theory of Fourier optics and holography including scalar diffraction theory, Fresnel and Fraunhofer diffraction, Fourier transforming properties of lenses, optical imaging systems, spatial filtering, and the theory and applications of holography. Prerequisite: EE 3305 or equivalent or consent of instructor.

5338. LASERS (3-0). Propagation of optical rays and waves, Gaussian laser beams, laser resonators, atomic systems, lasing and population inversion, laser amplifiers, practical gas and solid-state lasers including continuous-wave and pulsed lasers, mode locking, Q-switching, frequency doubling, tunable lasers, semiconductor lasers, vertical-cavity lasers and applications of lasers. Prerequisite: EE 3305 or equivalent or consent of instructor.

5339. TOPICS IN ELECTROMAGNETICS (3-0). Formal instruction in selected topics in electromagnetics. May be repeated when topic changes.

High Frequency Microelectronic Devices and Circuits

5340. SEMICONDUCTOR DEVICE THEORY (3-0). Quantum mechanics applicable to semiconductor theory. Energy band theory, density of states and effective mass theory. Intrinsic and extrinsic semiconductors, equilibrium statistics for electrons and holes. Transport, generation and recombination of excess carriers. Device equations and physics. Theory and performance of p-n and Schottky diodes, bipolar and MOS transistors. Prerequisite: consent of instructor.

5341. FUNDAMENTALS FOR SEMICONDUCTOR DEVICES (3-0). Fundamental theory required for the study of electron and optoelectronic devices based on semiconductor heterostructures: Quantum mechanics, electrodynamics and crystal structures. Electrons in periodic lattices, semiconductor band structure theory, effective mass theory. Doping and carrier statistics. Band structure engineering and quantum confinement of carriers. Optical processes in bulk and quantum structures, transport, generation and recombination of carriers. Basic heterostructure device concepts. Prerequisite: consent of instructor.

5342. SEMICONDUCTOR DEVICE MODELING AND CHARACTERIZATION (3-0). Device models and characterization procedures for the PN junction and Schottky diodes, the BJT, JFET, MOSFET, HBT, and optical sources and detectors. SPICE derived and higher level circuit simulator models will be presented. Prerequisite: EE 4329 or 5340 or 5341.

5343. INTEGRATED CIRCUIT FABRICATION TECHNOLOGY (2-3). Fundamentals of integrated circuit fabrication processes: crystal growth, thermal oxidation, dopant diffusion/implantation, thin film deposition/etching, and lithography. Introduction of process simulators such as SUPREM. Fabrication and characterization of resistors, MOS capacitors, junction diodes and MOSFET devices. Prerequisite: EE 4320, 4329, 5340 or 5341. $5 lab fee.

5344. GaAs INTEGRATED CIRCUIT FABRICATION TECHNOLOGY (3-0). Design and fabrication of gallium arsenide (GaAs) monolithic microwave integrated circuits (MMICs) for use in analog microwave applications. Review of RF/microwave circuit concepts as applied to MMIC design. GaAs device operation, fabrication and process techniques for MESFETs, HEMTs, HBTs and others. MMIC design based on commercial foundry processes. Prerequisite: EE 4339 or 4347, or consent of instructor.

5345. ELECTRONICS MANUFACTURING (3-0). Advanced study of electronic and semiconductor integrated circuit manufacturing. Process design, control, modeling, simulation, measurements, testing and diagnostics. Yield analysis, modeling and management. Product design for manufacturability, testing, quality and reliability. Prerequisite: EE 5343 or consent of instructor.

5346. MICROWAVE DEVICES (3-0). Device physics and applications of microwave semiconductor devices and vacuum tubes. Topics include operation, modeling and characterization of MESFETs and HEMTs, microwave diodes, and microwave vacuum tubes. Prerequisite: EE 4329 or 5340 or 5341 or consent of instructor.

5347. MICROWAVE CIRCUITS (3-0). Theory of microwave circuit design; techniques include use of Kuroda identities, Richard's transformation, and ABCD parameters; topics include design of couplers, transformers, filters, and resonators in coaxial lines, strip lines, and microstrip. Prerequisite: EE 4347, 5348/4339, or consent of instructor.

5348. RADIO-FREQUENCY CIRCUIT DESIGN (3-0). Design of lumped-element radio-frequency circuits operating at frequencies to 2 GHz. Impedance-matching, s-parameter design of amplifiers and oscillators, RF mixers. Other topics include noise theory (thermal and phase noise) and phase-locked loops. Prerequisite: EE 3304 or consent of instructor.

5349. TOPICS IN INTEGRATED CIRCUIT TECHNOLOGY (3-0). Formal instruction in selected topics in integrated circuit technology. May be repeated when topic changes.

6342. ADVANCED QUANTUM DEVICES (3-0). Advanced concepts in quantum theory of semiconductors. Epitaxial growth and characterization of heterostructures, quantum wells, and superlattices including strained layers; electronic and optical properties of these structures; electronic and optoelectronic devices based on quantum wells and superlattices. Prerequisite: EE 5340 or EE 5341 or consent of instructor.

6343. QUANTUM WELL LASERS (3-0). Introduction to semiconductor heterostructures and quantum wells. Quantum theory of optical processes and laser operation. Threshold, spectral, and dynamical behavior. Modern laser structures and technologies, including strained-layer and surface emitting lasers. Prerequisite: EE 5340 or EE 5341 or consent of instructor.

Signal Processing

5350. DIGITAL SIGNAL PROCESSING (3-0). Time and frequency domain analyses of linear time invariant systems. Stability analyses of causal and non-causal systems using the Z-transform. FIR digital filter design. Design of frequency selective IIR digital filters using frequency transformations and the bilinear transform. Prerequisite: EE 3317.

5351. ADVANCED DIGITAL SIGNAL PROCESSING (3-0). Discrete time systems, structures for discrete time systems, FIR filtering and convolution, and signal processing applications. Design of infinite and finite impulse response filters. Prerequisite: EE 5350 or consent of instructor.

5352. STATISTICAL SIGNAL PROCESSING (3-0). Estimation of autocorrelations and cross-correlations; estimation of power spectral densities using the DFT; AR modeling and Wiener filter design; Toeplitz recursion; maximum likelihood estimation and minimum mean square estimation. Prerequisites: EE 5350 and 5302.

5353. NEURAL NETWORKS (3-0). Introduction to feedforward and local neural networks. Training algorithms including back-propagation. Metrics for evaluation of neural network and conventional network performance. Applications in classification, estimation and forecasting. Prerequisite: EE 5350 or concurrent registration.

5355. DISCRETE TRANSFORMS AND THEIR APPLICATIONS (3-0). Principles and properties of discrete transforms such as discrete Fourier, discrete cosine, Walsh-Hadamard, slant, Haar, discrete sine, discrete Hartley, lapped and rapid transforms, and their applications in signal and image processing.

5356. DIGITAL IMAGE PROCESSING (3-0). Digital image processing as applied to image sampling and quantization, image perception, image enhancement, image restoration, image reconstruction from projections, and filtering and image coding. Prerequisite: EE 5350 or co-registration with 5351.

5357. NONLINEAR IMAGE PROCESSING (3-0). Analysis of order statistic and morphological filters. Deformation-invariant feature sets. Shape recognition using nonlinear classifiers. Prerequisites: EE 4318 and 5302 or 5352.

5358. DIGITAL PHOTOGRAMMETRY (3-0). Topics include image formation and sensing, overview of image processing, close and long range photogrammetric methods, sensor models and applications to target recognition, computer vision, visual systems, hardware-in-the-loop simulation, remote sensing, medical imaging, virtual reality and CAD. Prerequisite: Graduate standing in engineering.

5359. TOPICS IN SIGNAL PROCESSING (3-0). Formal instruction in selected topics in signal processing. May be repeated when topic changes.

6358. COMPUTER VISION (3-0). Advanced techniques for interpretation, analysis, and classification of digital images. Topics include methods for: segmentation, feature extraction, recognition, stereo vision, 3-D modeling, and analysis of time varying imagery. Also taught as CSE 6322. Prerequisite: EE 5356 or 5357 or CSE 6321.

Communications

5360. DATA COMMUNICATION ENGINEERING (3-0). Data communication network planning, design, and analysis. Topics include the OSI layered model, interface standards, signals and protocols, modem and LAN standards.

5362. DIGITAL COMMUNICATIONS (3-0). Fundamental principles underlying the transmission of digital data over noisy channels. Basics of source coding techniques including entropy coding, Huffman, Lempel-Ziv. Channel capacity. Spectral analysis of digital modulation techniques. Optimum receiver design and error probability performance of commonly used modulation schemes. Applications to lightwave and wireless systems. Prerequisites: EE 4330 and 5302.

5363. MODERN TELECOMMUNICATIONS (3-0). Basics of telecommunications and telephone networks. Switching and transmission systems. Circuit and packet switching. Call processing. Common channel signaling systems. Queuing theory and applications. OSI-layered reference architecture. ISDN. Prerequisite: EE 4330.

5364. INFORMATION THEORY AND CODING (3-0). Transmission of information over noisy channels, Shannon's coding theorems, techniques of coding and decoding for reliable transmission over noisy channels, error-detecting, and error-correcting codes. Prerequisite: EE 5302.

5365. FIBER OPTIC TRANSMISSION SYSTEMS (3-0). Propagation in optical fibers, characteristics and manufacture of fibers, semiconductor lightwave sources and detectors, optical transmitters and receivers, lightwave transmission systems for wide area and local area networks. Prerequisites: EE 4330 and 3305 or equivalent.

5366. COMMUNICATION SATELLITE SYSTEMS (3-0). Introduction of space communications, satellite orbits and their effect on communication system design. Atmospheric propagation effects. Communication link analysis, modulation, multiplexing, multiple access, encoding and forward error correction in satellite links. Design of communication satellites, earth station and their principal subsystems. Prerequisite: EE 4330.

5367. WIRELESS AND CELLULAR PROPAGATION (3-0). Fundamentals of VHF, UHF, and microwave propagation. Propagation over irregular terrain. Propagation in built up areas. Propagation modeling and prediction tools. Multipath phenomena. Signal statistics. Prerequisites: EE 5302 and 5306.

5368. WIRELESS COMMUNICATION SYSTEMS (3-0). Fundamental principles of radio system design and propagation. Basics of cellular systems, environment, propagation models, traffic models and spectral capacity. Multiple-access techniques including FDMA, TDMA, CDMA. Analog and digital modulation techniques used in wireless communication and problems with RF interference. Prerequisites: EE 4330 and 5302.

5369. TOPICS IN COMMUNICATIONS (3-0). Formal instruction in selected topics in communications. May be repeated when topic changes.

6361. NETWORK MODELING AND SIMULATION (3-0). Queueing network models, discrete event simulation, dynamic network models, application of network simulation software, analysis of network performance. Prerequisites: EE 5302 and 5360.

6362. ADVANCED DIGITAL COMMUNICATIONS (3-0). Digital communication systems design with intersymbol interference. Partial response signaling. Adaptive equalization. Viterbi decoding. Trellis coded modulation. Digital signaling on fading multi-path channels and wireless channels. Applications of error detecting and correction coding. Spread spectrum systems. Prerequisites: EE 5302 and 5362.

6363. SPREAD SPECTRUM COMMUNICATION (3-0). Direct-sequence spread spectrum systems utilizing pseudonoise (PN) generators. PN sequences and their properties. Maximal length codes, Gold codes. Code acquisition techniques. Phase-locked loops and their applications in carrier tracking and code tracking. Performance of spread spectrum systems in jamming environments. Prerequisite: EE 5362.

6364. ADVANCED DATA NETWORKS (3-0). Detailed analysis of data networks using advanced queueing theory. Other topics include multi-access networks, packet and circuit switched networks, routing algorithms and flow control. Prerequisites: EE 5302 and 5360.

6365. ADVANCED FIBER OPTICS SYSTEMS (3-0). Laser modulation, design of high speed optical transmitters and receivers. Coherent detection systems, fiber and semiconductor optical amplifiers. Photonic switching, future technologies. Prerequisite: EE 5365.

6367. ADVANCED WIRELESS COMMUNICATIONS (3-0). Performance analysis of cell systems with multipath propagation, diversity, equalization, smart antennas. Interference compensation and signal separation in multiuser systems. Micro-and-pico-cell design. Allocation of channels, hard and soft handoffs. Data transmission on mobile networks. Review of selected current and proposed systems. Prerequisite: EE 5368.

6368. SIMULATION OF COMMUNICATION SYSTEMS (3-0). Simulation methods of analysis of communications systems using customized commercial software and development of new software using C programming language. Analysis involving atmospheric point-to-point radio and cellular channels and fiber optic systems and modeling of their elements. Prerequisites: EE 5362 and 5368/5365, C and UNIX.

Energy Systems

5371. POWER SYSTEM TRANSMISSION I (3-0). The basic functions of a TransCo (transmission) Company are presented. Steady-state, power flow and voltage stability will be covered. The effects of reactive power on power system operation and planning are discussed. Graded A/B/C/D/P/F with permission of instructor.

5372. POWER SYSTEM TRANSMISSION II (3-0). Reliability and security issues of power transmission systems are presented. Transient stability and dynamic stability of power transmission systems. Graded A/B/C/D/P/F with permission of instructor.

5373. POWER SYSTEM GENERATION, OPERATION AND CONTROL (3-0). The fundamental operations of a GenCo (generation) Company are presented. Topics of load forecasting, power marketing, and power system operation and control are covered. Graded A/B/C/D/P/F with permission of instructor.

5374. POWER SYSTEM PROTECTIVE RELAYING (2-3). Fundamental understanding of symmetrical components, applications of symmetrical components in system protection, philosophy of power system protection, various protective relay systems, and the special considerations in applying the microprocessor based relays are covered. Experiments utilizing the Power System Simulation Laboratory are required. $25 course specific fee. Graded A/B/C/D/P/F with permission of instructor.

5375. POWER SYSTEM DISTRIBUTION (3-0). The basic functions of a DistCo (distribution) Company are presented. Load representation, distribution load flow and the philosophy of simulation for a distribution system are discussed in detail. Graded A/B/C/D/P/F with permission of instructor.

5376. POWER SYSTEM RELIABILITY IN PLANNING AND OPERATION (3-0). Loss of Load indices, Loss of Energy indices, Frequency and Duration methods, Interconnected Reliability methods, and Composite Generation and Transmission Reliability methods will be covered. Graded A/B/C/D/P/F with permission of instructor.

5377. INDUSTRIAL AUTOMATION (3-0). The application of Supervisory Control and Data Acquisition systems (SCADA), distributed computer control systems, Programmable Logic Controllers (PLC), transducers for industrial automation, and energy systems monitoring and control will be covered. Material covered is also applicable to various mechanical and civil engineering fields, thus enrollment of graduate engineering students from other disciplines is welcome. Experiments utilizing the Power System Simulation Laboratory are required. $25 course specific fee. Graded A/B/C/D/P/F with permission of instructor.

5378. POWER QUALITY (2-3). Principles of harmonics and filtering, source of voltage surges and surge protection, causes of voltage sags, flickers, and interruptions, and voltage supporting devices, and utility and end-user strategies for improving power quality are covered. Graded A/B/C/D/P/F with permission of instructor.

5379. TOPICS IN POWER SYSTEM ENGINEERING (3-0). Formal instruction in selected topics in power system engineering. May be repeated when topic changes. Graded A/B/C/D/P/F with permission of instructor.

Applied Physical Electronics

5380. PULSE ELECTRONICS (3-0). High voltage dc, ac, and pulsed power generation techniques and circuits. Topics include dc voltage multipliers, capacitive discharge circuits, Marx generators, pulse transformers, pulse forming networks, and transmission line pulsers.

5382. HIGH VOLTAGE ENGINEERING (3-0). Introduction to design, measurement and testing methods for high voltage systems. A study of electrical insulation materials and their properties, partial discharges and voltage breakdowns, electric field plotting methods, generation of high voltage test pulses, and high voltage measurement techniques. Prerequisite: consent of instructor.

5385. POWER ELECTRONICS ENGINEERING (3-0). Switched mode DC-DC converters, controlled rectifiers, commutated and resonant inverters. Also, performance evaluation of specific applications by means of state space analysis will be discussed. Prerequisite: consent of instructor.

5386. ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY (3-0). Analysis of electromagnetic interference (EMI) in electronic systems. Design of electronic systems to minimize noise, to minimize susceptibility, and to meet current and future electromagnetic compatibility (EMC) standards. Applications to computer, telecommunication, aerospace, entertainment, and military systems. Prerequisite: EE 3305 or equivalent.

Directed Studies in Electrical Engineering

5190. ELECTRICAL ENGINEERING GRADUATE SEMINAR (1-0). Topics vary from semester to semester. May be repeated for credit. Prerequisite: graduate standing or consent of the department. Graded P/F.

5191, 5391. ADVANCED STUDY IN ELECTRICAL ENGINEERING. Individual research projects in electrical engineering. Prior approval of the EE Graduate Advisor is required for enrollment. A written report is required. Graded P/F/R.

5392. PROJECT IN ELECTRICAL ENGINEERING. Individual research projects performed for fulfilling the requirements of the thesis substitute option. Prior approval of the EE graduate advisor is required for enrollment. A written and oral report is required. Graded P/F/R.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisite: graduate standing in electrical engineering.

6397, 6697, 6997. RESEARCH IN ELECTRICAL ENGINEERING. Individually approved research projects leading to a doctoral dissertation in the area of electrical engineering. Graded P/F/R.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

Department of Industrial and Manufacturing Systems Engineering

Area of Study and Degrees
Industrial Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis, Thesis Substitute and Non-Thesis

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Objective

The graduate program in industrial engineering is designed to provide the student with fundamental knowledge in the various areas of industrial engineering and with the opportunity to specialize in a particular area. A student pursuing a master's or doctoral degree may specialize in one of the following areas:

1. **General Industrial Engineering**—The design, analysis, and control of modern production systems.
2. **Human Factors**—The analysis of the physiological and behavioral characteristics of humans in the industrial environment.
3. **Operations Research and Systems Analysis**—Formulation and analysis of quantitative models of engineering and management problems, and their application to complex integrated systems.
4. **Quality Engineering and Applied Statistics**—The design and implementation of quality assurance plays and procedures for modern manufacturing.
5. **Manufacturing Systems**—The design and analysis of automated and computer integrated manufacturing systems.

In addition, special programs of study may be arranged.

Admission

Applicants for the master's degree who hold a baccalaureate degree in engineering must meet the general requirements of the Graduate School as stated under the section entitled "Admission Requirements and Procedures." Applicants not meeting all criteria will be admitted on provisional or probationary basis only under exceptional circumstances.

For applicants with no prior training in engineering, the same minimum criteria will apply, and, in addition, their records will be reviewed in relation to the intended program of study and specific remedial work may be required.

The acceptance of applicants who have already received a master's degree in engineering will be based on the above-mentioned minimum criteria and results of graduate work.

Continuation

The Industrial Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified professional engineers, has established certain policies and procedures. In addition to requirements of the Graduate School listed elsewhere, to continue in the program each industrial engineering graduate student must:

1. Maintain at least a B (3.0) overall GPA in all coursework, and
2. Demonstrate suitability for professional engineering practice.

At such time as questions are raised by industrial engineering graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in Industrial Engineering. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

Degree Requirements

Students with degrees in other engineering disciplines may qualify for graduate study in industrial engineering after the completion of prescribed deficiency courses. Entering graduate students who are not proficient in engineering economy, probability and statistics, operations research, or industrial engineering design and analysis may be required to take deficiency courses to provide an appropriate background for graduate study in industrial engineering. For applicants with no prior training in engineering, the same deficiency courses will apply, and, in addition, courses in mathematics, physics, computer science, and engineering science may be required depending on the applicant's background.

Each graduate student will be required to take four courses as part of an industrial engineering core curriculum. The rest of the student's program will be elective, subject to the approval of the student's supervisory committee. The core curriculum is as follows:

1. Three hours of coursework in probability and statistics approved by the Graduate Advisor.
2. Three hours of coursework in operations research approved by the Graduate Advisor.
3. Three hours of coursework in human factors approved by the Graduate Advisor.
4. Three hours of industrial engineering design approved by the Graduate Advisor.

A final examination covering the coursework is required for each master's candidate. In the option involving a thesis, this final examination will be oral and will also cover the thesis. The final examination involved in the other two options will be written and/or oral.

Master of Science

The Master of Science Degree is a research-oriented program which consists of a thesis option, thesis-substitute option, and a non-thesis option.

Master of Engineering

The Master of Engineering Degree is an engineering practice-oriented program. The degree is a 36 credit-hour program in which a maximum of six credit hours may be earned by an acceptable design project report, internship, or additional coursework. Applicants for this degree must have a baccalaureate degree in an engineering discipline.

General degree requirements for the Master of Engineering are given under the catalog section entitled "Advanced Degrees and Requirements."

Doctor of Philosophy

The Ph.D. degree should normally require four years of full-time study or less after completion of the BS degree. There is no foreign language requirement for the Ph.D. degree.

The Ph.D. requirements are listed in the catalog section entitled "Advanced Degrees and Requirements." A student's program will consist of coursework, independent study, and a dissertation in fields pertinent to the student's areas of interest. The program for each student will be planned by the student and a committee of faculty members. Students with undergraduate degrees in fields other than engineering will be required to take the necessary courses to establish a background in science, mathematics, and the engineering courses equivalent to that required in the undergraduate programs.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Industrial Engineering (IE)

5300. TOPICS IN INDUSTRIAL ENGINEERING (3-0). A study of selected topics in industrial engineering. May be repeated when topics vary. Prerequisite: consent of instructor and Graduate Advisor.

5301. ADVANCED OPERATIONS RESEARCH (3-0). Advanced techniques in operation research. Identification of current research areas. Prerequisite: IE 5323 or equivalent.

5303. TOPICS IN QUALITY CONTROL (3-0). Principles and practices of industrial quality control. Includes the theory of statistical sampling and control. Prerequisite: IE 5317 or equivalent.

5304. ENGINEERING ECONOMY II (3-0). Probabilistic cash flow models and the use of simulation for the evaluation of capital investments. Prerequisites: IE 5316 and 5317 or equivalent.

5305. LINEAR PROGRAMMING AND EXTENSIONS (3-0). Theory of linear programming including the simplex method, duality, sensitivity analysis, decomposition principles, the transportation problem, and integer programming. Prerequisite: IE 5323 or equivalent.

5306. DYNAMIC OPTIMIZATION (3-0). Multi-stage decision problems are characterized as dynamic programming problems. Numerical approximation schemes for dynamic programming problems are discussed. Solution of variational problems studied both from a classical and dynamic programming approach. Prerequisite: IE 5323 or equivalent.

5307. THEORY OF QUEUES (3-0). Theory of queues with particular emphasis on industrial applications. Prerequisite: IE 5317 and 5323 or equivalent.

5309. ANALYSIS OF STOCHASTIC PROCESS (3-0). Background for probabilistic model building. Stationary and non-stationary processes, counting processes, renewal theory. Markov chains, and random walk. Prerequisite: IE 5317 and 5323 or equivalent.

5310. PRODUCTION SYSTEMS DESIGN (3-0). Problems and methods of systems design will be made. Particular emphasis is given to the construction of models representing the system, their optimization, and the presentation of results. Prerequisite: IE 5344 and 5323 or equivalent.

5311. STATISTICAL METHODS FOR INDUSTRIAL DECISION (3-0). Statistical decision theory with applications. Prerequisite: IE 5317 or equivalent.

5312. ADVANCED PRODUCTION AND INVENTORY CONTROL SYSTEMS (3-0). Continuation of the undergraduate course. Emphasis on mathematical model building and optimization. Prerequisite: IE 5323 or equivalent.

5313. RELIABILITY AND ADVANCED QUALITY CONTROL TOPICS (3-0). Includes advanced quantitative topics in reliability design and quality control. Management of reliability and quality control functions are also included. Prerequisite: IE 4308 or 5303.

5314. SAFETY ENGINEERING (3-0). A study of safety engineering as it relates to hazard identification, accident investigation, and prevention. Prerequisite: graduate standing.

5318. ENGINEERING STATISTICS II (3-0). Multivariate normal distribution and related functions---Chi-square, t, and F; a matrix approach to regression analysis and analysis of variance; a survey of nonparametric statistical techniques. Prerequisite: IE 3301.

5319. ADVANCED STATISTICAL PROCESS CONTROL AND TIME SERIES ANALYSIS (3-0). Design of control schemes for statistical monitoring and control of modern manufacturing systems. Topics include effect of autocorrelization on SPC charts. Time Series approaches to controlling autocorrelated data, Optimal controllers and Recursive estimation. Prerequisite: IE 5303 or equivalent.

5320. ENTERPRISE ENGINEERING METHODS (3-0). A survey of enterprise engineering methods. Topics include a system development methodology, a discussion of enterprise architectures, activity modeling (IDEFO), business modeling (IDEFIX), activity based performance analysis, simulation, and process improvement. Prerequisite: graduate standing.

5321. ENTERPRISE ANALYSIS AND DESIGN (3-0). An in-depth study of techniques useful for the analysis and design of the manufacturing enterprise. This course presents an advanced process description technique which is used, with simulation and activity based costing, to facilitate analysis and design. Prerequisite: IE 5320.

5322. SIMULATION AND OPTIMIZATION (3-0). Survey and applications of computer languages suitable for Monte Carlo simulation of random processes. Optimization and search techniques of functions introduced. Prerequisites: IE 5317 and consent of instructor.

5326. BIOMECHANICS (3-0). Fundamentals and objectives of biomechanics. Discussion will concern anthropometry, link system of the body, kinematic aspects of extremity joints, biomechanical aspects of injury and prosthesis.

5329. MODELING AND CONTROL OF INDUSTRIAL SYSTEMS (3-0). Study and design of mathematical models for the effective control of industrial systems. Prerequisite: IE 5318.

5330. INDUSTRIAL AUTOMATION (3-0). The design, control, and specification of automated production processes for manufacturing. Topics include numerical control, robotics, group technology, just-in-time, automated inspection, and flexible manufacturing systems. Prerequisite: graduate standing.

5331. ERGONOMICS (3-0). Relationships of humans with their work environment. Physiological and anatomical characteristics of people. Considerations of fatigue, accidents, and other human problems in industry. Prerequisite: IE 4344 or 5345.

5332. NONLINEAR PROGRAMMING (3-0). Optimization theory for unconstrained, equality constrained, and inequality constrained problems is first developed. Specific techniques then studied. Convex programming, geometric programming, quadratic programming, and optimum seeking methods presented. Prerequisite: IE 5305.

5339. CONCURRENT ENGINEERING, PRODUCIBILITY, AND RELIABILITY (3-0). Concurrent engineering techniques for developing products to insure producibility and reliability; product simplification, thermal analysis, testability, technical risk analysis, design for manufacture and quality. Prerequisite: graduate standing.

5342. JOB DESIGN AND STANDARDIZATION (2-3). A study of work measurement and methods improvement. The course includes a survey of several measurement methods including computerized methods as well as the development of standard data, formulas and tables. The use of standard data in contemporary manufacturing will be introduced. Prerequisite: IE 3343 or equivalent. $2 lab fee.

5343. ENVIRONMENTAL BIOTECHNOLOGY (2-3). Physical, physiological, and psychological aspects of interaction between humans and thermal, atmospheric, radiant, and mechanical agents and energies in the environment. Biological and physical requirements for engineering design and control of the environment; applications to design of complex systems. Prerequisite: IE 4344 or 5345. $2 lab fee.

5345. HUMAN ENGINEERING (2-3). Background in industrial human factors engineering. Emphasis placed on study of human structural, physiological, and psychological limitations and their effects on design of work systems. Prerequisites: IE 5344 or consent of the instructor and IE 5318. $2 lab fee.

5349. INDUSTRIAL ROBOT APPLICATIONS (2-3). A study of the requirements and selection criteria for the integration of robots into simple and complex industrial activities. Prerequisite: IE 5330 or equivalent. $2 lab fee.

5191, 5291, 5391. ADVANCED STUDIES IN INDUSTRIAL ENGINEERING. Individually approved research projects selected from the various branches of industrial engineering. Work performed as a thesis substitute normally will be accomplished under IE 5391, with prior approval of the Industrial Engineering Committee on Graduate Studies. Graded R.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisite: graduate standing in industrial engineering.

6197-6997. RESEARCH IN INDUSTRIAL ENGINEERING. Supervised research projects directed toward the dissertation. Prerequisites: graduate standing in industrial engineering and approval of advisor. Graded P/F/R.

6301. ENTERPRISE ARCHITECTURES AND FRAMEWORKS (3-0). A survey of enterprise architectures and analysis frameworks that have been proposed for the integration of large complex enterprise systems. Emphasis is placed on state-of-the-art approaches. Prerequisite: IE 5320.

6302. MANUFACTURING FACILITIES PLANNING (3-0). Advanced techniques for the selection, location, and integration of manufacturing equipment and facilities for developing or expanding manufacturing organizations; significant design project required. Prerequisites: IE 5323, 5329, and 5344 or consent of the instructor.

6303. COMBINATORIAL ANALYSIS (3-0). The study of the discrete combinatorial methods including the formulation and solution of recurrence relations. Applications in computer science, graph theory and probability are presented.

6305. ENGINEERING MANAGEMENT (3-0). The engineering function as it relates to managing productive processes through the use of organization and management theory. Prerequisite: graduate standing.

6308. DESIGN OF EXPERIMENTS FOR QUALITY (3-0). Statistical designs are studied for industrial process and product improvement. Fractional factorial, central composite, and customized designs are included. Prerequisite: IE 5318 or consent of instructor.

6309. RESPONSE SURFACE METHODOLOGY (3-0). Empirical model building and process optimization using experimental design. Topics include first and second order models and designs, multiresponse experiments and mixture experiments. Prerequisite: IE 6308.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

A limited number of undergraduate courses may be applicable toward the graduate program if approved in advance by the Graduate Advisor.

Department of Mechanical and Aerospace Engineering

Area of Study and Degrees
Mechanical Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis (M.S.) and Non-Thesis (M.Engr.)

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Professors
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Associate Professors
Aswath, Lu, Tong, You

Assistant Professors
Harris, Kim, Musielak, Shiakolas

President Emeritus and Professor Emeritus
Woolf

Professors Emeritus
Barker, Wiseman

Objective

The graduate program provides opportunities for professional development in such forms as: instructional courses to enhance technical competence in areas of mechanical engineering practice; training through a variety of experiences in design, development, research, experimentation, and/or analysis in joint efforts with faculty and peers; specialized courses of study required for entry into career fields allied to the mechanical engineering discipline; guided individual study under faculty supervision; and supportive coursework for programs leading to careers that require interdisciplinary competence.

A student with aid from a faculty advisor plans a program which will be consistent with his or her technical interests and the available facilities and course offerings. Typically, programs are classified as:

1. Automatic Control and Systems
2. Design
3. Fluid Mechanics
4. Heat Transfer
5. Manufacturing Processes
6. Solid Mechanics and Dynamics
7. Thermodynamics

Admission Requirements

Applicants for the Master's degree who hold a baccalaureate degree in engineering must meet the general requirements of the Graduate School as stated in the section entitled "Admission Requirements and Procedures." Applicants not meeting all criteria will be admitted on provisional or probationary basis only under exceptional circumstances.

For applicants with no prior training in engineering, the same minimum criteria will apply and, in addition, their records will be reviewed in relation to the intended program of study. Probationary status with specific remedial work required may be a basis for acceptance of such applicants.

The acceptance of applicants who have already received a master's degree in engineering will be based on the above-mentioned minimum criteria and results of graduate work, including the master's thesis.

Continuation

The Mechanical Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified professional engineers, has established certain policies and procedures. In addition to the requirements of the Graduate School listed elsewhere, to continue in the program each mechanical engineering graduate student must:

1. Maintain at least a B (3.0) overall GPA in all coursework, and
2. Demonstrate suitability for professional engineering practice.

At such time as questions are raised by mechanical engineering graduate faculty regarding either of the above, the student will be notified and will be provided the opportunity to respond to the Committee on Graduate Studies in Mechanical Engineering. The Committee on Graduate Studies will review the student's performance

and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other than Grades."

Degree Requirements

The following coursework is required of all MS and MEngr candidates in Mechanical Engineering

1. CORE COURSES: One course in three of the following areas (Nine credit hours):
   Thermal Sciences: ME 5317 Convection Heat Transfer, or ME 5321 Advanced Classical Thermodynamics, or ME 5316 Thermal Conduction, or ME 5318 Radiative Heat Transfer
   Fluid Science: ME 5313 Fluid Dynamics, or ME 5342 Advanced Gas Dynamics I, or ME 5344 Viscous Flows, or AE 5305 Laminar Boundary Layers
   Design, Mechanics and Manufacturing: ME 5339 Structural Aspects of Design, or ME 5310 Structural Statics, or ME 6314 Mechanisms, or ME 5337 Introduction to Robotics
   Controls and Systems: ME 5303 Classical Methods of Control Systems Analysis and Synthesis, or ME 5305 Dynamic Systems Modeling, or ME 5307 Modern Methods of Control System Analysis and Synthesis, or ME 5341 Control Systems Components.
2. ANALYSIS COURSES: Two courses (six credit hours) in Engineering Analysis (ME 5331 and ME 5332 or approved mathematics courses).

Master of Science in Mechanical Engineering

The Master of Science degree is a research-oriented program in which completion of a thesis is mandatory. A minimum of 30 credit hours is required as follows: four core courses and two courses from the engineering analysis or mathematics general degree requirements listed above; three courses (nine credit hours) related to a specialty in mechanical engineering; and six credit hours of thesis. The student must enroll in ME 5398 or ME 6397 every semester in which the student is actively involved in thesis preparation or research, except that the student must enroll in ME 5698 in the semester of graduation.

Master of Engineering in Mechanical Engineering

The Master of Engineering degree is an engineering practice-oriented program. A minimum of 36 credit hours is required as follows: three core courses and two engineering analysis or approved math courses from the general degree requirements list above; six courses (18 credit hours) of elective courses in engineering, mathematics, and/or science relating to the student's interest areas. The elective courses may include as many as six hours of special project courses (ME 5391).

Manufacturing Engineering Option

Students desiring a program in manufacturing engineering may achieve this goal while meeting the requirements for a graduate degree in mechanical engineering. This is accomplished by selecting a specific program of courses. Upon completion, the student receives a Manufacturing Engineer's Certificate along with the MSME or MEME. Specifics are available in the Mechanical Engineering office.

Doctor of Philosophy

The Ph.D. degree should normally require four years of full-time study after completion of the BS degree. There is no foreign language requirement for the Ph.D. degree.

To meet the educational goal of a broad-based technical background in mechanical engineering, it is expected that each student will take sufficient coursework to obtain in-depth knowledge in at least two areas of mechanical engineering. Consequently, the Department expects all Ph.D. candidates to complete at least the following minimum requirements:

1. Three core courses (nine credit hours) listed for the MS and MEngr degrees.
2. One additional course (three credit hours) at the graduate level in one of the broad areas of mechanical engineering outside the student's major area of specialization. Core courses are also acceptable for meeting this requirement.
3. Six additional courses (18 credit hours) in the student's major area of interest.
4. Two courses (six credit hours) of engineering analysis (ME 5331, 5332, or other approved graduate level course).
5. Two courses (six credit hours) of mathematics, numerical analysis, computer science, or statistics, outside of mechanical engineering.
6. Two courses (six credit hours) in science and/or engineering outside of mechanical engineering.
7. Nine credit hours (ME 6999) for Dissertation.

Final course requirements are determined by the student's supervising committee. The student must submit the Application for Candidacy and Final Program of Work to the Mechanical Engineering Committee on Graduate Studies immediately after completion of the comprehensive examination. Courses taken for the MS degree at this institution or another institution may be used to meet these requirements; however, courses listed for the MS degree or any other degree cannot be listed as the actual course requirement on the Final Program of Work.

A diagnostic examination will be administered to the student within the first two semesters after an MS degree or before the first 39 hours have been taken beyond the BS degree. The diagnostic examination tests for fundamental knowledge at the undergraduate level in four areas of mechanical engineering (thermodynamics and heat transfer, fluid mechanics, design and mechanics, dynamic systems and control) and mathematics. The mathematics portion of the exam will be at the level covered in ME 5331 and 5332. The diagnostic examination for Ph.D. students is offered the first month of the Fall and Spring Semesters.

A comprehensive examination will be administered to the student after the successful completion of all phases of the diagnostic examination and before the student starts research work for the dissertation. The comprehensive examination is used to determine if the student has the necessary background and specialization required for the dissertation research and if the student can organize and conduct the research.

The student must enroll in at least three hours of dissertation course (ME 6399-6999) or research course (ME 6397-6999) every semester in which the student is actively involved in dissertation preparation or research, except that the student must enroll in ME 6999 in the semester of graduation.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Mechanical Engineering (ME)

5303. CLASSICAL METHODS OF CONTROL SYSTEMS ANALYSIS AND SYNTHESIS (3-0). Intended to equip the student with detailed familiarity with historically significant tools of the control engineer. Detailed discussion of block diagram algebra, the root locus, the Bode diagram, and state variable methods for simulation and control system design are presented.

5305. DYNAMIC SYSTEMS MODELING (3-0). To equip the student with the capability of determining the necessary equations to model a system of mixed physical types in an orderly, logical fashion. Lumped and distributed parameter modeling techniques formulated for computer simulation of mechanical, fluid, and thermal systems are presented.

5306. FLUID POWER CONTROL (3-0). Mathematical models for hydraulic and pneumatic control components and systems including hydraulic pumps, motors, and spool valves. The application of electrohydraulic and hydromechanical servomechanisms for position and velocity control are treated. Theory supported by laboratory demonstrations and experiments. Prerequisite: ME 4310 or ME 5303.

5307. LINEAR SYSTEMS ENGINEERING (3-0). To equip the student with knowledge of systems applications of the state-space concept and real-time solution techniques. State-space formulations, reference trajectory, linearization, linear vector spaces, the state transition matrix and its properties; and controllability and observability concepts treated.

5308. MODERN CONTROL I (3-1). Introduces multivariable robust and optimal control design theory with emphasis on LQG, H2, H-infinity, QFT, and computer solutions using loop transfer recovery (LTR). Feedback fundamentals including limitations on performance, Bode's integral theorem, and generalizations of Nyquist Stability to multivariable systems are discussed in depth. Prerequisite: ME 5307 or equivalent.

5309. NONLINEAR (AI) CONTROL (3-1). Emphasizes artificial intelligence (AI) methods as applied to feedback control systems. Fuzzy Logic and Neural Net based controllers with structures that yield nonlinear robust and adaptive controllers are studied. Prerequisite: ME 5308 or consent of instructor.

5310. FINITE ELEMENT METHODS (3-0). Finite element method in the study of the static response of complex structures and of continua; applications to field problems; analytical methods emphasized, and digital computer application undertaken. Also offered as EM 5317.

5311. STRUCTURAL DYNAMICS (3-0). Natural frequencies; forced and random response of complex structural systems studied through the use of the finite element method; computational aspects of these problems discussed, and digital computer applications undertaken. Also offered as EM 5318.

5312. CONTINUUM MECHANICS (3-0). Study of the underlying physical and mathematical principles relating to the behavior of continuous media; interrelationships between fluid and solid mechanics. Also offered as EM 5332.

5313. FLUID DYNAMICS (3-0). Basic conversation laws, flow kinematics, special forms of the governing equations, two-dimensional potential flows, surface waves and some exact solutions of viscous incompressible flows.

5314. FRACTURE MECHANICS IN STRUCTURAL DESIGN (3-0). Linear elastic fracture mechanics, general yielding fracture mechanics, damage tolerance and durability design, fail safe and safe life design criteria, analysis of fatigue crack growth, residual strength analysis.

5316. THERMAL CONDUCTION (3-0). Fundamental laws, initial and boundary conditions, basic equations for isotropic and anisotropic media, related physical problems and steady and transient temperature distributions in solid structures.

5317. CONVECTION HEAT TRANSFER (3-0). Equations of motion of viscous fluids are reviewed and the energy equations are introduced. Exact and approximate solutions are made for forced convective problems with non-isothermal and unsteady boundaries. Free convection and combined free- and forced-convection problems are solved.

5318. RADIATIVE HEAT TRANSFER (3-0). General equations of radiative transfer derived and solved for special problems, and the elements of atomic, molecular and continuum radiation are introduced.

5319. ADVANCED FINITE ELEMENT METHODS (3-0). Continuation of ME 5310. Modeling of large systems, composite and incompressible materials, substructuring, mesh generation, solids applications. Prerequisite: ME 5310 or equivalent.

5321. ADVANCED CLASSICAL THERMODYNAMICS (3-0). Fundamentals of thermodynamics reviewed. Different treatments of principles studied, compared and formal relationships developed and applied to chemical, magnetic, electric and elastic systems.

5322. ADVANCED STRUCTURAL DYNAMICS (3-0). Normal mode method for undamped and proportionally damped systems, component mode synthesis, generally damped systems, complex modes, effect of design modification on system response. Prerequisite: ME 5311 or equivalent.

5325. COMBUSTION (3-0). Fundamental treatment of problems involving simultaneous occurrence of chemical reaction and transfer of heat, mass and momentum. Topics include kinetically controlled combustion phenomena; diffusion flames in liquid fuel combustion; combustion of solids; combustion of gaseous fuel jets; flames in premixed gases. Also offered as AE 5325. Credit may not be received for both courses.

5329. COMPUTER CONTROL OF MANUFACTURING SYSTEMS (3-0). Fundamentals in NC and CNC for machine tools; motion control, interpolation techniques and programming; industrial robot concepts, control, programming and application; shop floor communication; programmable controllers.

5330. MECHATRONICS (3-0). Analog and digital circuits in mechanical systems; electrical-mechanical interfacing; analysis and application of computerized machinery; motor, actuator and mechanical component selection; position, velocity and force measurement; performance prediction and testing techniques.

5331. ANALYTIC METHODS IN ENGINEERING (3-0). Introduction to advanced analytic methods in engineering. Methods include multivariable calculus and field theory, Fourier series, Fourier and Laplace Transforms. Prerequisite: undergraduate degree in engineering, physics, or mathematics.

5332. ENGINEERING ANALYSIS (3-0). Introduction to partial differential equations and complex variable theory with application to modeling of physical systems. Prerequisite: undergraduate degree in engineering, physics, or mathematics.

5333. MICROPROCESSORS AND APPLICATIONS (3-0). Microprocessor and microcomputer based systems for applications in mechanical engineering are studied. Programming, interfacing, and applications design are included.

5334. APPLICATION OF THEORY OF STATISTICS AND PROBABILITY TO MECHANICAL ENGINEERING SYSTEMS (3-0). Fundamentals of probability theory and statistics as related to conventional mechanical engineering problems. These principles applied to problems in random vibrations and in the behavior of dynamic systems due to random disturbances and conditions.

5335. AUTONOMOUS VEHICLE DESIGN (3-0). Survey of system integration issues related to design and implementation of controllers and other sub-systems for semi- and fully-automated mobile robotics. Topics from low-cost sensor integration to high-level mission planning are covered via original design/implementation projects completed by students.

5337. INTRODUCTION TO ROBOTICS (3-0). An overview of industrial robots. Coordinate systems and homogeneous transformations, kinematics of manipulators; motion characteristics and trajectories; dynamics and control of manipulators. Demonstration of robot programming using an industrial robot.

5339. STRUCTURAL ASPECTS OF DESIGN (3-0). Emphasis on determination of stresses and prediction of failure in machine and structural components; stress-strain relations in elastic and plastic regions; static failure and failure criteria; residual stress and strain due to yielding; contact stress; notched sensitivity; strain-fatigue life relationship; characteristics of crack in structural components; creep and creep rupture.

5340. AUTOMOTIVE ENGINEERING (2-2). Analysis and design of automotive systems including power train, suspension, frame and chassis, braking systems, and control systems. Emphasis on racing applications and performance. Lectures are augmented with hands-on experience.

5341. CONTROL SYSTEM COMPONENTS (3-0). The components and hardware used in electronic, hydraulic, and pneumatic control systems; techniques of amplification, computation, compensation, actuation, and sensing; modeling of multiport systems as well as servo systems analysis. Prerequisite: ME 4310 or ME 5303.

5342. GASDYNAMICS (3-0). Review of fundamental compressible flow theory, method of characteristics for perfect gases, the Rankine-Hugoniot conditions, linearized flow theory. Also offered as AE 5342.

5343. TWO-PHASE FLOW AND BOILING HEAT TRANSFER (3-0). This is to introduce significant progress in phase change heat transfer and two-phase flow. Boiling heat transfer will be followed by the study of pressure drop and heat transfer in the pipes of two-phase flow. Boiling heat transfer includes pool boiling, forced convection boiling, and critical heat flux. Also selected topics by the instructor (heat pipe, condensation, Helmholtz wave instability, etc.)

5344. VISCOUS FLOWS (3-0). Navier-Stokes equations and Prandtl's boundary layer approximations; laminar and turbulent boundary layers including internal and external flows.

5345. NUMERICAL HEAT TRANSFER (3-1). Discussion of numerical methods for conduction and convection heat transfer problems includes introduction to various computational techniques suitable for digital computers. Finite difference method is emphasized.

5346. COOLING OF ELECTRONIC PACKAGES (3-0). This course deals with the development and application of analytical models of thermal phenomena occurring in electronic equipment. The calculation of heat loads and temperature fields using different cooling techniques. Includes parameter evaluation and design studies. Prerequisite: ME 3311.

5347. HEAT EXCHANGER DESIGN (3-0). Design procedures, system evaluations and design parameters in heat exchangers. Heat exchanger configurations; student design projects. Prerequisite: ME 3302.

5348. FUNDAMENTALS OF COMPOSITES (3-0). Fundamental mechanics concepts of fiber-reinforced composites; relationships between the properties of the constituents and those of the unit composite ply; lamina and laminate anisotropic behavior; structural characteristics of A, B, and D matrices; lamination theory; strength criteria; hygrothermal analysis; interlaminar stress analysis. Also offered as MSE 5348 or AE 5315.

5349. APPLIED COMPOSITES (3-0). Review of current state-of-the-art applications of composites; structural properties including section property; laminate sizing in preliminary design; notched sensitivity; delamination; fatigue characteristics; composite material testing; characteristics of composite joints. Also, offered as MSE 5349. Prerequisite: ME 5348 or MSE 5348.

5390. SPECIAL TOPICS IN MECHANICAL ENGINEERING (3-0). Seminar to provide formal instruction in special topics pertinent from semester to semester depending on the availability of faculty. May be repeated provided topics differ.

5191, 5291, 5391. ADVANCED STUDIES IN MECHANICAL ENGINEERING. May be repeated for credit as topics change. Work performed as a thesis substitute will normally be accomplished under this course number, with prior approval of the Committee on Graduate Studies. Graded P/F.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: graduate standing in mechanical engineering.

6314. MECHANISMS (3-0). Rational design of linkages to satisfy various design requirements. Two- and three-dimensional motions considered. Computer-aided mechanism design used as a tool.

6337. COMPUTER AIDED DESIGN (3-0). Role of graphics; image representation, batch and interactive computing, methods of automated mathematical model generation, mainframe and microcomputing in engineering design. Application in mechanical, structural, thermal, controls areas of mechanical engineering.

6344. HEAT TRANSFER IN TURBULENT FLOW (3-0). Introduction to heat transfer in turbulent boundary layers including internal and external flows, turbulence structure, the Reynolds analogy, van Driest hypothesis, high and low Prandlt number two equation model, effects of surface roughness on heat transfer.

6197-6997. RESEARCH IN MECHANICAL ENGINEERING. May be repeated for credit. Graded P/F/R.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

The College of Liberal Arts

Interim Dean: Ruth V. Gross, Ph.D.
210 University Hall • Box 19617 • 817-272-3291

Mission and Philosophy

The mission of the College of Liberal Arts is to provide a learning community wherein students are provided both broad-based and specialized education and to vitalize the educational process by creating and transmitting knowledge through research, scholarship and creative activity.

The college is characterized by a diversity of intellectual styles and interests. Departments and programs cluster into social sciences, humanities and fine arts. Liberal Arts disciplines address the rich meanings of human experience and expression and liberate the imagination by producing knowledge and creating beauty.

The faculty and administration of the college address the traditional objectives of liberal arts in the University: 1) to develop the tools for analysis, appreciation and communication; for written and oral expression; for comprehension, interpretation, and analysis of textual material; for analytic reasoning and scientific method; and for appreciation of aesthetic experience; 2) to prepare students for a range of careers in academia and public and private sector organizations. (Graduates of the college contribute to the region, the state and the nation as college and university professors, elementary and secondary teachers, legal professionals, in government agencies, social services, international business and industry, media and advertising, health and recreation, and cultural and entertainment industries); and 3) to promote understanding and critical evaluation of the cultural milieu—the attitudes and ideas that shape institutions and strategies in contemporary society.

Accomplishing these objectives culminates in students reaping the creative, utilitarian and life enriching benefits of a liberal arts education.

History and Overview

The University of Texas at Arlington College of Liberal Arts acquired its first graduate degrees in 1968, with the establishment of M.A. programs in English and history. Since that time, the number of M.A. programs offered has expanded to 13. In 1974, the college established its first Ph.D. level program, Humanities. The Humanities Program was reorganized in 1997 and replaced by three new Ph.D. level programs in English (Literature and Rhetoric/Composition tracks), history (transatlantic) and linguistics.*

*** The doctoral programs in English, history and linguistics are pending approval. If approved, they will become effective for fall 1998. Contact the appropriate Graduate Advisor for information.**

Scholastic Activity and Research Interests of the Faculty

The faculty in the College of Liberal Arts excel in their roles as educators, creative scholars and researchers. Two faculty members have won the Academy of Distinguished Teachers Award, and three faculty are Chancellor's Teaching Award recipients. Several faculty from a variety of departments in the college also have won the University Research Achievement Award. Numerous faculty have received recognition for their published scholarship, including Pulitzer Prize nominations and the *Choice* magazine Outstanding Academic Book Award.

Faculty scholarly and research activities cover a range of areas represented within the 13 disciplines in the college. History faculty research interests center on transatlantic broadly defined, and research specializations of faculty include southern, western and southwestern history, frontier development, women and gender, urban and labor and public history. English faculty research strengths lie in the areas of American, British and comparative literatures; and rhetoric, composition and criticism. Linguistics faculty specialize in field linguistics. Numerous faculty throughout the college also conduct research on gender and women's issues. Anthropology faculty members recently became the first foreign archaeological team to excavate in Albania in more than 50 years.

Special Programs and Opportunities

The College of Liberal Arts provides a number of special programs and opportunities for graduate students. College lecture series and seminars, conferences, publications, academic centers, library collections and an art gallery provide a mosaic of events and resources that enrich the university community.

Lecture Series, Seminars and Conferences:

- Each fall the English Department sponsors the Hermann Lecture series, which brings scholars from UTA and other universities together for discussions and master classes on an issue of general theoretical interest.
- The Exercise, Sport and Health Studies Department presents several lecture series and seminars semi-annually, including the Anderson Sports Performance Lecture Series, the American College of Sports Medicine Lectures, the Exercise Science Seminars (weekly), and Health Fitness Instructor Workshop and Certification.
- The History Department presents the Walter Prescott Webb Memorial Lectures each March. Nationally prominent speakers make presentations on an annual topic, followed by a dinner in the University Center and a keynote address.
- Graduate students in linguistics sponsor a Linguistics Conference each year. This conference provides an opportunity for students to begin their professional careers by organizing the sessions, reviewing paper abstracts and presenting their own research.
- The Women's Studies Program organizes an annual, month-long Women's History Month Lecture Series. Exhibits and film/video presentations also are included as part of the events scheduled during the month of April. The Women's Studies Brown Bag Colloquium is another forum for scholars, primarily UTA faculty, to share their research with the University community.

- The Criminal Justice and Criminology Program sponsors a Brown Bag Lecture Series every spring semester, and students have the opportunity to receive credit for practicums.
- The Arlington Humanities Colloquium, a graduate student conference devoted to theory and practice in the humanities, is held annually in the spring. The colloquium is entirely planned and funded by graduate students. It features well-known guest speakers and attracts graduate student presenters from around the nation.

Publications:

- The Program in Linguistics publishes "Working Papers in Linguistics" and the "SIL/UTA Publications in Linguistics Series" (published in conjunction with the Summer Institute of Linguistics). These publications provide an opportunity for professional linguists and graduate students to disseminate their research findings.
- The History Department publishes an annual volume comprised of Webb Lecture Series papers.
- Individual departments/programs publish newsletters which provide news and information about and for students, faculty and alumni.

Centers:

The College of Liberal Arts houses numerous centers designed to promote scholarship, research and teaching. These centers organize conferences, lecture series and workshops and provide a conduit for making faculty expertise available to the community. College of Liberal Arts centers are listed below and described in the Facilities for Advanced Studies and Research section of this catalog.

The Southwestern Studies Center
The Women and Minorities Research and Resource Center
The International Linguistics Center
The English Language Institute
The Center for Social Research
The Center for Research and Fieldwork in Anthropology
The Center for Post-Soviet and East European Studies
The Center for Criminal Justice Research and Training
The Language Acquisition Center

Other Resources:

- In support of the history M.A. and Ph.D. programs, the UTA Library Special Collections houses the Jenkins Garrett Library of Texana and Mexican War historical material and the Cartographic History Library. In addition, Special Collections has material on U.T. Arlington's history since 1895, the history of organized labor in Texas and the Southwest, and Yucatan and Honduran archival materials.
- CRCA: The Gallery at UTA presents a full program of major exhibitions in its 4,000-square-foot gallery, including lectures, symposia, screenings and publications. CRCA's program demonstrates the complementary roles of visual and verbal literacy.
- The Department of Foreign Languages has a Language Laboratory which produces innovative software in language learning.
- The Anthropology Program offers an archaeological field school every summer where students can gain academic credit for learning and applying archaeological field methods.
- Numerous student organizations exist on campus to provide students with the opportunity to interact with peers in their disciplines. These student groups include the Gorgias Society, an interdisciplinary organization of graduate students interested in the study of Rhetoric; Sigma Tau Delta, the International English Honor Society; and Alpha Kappa Delta, the Sociology Honor Society.
- Student awards, scholarships and teaching and research assistantships are available in many College of Liberal Arts departments and programs. Each spring the History Department awards an outstanding graduate student the Wolfskill Prize, a cash award and plaque representing superior attainment in history studies. The English Language Institute, a part of the Program in Linguistics, provides graduate teaching assistantships.

Programs

The College of Liberal Arts offers the following graduate degree programs:

Anthropology, M.A.
Criminology and Criminal Justice, M.A.
English, M.A., Ph.D.*
French, M.A.
German, M.A.
History, M.A., Ph.D.*
Humanities, M.A., M.A.T.
Linguistics, M.A., Ph.D.*
Political Science, M.A.
Sociology, M.A.
Spanish, M.A.

*** The doctoral programs in English, history and linguistics are pending approval. If approved, they will become effective for fall 1998. Contact the appropriate Graduate Advisor for information.**

Department of Art and Art History

Area of Study and Degrees
Humanities
M.A.
(See Program in Humanities)

Chair
Kenda North
335 Fine Arts, 817-272-2891

Graduate Faculty
Associate Professors
Spurlock, Wright

Assistant Professors
Vaccaro

Objective

The graduate course offerings in art history are provided to support other graduate degree programs, for example, an art history concentration in Humanities, and to meet the express needs of students. No program leading to a graduate degree in art or art history exists at this time.

The grade of R (research in progress) is a permanent grade. An incomplete (the grade of X) cannot be given in a course which is graded R. To receive credit for an R-graded course the student must continue to enroll in the course until a passing grade is received. Three-hour thesis and three-and six-hour dissertation courses are graded R/F only. The grade of P (required for graduation) can be received in six- or nine-hour thesis courses and nine-hour dissertation courses only. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." (See also the section entitled "R" GRADE in this catalog.)

Art History (ART)

5320. HISTORY OF ART CRITICISM (3-0). Survey of the sources of art history and its literature from classical antiquity to the modern period.
5330. SEMINAR IN SPECIAL TOPICS IN ART HISTORY AND CRITICISM. May be repeated for credit as the topic changes.
5391. INDEPENDENT STUDY (3-0). Independent research projects in art. Must be stated in writing and approved by supervising faculty and Graduate Advisor prior to registration. May be repeated for credit.

Objective

The graduate course offerings in communication are provided in support of other graduate programs and to meet the express needs of students. No program leading to a graduate degree in communication exists at this time.

Speech (SPCH)

5310. PERSUASION (3-0). A comparison of traditional with contemporary behavioral science theories of persuasive discourse and their supporting research.

5320. AMERICAN PUBLIC ADDRESS (3-0). Examination of significant public discourse throughout American history considering its intellectual merit and cultural influence on American life and character.

5330. FREEDOM OF EXPRESSION (3-0). Reading and analysis of legal, philosophical, and rhetorical works concerned with the First Amendment, especially as applied to communication in the 20th Century.

Journalism (JOUR)

5341. MEDIA ANALYSIS OF URBAN INDICATORS (3-0). Analysis of media information systems for reporting social, economic, demographic, political trends in urban environment; precision reporting through use of statistical indicators, survey methodology.

Department of Communication

Areas of Study and Degrees

Humanities
M.A.
(See Program in Humanities)
Urban Affairs
M.A.

Chair

Karin McCallum
118 Fine Arts, 817-272-2163

Graduate Faculty

Professors
Andresen, McCallum

Assistant Professors
Markham Shaw, Pennington, Woods

Program in Criminology and Criminal Justice

Area of Study and Degree
Criminology and Criminal Justice
M.A.

Master's Degree Plans
Thesis, Thesis Substitute and Non-Thesis

Program Director
Robert L. Bing III
362 University Hall, 817-272-3318

Graduate Advisor
Robert L. Bing III
362 University Hall, 817-272-3318

Graduate Faculty
Associate Professors
Bing, MacKenna

Assistant Professors
del Carmen, Polk

And others as appropriate
from the graduate faculties
of the departments of Sociology and
Political Science, and from the schools
of Social Work and Urban and Public Affairs

Objectives

The program leading to the MA degree in criminology and criminal justice is a multidisciplinary one which offers a comprehensive examination of the criminal justice system, an exploration of deviant behavior, a foundation in research and statistics, and an opportunity to explore other relevant topics of interest to the student.

It is designed for:

1. Pre-professional students who wish to pursue a career in some aspect of criminal justice, or in a related field, and to develop the perspectives and knowledge appropriate to doing so;
2. In-service professionals who wish to enhance and broaden their knowledge in this and related areas of study;
3. Students—pre-professional or in-service—who wish to pursue further relevant post-graduate studies, whether academic or professional.

To meet these objectives, and to develop a broadly-educated student, the program offers several options.

The coursework (non-thesis) option is generally recommended for students who do not intend to pursue doctoral-level studies. Pre-professional students may be expected to include the practicum in their course of study or, alternately, to select the thesis-substitute option. That option, too, requires an internship/practicum (professional or pre-professional work experience in an appropriate setting), but also requires a subsequent thesis-level internship report.

The thesis option is generally recommended for students wishing to pursue doctoral level studies. For those without professional experience in the field, however, the thesis-substitute may be a desirable alternative.

With the approval of the Graduate Advisor, students may also use their elective hours to concentrate on a particular field of study, such as sociology or political science, or on a multidisciplinary approach to a particular focus, such as administration or research.

Admission and Degree Requirements

The MA degree in criminology and criminal justice requires a minimum of 36 semester hours, regardless of the option selected, and includes 24 semester hours of required core coursework.

1. Core: CRCJ 5301, CRCJ 5307 or CRCJ 5350, CRCJ 5309, CRCJ 5319, CRCJ 5327, CRCJ 5332, and CRCJ 5380, plus any one of the following: SOCI 5303 or SOCI 5304 or SOCW 5322 or URBA 5360 or URBA 5362.
2. **Electives:** The number of semester hours available for electives ranges from a minimum of 6 to 12, depending on the option selected (thesis, thesis-substitute, coursework). Ordinarily, elective hours are taken in areas of particular interest to the individual student, with the advice and approval of the Graduate Advisor.

All candidates for the graduate degree must pass a final comprehensive examination, written, oral, or both written and oral. The scope, content, and form of this examination will be determined by the student's supervising committee.

The overall admission and degree requirements for the MA in criminology and criminal justice conform to those of the Graduate School as delineated elsewhere in this catalog and it is incumbent upon the applicant/student to be aware of, and to follow, the

procedures and regulations in the Graduate Catalog. More specific information regarding the graduate program in criminology and criminal justice is available from the program's Graduate Advisor.

Dual Degree Program

Students in criminology and criminal justice may participate in one of three dual degree programs whereby they can earn a Master of Arts in Criminology and Criminal Justice and 1) a Master of Science in Social Work, 2) a Master of Arts in Political Science, or 3) a Master of Public Administration. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs.

To participate in the dual degree program, students must be admitted to each program and must submit a separate Program of Work for each degree. Those interested in a dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement on Dual Degree Programs in the general information section of this catalog.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Criminology and Criminal Justice (CRCJ)

5301. THE ADMINISTRATION OF JUSTICE (3-0). Examination of administrative practices and procedures in criminal justice agencies/institutions. Emphasis on the administrative structure of various components of criminal justice system and on functioning and interrelationships of these units within the total criminal justice process. Students expected to select one area of administration for special study. Formerly CRJU 5315; credit will not be granted for both 5301 and 5315.

5307. DEVIANT BEHAVIOR (3-0). Examination of construct of deviance from historical and contemporary frames of reference. Attention is given both to diverse theoretical formulations and to applied aspects, particularly in dynamics of contemporary societal responses to deviancies including crime and delinquency.

5309. RESEARCH AND STATISTICS IN CRIMINAL JUSTICE (3-0). Examination of research methodology and statistical analysis. Special emphasis on methods and techniques for conducting research in criminal justice, including a review of problems encountered in sampling and survey research, field research, public policy implementation, and program evaluation.

5318. CRIMINAL JUSTICE PERSONNEL ADMINISTRATION (3-0). Personnel administration and management in criminal justice agencies and institutions; analyzes functions of recruitment, selection, hiring, placement, evaluation, dismissal, benefits systems, minority recruitment, training, education, promotion, career development, and retirement.

5319. ADVANCED LAW ENFORCEMENT PRINCIPLES AND PRACTICE (3-0). Analyzes the problems, practices, and philosophies of law enforcement in contemporary society. Students expected to give special attention to particular areas such as personnel selection, police-community relations, crisis intervention, patrol innovations.

5327. JUDICIAL AND CONSTITUTIONAL PROCESSES (3-0). Examination of the structure, functions, and operations of the courts, with special attention to contemporary constitutional issues and their impact on the criminal justice process.

5332. CORRECTIONAL THEORY AND PRACTICE (3-0). Examination of social, psychological, political, and historical bases of interventions in the control and disposition of offenders. Emphasis on contemporary policies, practices, and problems in institutional, semi-institutional, and community-based corrections.

5350. THEORETICAL CRIMINOLOGY (3-0). Explores the etiology of crime, theory development and crime causation. Emphasis is on theoretical perspectives and policy implementation.

5370. PRACTICUM (3-0). Professional or pre-professional experience in a criminal justice related agency or institution with the approval and direction of the student's supervising professor; intended for non-thesis option students who do not have professional experience related to criminal justice. Graded P/F/R.

5380. CRIMINAL JUSTICE SEMINAR (3-0). Synthesis course for advanced graduate students. Special emphasis on examination of constructs of crime/criminals, justice and systems. Requires individual research in area of particular concern to student. Graded P/F.

5393. TOPICS IN CRIME AND CRIMINOLOGY (3-0). May be repeated for credit as the topic changes.

5394. TOPICS IN JUSTICE ISSUES (3-0). May be repeated for credit as the topic changes.

5396. CONFERENCE COURSE IN CRIMINAL JUSTICE (3-0). Reading and research in a specialized area of criminal justice under the direction of a member of the graduate faculty. Graded P/F/R.

5397, 5697. INTERNSHIP/INTERNSHIP REPORT. Professional or pre-professional experience in relevant agency or institution with placement and work experiences approved and directed by student's supervising professor; intended for thesis-substitute students without related professional experience. Course credit requires writing internship report meeting standards of scholarship expected of traditional research theses. 5397 graded R/F only; 5697 graded P/F/R.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R.

Department of English

Areas of Study and Degrees
English
M.A.
Humanities
M.A., M.A.T.
(See Program in Humanities)

Master's Degree Plans
Thesis and Non-Thesis

Chair
Philip G. Cohen
203 Carlisle, 817-272-2692

Graduate Advisor
Timothy Morris
206 Carlisle, 817-272-2739

Graduate Faculty
Professors
Estes, Faris, Kellner, T. Porter, Roemer, Vitanza, Wood

Associate Professors
Barros, Cohen, Danahay, Frank, Lacy, Morris, L. Porter, Reddick, Smith, Turbeville

Assistant Professors
Alaimo, Kolko, Sudan

Objectives

The Department of English offers a wide variety of graduate courses to meet the needs of students with a diversity of interests and academic backgrounds who wish to enhance their awareness of their literary and cultural environment by additional formal instruction or to increase their professional competence.

The Master of Arts program in English is designed to enable students to learn about, critique, and work in teaching, scholarship, writing, or other fields which value a strong background in language, rhetoric, and the study of culture through texts.

Early in the program each student takes one core course. It serves as an introduction to theory as it is currently used in English scholarship. Another course, highly recommended, deals with the history and current state of the profession of English as an institution that produces knowledge.

Each student plans an individual program of coursework, with the help of the Graduate Advisor and the chair of the student's thesis or exam committee. This program draws on the department's varied courses, which offer students ways to study literature, rhetoric, and criticism, as well as methods of studying culture through texts and traditions of discourse.

The M.A. in English provides a strong grounding in scholarly methods and in theory, making it an ideal preparation for doctoral study in disciplinary or interdisciplinary programs. M.A. graduates in English pursue careers in journalism, educational administration and services, publishing, and many business fields that demand writing and communication skills. The M.A. in English is also useful for prospective or experienced teachers who want both to sharpen their ability to teach literature and writing, and to advance professionally.

SPECIAL NOTE: The English Department has applied for authorization to grant a Ph.D. The program, now pending approval, will have tracks in literature and rhetoric/composition. If approved, the English Ph.D. will begin in fall 1998. The literature track emphasizes the ability to analyze and interpret a wide range of literary texts in their historical and cultural contexts and by the study of literary theory and criticism. The rhetoric/composition track emphasizes the analysis of discourse, the history of rhetoric, and communication in both print and electronic environments. Students in either track will be able to take a limited number of courses from the other track and in other disciplines. For information on the status of the Ph.D. program in English, contact the Graduate Advisor.

Writing Sample

In addition to the admission requirements set by the Graduate School, the English Department requires all international students to have speaking, reading, and writing competence in English and all applicants to submit to the Graduate Advisor a sample of his/her best academic writing.

Degree Requirements

Master of Arts

The Master of Arts degree in English has thesis and non-thesis options. Under either the thesis or the non-thesis option, 5300 "Theory and Practice in English Studies" is required. It must be taken within a student's first 12 hours of study. Enrollment requires the approval of the Graduate Advisor in English.

The thesis option is a 30 hour program and requires 24 hours of coursework (a three hour core course and 21 hours of electives) and at least six hours of thesis. The degree culminates with the defense of thesis. A student who elects to write a thesis must select a topic in consultation with his/her thesis director. Before the student registers for thesis, a Thesis Committee (a director and two readers) must be established and the thesis prospectus must be approved by the Thesis Committee.

The non-thesis option requires a 36 hour program of coursework (a three hour core course and 33 hours of electives) and a comprehensive examination on coursework.

Under either thesis or non-thesis option, the coursework of the master's candidate must be approved in advance by the Graduate Advisor, who should be consulted on all problems related to the student's program. New students must consult with the Graduate Advisor to obtain additional program requirements and a copy of the English Graduate Student Handbook. Regular counseling sessions will be scheduled each year. Notification of specific time and place will be sent to all students who have been accepted into the graduate program.

Graduate standing is prerequisite for the courses listed below. Courses so designated may be repeated for credit as often as their subject matter changes. The titles are general descriptions. Students should consult the Department of English each semester for more specific information about the individual offerings.

Doctor of Philosophy

The Doctor of Philosophy degree in English is still pending approval. Please see the SPECIAL NOTE on p. 146, and contact the Graduate Advisor for more information.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

English (ENGL)

General

5300. THEORY AND PRACTICE IN ENGLISH STUDIES (3-0). Current issues in criticism, rhetoric, and literary studies, with emphasis on library and bibliographical resources as they are brought to bear on these issues. Previously listed as ENGL 5335. Credit may not be given for both ENGL 5300 and 5335. Enrollment requires the approval of the Graduate Advisor in English.

5302. THE PROFESSION OF ENGLISH STUDIES (3-0). Consideration of the structure of English studies, of the changes and conflicts within and among its constituent areas, and of the current situation of careers in the field. Recommended for students seeking a Ph.D. or entering careers in teaching and scholarship.

5391. GRADUATE READINGS IN LITERATURE (3-0). Supervised individual study at the M.A. level. May be repeated for credit when content changes. Prerequisite: permission of instructor and Graduate Advisor.

5398, 5698, 5998. THESIS. The graduate student must be registered for this course (a) when in consultation over the thesis with the supervisory committee, and (b) in the semester or term in which the Master of Arts degree will be conferred. Prerequisite: permission of Graduate Advisor in English at least 30 days before enrolling. 5398 graded R/F only; 5698 and 5998 graded P/F/R.

6391. GRADUATE READINGS IN LITERATURE (3-0). Supervised individual study at the Ph.D. level. May be repeated for credit when the content changes. Prerequisite: permission of instructor and Graduate Advisor.

American Literature

5320. SELECTED READINGS IN AMERICAN LITERATURE BEFORE 1800 (3-0). Designed to establish the diversity of our early literature. Includes Indian oral literature, travel accounts, Puritan writing, diaries, autobiography, poetry, drama and fiction. Cultural context stressed.

5321. AMERICAN LITERATURE FROM 1800 TO THE CIVIL WAR (3-0). Literature of the young republic and the American Renaissance.

5322. AMERICAN LITERATURE FROM THE CIVIL WAR TO 1910 (3-0). Literature which expresses in theme and form the evolving cultural consciousness of America.

5323. AMERICAN LITERATURE SINCE 1910 (3-0). Includes representative works of multiple authors selected for the study of modern and contemporary themes and methods.

5324. AMERICAN POETRY (3-0). Concentrates each semester on two or three major poets such as Taylor, Longfellow, Dickinson, Whitman, Frost, Stevens, Williams, Eliot, Pound, and Plath. Subject poets to be announced prior to registration.

5325. AMERICAN DRAMA (3-0). Representative American drama with an emphasis on the interaction of culture and dramatic structure.

5326. TOPICS IN AMERICAN LITERATURE BEFORE 1900 (3-0). May focus on one to three major writers or the process of canon formation or a significant theme or movement. May be repeated when content changes.

5327. TOPICS IN 20TH-CENTURY AMERICAN LITERATURE (3-0). May focus on one to three major writers or on the process of canon formation or a significant theme or movement. May be repeated when content changes.

6339. TOPICS IN AMERICAN LITERATURE (3-0). Themes or issues not bound by particular historical periods, for example, women writers, canon formation, American Indian literature, utopian literature. May be repeated when content changes.

British Literature

5301. MEDIEVAL ENGLISH LITERATURE (3-0). English literature of the period before 1500. May include Old English poetry, Anglo-Latin prose, William Langland, the alliterative revival, romances, Malory, and Chaucer.

5303. 17TH-CENTURY ENGLISH LITERATURE (3-0). Poetry and prose of the 17th Century. May include a study of Milton and/or a study of writers and motifs of the period.

5304. 18TH-CENTURY ENGLISH LITERATURE (3-0). May include an intensive study of the entire period or highly concentrated work in a particular genre or in one or more major authors.

5305. THE ROMANTIC PERIOD IN ENGLISH LITERATURE (3-0). Works of one or more of the major romantic poets supplemented by readings in the general literature and criticism of the period.

5306. VICTORIAN ENGLISH LITERATURE (3-0). Concepts and problems in texts by Victorian novelists, poets, and essayists (writers will vary). Attention to historical and cultural as well as literary issues.

5307. 20TH-CENTURY ENGLISH POETRY (3-0). Major poetry of this century. May vary from a concentration on specific writers to significant movements or themes.

5308. SHAKESPEARE (3-0). Representative works of Shakespeare. May vary from comprehensive readings in the dramatic literature to intensive examination of certain plays, or to other related topics.

5309. ENGLISH DRAMA (3-0). English drama, excluding Shakespeare, constituting both major playwrights and principal types of drama, in one of these periods: (1) Medieval and Tudor drama, from the beginnings to about 1590; (2) Elizabethan and Jacobean drama, 1590-1642; (3) Restoration and 18th Century drama, 1660-1800; (4) modern drama.

5310. ENGLISH FICTION (3-0). British fiction which may vary according to (1) historical periods, (2) a major figure or figures, (3) development of themes or types.

5313. 20TH-CENTURY BRITISH LITERATURE (3-0). A study of English and Irish writing in the 20th Century; may focus on major authors, themes, or topics.

6335. TOPICS IN ENGLISH LITERATURE (3-0). Studies of topics such as revolution, history, or nature as developed by selected writers from one or several chronological periods of English literature. May be repeated when content changes.

Comparative Literature

5342. TOPICS IN THE CLASSICAL INFLUENCE (3-0). Hellenic, Alexandrian, and Latin masterpieces that have influenced Western literature; may concentrate on the epic, on tragedy and comedy, on lyric poetry, on the romance, and on other literary genres such as satire; may also include literature's relationship to the other arts or to historical, philosophical, or sociological structures; emphasis on Greek and Roman mythology and the various theories of myth. May be repeated when content changes.

5345. COMPARATIVE LITERATURE OF THE 18TH CENTURY (3-0). The development of European literature during the century of literary ferment that sees the Age of Reason give way to the Age of Romanticism; early Romantics are contrasted to Enlightenment and Neoclassical writers; emphasizes, though not exclusively, the literatures of France, England, and Germany.

5346. COMPARATIVE LITERATURE OF THE 19TH CENTURY (3-0). Poetry and prose of this rich, contradictory era; may focus on major authors, genres, themes, topics, or literary movements such as Romanticism, Realism, Naturalism, Symbolism, and Decadence; may treat the relationships between literature, philosophy, science, politics, economics, technology, and the fine arts.

5347. COMPARATIVE LITERATURE OF THE 20TH CENTURY (3-0). Literature in a radically pluralist environment; may focus on literary movements, major genres, and the rupture of genres, critical, philosophical, and psychological schools, and the influence on literature of art, politics, science, technology and economics.

6329. TOPICS IN MAJOR THEMES IN COMPARATIVE LITERATURE (3-0). Themes such as "Literature and Revolution," "Psychoanalysis and Literature," "The Quest," "Alienation," or "The Initiation Experience," traced through the literatures of Western Europe, in order to illuminate cultural differences and similarities, to demonstrate intellectual, aesthetic, and social trends, and to provide a cohesive element in the formal examination of several genres; may be repeated when content changes.

6331. TOPICS IN MAJOR FIGURES IN COMPARATIVE LITERATURE (3-0). Writers whose work has strongly influenced individual writers and movements and had a significant and lasting effect on Western culture; may be repeated when content changes.

6333. TOPICS IN GENRE STUDY IN COMPARATIVE LITERATURE (3-0). Theory of literary forms or types and the conventions they embody or expectations they generate; may focus on epic, autobiography, satire, the lyric, the short story, the novel, etc.; may be repeated when content changes.

Criticism

5330. TOPICS IN CRITICISM (3-0). Studies in critical topics such as textual criticism, psychoanalytic criticism, philosophy and criticism, Renaissance poetics and literature, critical movements, or focus on a major theorist in criticism. May be repeated when content changes.

5340. CRITICAL THEORY: THE MAJOR TRADITIONAL TEXTS (3-0). A study of literary and cultural theory and practice from the Greco-Roman period to the early 20th Century. May include such theorists as Plato, Aristotle, Horace, Longinus, Dante, Sidney, B. Jonson, Dryden, Pope, Johnson, Coleridge, Arnold, Richards, Eliot, and others.

5360. TOPICS IN CONTEMPORARY CRITICAL THEORY (3-0). Study of contemporary theories of interpretation, concentrating on one or more schools of critical and cultural theory; may include, e.g., New Criticism, the Neo-Aristotelians, Marxist Critical Theory, hermeneutics, psychoanalysis, Russian Formalism, semiotics, speech-act theory, phenomenology, structuralism, and post-structuralism. May be repeated when content changes.

5380. TEXTUAL THEORIES OF CULTURE (3-0). Study of the interpretations of culture yielded by the traditions of semiotics and hermeneutics; may include works by the following: Lyotard, Foucault, Habermas, N.O. Brown, Derrida, Pierce, Barthes, Deleuze, Gadamer, Lévi-Strauss.

5390. RHETORICAL CRITICISM (3-0). The application of explicitly rhetorical theories to the analysis and evaluation of human discourse in rhetorical situations.

6340. METACRITICAL THEORY (3-0). A study of theories of literature from the point of view of their systems-theoretical character. Focuses on the writing of selected metatheorists such as Barbour, Braithwaite, Bruss, Harr, Lakotos, Popper, Rescher, and others, on questions of the genesis, nature, function, validity, and potential of literature theory.

6360. TOPICS IN FEMINIST CRITICISM (3-0). Studies of critical approaches, patterns of thought, and discourse practiced predominantly by women from the Graeco-Roman period through the 20th Century. Examination of relationships among gender, language, and discourse from theorists such as Hélène Cixous, Michel Foucault, Jane Gallop, Carol Gilligan, Julia Kristeva, Robin Lakoff, Walter Ong, and Virginia Woolf. May be repeated when content changes.

Rhetoric/Composition

5188. TOPICS IN TEACHING COLLEGE ENGLISH (1-0). Enrollment will be restricted to teaching assistants and teaching associates. May be taken for credit a second time when course content changes; may not be counted for credit toward degree requirement.

5334. TOPICS IN STYLISTICS (3-0). A study of the stylistic features of discourse. Attention may be given to the development of English prose style, to metrical and prosodic theory, to linguistic rhetorical-computational-affective approaches as well as newer methods such as narratology and phenomenological analysis. Assignments include the extensive analysis of texts. May be repeated when content changes.

5336. TOPICS CURRENT IN RHETORIC (3-0). A seminar in historical and theoretical/ metatheoretical studies of rhetoric. May include one or more topics such as irony, ethos, tropes/schemes, the rhetoric of science, the Sophists, metaphor, and rhetoric as epistemic. May be repeated when content changes.

5351. HISTORY OF RHETORIC I: CLASSICAL/MEDIEVAL (3-0). A study of the history of rhetoric from the Pre-socratics to the Medieval period with emphasis on the Greco-Roman tradition. Attention given to major theorists such as Plato, Aristotle, Isocrates, Cicero, Quintilian, St. Augustine, and Boethius.

5352. TOPICS IN MAJOR FIGURES IN MODERN RHETORICAL THEORY (3-0). Intensive study of one or more modern theorists whose interests can be interpreted as rhetorical, e.g., Burke, Weaver, Richards, Perelman, Booth, Cassirer, Ricoeur, and Derrida. May be repeated when content changes.

5353. PRINCIPLES AND THEORIES OF RHETORICAL INVENTION (3-0). Examination of the art, method, and theory of rhetorical invention, with special attention given to its historical development, from the classical topoi and doctrine of statis to more contemporary approaches; assignments include the use of such methods.

5354. ENGLISH LINGUISTICS (3-0). Introduction to the analysis of grammatical structures in English, concentrating on the goals and methods of contemporary analysts operating according to a variety of current theories, including structuralism, tagmemics, transformationalism, and discourse grammar.

5355. STUDIES IN ENGLISH DISCOURSE (3-0). Analysis of English grammatical structures above the level of the clause, including the sentence, the paragraph, and the whole text; examination of the work of major discourse theorists—Dik, Harris, Halliday, Longacre, Pike and van Dijk.

5356. RHETORIC OF COMPOSING (3-0). Study of research into the composing process and of the available methods of conducting research; special attention given to such researchers as Emig, Britton, Flower and Hayes, Scardamalia, Bereiter, and Perl; intensive self-analysis of the student's own composing process.

5357. RHETORIC OF READING (3-0). Study of the phenomenology of reading, focusing on the literature about and research into the reading process; attention given to aesthetic response to literary texts and the relationship between reading and composing; special attention given to Iser, Kintsch, de Man, van Dijk, Barthes, Schank, Ingarden, Holland, Derrida, and others; intensive self-analysis of the reading process.

5358. PRINCIPLES AND METHODS OF EVALUATION (3-0). Study of the available means of evaluating writing; special attention given to evaluating individual student-writing in and out of conferences and to evaluating large groups of student-writers, with such methods as holistic and primary-trait scoring; may include peer and curriculum evaluation; evaluation of student papers.

5359. ARGUMENTATION THEORY (3-0). Emphasis on theories of writing that concern the rhetorical aims of "to persuade" and "to convince." Attention to forms of argumentation, claims, case construction, revision, distinction between "rhetorical" and "logical" argumentation. Attention to such theorists as Aristotle, Cicero, Perelman, and Toulmin.

5361. HISTORY OF RHETORIC II: RENAISSANCE THROUGH 19TH CENTURY (3-0). A study of the history of rhetoric from the Renaissance through the 19th Century with emphasis on the re-emergence of the Neoclassical tradition. Attention given to major theorists such as Ramus, Vico, Campbell, Blair, and Whately.

5370. SCHOLARLY ARGUMENT (3-0). An introduction to the research for the writing of argumentative scholarly essays. Surveys research skills, materials, forms of scholarly argument, and involves the writing of a research-based essay.

5389. TOPICS IN TEACHING COMPOSITION (3-0). Seminar for investigating problems of and approaches to teaching composition. Special attention given to current compositional theorists. May be repeated when content changes.

Department of Exercise, Sport and Health Studies

Chair
Barry C. McKeown
112 Physical Education, 817-272-3288

Graduate Faculty
Professors
McKeown, Ridgway

Associate Professor
Beehler

Objective

The graduate course offerings in exercise, sport, and health studies are provided to support other graduate degree programs in such areas as nursing, education, and biomedical engineering and to meet the express needs of students. No program leading to a graduate degree in exercise, sport, and health studies exists at this time.

Exercise and Sport Studies (EXSS)

5320. APPLICATION OF EXERCISE PHYSIOLOGY (2-2). Basic exercise physiology as related to training for bioenergetics, circulorespiratory, and neuromuscular function; physical fitness assessment; exercise prescription and leadership; body composition techniques; special problems related to physical training. $2 lab fee. $50 course specific fee.

5192, 5292, 5392. SPECIAL TOPICS IN PHYSICAL EDUCATION. In-depth study of selected topics in physical education and exercise science. May be repeated when topics vary. Prerequisite: consent of instructor.

Objectives

Acquisition of Language, Literature and Culture (French, German, Spanish)

This graduate program in language, literature, and culture affords students the opportunity to study literary and cultural texts in their major fields as well as the structure of language as meaning and beliefs within a cultural system. Methods of teaching the above, combined with appropriate coursework in linguistics and allied fields, are offered through a supervised internship program. The specific objective is to prepare students to teach effectively foreign language and text in their cultural context.

Foreign Languages (French, German, Spanish)

Graduate programs in foreign languages are designed to enhance students' competence in the language and literature of their major language field. Specific objectives are to prepare students for a career in teaching, or in any area in private or public life in which knowledge of a foreign language is essential, and to help them develop the techniques of independent research necessary for work beyond the master's level.

Degree Requirements

In addition to the Graduate School requirements for Master's degree programs, the following requirements apply in the Department of Foreign Languages:

Thesis: A written comprehensive examination may be given at the discretion of the student's committee.

Thesis Substitute: There will be a comprehensive examination on the coursework and appropriate reading list. An oral defense of the thesis substitute may be required at the discretion of the student's supervising committee. At least 30 hours must be in coursework.

Non-thesis: There will be a comprehensive written examination on the coursework and an appropriate reading list.

Acquisition of Language, Literature and Culture (French, German, Spanish)

Those wishing to study in this 36 hour non-thesis program must upon admission have a baccalaureate degree with a major in the chosen language or a minimum of 18 advanced hours. In addition, candidates are required to demonstrate an advanced level of proficiency in the target language prior to acceptance in the program.

Coursework consists of two sets of courses, Block A and Block B. In Block A, one course in literary theory and five courses in language-specified literature, linguistics (philology, history of the language, structure of the language, dialectology etc.), and culture are required (18 hours). In Block B, an overview course, FORL 5307, is required, in addition to one approved course each in sociolinguistics, textlinguistics, cultural anthropology, and methods of teaching language. The final course may be any approved related course (for a total of 18 hours).

The internship is a four-semester program proceeding concurrently with coursework and consisting of pre-semester orientation seminars, student teaching of lower division foreign language courses, and ongoing practica, one year of which must be completed in residence as a full-time student.

Department of Foreign Languages

Areas of Study and Degrees

French
M.A.
German
M.A.
Spanish
M.A.
Humanities
M.A., M.A.T.
(See Program in Humanities)

Master's Degree Plans

Thesis, Thesis Substitute and Non-Thesis

Acting Chair

Elizabeth Ordóñez
230 Hammond, 817-272-3161

Graduate Advisor

Ronald Werth
229 Hammond, 817-272-3161

Graduate Faculty

Professors
Gross, Ordóñez, Werth

Associate Professors
Capote, Israel-Pelletier
Rings, Sanchez, Viña

Assistant Professors
Conway, Elliott, Sol,
Van Noort, Wyszynski

Professors Emeritus
Acker, Monostory

A knowledge of a second foreign language will be required, including listening, speaking, reading and writing skills as demonstrated by the successful completion of two semesters of coursework at the second-year level or by an appropriate examination.

Foreign Languages (French, German, Spanish)

Those wishing to major in a foreign language or literature must upon admission have a baccalaureate degree with a major in that foreign language or have a minimum of 18 advanced hours, or the equivalent in language proficiency and course content.

A knowledge of a second foreign language will be required, including listening, speaking, reading and writing skills as demonstrated by the successful completion of two semesters of coursework at the second-year level or by an appropriate examination.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Foreign Languages (FORL)

5301. FOREIGN LANGUAGES FOR GRADUATE READING (3-0). An intensive one-semester course designed for Ph.D. candidates and other graduate students to fulfill departmental foreign language requirements. Sections may be offered in French, German, Spanish, Russian, or other applicable or appropriate languages. Does not fulfill any graduate degree requirements.

5307. TOPICS IN SECOND LANGUAGE ACQUISITION (3-0). May include topics in the areas of second language acquisition, methodologies, culture, and disciplines related to second language acquisition. May be repeated for credit as topics change.

5308. TECHNOLOGY AND LANGUAGE INSTRUCTION (3-0). Presentation and critique of research regarding the use of electronic media in language instruction; emphasis on computer and video, with attention to the application of research findings to the language classroom.

5309. TECHNOLOGY IN LANGUAGE INSTRUCTION II (3-0). Continuation of FORL 5308. Presentation and critique of research on multimedia and World-Wide-Web-based technologies in language instruction.

5310. THEORIES OF LITERATURE AND CULTURE (3-0). Readings, analyses, and applications of recent literary and cultural theories. Particular attention to how such theories may serve to focus or refocus literature as cultural production. Required for the M.A. in French, German, and Spanish.

French (FREN)

Students pursuing the MA degree in French are required to take FORL 5310 in their first year. Students are encouraged to take at least one course in each of (1) History of the French Language; (2) 17th Century; (3) 18th Century; (4) 19th Century; (5) 20th Century; (6) Topics in French Culture.

5101. TEACHING PRACTICUM I (1-0). Required of all teaching assistants in French in their first semester. May not be counted toward a master's degree. Graded P/F/R.

5102. TEACHING PRACTICUM II (1-0). Required of all teaching assistants in French in their second semester. May not be counted toward a master's degree. Graded P/F/R.

5190. CONFERENCE COURSE IN FRENCH LANGUAGE, CULTURE, OR LITERATURE (1-0). Graded F/R.

5300. HISTORY OF THE FRENCH LANGUAGE (3-0). Brief French phonology. A vertical tracing of the birth and development of the French language from Roman times to modern French. Includes short readings of documents representing Romance, Old French, middle and Renaissance and classical French at various stages in the development of the language.

5321. TOPICS IN GENRES OF THE 17TH CENTURY (3-0). Investigates ideology and practice through literature, the visual arts, music and other cultural "texts." Major topics may include "Versailles: Architecture, Literature, and Politics," "Jansenism and its Discontents: Pascal, Racine, de Lafayette," "Libertins: Masks and Counter Masks." May be repeated for credit when topic changes.

5325. TOPICS IN GENRES OF THE 18TH CENTURY (3-0). Studies oppositional discourse as expressed through the different genres (theatre, poetry, fiction, political and philosophical writings) popular in the 18th century as well as the role and the effect of these works in constituting the Republic of Letters. May be repeated for credit when topic changes.

5330. TOPICS IN GENRES OF THE 19TH CENTURY (3-0). Concentrates on literature, the visual arts, entertainment, and fashion as expressions of popular culture. The rise of the "petite bourgeoisie," social utopias, the rebuilding of Paris, and responses to modernity will be studied in such courses as "Paris and Its Subcultures," "Impressionism and the Bourgeoisie," "The Novel and the Body." May be repeated for credit when topic changes.

5331. TOPICS IN GENRES OF THE 20TH CENTURY (3-0). Focuses on the work of French and Francophone writers in the light of modernist and post-modernist aesthetics. Literature, art, architecture, music, film, video, television, and other forms of popular production are studied as reflections of an era in crisis. May be repeated for credit when topic changes.

5338. TOPICS IN FRENCH CULTURE (3-0). Survey of themes and structures on a range of topics such as "Women in/as Fiction," "Self and Society," "Revolutions," "French Film." May be repeated for credit when topic changes.

5391. CONFERENCE COURSE IN FRENCH LINGUISTICS, CULTURE, OR LITERATURE. Graded R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of Graduate Advisor.

A course may be repeated for credit when the topic changes.

German (GERM)

5101. TEACHING PRACTICUM I (1-0). Required of all teaching assistants in German in their first semester. May not be counted toward a master's degree. Graded P/F/R.

5102. TEACHING PRACTICUM II (1-0). Required of all teaching assistants in German in their second semester. May not be counted toward a master's degree. Graded P/F/R.

5190. CONFERENCE COURSE IN GERMAN LANGUAGE AND LITERATURE (1-0). Graded P/F/R. Prerequisite: permission of Graduate Advisor.

5304. TOPICS IN GERMAN LANGUAGE AND LINGUISTICS (3-0). May include topics such as history of the German language, applied German linguistics, dialectology, Middle High German. May be repeated for credit when topic changes.

5312. ADVANCED GERMAN GRAMMAR AND STYLE (3-0). Readings of samples of contemporary German prose, both narrative and expository, as a basis for the writing of exercises and essays stressing application of grammatical and stylistic principles.

5320. TOPICS IN GERMAN LITERATURE (3-0). May include topics from any period, genre, or author of literature in German. May be repeated for credit when topic changes.

5331. TOPICS IN GERMAN NARRATIVE, 1700 TO PRESENT (3-0). The novel, Novelle, short story and other forms of German prose: historical overview, theory and selected primary texts as illustration. Topics vary in focus and methodology; emphasis ranges from individual authors, works or themes to theoretical or interdisciplinary issues. May be repeated for credit when topic changes.

5332. TOPICS IN OLDER GERMAN LITERATURE, TO 1700 (3-0). Topics vary in focus and methodology; emphasis may range from individual authors, works, or themes to theoretical or interdisciplinary issues. May be repeated for credit when topic changes.

5333. TOPICS IN GERMAN DRAMA (3-0). History and theory of the drama in German-speaking countries; methods of drama analysis, interrelationship of drama, theatre, audience. Topics vary in focus and methodology, emphasis may range from individual authors, works, themes, or periods to theoretical or interdisciplinary issues. May also include the study of German film. May be repeated for credit when topic changes.

5334. TOPICS IN GERMAN POETRY (3-0). Study of the development of German poetry, and a close study of representative poets and poems from the Baroque to the present. Focus on selected poetic forms including the folksong, ballad, epic poem, sonnet, and religious and political poetry. Topics may vary in focus and methodology. May be repeated for credit when topic changes.

5391. CONFERENCE COURSE IN GERMANIC LINGUISTICS AND LITERATURE. Graded R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of Graduate Advisor.

Spanish (SPAN)

All students pursuing the MA in Spanish must take SPAN 5300 and 5303, and FORL 5310.

5101. TEACHING PRACTICUM I (1-0). Required of all teaching assistants in Spanish in their first semester. May not be counted toward a master's degree. Graded P/F/R.

5102. TEACHING PRACTICUM II (1-0). Required of all teaching assistants in Spanish in their second semester. May not be counted toward a master's degree. Graded P/F/R.

5190. CONFERENCE COURSE IN SPANISH LANGUAGE AND LITERATURE (1-0). Graded P/F/R. Prerequisite: permission of Graduate Advisor.

5300. HISTORY OF THE SPANISH LANGUAGE (3-0). Development of the Spanish language from its earliest forms to the present. Required for the MA in Spanish, the MA in Humanities with Spanish concentration and for the MAT with Spanish concentration.

5302. SPANISH DIALECTOLOGY (3-0). Phonological, lexical, and grammatical features in Iberia, South and North America, the Philippines, and in Sephardic dialect.

5303. APPLIED SPANISH LINGUISTICS (3-0). Pedagogy, pronunciation and orthography, morphology, syntax, semantics, and culture. Required for the MA in Spanish and the MA in Humanities with Spanish concentration unless 5302 taken.

5306. GRAMMAR AND COMPOSITION (3-0). Advanced studies of grammar with attention to style. Practices and strategies for effective research and academic writing.

5315. MEXICAN LITERATURE AND CULTURE (3-0). Readings in all literary genres from various critical perspectives. Particular attention given to the novel, poetry, and essay of the 20th Century and to interrelationships between text and culture.

5318. TOPICS IN HISPANIC LITERATURE AND CULTURE (3-0). Special studies in areas not ordinarily covered by regular course offerings. Different topics may be repeated for credit.

5319. 20TH CENTURY SPANISH-AMERICAN NOVEL AND SHORT STORY (3-0). Examination of landmark narrative texts within a context of literary and cultural theory and criticism. Attention given to related topics in Spanish-American history and society.

5320. MODERN SPANISH NARRATIVES (3-0). Readings of 19th and 20th century Spanish narratives within their cultural and historical contexts and in light of appropriate literary and cultural criticism.

5330. ADVANCED STUDIES IN HISPANIC POETRY (3-0). Close critical readings of Spanish and Spanish American poetry. Analysis of poetic currents across the centuries.

5332. CHICANO LITERATURE AND CULTURE (3-0). Readings of poetry, theater, and prose in relation to the specific socio-historical and political context of Chicano life. Charts changing concepts of cultural identity and the evolution of cultural coding in texts written after 1960.

5340. CERVANTES (3-0). The major Cervantine works in prose (El Quijote, Las novelas ejemplares, and Los trabajos de Persiles y Segismunda) will be read and analyzed from a rhetorical-poetical orientation. Additional readings may include some of Cervantes' minor poetic and dramatic texts as well as Renaissance treatises of rhetoric and poetics.

5342. ADVANCED STUDIES IN HISPANIC DRAMA (3-0). Readings of dramatic texts from the Golden Age to contemporary period. May include the analysis of dramatic theory and its implementation in specific texts, theater as performance and spectacle, changing concepts of the esthetic and social functions of theater.

5350. WOMEN IN HISPANIC LITERATURE (3-0). Readings of literary texts by women writers from medieval Spain to contemporary Spanish America. Attention to recurrent motifs as well as to the literary expression of historical and cultural transformation.

5391. CONFERENCE COURSE IN SPANISH LINGUISTICS AND LITERATURE. Graded R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of Graduate Advisor.

A topics course may be repeated for credit when the topic changes.

Department of History

Areas of Study and Degrees
History
M.A.
Humanities
M.A.
Archival Administration
Certificate

Master's Degree Plans
Thesis and Non-Thesis

Chair
Kenneth R. Philp
202 University Hall, 817-272-2861

Graduate Advisor
Stanley Palmer
201 University Hall, 817-272-2869

Graduate Faculty
Professors
Buisseret, Francaviglia, Green, Lackner, Palmer, Philp, Richmond, Rodnitzky

Associate Professors
Anders, Cawthon, Fairbanks, Goldberg, Haynes, Kyle, Maizlish, Morris, Narrett, Reinhardt, Reinhartz, Underwood

Assistant Professors
Cole, Eghigian, Jalloh, Parker

Adjunct Associate Professor
Saxon

Objective

The general purpose of the Master of Arts in History program is to provide the student with a greater breadth of understanding of both the past and the contemporary world, a continued exploration of the diversity of human experiences and ideas, and a greater depth of experience in historical methods and techniques. Specific objectives are to prepare the student for a career in business, government, research, teaching, archival and/or museum administration, or further graduate study. The program is designed to be flexible and, insofar as possible, to meet students' individual interests and career objectives.

SPECIAL NOTE: The Department of History has applied for authorization of a Ph.D. program in Transatlantic History. If approved, this program will be instituted in fall 1998. The program in Transatlantic History will focus on the contacts, exchanges and interrelationships among Europe, Africa and the Americas from 1492 to the present. The program is founded on the belief that current issues of multiculturalism and globalization have deep historical roots. For information on the status of the proposed Ph.D. program in Transatlantic History, contact the Graduate Advisor.

M.A. Degree Requirements

Courses taken toward a master's degree should fit into a unified program aimed at providing a student with both a comprehensive background and depth of understanding in a major field in either American (including non-U.S.) or European history. All students are required to take HIST 5339 Historical Theory and Methodology and the Issues and Interpretations course corresponding to their major field (either HIST 5340 or 5341). All students must take a minimum of six hours in both the Colloquium and the Seminar courses. Students must consult with the Graduate Advisor to determine their program.

Competency in one foreign language is required. This may be demonstrated by credit in an approved language through the sophomore level or by successful completion of an examination administered by the Department of Foreign Languages. In special cases, alternatives such as computer language or statistics may be considered on an individual basis.

The following requirements are in addition to the Graduate School requirements:

The **thesis** degree plan is designed for the student who wishes to research and write a substantial, original work on a historical topic of personal interest. The plan requires completion of 30 semester credit hours (24 hours of coursework, including 18 hours in a major field, plus 6 hours of thesis preparation). With the approval of the Graduate Advisor, the student may have a minor of as many as six hours of graduate and/or advanced undergraduate courses in a discipline other than history. As many as nine hours (six hours if a non-history minor is selected) of advanced undergraduate history coursework may be taken for graduate credit. In the event of failure of the oral defense of the thesis required for the degree, the student may petition the Graduate Studies Committee for re-examination.

The **non-thesis** degree plan requires completion of 36 semester credit hours of coursework, including 24 hours in a major field. In the final semester, the non-thesis student is required to take HIST

5395, a course that prepares the student for the comprehensive examination. With the approval of the Graduate Advisor, the student may have a minor of as many as nine hours of graduate and/or advanced undergraduate courses in a discipline other than history. A maximum of nine hours of advanced undergraduate coursework may be taken for graduate credit. A comprehensive examination (written and oral), over specific areas of concentration within the major field, is required for the degree; these areas will be defined by students in consultation with their faculty committees, the Graduate Advisor, and the Graduate Studies Committee. In the event of failure of the comprehensive examination, the student may petition the Graduate Studies Committee for re-examination.

Archival Administration and Public History

These studies involve application of historical knowledge and methodology in non-academic settings such as private businesses or public historical agencies (e.g., archives, museums, preservation societies).

Students desiring a certificate of **archival administration** as part of the Master of Arts in History degree must take HIST 5339 and HIST 5340 or HIST 5341, and enroll in 18 hours of content courses—in either American or European history. In addition, they must take HIST 5342 and HIST 5343, plus an additional six hours of internship, HIST 5644. Students already holding a MA or Ph.D. degree in history or a related field, as well as students enrolled in graduate programs other than history, who desire a certificate in archival administration should consult the Graduate Advisor.

Students desiring **public history** as an area of study as part of the Master of Arts in History degree must take HIST 5339, HIST 5340 or HIST 5341, and HIST 5395, and enroll in 9 hours of content courses—in either American or European history, but at least 3 hours in both colloquium and seminar courses. In addition, they must take HIST 5342, HIST 5343, HIST 5345, and HIST 5348, plus an additional six hours of internship (HIST 5644 or HIST 5655). Students electing to complete an internship in archival management (HIST 5644) will also earn the certificate in archival administration (see above).

Students interested in either archival administration or public history as areas of study are encouraged to consult the Graduate Advisor to discuss a program of work.

Master of Education in Teaching (MET)

History may be chosen as an appropriate academic specialization or teaching field for students enrolled in the Master of Education in Teaching Degree Program, and the department offers courses that qualify as an academic area or teaching field for elementary and secondary teachers. HIST 5340 and /or HIST 5341 are especially recommended for students in the M.E.T. program, and for others who wish to broaden their historical knowledge for classroom teaching. See Master of Education in Teaching Degree Program.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

History (HIST)

Note: A course may be repeated for credit when the topic changes. Graduate standing is prerequisite.

5300. COLLOQUIUM IN 17TH AND 18TH CENTURY AMERICAN HISTORY (3-0). An examination of the historical literature and issues in 17th and 18th Century American history. The specific literature and issues examined will vary with the instructor.

5301. COLLOQUIUM IN 19TH CENTURY AMERICAN HISTORY (3-0). An examination of the historical literature and issues in 19th Century American history. The specific literature and issues examined will vary with the instructor.

5302. COLLOQUIUM IN 20TH CENTURY AMERICAN HISTORY (3-0). An examination of the historical literature and issues in 20th Century American history. The specific literature and issues examined will vary with the instructor.

5304. COLLOQUIUM IN REGIONAL/TOPICAL HISTORY OF THE U.S. (3-0). An examination of the historical literature and issues pertaining to a region or a major topic in the history of the U.S. The specific literature and issues examined will vary with the instructor.

5309. COLLOQUIUM IN LATIN AMERICAN HISTORY (3-0). An examination of the historical literature and issues in Latin American history. The specific literature and issues examined will vary with the instructor.

5310. COLLOQUIUM IN ANCIENT AND MEDIEVAL HISTORY (3-0). An examination of the historical literature and issues in ancient and medieval history. The specific literature and issues examined will vary with the instructor.

5311. COLLOQUIUM IN EARLY MODERN EUROPEAN HISTORY (3-0). An examination of the historical literature and issues in early modern European history. The specific literature and issues examined will vary with the instructor.

5312. COLLOQUIUM IN MODERN EUROPEAN HISTORY (3-0). An examination of the historical literature and issues in modern European history. The specific literature and issues examined will vary with the instructor.

5313. COLLOQUIUM IN EUROPEAN REGIONAL/TOPICAL HISTORY (3-0). An examination of the historical literature and issues pertaining to a region or a major topic in European history. The specific literature and issues examined will vary with the instructor.

5320. SEMINAR IN 17TH AND 18TH CENTURY AMERICAN HISTORY (3-0). A detailed investigation of a major aspect of 17th and 18th century American history, involving original research and the use of historical resources. The particular aspect investigated will vary with the instructor.

5321. SEMINAR IN 19TH CENTURY AMERICAN HISTORY (3-0). A detailed investigation of a major aspect of 19th Century American history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5322. SEMINAR IN 20TH CENTURY AMERICAN HISTORY (3-0). A detailed investigation of a major aspect of 20th Century American history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5324. SEMINAR IN REGIONAL/TOPICAL HISTORY OF THE U.S. (3-0). A detailed investigation of a major aspect of a region or a major topic in the history of the U.S., involving research and use of historical resources. The particular aspect investigated will vary with the instructor.

5329. SEMINAR IN LATIN AMERICAN HISTORY (3-0). A detailed investigation of a major aspect of Latin American history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5330. SEMINAR IN ANCIENT AND MEDIEVAL HISTORY (3-0). A detailed investigation of a major aspect of ancient and medieval history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5331. SEMINAR IN EARLY MODERN EUROPEAN HISTORY (3-0). A detailed investigation of a major aspect of early modern European history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5332. SEMINAR IN MODERN EUROPEAN HISTORY (3-0). A detailed investigation of a major aspect of modern European history, involving original research and use of historical resources. The particular aspect investigated will vary with the instructor.

5333. SEMINAR IN EUROPEAN REGIONAL/TOPICAL HISTORY (3-0). A detailed investigation of a region or a major topic in European history, involving research and use of historical resources. The particular aspect investigated will vary with the instructor.

5339. HISTORICAL THEORY AND METHODOLOGY (3-0). An examination of theories of historical knowledge, the history of the discipline, various historical methodologies, and research techniques. Required for all History M.A. students.

5340. ISSUES AND INTERPRETATIONS IN AMERICAN HISTORY (3-0). A critical survey of American historical scholarship from colonial times to the present. Required for all students who are emphasizing American history.

5341. ISSUES AND INTERPRETATIONS IN EUROPEAN HISTORY (3-0). A critical survey of European historical scholarship from ancient times to the present. Required for all students who are emphasizing European history.

5342. PRINCIPLES OF ARCHIVES AND MUSEUMS I (3-0). The historical evolution of archival science, emphasizing the development of the archives profession, archival principles and theories, appraisal and acquisition techniques, the laws affecting archives, programming and outreach, automation, conservation and preservation, and administration of collections. HIST 5342 is a prerequisite for HIST 5343.

5343. PRINCIPLES OF ARCHIVES AND MUSEUMS II (3-0). Training in the methods and techniques of processing archives and historical manuscripts. Focuses on the day-to-day responsibilities of archivists and curators, such as appraising, accessioning, arranging, and describing collections. Prerequisite: HIST 5342.

5345. INTRODUCTION TO PUBLIC HISTORY (3-0). An overview of the field of public history focusing on public historians, their work, their relationship to academic historians, their accomplishments, and the ethical principles under which they operate.

5348. TOPICS IN PUBLIC HISTORY (3-0). A detailed examination of some aspect of public history (e.g. historical editing, oral history, historic preservation). The particular topic will vary with the instructor. Prerequisite: HIST 5345.

5349. TOPICS IN WORLD CIVILIZATION (3-0). Examines subjects of immediate interest relating to world civilization not covered in other existing courses.

5350. HISTORY OF CARTOGRAPHY (3-0). A history of maps and their making and cartographic documentation as a source for understanding historical development. An aspect of the history of science and technology and the history of discovery and exploration.

5391, 5691. INDEPENDENT STUDY. For graduate students whose needs are covered by no course immediately available. Graded R.

5392. HISTORICAL PERSPECTIVES ON THE HUMANITIES (3-0). An historical inquiry into problems and issues of contemporary relevance in the humanistic disciplines. The particular problems and issues investigated will vary with the instructor.

5395. NON-THESIS CAPSTONE (3-0). Readings in the non-thesis student's final semester, directed by the three-person faculty committee supervising the student's program of work. Required of all non-thesis students.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R.

5644. ARCHIVAL INTERNSHIP. Hands-on experience in archives, records centers, or historical manuscripts repositories. Graded P/F/R. Prerequisites: HIST 5342 and 5343.

5655. PUBLIC HISTORY INTERNSHIP (3-0). Placement in a history-oriented position in a private or public agency or organization in the community. Prerequisites: HIST 5345 and 5348. Graded P/F/R.

6391. INDEPENDENT STUDY (3-0). Graded R.

SPECIAL NOTE: Doctoral programs in English, history and linguistics are under consideration to replace the doctoral program in humanities.* The doctoral program in humanities has been terminated, and no new students are being admitted to the program. Students who were enrolled in the program as of September 1, 1997, may complete the program providing they satisfactorily complete all of the requirements for the degree, including dissertation and dissertation defense, by December 2000.

*** For information about these programs, see the entries for the Department of English, Department of History and Program in Linguistics within the College of Liberal Arts section of this catalog.**

Objective

The Graduate Humanities Program offers a course of study designed to instill understandings across the spectrum of those fields traditionally identified as the humanities, that is, the study of humankind and of the cultures it has created. The program combines a strong foundation in the concepts and methods shared by the humanities with intensive study in an area of concentration that synthesizes or integrates two or more disciplines. It is not suited for those wishing to pursue a traditional disciplinary degree, because its views, subject matter and methods transcend those normally allowed in a single discipline. Its focus is centripetal and aimed at allowing integration and forging connections across disciplinary boundaries. Coursework and examinations must reflect the methods and perspectives of the humanities.

The foundation of the program is a series of courses, taken at the outset of study, whose purpose is to teach heuristic and analytic methods and to enhance a student's ability to view complex issues from a variety of perspectives. Drawing on classical and contemporary approaches to grammar, rhetoric, and logic, the foundation courses present and illustrate the basic concepts and the theoretical frameworks of the humanities.

The Master's Program in Graduate Humanities, after the completion of foundation courses, applies the methods and perspectives of the humanities foundation in integrating the subject areas of concentration. Graduates of the program utilize these abilities in teaching, research, translation, the ministry, government service, and private non-profit organizations. Each student's course of study is planned individually and provides in-depth training in a specialization within the context of the humanities' traditional focus on human goals, needs, and values.

Degree Requirements

The basic general admission and degree requirements are those of the Graduate School, as stated in this catalog. A Student Handbook is provided each student in the Graduate Humanities Program. Students are responsible for all information regarding rules, policies, and procedures as defined in the student handbook. In addition, all students (MA, MAT) must fulfill the following requirements:

1. **Foundation requirement**—Four courses are required. All students must complete the Conceptual Bases of the Humanities (HUMA 5300) within their first two semesters in the program. Students must also take two of the following courses within

Program in Humanities

Area of Study and Degrees
Humanities
M.A., M.A.T.

Master's Degree Plan
Non-Thesis

Director of Humanities
Susan J. Hekman
320 Carlisle Hall, 817-272-2389

Graduate Faculty
The Graduate Faculty of the College of Liberal Arts

their first four semesters: HUMA 5301 Rhetoric and the Humanities, HUMA 5302 Theory of Discourse, and HUMA 5304 Methods of Logical Analysis. Students may then complete the fourth requirement by choosing either one of the above courses or one of the remaining foundation courses: HUMA 5303 Topics in Culture and Society, HUMA 5305 Semiotics, HUMA 5306 Cultural Studies, and HUMA 5307 Topics in Gender Studies.

2. **Foreign Language requirement**—Students must demonstrate the ability to use one foreign language as a research tool in the humanities by means of a translation or other written exercise.
3. **Scope requirement**—To insure a humanities perspective in the study of language, literature or cultural topics, 18 hours of coursework must be chosen from (A) or (B) below.

   (A.) at least two of the areas of study currently represented in the College of Liberal Arts, such as:

   American Literature
   Art Criticism and Art History
   British Literature
   Classical Studies
   Comparative Literature
   Criticism
   Cultural Anthropology
   Cultural Studies
   English for Speakers of Other Languages
   French Language and Literature
   German Language and Literature
   Grammar Theory
   Historical Studies
   Music History and Theory
   Philosophical Studies
   Political Theory
   Rhetoric/Composition
   Social Theory
   Spanish Language and Literature
   Speech Communication
   Teaching Methodology, Instruction, and Curriculum
   Text Theory
   Women's Studies

   No more than nine of these 18 semester hours may be taken from any one area of study.

   (B.) an integrated program of multidisciplinary study organized by theme, such as American Studies, Art and Society, etc.

Master of Arts in the Humanities

The MA is a 36 semester-hour, non-thesis program. Twelve of these hours are devoted to the Foundation courses; 18 hours of study to the Scope requirement. A minimum of six further hours is required. In order to qualify for the final master's examination, the student must also submit one article-length paper for evaluation to his or her advisory committee. A positive assessment of the paper requires that the student demonstrate research competence and facility with appropriate humanities methodologies. The requirement of the article length paper must be satisfied before taking the final examination.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Humanities (HUMA)

Foundation Courses

5300. CONCEPTUAL BASES OF THE HUMANITIES (3-0). Introduces students to fundamental concepts, methods, and issues central to the humanities. Particular attention will be given to a variety of epistemological approaches in humanistic inquiry, to theories of interpretation as applied to cultural constructs, and to recent issues and problems in the humanities. Required of all MA candidates in the humanities.

5301. RHETORIC AND THE HUMANITIES (3-0). Examination of the role of rhetoric in humanistic studies and the employment of rhetorical strategies in the human sciences. Discussion of such topics as the conflict between rhetoric and philosophy, the relations between rhetoric and epistemology, ethics, and politics. Fulfills Foundations requirement.

5302. THEORY OF DISCOURSE (3-0). Description and analysis of discourse, including the types utilized in humanistic studies, e.g., linguistic, sociological, psychological, literary critical. Discussion of the relations between discourse and ideology and the social construction of discourses. Examination of the role of discursive practice in creating and maintaining social reality. Fulfills Foundations requirement.

5303. TOPICS IN CULTURE AND SOCIETY (3-0). Examination of the interaction of culture and society from various disciplinary perspectives. Includes analysis of specific cultural systems in selected societies. May be repeated for credit when topic changes. Fulfills Foundations requirement.

5304. METHODS OF LOGICAL ANALYSIS (3-0). Foundations of modern logic and logical terminology in language-centered disciplines; applications of logical method to selected problems in the humanities illustrating a diversity of philosophical approaches, e.g., analytic philosophy, hermeneutics, phenomenology. Fulfills Foundations requirement.

5305. SEMIOTICS (3-0). Study of signs and sign systems as they work to constitute cultures and cultural meaning. Analysis of symbolic systems from linguistic, philosophical and/or visual perspectives. Examination of the ways in which the identity, reception, influence, and meaning of cultural artifacts are determined. Fulfills Foundations requirement.

5306. CULTURAL STUDIES (3-0). The interdisciplinary study of culture as a contested domain of social life. Exploration of new critical methods of cultural study. Focus on factors in identity such as class, race, gender and ethnicity. Fulfills Foundations requirement.

5307. TOPICS IN GENDER STUDIES (3-0). Analysis of the role of gender studies in the humanities disciplines. Topics may include examination of the methods and conclusions of gender analysis in history, the social sciences, philosophy, or literary criticism. Fulfills Foundations requirement.

Other Courses

5391. CONFERENCE COURSE IN THE HUMANITIES. Prerequisite: permission of the instructor and Graduate Advisor. Graded P/F/R.

5392. TOPICS IN THE HUMANITIES (3-0). Selected topics of interdisciplinary interest. May be repeated for credit when subject matter changes.

6391. READINGS IN THE HUMANITIES (3-0). Supervised individual study for students preparing for the comprehensive examination. Prerequisite: permission of the instructor and Graduate Advisor. Graded P/F/R.

6399, 6699, 6999. DISSERTATION. Prerequisite: admission to candidacy for the Ph.D. in Humanities. Graded P/F/R.

Program in Linguistics

Areas of Study and Degrees
Linguistics
M.A.
Humanities
M.A., M.A.T.
(See Program in Humanities)

Master's Degree Plans
Thesis, Thesis Substitute and Non-Thesis

Program Director
Jerold A. Edmondson
408 Hammond, 817-272-3133

Graduate Advisor
Irwin Feigenbaum
226 Hammond, 817-272-3133

Graduate Faculty
Professor
Edmondson

Associate Professors
Burquest, Feigenbaum, Herring

Assistant Professors
Paolillo, Silva

Adjunct Professors
Grimes, Headland, G. Huttar, Merrifield, Pike, Rensch, Robbins

Adjunct Associate Professors
Franklin, Gregerson, Hwang

Adjunct Assistant Professors
Boothe, Bowling, Bruce, del Aguila, Diehl, Gallman, Hohulin, M. Huttar, Larson, Leaders, McElhanon, C. McKinney, N. McKinney, Moore, Morgan, Morren, Reed, Simons, Turnbull, Walter, Wendell, L. Yost, W. Yost

Professor Emeritus
Longacre

Objectives

Linguistics, the systematic study of human language, is situated at the crossroads of the humanities, the social sciences, and the physical sciences. The program in linguistics at The University of Texas at Arlington provides comprehensive training in methods of linguistic analysis, as informed by current linguistic theory and data from a variety of languages. Students receive instruction in the analysis of sound systems (phonetics and phonology) and grammar (morphology and syntax); in addition, the program has strengths in field linguistics, discourse analysis, sociolinguistics, literacy, translation and teaching English to speakers of other languages (TESOL). Linguistic science has applications in language learning and teaching, literary analysis and criticism, psychology, communication, anthropology, philosophy, neurology, sociology, speech recognition and synthesis, and artificial intelligence. Graduates of the program may find employment in fieldwork and field program administration, international affairs and development, literacy consultation and language planning, language technology, research, teaching, translation and other fields.

The master's degree provides broad-based training in the core areas of linguistics as well as firsthand experience working with geographically diverse, often previously undocumented languages. Optionally, students may specialize in the application of linguistics to teaching English to speakers of other languages.

SPECIAL NOTE: The Program in Linguistics has applied for authorization to grant a Ph.D. degree. If approved, this program will provide advanced training in field linguistics and linguistic computing and experience in presenting original research in professional venues. Students will be expected to develop in-depth expertise in two or more areas of specialization. For information on the status of the proposed Ph.D. Program in Linguistics, contact the Graduate Advisor or consult the program's Web site at: http://ling.uta.edu

Degree Requirements

Graduate programs in linguistics are primarily designed for those with a background in one or more foreign languages and/or a background in the linguistic aspects of the English language, but others who are willing to fulfill the listed prerequisites are invited to apply. Candidates must present the following prerequisite undergraduate coursework: articulatory phonetics, phonology, grammar and grammatical analysis.

Requirements for master's and Ph.D. degrees are given in the Advanced Degrees and Requirements section of this catalog. In addition, the following apply to linguistics students:

All M.A. students take the core courses in linguistics. Also, they demonstrate analytical knowledge of the linguistic structure of a non-Western language.

M.A. Thesis Degree Plan: 24 hours coursework plus one hour thesis writing course (LING 5100) plus six hours thesis credit (LING 5698).

M.A. Thesis Substitute Degree Plan: 30 hours coursework plus one hour thesis writing course (LING 5100) plus three hours thesis substitute credit (LING 5392) plus written examination plus oral defense of the thesis substitute.

M.A. Non-Thesis Degree Plan: 36 hours coursework plus comprehensive written examination on the coursework.

All Ph.D. students demonstrate knowledge of core areas of linguistics by passing a preliminary examination within their first 18 hours of enrollment in the Ph.D. program. In addition, there is a foreign languages requirement and a professional activities requirement.

Ph.D. Degree Plan: 12 hours foundation coursework plus 18 hours support coursework plus three hours dissertation proposal and comprehensive examination (LING 6391) plus nine hours dissertation (LING 6999).

For additional information on prerequisites or degree requirements, consult the Graduate Advisor.

Certificate in Teaching English to Speakers of Other Languages (TESOL)

This program provides preparation—through study and practice—for the individual who wishes to teach English to speakers of other languages. It is available to any student who has been admitted to the Graduate School at U.T. Arlington.

The Certificate requires 18 hours of coursework: LING 5300, 5317, 5327, 5353, 5354, and 5355 or 5356. In addition to the coursework, there is a practicum; this is done under LING 5153. LING 5300 (or equivalent linguistics coursework) is a prerequisite for LING 5317, 5327, and 5353; LING 5353 is a prerequisite for LING 5354, 5355, and 5356. Even if the student presents an equivalency of LING 5300, 5353, and/or other coursework, the 18-hour requirement must be met. A maximum of three credit hours of coursework done at another institution can be transferred and counted toward the Certificate.

Upon beginning study for the Certificate, the student should contact the Graduate Advisor in Linguistics to declare the intention to earn the Certificate.

The International Linguistics Center (The Summer Institute of Linguistics)

The International Linguistics Center in Dallas (near Duncanville) and The University of Texas at Arlington offer cooperatively a program in linguistic training and research. This program leads to the MA and the Ph.D. degree at U.T. Arlington. Participants must apply for admission to U.T. Arlington.

Persons who wish to pursue the program at ILC but who are not eligible for admission to U.T. Arlington may make arrangements with ILC.

Registration is administered by U.T. Arlington on campus. Students may take the courses on either or both campuses. Refer to the semester Schedule of Classes for location of courses.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Linguistics (LING)

5100. THESIS WRITING SEMINAR (1-0). Graded P/F only. Techniques for researching and writing a thesis/dissertation in linguistics. Required of all students who have elected the Thesis or Thesis Substitute degree option in Linguistics.

5153. CERTIFICATE IN TESOL PRACTICUM (1-0). Graded P/F only. In observing ESOL classes or in teaching learners of ESOL, the student demonstrates ability to apply the principles presented in the TESOL Certificate coursework. Prerequisite: permission of instructor.

5190. CONFERENCE COURSE IN LINGUISTICS (1-0). Graded P/F/R. Prerequisite: permission of Graduate Advisor.

5300. LINGUISTIC ANALYSIS (3-0). An overview of the study of human language from a linguistic perspective. Topics covered may include the analysis of language structures, the study of language in social contexts, the principles governing language change, and the application of linguistic analysis to language teaching, literary studies, literacy, and translation. May not be used to fulfill the MA degree requirements in linguistics.

5301. PHONOLOGICAL THEORY I (3-0). Explores the principles governing sound systems in human languages.

5303. GRAMMATICAL THEORY I (3-0). Explores grammatical systems in human languages. May be repeated for credit when topic changes.

5304. PHONOLOGICAL THEORY II (3-0). A continuation of LING 5301. Topics include autosegmental analysis, lexical phonology, metrical phonology and phonological feature geometry. May be repeated for credit when topic changes. Prerequisite: LING 5301.

5305. FIELD METHODS (3-0). The principles, techniques and practical aspects of linguistic field research. The course includes extensive practice in eliciting data (phonological, morpho-syntactic, textual and lexical) directly from a native speaker, as well as in managing, analyzing and describing the data obtained.

5306. GRAMMATICAL THEORY II (3-0). A continuation of LING 5303. Taught alternately as government and binding theory, functional-typological grammar, discourse grammar, and other current theoretical approaches. May be repeated for credit when topic changes. Prerequisite: LING 5303.

5307. TOPICS IN LINGUISTICS, LITERACY, AND LANGUAGE TEACHING (3-0).

5308. TOPICS IN SOCIOLINGUISTICS (3-0). Selected topics relating the scientific methodologies of linguistics to larger concerns of society and culture including cognition, motivation, description and analysis. May be repeated for credit when topic changes.

5309. LANGUAGE USE IN MULTILINGUAL SOCIETIES (3-0). An overview of linguistics and some of its applications, with primary focus on language use in developing nations. May not be used to fulfill the MA degree requirements in linguistics.

5310. ACOUSTIC PHONETICS (3-0). An investigation into the physical properties of human speech. Students will gain hands-on experience with computer-assisted speech analysis. No prior computer experience is assumed.

5311. PRINCIPLES OF TRANSLATION I (3-0). Theory and procedures in cross-language transfer with emphasis on basic linguistic notions such as form vs. meaning, multiple senses, and types of lexical equivalences and sociolinguistic factors involved in idiomatic translation. Prerequisite: LING 5303, or permission of the instructor. May not apply toward degree requirements if LING 5336 and ANTH 3322 are applied.

5312. MORPHOLOGY (3-0). A theoretical and typological investigation into the nature of word-structure and word-formation processes in human languages.

5313. LANGUAGE UNIVERSALS AND LINGUISTIC TYPOLOGY (3-0). Consideration of universals in human language, their explanation and description, and language types.

5316. SOCIOLINGUISTICS OF SOCIETY (3-0). The study of macro-sociolinguistics, including topics such as multilingualism, language standardization and planning, literacy, language dominance, maintenance and death, language and identity, diglossia, and pidgins and creoles.

5317. SOCIOLINGUISTICS (3-0). The study of language in its social context, including topics such as linguistic variation, address and reference, speech levels, bilingualism, code switching, speech acts, conversational analysis, and language and gender.

5318. LANGUAGE AND GENDER (3-0). The role of language in the expression and creation of gender identities. Gender differences in language structure and use, men's and women's languages in other cultures, the acquisition of gendered ways of speaking, and sexism in language.

5320. HISTORICAL AND COMPARATIVE LINGUISTICS (3-0). The study of language development and change; comparative method and its use in linguistic reconstruction; laws of language change.

5327. LANGUAGE ACQUISITION (3-0). Study of the processes of first and second language acquisition, their similarities and differences, language disorders, language perception and production, and implications of language acquisition research for linguistic theory and language teaching.

5330. THE COMPUTER AND NATURAL LANGUAGE (3-0). Applications of computers to linguistic analysis, and applications of linguistic analysis to computing. Topics may include natural language processing, speech recognition and synthesis, language prostheses, statistical analysis, text processing, and corpus analysis.

5332. SURVEY OF LINGUISTIC THEORIES (3-0). A comparison and contrast of various linguistic theories, with consideration of their assumptions and problem-solving capacities.

5333. READINGS IN LINGUISTICS (3-0). May be repeated for credit when topic changes.

5336. PRINCIPLES OF LITERACY (3-0). Principles involved in the introduction of literacy to preliterate societies. Includes consideration of motivational factors, stimulation of indigenous authorship, orthography design, elements of reading methodology and alternative strategies for literacy programs. May not apply toward degree requirements if LING 5311 and SOCI 5342 are applied.

5338. READING THEORY AND APPLIED LINGUISTICS (3-0). Survey of reading theory with practical application to preparation of literary materials for preliterate societies. Focuses on specific linguistic and psycholinguistic factors involved. Prerequisites: LING 5301.

5339. SOCIOLINGUISTIC ASPECTS OF LANGUAGE PROGRAMS (3-0). Survey of the linguistic and social factors involved in the development of language programs for preliterate speakers of vernacular languages. Special attention given to the effect of using the mother tongue and/or a second language in such programs, and accompanying measurement and documentation.

5340. NON-WESTERN LINGUISTIC STRUCTURES (3-0). Study of a selected non-Western language, language family or language area based on descriptive linguistic analysis. May be repeated once for credit as the topic varies.

5342. READINGS IN NON-WESTERN LINGUISTIC STRUCTURES (3-0). May not be used to fulfill the non-Western language requirement. Prerequisite: LING 5340 or equivalent.

5345. SEMANTICS (3-0). Considers meaning with respect to how humans form concepts in terms of semantic features, categorization, prototype imaging, cultural scenes, scripting and coherence within world views.

5346. SPOKEN DISCOURSE (3-0). Techniques for collecting, transcribing, and analyzing conversation and other forms of spoken communication. Topics may include discourse prosody, turn-taking and exchange structure, interactional sociolinguistics, discourse in oral cultures, and cross-cultural communication.

5348. TEXT ANALYSIS (3-0). Methods of charting and analyzing texts to reveal the systematic contributions of pragmatic choices to their organization and meaning. Prerequisite: LING 5303.

5353. TEACHING ENGLISH AS A SECOND OR FOREIGN LANGUAGE (3-0). Presentation and critique of methodologies of teaching English to speakers of other languages, with emphasis on techniques of teaching aural comprehension; speaking, reading, and writing skills; attention to testing, language laboratory, and linguistic-cultural differences. Prerequisite: introductory course in linguistics or permission of instructor.

5354. METHODS AND MATERIALS FOR TEACHING ENGLISH AS A SECOND OR FOREIGN LANGUAGE (3-0). Systematic study of the application of linguistic theory and findings; emphasis on pedagogical strategies, materials, and tests; attention to current and past research and practices. Prerequisite: LING 5353.

5355. CONTRASTIVE ANALYSIS AND ERROR ANALYSIS IN THE TEACHING OF ENGLISH AS A SECOND OR FOREIGN LANGUAGE (3-0). A study of contrastive analysis and error analysis as means of defining student problems and progress; emphasis on current research; application to specific problems and contexts. Prerequisite: LING 5353.

5356. PEDAGOGICAL GRAMMAR OF ENGLISH (3-0). Grammaticality, variation, and acceptability applied to teaching English as a second or foreign language. Problems of description; means of application; adaptation to current pedagogical methods. Prerequisite: LING 5353.

5391. CONFERENCE COURSE IN LINGUISTICS. Graded P/F/R. Prerequisite: permission of instructor.

5392. THESIS SUBSTITUTE (3-0). Graded P/F/R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of Graduate Advisor.

6310. SEMINAR IN LINGUISTICS (3-0). Course may be repeated for credit when topic changes.

Objective

The graduate course offerings in music are provided to support other graduate degree programs and to meet the express needs of students. No program leading to a graduate degree in music exists at this time.

Music (MUSI)

5191, 5291, 5391. CONFERENCE COURSE IN MUSIC.
Prerequisite: permission of instructor and Graduate Advisor.

Department of Music

Area of Study and Degrees

Humanities
M.A.
(See Program in Humanities)

Chair

Gary Ebensberger
101 Fine Arts, 817-272-3471

Graduate Faculty

Professor
Powell

Department of Philosophy and Humanities

Area of Study and Degrees
Humanities
M.A.
(See Program in Humanities)

Acting Chair
Lewis Baker
305 Carlisle Hall, 817-272-2774

Graduate Faculty
Associate Professors
Baker, Bradshaw, Burgess-Jackson, Chiasson, Mahoney, Nussbaum, Reeder

Assistant Professor
Dyson

Objective

The graduate course offerings in philosophy and classics are provided to support other graduate programs, particularly those in Humanities and in the Social Sciences, and to meet the expressed needs of students. The courses are designed to provide the theoretical background necessary to the complete understanding and use of professional skills in these areas. No program leading to a graduate degree in philosophy exists at this time. Philosophy is a possible area of concentration in the Graduate Humanities Program.

Philosophy (PHIL)

5391. CONFERENCE COURSE IN PHILOSOPHY. May be taken only with the permission of the instructor and the Graduate Advisor.
5392. TOPICS IN THE HISTORY OF PHILOSOPHY (3-0). Consideration in depth of the work of a single philosopher or a related philosophical school against the background of the development of philosophy. May be repeated for credit as the topic changes.
5393. PHILOSOPHICAL PERSPECTIVES ON THE HUMANITIES (3-0). A philosophical inquiry into problems and issues of relevance in humanistic disciplines. May be repeated for credit as the topic changes.

Greek (GREK)

5391. CONFERENCE COURSE IN GREEK. May be taken only with the permission of the instructor and the Graduate Advisor.

Latin (LATN)

5391. CONFERENCE COURSE IN LATIN. May be taken only with the permission of the instructor and the Graduate Advisor.

Classics (CLAS)

5392. TOPICS IN CLASSICAL STUDIES (3-0). Studies in the social, political and cultural systems of the ancient Greeks and Romans, including their influence upon subsequent societies. May be repeated for credit as the topic changes.

Objective

The program leading to a Master of Arts degree in Political Science emphasizes preparation for service in many areas of our national life, both public and private. Students interested in careers in teaching and research or in leadership roles in the public or private sectors may pursue programs adapted to their individual objectives. The Department of Political Science endeavors to equip students with the research techniques and substantive background for coursework undertaken beyond the master's level. Particular attention is given to newer methodologies and approaches employed by scholars in the field.

Degree Requirements

The thesis degree plan requires 24 hours of coursework including three hours of methods in Political Science for those who have not had POLS 3310 or its equivalent. Of the remaining 21 hours, at least one course each must be taken from four of the following six areas:

Political Behavior and Processes—5305, 5314, 5315, 5350, 5391.
Comparative Politics—5336, 5337, 5352, 5391.
International Politics and Organization—5354, 5391.
Public Law and Jurisprudence—5320, 5355, 5391.
Public Administration and Policy Studies—5331, 5332, 5356, 5391.
Political Theory (Thought and Methodology)—5339, 5391.

Students should consult the Political Science Graduate Student Handbook for regulations on transfer courses, undergraduate courses, conferences, internships, and special courses.

The non-thesis degree plan requires a minimum of 36 hours, including three hours of methodology, and courses from four of the six areas.

All candidates for the degree of Master of Arts with a major in political science must pass a final comprehensive examination, written, oral, or both written and oral. The scope, content, and form of the examination will be determined by the student's supervising committee. In the event of failure of the final comprehensive examination, the student may petition the Committee on Graduate Studies to retake the examination on a date no sooner than 60 days after the first examination. Students will not be permitted more than one reexamination after failure of the initial examination.

International Studies Option

The International Studies option of the Master of Arts program in Political Science emphasizes comparative politics and international politics within the framework of Political Science. This option requires courses from three of six areas of Political Science and 12 hours in comparative politics and/or international politics. Students must have three hours of a methods course.

Department of Political Science

Areas of Study and Degrees

Political Science
M.A.
Public Administration
M.P.A.
(See School of Urban and Public Affairs)
Humanities
M.A.
(See Program in Humanities)

Master's Degree Plans

Thesis and Non-Thesis

Chair

Dale Story
206 University Hall, 817-272-2991

Graduate Advisor

Thomas Little
409 University Hall, 817-272-3988

Graduate Faculty

Professors
Cole, Hekman, Marshall, Story

Associate Professors
Cichock, Clark,
Gutierrez, Ignagni, Simowitz

Assistant Professors
Deen, Farrar-Myers,
Little, Moore

U.S. Political Institutions and Processes Option

The U.S. Political Institutions and Processes option of the Master of Arts program in Political Science emphasizes political behavior and processes and public law and jurisprudence within the framework of political science. This option requires courses from three of six areas of Political Science and 12 hours in political behavior and processes and/or public law and jurisprudence. Students must have three hours of a methods course.

Master of Public Administration

The Department of Political Science participates in the interdisciplinary Master of Public Administration along with the School of Urban and Public Affairs (see the School of Urban and Public Affairs, Program in Public Administration).

Dual Degree Program

Students in political science may participate in a dual degree program whereby they can earn a Master of Arts in political science and a Master of Arts in criminal justice. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs. To participate in the dual degree program, students must make separate application to each program and must submit a separate program of work for each degree. Those interested in a dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement on "Dual Degree Programs" in the general information section of this catalog.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Political Science (POLS)

5197. MASTER'S COMPREHENSIVE EXAMINATION. Required of all non-thesis Master of Arts students in the semester of their graduation. Graded P/F/R.

5305. STATE AND LOCAL POLITICS (3-0). Problems and policies relating to American politics at the state and local level. Field research with and for area governments emphasized where practical. Also offered as URPA 5304; credit will be granted only once.

5314. CONGRESSIONAL PROCESS AND BEHAVIOR (3-0). An in-depth examination of the role of Congress in the U.S. political system. Topics include the role of committees and party leadership, factors influencing the legislative behavior of members, congressional elections, and the responsiveness of Congress to constituencies.

5315. AMERICAN POLITICAL INSTITUTIONS (3-0). The politics, processes, and policies of American political institutions. Includes issues of the presidency, Congress, bureaucracy, and courts, and the primary theories concerning the activities and influence of these institutions.

5320. CONTEMPORARY JUDICIAL POLITICS AND BEHAVIOR (3-0). Process and decision- making of the American judiciary with emphasis on contemporary constitutional issues.

5331. URBAN GOVERNMENT ADMINISTRATION (3-0). Problems of governmental administration at all levels—national, state, and local—in urban areas, with emphasis on metropolitan and regional approaches in political decision-making. Also offered as URPA 5321; credit will be granted only once.

5332. PUBLIC POLICY ANALYSIS (3-0). Contemporary public policy analysis, focusing upon policy system modeling, the policy process as a descriptive phenomenon, and upon the profession of policy analysis. Oriented toward equipping students with analytic skills essential to analysis of public policies.

5336. THE POLITICAL SYSTEMS OF RUSSIA AND THE SUCCESSOR STATES (3-0). Analysis of comparative theories in relation to the 15 former republics of the Soviet Union. Particular emphasis on the current political and economic structures of the various republics.

5337. COMPARATIVE POLITICAL SYSTEMS (3-0). Theories and concepts relating to the scope of comparative politics and methods of comparing various aspects of the political system.

5339. EMPIRICAL THEORY AND METHODOLOGY (3-0). Selected empirical theories and research methods. Systems theory, structural-functional theory, and other empirical theories and such methodological concerns as research design, data collection, and data analysis and interpretation. Also offered as URPA 5302; credit will be granted only once.

5350. TOPICS IN POLITICAL BEHAVIOR AND PROCESSES (3-0).
5352. TOPICS IN COMPARATIVE POLITICS (3-0).
5354. TOPICS IN INTERNATIONAL POLITICS AND ORGANIZATION (3-0).
5355. TOPICS IN PUBLIC LAWS AND JURISPRUDENCE (3-0).
5356. TOPICS IN PUBLIC ADMINISTRATION AND POLICY STUDIES (3-0).

These topics courses may be repeated for credit as the topic changes.

5391. CONFERENCE COURSE IN POLITICAL SCIENCE. Research and reading in a specialized field under the direction of a member of the graduate faculty. Graded P/F/W.

5398, 5698. THESIS. Original research designed to augment existing studies of problems or topics related to one of the major fields of study. 5398 graded R/F only; 5698 graded P/F/R.

Objectives: M.A. in Sociology

The Master of Arts program in sociology is designed to provide students with a firm substantive background in sociological theory and in the techniques of contemporary research methodology and statistical analyses. In addition to these core concerns, the program offers a variety of seminars, as well as practicum opportunities, to help prepare students for a wide range of professional careers in both the private and public sectors or continued graduate education at the Ph.D. level.

Admission and Degree Requirements, Sociology

The admission requirements of the graduate program conform to the general Graduate School requirements (found elsewhere in this catalog). A bachelor's degree in sociology is not required for admission, although some preparatory coursework may be required. Interested students should contact the Graduate Advisor for details.

Applicants whose native language is not English must achieve a satisfactory score on the Test of English as a Foreign Language (TOEFL).

Students may select from two options: the thesis or non-thesis degree plan.

Thesis Option: Satisfactory completion of a minimum of 24 hours of coursework, including core courses in theory, methods, and statistics, plus the six hour thesis.

Non-Thesis Option: Satisfactory completion of a minimum of 36 hours of coursework, of which at least 24 hours must be in the major area(s) of study, including core courses in theory, methods, and statistics, and SOCI 5388.

All candidates for the degree Master of Arts with a major in sociology must pass a final examination. For thesis candidates, it is the oral defense of the completed thesis. For non-thesis candidates, it is a comprehensive examination, the scope, content and form of which shall be determined by the student's supervising committee.

Dual Degree Program

Students in sociology may participate in one of two dual degree programs whereby they can earn a Master of Arts in Sociology and a 1) Master of Public Administration or 2) Master of Science in Social Work. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of graduate advisors from both programs.

To participate in the dual degree program, students must make a separate application to each program and must submit a separate Program of Work for each degree. Those interested in a dual degree program should consult the appropriate graduate advisor(s) for further information on course requirements. Students wishing to pursue dual degree programs other than those specifically defined in the catalog should contact the Graduate School for details. See also the entry on Dual Degree Programs in the Advanced Degrees and Requirements section of this catalog.

Department of Sociology and Anthropology

Areas of Study and Degrees

Sociology
M.A.
Anthropology
M.A.
Humanities
M.A.
(See Program in Humanities)

Master's Degree Plans

Thesis and Thesis Substitute (Anthropology only)
Thesis and Non-Thesis (Sociology only)

Chair

Francis B. Harrold
430 University Hall, 817-272-2661

Graduate Advisors

Sociology
Norma Williams
419 University Hall, 817-272-3778

Anthropology
Shelley Smith
423 University Hall, 817-272-3765

Graduate Faculty

Professors
Agger, Bastien, Eve,
Harrold, Shelton,
Weed, Williams

Associate Professors
Almore, Anderson, Dunn,
Hanson, Petruso, Reed-Danahay,
Rouse, Smith, Stacey, Young

Assistant Professor
Waller

Objectives: M.A. in Anthropology

The Anthropology M.A. program offers students a well-integrated curriculum in cultural anthropology, archaeology, and biological anthropology. It is intended both (1) for students who wish to prepare for admission to an anthropology Ph.D. program at another university, and (2) for those who wish to learn anthropological skills and perspectives to enhance their careers (in education, the helping professions, or other fields) in an increasingly diverse society.

Students may choose between a thesis option (30 credit hours), recommended for those planning to go on to a Ph.D. program, and a non-thesis option (36 credit hours, ordinarily including a three-hour practicum and ANTH 5370).

Admission and Degree Requirements, Anthropology

The admission requirements of the graduate program in anthropology conform with the general Graduate School requirements. A bachelor's degree in anthropology is not a prerequisite for admission; however, students who lack adequate undergraduate preparation will be required to make up such deficiencies before work can be credited toward the graduate degree. Ordinarily, students will be expected to have completed one undergraduate course in each of the three subfields of cultural anthropology, archaeology, and biological anthropology. Interested students should contact the Graduate Advisor for details.

Thesis Option: Satisfactory completion of a minimum of 30 credit hours. Program must include 1) ANTH 5310; 2) ANTH 5351; 3) a 3 hour statistics course at either the graduate or undergraduate level, as specified by the students' committee; 4) 6 hours of ANTH 5330 (including 3 hours of archaeology or biological anthropology and 3 hours of ethnography or ethnohistory) and 5) 6 hours of thesis.

Thesis Substitute Option: Satisfactory completion of a minimum of 36 credit hours. Program must include 1-4 above, ANTH 5370, and ANTH 5371.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Sociology (SOCI)

Enrollment in graduate courses in sociology requires admission to the Graduate School or permission of the instructor.

5388. RESEARCH PRACTICUM/INTERNSHIP (3-0). Under faculty supervision, students prepare a scholarly paper focusing on a particular professional or research issue and suitable for submission as a journal article or presentation at a professional meeting; subject area with consent of instructor. Graded P/F/R.

Core Courses

5301. SOCIOLOGICAL THEORY (3-0). A comprehensive review, analysis, and evaluation of the dominant conceptual perspectives, and their proponents, in sociological theory.

5303. RESEARCH DESIGN (2-2). Seminar on the design, plan, structure, and strategies of contemporary social research. Examines the interrelationships of theory, methods, and statistics along with the problems of measurement, sampling, scaling techniques, and the presentation of statistical data. Prerequisite: three hours of undergraduate research methods.

5304. SOCIAL STATISTICS (2-2). Examines a variety of statistical methods including analysis of variance and covariance, multivariate regression models, multiple and partial correlations, factor analysis, and other contemporary parametric and nonparametric techniques. Emphasis is on the application of these methods to social science data. Prerequisite: three hours of undergraduate statistics.

Seminars

5310. SEMINARS IN SOCIAL PSYCHOLOGY (3-0). Introduction and discussion of theoretical and methodological perspectives in social psychology. Focusing on particular domains of social life, these seminars examine fundamental processes of social interaction and the influence of social situations and social experience on the thought, feeling, and behavior of individuals. (May be repeated for credit when topics vary.)

1. Perspectives in Social Psychology
2. Intercultural Communication
3. Socialization
4. Deviant Behavior
5. Special Seminars in Social Psychology

5319. SEMINARS IN SOCIAL INSTITUTIONS AND CHANGE (3-0). Seminars in this area are concerned with the structure and change of the basic elements of society that represent ordered and regulated aspects of social life. Also examined are collective behavior and social movements which result from instability in institutional arrangements and represent efforts to enact social change. (May be repeated for credit when topics vary.)

1. Sociology of Family
2. Sociology of Education
3. Sociology of Work and Occupations
4. Formal Organizations
5. Social Movements
6. Social Change and Development
7. Science, Knowledge, and Technology
8. Special Seminars in Social Institutions and Change

5330. SEMINARS IN SOCIAL DIFFERENTIATION (3-0). In all human societies, perceptions of differences in individuals, social positions and groups arise and form a basis for social evaluation. Seminars in this area examine the processes involved in social differentiation, social evaluation, and resulting forms of social inequality. (May be repeated for credit when topics vary.)

1. Stratification/Inequality
2. Gender and Society
3. Minorities
4. Population and Development
5. Population and Environment
6. Special Seminars in Social Differentiation

5341. SEMINARS IN THEORY AND RESEARCH METHODS (3-0). Research methods seminars address a variety of issues related to quantitative and qualitative approaches to data collection and analysis. Theory courses offer extended treatment of topics in theory and theory construction, reflecting systematic efforts to understand the nature and operation of human society and social behavior. (May be repeated for credit when topics vary.)

1. Methods of Demographic Research
2. Evaluation Research
3. Qualitative Research Methods
4. Advanced Social Statistics
5. Theory Construction
6. Special Seminars in Theory and Research Methods

More detailed descriptions of individual courses are available from the main office of the Department of Sociology and Anthropology, 430 University Hall.

Individual Study

5389. TEACHING SOCIOLOGY (3-0). To learn strategies of coping with practical problems of teaching undergraduate sociology, students assist one or more professors in lecture preparation, grading, and examination construction. Not to be counted toward the degree requirement. Graded P/F/R.

5392. CONFERENCE COURSE IN SOCIOLOGY. Graded P/F/R.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R.

Anthropology (ANTH)

5310. HISTORY OF ANTHROPOLOGICAL THEORY (3-0). This course is a critical examination of major theoretical trends in ethnological theory, from mid-19th century to the present.

5330. ANTHROPOLOGICAL METHODS (3-0). Research methods and underlying theory in one of four fields: biological anthropology; archaeology; ethnography; and ethnohistory. May be repeated for credit when the topic varies.

5340. EUROPEAN CULTURE AND SOCIETY (3-0). An exploration of anthropological studies of both Western and Eastern Europe. Traces the history of ethnography in Europe, from early community studies to recent work on institutions and political structures. Themes of cultural identity, nationalism, gender, and class will be addressed.

5342. ADVANCED ETHNOLOGY (2-2). Seminar based on student reports and critiques of assigned readings. Major emphasis on the areas of ethnology and social anthropology.

5343. HUMAN ECOLOGY (3-0). A critical examination of the application of models, theories, and concepts of human ecology in cultural anthropology and human adaptation.

5344. CULTURES OF LATIN AMERICA (3-0). An ethnological comparison of societies and cultures in Central and South America. Emphasis on gender, ethnicity, and political economy.

5345. RELIGION AND CULTURE (3-0). An ethnological comparison of native religions to understand non-western belief systems. Emphasis on rituals, myths, totemic systems, taboos, and cosmology.

5349. TOPICS IN ANTHROPOLOGY (3-0). May be repeated for credit as the topic changes.

5351. EMERGENCE OF HUMANKIND (3-0). An intensive review of the evidence for, and main outlines of, human biological and cultural evolution up to agricultural origins. $20 lab fee.

5353. MEDICAL ANTHROPOLOGY (3-0). An examination of anthropological concepts for understanding curing practices and attitudes toward health programs in various cultures.

5360. ANTHROPOLOGY AND EDUCATION (3-0). The study of socialization and education in cross-cultural perspective. Themes include education and language, schooling and nationalism, multicultural education, childhood socialization, literacy, adult learning, and school culture.

5363. ETHNOGRAPHY AND PERSONAL NARRATIVE (3-0). Explores the role of life stories in cultural processes. Focus is on anthropology and autobiography, autoethnography, life history, and narrative constructions of selfhood in different cultural contexts.

5369. FOLKLORE AND MYTHOLOGY (3-0). Function, forms, and interpretation of folklore and myth in traditional societies; examination of oral literature as an expression of continuity and change; emphasis on a structural analysis of myth.

5370. APPLIED ANTHROPOLOGY (3-0). Explores the principles of cultural dynamics and the sources of cultural change in innovation and diffusion. Focuses particularly on the anthropological theories, methods, and findings relevant to problems of directed culture change, especially as illustrated by non-literate and peasant groups in contact with western civilization.

5371. RESEARCH PRACTICUM/INTERNSHIP (3-0). Graded P/F/R.

5373, 5673. ARCHAEOLOGY FIELD SCHOOL (3-0). This course, conducted during the summer sessions, consists of on-site and classroom instruction in techniques of archaeological survey, excavation, laboratory, processing, and analysis. Students can receive either three or six hours of credit. Enrollment by permission of instructor only. Prior coursework in anthropology desirable but not necessary. $500 course specific fee.

5389. TEACHING ANTHROPOLOGY (3-0). To learn strategies of coping with practical problems of teaching undergraduate anthropology, students assist one or more professors to gain experience in preparing lectures, grading, and constructing examinations. Not to be counted toward the degree requirement. Graded P/F.

5392. CONFERENCE COURSE IN ANTHROPOLOGY. Graded P/F/R.

5398, 5698. THESIS. 5398 graded R/F only. 5698 graded P/F/R.

5483. GEOARCHAEOLOGY (3-1). Geological, geochemical, and geophysical techniques employed in the study of archaeological sites and materials. Also listed as GEOL 5483.

Program in Theatre Arts

Director
Joseph T. Kongevick
191 Fine Arts, 817-272-2650

Graduate Faculty
Faculty members of the Program of Theatre Arts serve as graduate instructors.

Objective

The graduate course offerings in theatre arts are provided to support other graduate degree programs and to meet the express needs of students. No program leading to a graduate degree in theatre arts exists at this time.

The grade of R (research in progress) is a permanent grade. An incomplete (the grade of X) cannot be given in a course which is graded R. To receive credit for an R-graded course the student must continue to enroll in the course until a passing grade is received. Three-hour thesis and three- and six-hour dissertation courses are graded R/F only. The grade of P (required for graduation) can be received in six- or nine-hour thesis courses and nine-hour dissertation courses only. In the course listings below, R-graded courses are designated either Graded P/F/R or Graded R. (See also the section entitled R GRADE in this catalog.)

Theatre (THEA)

5320. FILM AND TELEVISION AS DRAMA (3-0). A study of dramatic arts as presented in film and on television.

5393. TOPICS IN THEATRE ARTS (3-0). Special topics in theatre; offered periodically, with subject matter determined by instructor and student interest. Previous topics have included: Design Portfolio Workshop; Alternative Actor Training Workshop; Playwriting; Improvisation; and Styles in Acting.

The School of Nursing

Dean: Elizabeth C. Poster, Ph.D.
669 Pickard Hall • Box 19407 • 817-272-2776

Mission and Philosophy

The School of Nursing, an integral component of The University of Texas at Arlington, seeks to assure health care of the highest quality for the people of Texas. Through its baccalaureate, graduate and continuing education programs, the School of Nursing is committed to the preparation, enhancement and development of individuals who will use professional nursing roles to collaborate with other professionals and consumers in the delivery of health care. The faculty believes in the promotion and support of excellence in professional nursing through teaching, scholarly endeavors and community service.

The faculty subscribes to a philosophy in which the person is viewed holistically. A person has unique and complex needs that are communicated through a variety of behaviors in the process of living and dying. Each person has unique environmental, physiological, psychosocial-cultural, philosophical, developmental and spiritual dimensions with inherent dignity, worth and responsibility to society. Each person has the right to health care provided through interdisciplinary collaboration.

Nursing, as a part of the health care delivery system, is a socially determined profession whose practice evolves in response to the needs of individuals, families, groups, communities and societies. These needs provide direction for the current and emerging roles of professional nursing practice.

The professional nurse, guided by concern for quality of life, functions in diverse practice settings with persons of various cultures. Professional nursing practice encompasses the application of knowledge and skills in the management of nursing care. Nursing, utilizing research and implemented through the merging of nursing process and roles, is accountable for helping the person toward the maximum potential for daily living.

Learning, a continuous lifelong process, is the responsibility of each individual. In nursing education, learning experiences are planned to achieve sequence, continuity and synthesis of knowledge and skills as defined by the educational objectives. The teaching and learning processes involve the teacher and student in setting goals, selecting learning experiences, evaluating student progress and appraising instructional methods. Faculty and students share the responsibility for creating an educational climate which fosters intellectual inquiry, critical thinking and creativity; facilitates the development of each person's potential; and reflects democratic values and ethical principles.

Undergraduate nursing education is based upon studies in the arts, sciences and humanities and provides a foundation for continuing personal, professional and educational development. The baccalaureate program is designed to prepare a competent, self-directed, general practitioner of nursing who can assume increasing responsibility and leadership in the delivery of nursing care for individuals, families, groups, communities and societies.

Graduate nursing education builds on a foundation of undergraduate nursing education and provides an opportunity for professional nurses to develop a specialty practice that is congruent with an expanding theoretical and empirical knowledge base. The graduate program in nursing is designed to assist professional nurses to prepare for advanced clinical and functional roles that require increased accountability, expertise and leadership. The master's program facilitates the use of the research process through the course of study and prepares the graduate to be a critical thinker and a self-directed professional who collaborates with consumers and other health care providers.

Continuing education in nursing is based upon the premise that maintaining competency in nursing practice is the responsibility of each professional nurse. The faculty believes it is the responsibility of the School of Nursing to be sensitive to the influences inherent in a changing society and to respond to the continuing educational needs of professional nurses in Texas.

History and Overview

The UTA School of Nursing was established in 1971 as the U.T. System School of Nursing in Fort Worth and was housed in John Peter Smith Hospital. The first baccalaureate class enrolled in fall of 1972; the graduate program (MSN) began in 1975. In 1976, the school became an academic unit of UTA, moving to the campus in 1977.

The Undergraduate Program consists of the BSN and the RN to BSN programs. In addition to the Arlington campus, the RN to BSN program is offered via videotape and site coordinators on the following extended campuses in the following rural areas (parenthesis indicate the year in which each program was established): Texarkana (1985 to 1995), Waco (1989), Grayson (1990), Paris (1990) and Kaufman (1996). The Graduate Program offers a Master of Science in Nursing with preparation as a nurse practitioner in the areas of Acute Care (1996), Adult (1989), Child Health/Pediatric (1985), Family (1975), Gerontology (1984) and Psychiatric/Mental Health (1995). In addition, the UTA Graduate Nursing Program offers preparation in nursing administration and the functional roles of educator and administrator. The school began offering a professional field in nursing as part of the Ph.D. in Urban and Public Administration, fall 1996.

Since the fall of 1976, the school has graduated more than 4,500 individuals with baccalaureate degrees and more than 900 with an MSN, of which 450 are prepared as nurse practitioners. Currently, UTA has an enrollment of approximately 260 master's students and eight students in the doctoral professional field.

In addition to the academic programs of the school, support programs include Continuing Nursing Education and the Rural Health Outreach Program (1975). The school also has a Center for Nursing Research (1987), a Center for Health Services (1996) and the Center for Hispanic/Latin American Studies in Nursing and Health (1996). The Learning Resources Center offers a variety of services to undergraduate and graduate students (see the section on Special Programs and Opportunities for details).

Accreditation

The Master of Science in Nursing degree program is accredited by the National League for Nursing Accrediting Commission (NLNAC). An annually updated source for the program's required tuition, fees and program length is NLNAC, 350 Hudson Street, New York, NY 10014 (telephone: 212-989-9393).

Scholastic Activities and Research Interests of the Faculty

The research programs of School of Nursing faculty are diverse. A sampling of their areas of study includes Hispanic health care (Dr. Mary Lou Bond and Mary Elaine Jones); effects of nursing care interventions such as enemas (Dr. Marilee Schmelzer); patient education (Dr. Carolyn L. Cason); chemical dependency and abuse (Drs. Cheryl Anderson and Diane Snow); care of persons with HIV disease and AIDS (Dr. Jennifer Gray); sickle cell disease (Dr. Phyllis Adams); cancer (Drs. Nancy Burns and Karen Heusinkveld); care of the elderly (Drs. Ferne Kyba and Barbara Raudonis); adolescent pregnancy (Dr. Imelda Nwogea); care of ill children (Drs. Laura Gibson and Andi Smith); and health services research (Drs. Susan K. Grove and Reni Courtney).

Special Programs and Opportunities

Center for Continuing Nursing Education

Director: Jean Ashwill
Mission: To provide quality continuing nursing education for the improvement of nursing practice and health care in North Texas. The program strives to be a regional center for the advancement of professional continuing nursing education and to meet the diverse needs of nurses in most every clinical specialty and all levels of functional roles.

Center for Hispanic/Latin American Studies in Nursing and Health

Co-Directors: Dr. Mary Lou Bond and Dr. Mary Elaine Jones
Mission: To foster understanding between health care professionals and people of Hispanic/Latin American origin for the purpose of increasing the quality of health care for these groups. The center was established in January 1996 with the goal of becoming an education resource and research center. The center cooperates with the highly successful *Challenge to Leadership* program, which offers mentoring and support programs for Hispanic nursing students, and with the Center for Continuing Nursing Education to provide cross-cultural learning experiences.

Center for Nursing Research

Associate Dean for Research: Dr. Carolyn Cason
Mission: To provide research support services to faculty and students including identifying funding sources, developing competitive proposals, writing grant applications, retrieving literature, collecting, entering and analyzing data, and disseminating research results. Faculty members' research programs address areas in Hispanic health care, effects of nursing care interventions such as enemas, chemical dependency, family violence, spiritual care, care of persons with AIDS, sickle cell disease and care of the elderly. Collaborative relationships for research with Metroplex health care agencies are in place.

Center for Health Services

Mission: To assist faculty to use a variety of practice models that promote the delivery of community-based, family-focused health care services to people of all ages in numerous settings. The center is a vehicle through which faculty have the opportunity to demonstrate practice that is fully integrated with education and research. This center provides a unique opportunity to partner with the community, providing cost-effective, acceptable, accessible and holistic health care.

Learning Resources Center

Director: Susan Chappell
Mission: To provide both undergraduate and graduate students a place to develop, refine and apply knowledge in the clinical practice of skills. A computer lab is available for student use. Faculty are provided resources to support classroom instruction, clinical learning activities and scholarly endeavors.

Rural Health Outreach Program

Director: Dr. Myrna Pickard
Mission: To provide appropriate, affordable, accessible continuing education to the nursing staffs of acute care and psychiatric hospitals, long-term care facilities, home health agencies and other health care facilities in the rural communities of North Central Texas.

Center for Nursing Leadership Development

Director: Sharon Jenkins
Mission: To provide students, faculty, nurse executives, managers and clinicians working in all types of health care settings the educational resources and specific programs to develop leadership skills complementary to the formal curricula of schools of nursing. Objectives are still under development for this center.

Center for Psychopharmacology Education and Research

Director: Dr. Elizabeth C. Poster
Mission: The Center for Psychopharmacology Education and Research is committed to advancing the knowledge of psychopharmacology and related neuroscience. The center promotes the acquisition of this knowledge through education of Advanced Practice Registered Nurses (APRNs) and other health care professionals.

Programs

Major Areas of Study

Nursing Administration
Nurse Practitioner Programs
- Acute Care Nursing
- Adult Nursing
- Family Nursing
- Gerontological Nursing
- Pediatric Nursing
- Psychiatric-Mental Health Nursing

Nursing

Objective

Graduate nursing education builds on a foundation of undergraduate nursing education and provides an opportunity for professional nurses to develop a specialty practice that is congruent with an expanding theoretical and empirical knowledge base. The graduate program in nursing is designed to assist professional nurses to prepare for advanced clinical and functional roles that demand increased accountability, expertise, and leadership. The master's program facilitates the use of the research process through the course of study and prepares the graduate to be a critical thinker and a self-directed professional who collaborates with consumers and other health care providers.

Degree Requirements

The applicant for the master's degree in nursing must meet the general requirements of the Graduate School and have a Bachelor of Science in Nursing degree from a program accredited by the National League for Nursing or proof of equivalent education at a foreign institution. Individual consideration may be given to applicants who hold a BSN degree from non-NLN accredited programs and to applicants with baccalaureate degrees in other areas. The Graduate Record Exam (GRE) is required with a total score of 1000 on the verbal and analytical sections. Graduates of the U.T. Arlington BSN program within the last three years with a GPA of 3.5 are exempt from the GRE.

In addition to the general admission requirements of the Graduate School, applicants must have completed a basic statistics course with a satisfactory grade (C or higher) prior to enrolling or during the first semester of graduate study, and present evidence of inclusion of basic physical assessment content in the undergraduate program or completion of a continuing education program in physical assessment. Students selecting nurse practitioner and educator roles must have current physical assessment within the last three years and two years of clinical experience recommended. Students selecting Nursing Administration must have a computer background as designated by the Administration faculty. A current Texas RN license number and a health history must be on file in the Graduate Nursing Office.

Foreign students whose native language is not English must take, in addition to the Test of English as a Foreign Language (minimum score of 550), the Test of Spoken English. The foreign student must possess a current Texas RN license before registering for the selected clinical nursing area courses.

Students are required to have each semester's planned program approved by the Graduate Advisor prior to registration. A minimum of 43 semester hours, thesis or non-thesis, is required for the degree. Six semester hours of elective coursework that supports the selected nursing study area are required and must be approved by the Graduate Advisor prior to registration. Students selecting nurse practitioner preparation in Acute Care Nursing, Adult Nursing, Family Nursing, Gerontological Nursing, Pediatric Nursing, or Psychiatric-Mental Health Nursing and electing the thesis option are required to complete 51-54 semester hours for the degree. Students selecting Adult Nursing, Family Nursing, Pediatric Nursing or Gerontological Nursing must select Nurse Practitioner as their functional area.

All non-thesis candidates for the degree of Master of Science in Nursing shall pass a written examination (comprehensive exams or

Area of Study and Degree
Nursing
M.S.N.

Master's Degree Plans
Thesis and Non-Thesis

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Elizabeth C. Poster
669 Pickard Hall, 817-272-2776

Assistant Dean of Nursing and Graduate Advisor
Susan K. Grove
659 Pickard Hall, 817-272-2776

Graduate Faculty
Professors
Bond, Burns, Cason, Grove, Jones, Poster

Associate Professors
Courtney, Hegstad, Heusinkveld, Okimi, O'Quinn

Assistant Professors
Adams, Anderson, Gibson, Gray, Nwoga, Raudonis, Schmelzer, Smith

Adjunct Assistant Professors
Handy, Kyba

Senior Lecturer
Summerlin

Specialist
Carlson, Clark, Gurica, Hawley, Judkins, Leipheimer Parker, Patrick, Schira, Snow

master's completion project) over the candidate's graduate coursework as determined by the School of Nursing. All thesis candidates for the degree of Master of Science in Nursing shall present the completed thesis in a final oral examination.

Required Courses
NURS 5327. Analysis of Theories for Nursing
NURS 5301. Research in Nursing
NURS 5205. Professional Nursing-Issues and Influences
NURS 5328. Theory and Research Application in Nursing

Nursing Areas
Each student must complete the required courses in at least one nursing area:
Nursing Administration: NURS 5311, 5382, 5340, 5342
Nurse Practitioner Programs:
Acute Care Nursing: NURS 5315, 5316, 5334, 5305, 5203, 5435, 5436, 5631
Adult Nursing: NURS 5315, 5316, 5334, 5305, 5203, 5420, 5421, 5631
Pediatric Nursing: NURS 5315, 5316, 5334, 5203, 5306, 5442, 5443, 5631
Family Nursing: NURS 5315, 5316, 5334, 5305, 5203, 5306, 5420, 5431, 5631
Gerontological Nursing: NURS 5315, 5316, 5334, 5305, 5203, 5420, 5422, 5631
Psychiatric-Mental Health Nursing: NURS 5315, 5316, 5334, 5203, 5305 and/or 5306, 5424, 5425, 5631

Functional Areas
Each student must complete the required courses in at least one functional area:
Administration: NURS 5339, 5341
Nurse Practitioner: NURS 5350
Educator: NURS 5302, 5429
Administration for non-adm. major: NURS 5343, 5344

Electives/Independent Study
Elective courses may be taken in an area of concentration in other departments of the University. Independent study offers the student the opportunity to explore topics of special interest.

Cooperative Programs

Cooperative Agreement between The University of Texas at Arlington School of Nursing (UTASON) and Texas Tech University Health Sciences Center School of Nursing (TTUHSCSON). Students may transfer a maximum of 21 hours of designated courses from TTUHSCSON to fulfill part of the requirements for an MSN in Psychiatric-Mental Health Nursing at UTA. Students must complete 27 designated course hours at UTA. See Graduate Advisor for details of Cooperative Agreement.

Cooperative Agreement between The University of Texas at Arlington School of Nursing (UTASON) and The University of Texas Southwestern Women's Health Care Nurse Practitioner Program. Students who had a BSN and then completed the Women's Health Nurse Practitioner Program may receive 11 hours of credit toward an MSN at UTA. The remainder of the nurse practitioner course requirements must be completed at UTA. See Graduate Advisor for details of Cooperative Agreement.

Cooperative Agreement between The University of Texas at Arlington School of Nursing (UTASON) and The University of Texas at Tyler (UTT). Students may transfer a maximum of 21 hours of designated courses from UTT to fulfill part of the requirements for an MSN at UTA. Students must complete 27 designated nurse practitioner course hours at UTA. See Graduate Advisor for details of Cooperative Agreement.

Dual Degree Program

Students in nursing may participate in a dual degree program whereby they can earn a Master of Science in Nursing and a Master of Public Administration. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs. To participate in the dual degree program, students must make separate application to each program and must submit a separate program of work for each degree. Those interested in a dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement on "Dual Degree Programs" in the general information section of this catalog.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Nursing (NURS)

5203. PSYCHIATRIC MANAGEMENT IN ADVANCED NURSING PRACTICE (1-3). Foundations of clinical management of individuals with common psychiatric-mental health problems in ambulatory settings. Prerequisite: NURS 5316, 5334, or permission of instructor. Course specific fee: $20. Distance Education Fee: $20.

5205. PROFESSIONAL NURSING-ISSUES AND INFLUENCES (2-0). Exploration and evaluation of contemporary issues and trends relevant to nursing. Prerequisite: senior status or graduate standing.

5301. RESEARCH IN NURSING (3-0). Exploration of the research process and critical examination of published studies with emphasis on statistical analysis, critique, and utilization. Prerequisite: NURS 5327 or concurrent, and elementary statistics. Course specific fee: $15.

5302. CURRICULUM DEVELOPMENT IN NURSING (3-0). Explore the nature of nursing education. Focus on the curriculum process and its application to nursing education programs. Prerequisite: NURS 5301 or permission of instructor.

5305. ADULT MANAGEMENT IN ADVANCED NURSING PRACTICE I (2-3). Foundations of clinical management for commonly occurring conditions of adults in primary care. Prerequisites: NURS 5316, NURS 5334, or permission of instructor. Course specific fee: $20. Distance Education Fee: $30.

5306. INTRODUCTION TO PEDIATRIC PRIMARY CARE MANAGEMENT IN ADVANCED NURSING PRACTICE (2-3). Introduction to advanced clinical practice in the primary care of children, birth through adolescence. Family centered focus is on the development, health promotion and management of common health problems of children and adolescents. Prerequisites: NURS 5316, NURS 5334, or permission of instructor. Course specific fee: $20. Distance Education Fee: $30.

5308. NURSING INFORMATICS (2-3). Focus on the impact of computers on nursing. Gain knowledge and skills in word processing, database management and use of spreadsheets. Prerequisite: graduate standing. Course Specific Fee: $20.

5310. NEGOTIATION AND CONFRONTATION (3-0). Focus on analysis and synthesis of knowledge from relevant theories and implementation of interpersonal skills and techniques of negotiation and confrontation. Prerequisite: graduate standing.

5311. NURSING ADMINISTRATION I: FOUNDATIONS OF ORGANIZATION AND ADMINISTRATION (3-0). Considers development of theories of leadership and organizational behavior as applied to the health care arena. Prerequisite: NURS 5327 or concurrent enrollment.

5312. LEADERSHIP AND OUTCOMES MANAGEMENT (2-3). Focuses on leadership and strategies for outcome evaluation in a health care setting. Prerequisite: graduate standing. Course Specific Fee: $5.

5315. ADVANCED PATHOPHYSIOLOGY FOR NURSING PRACTICE (3-0). Focuses on developing an advanced knowledge base of pathophysiology and psychopathology for nursing practice. Prerequisite: graduate standing. Course Specific Fee: $10.

5316. ADVANCED HEALTH ASSESSMENT IN NURSING PRACTICE (2-3). Apply theoretical foundations and clinical skills in comprehensive health assessment across the lifespan. Prerequisite: NURS 5301 and 5315 or concurrent enrollment or permission of instructor. Course Specific Fee: $35. Distance Education Fee: $30.

5317. ADVANCED PSYCHOPHARMACOLOGY (3-0). The study of psychopharmacology practice for advanced practice nurses. Prerequisites: APRN (Master's Degree in Nursing, National Certification).

5320. CASE MANAGEMENT OF THE CHILD WITH SPECIAL HEALTH CARE NEEDS (2-3). Nursing assessment and case management of children with special health care needs 0-21 years and their families in ambulatory care settings. Prerequisite: NURS 5316 or permission of the instructor. Course Specific Fee: $5.

5321. NUTRITION IN HEALTH AND DISEASE FOR NURSING PRACTICE (3-0). Focuses on the development of a scientific knowledge base of current nutritional practices in preventive, therapeutic management and clinical research. Prerequisite: Graduate standing.

5322. ANALYSIS AND INTERPRETATION OF RESEARCH DATA IN HEALTH CARE (3-0). Analysis and interpretation of research data for health related studies using a Windows-based computer statistical package. Prerequisite: Elementary statistics.

5327. ANALYSIS OF THEORIES FOR NURSING (3-0). Critical examination of philosophical and theoretical bases for nursing. Analysis of selected concepts and theories. Prerequisite: graduate standing. Course Specific Fee: $20.

5328. THEORY AND RESEARCH APPLICATION IN NURSING (3-0). Integration of theoretical and empirical elements of nursing research with emphasis on proposal development. Prerequisites: NURS 5327 and NURS 5301. Course specific fee: $15.

5330. CLINICAL DECISION-MAKING IN ADVANCED NURSING PRACTICE (2-3). Systematic clinical decision making and development of management plans in advanced nursing practice. Prerequisite: NURS 5417, 5421, or 5525 or concurrent enrollment. Course Specific Fee: $10.

5334. ADVANCED PHARMACOLOGY FOR NURSE PRACTITIONERS (3-0). Study of clinical pharmacological therapeutics for advanced nursing practice. Prerequisite: Graduate standing, NURS 5315 and/or permission of faculty. Course Specific Fee: $10.

5339. NURSING ADMINISTRATION ROLE I: MANAGEMENT ROLES AND FUNCTIONS (1-6). Examine and implement roles and functions of the administrative executives and managers in health care organizations. Prerequisites: NURS 5311 or MANA 5312; NURS 5328 or concurrent enrollment. Course Specific Fee: $10. Distance Education Fee: $30.

5340. NURSING ADMINISTRATION III: MANAGEMENT SEMINAR AND PRACTICE (1-6). Analysis, application, and synthesis of management; organizational and leadership concepts and theories in selected health care settings. Prerequisite: NURS 5339. Course Specific Fee: $10. Distance Education Fee: $30.

5341. NURSING ADMINISTRATION ROLE II: FINANCIAL MANAGEMENT IN NURSING (2-3). Financial management concepts, financial planning and budgeting, reimbursement systems in health care, financial management skills in nursing. Prerequisite: Computer literacy with spreadsheets and graduate standing. Course Specific Fee: $10.

5342. MANAGEMENT OF NURSING OPERATIONS (2-3). Strategic planning for health care systems. Prerequisite: Doctoral graduate standing, NURS 5341. Course specific fee: $10.

5343. NURSING LEADERSHIP AND COMPLEX HEALTH CARE SYSTEMS (3-0). Analysis of current and predicted health care systems. Includes dimensions of environment, organizations, leadership, health care policy, ethics, and political action. Prerequisite: Graduate standing. Course Specific Fee: $10.

5344. FINANCE AND HUMAN RESOURCE MANAGEMENT FOR ADVANCED NURSING PRACTICE (2-3). Enhance the effectiveness of the advanced practice nurse through the development of skills in financial and human resource management. Prerequisite: NURS 5343. Course specific fee: $15.

5350. ROLE OF THE NURSE IN ADVANCED PRACTICE (2-3). Theory and application of the multiple roles of the advanced practice nurse within the health care system. Prerequisite: NURS 5315 and 5328 or concurrent enrollment or permission of instructor. Course Specific Fee: $10. Distance Education Fee: $30.

5382. NURSING ADMINISTRATION II: NURSING AND HEALTH CARE POLICY (3-0). Examines historical, current, and predicted health care policies formulated at the national, state, and local levels. Emphasizes collaboration of nursing in determining and implementing health policy. Prerequisite: graduate standing.

5385. NURSING CARE OF INDIVIDUALS/FAMILIES WITH ADDICTIVE BEHAVIORS (3-0). Theoretical foundations for understanding the scope of the problem of addiction. Focuses on gaining expertise in the area of prevention and/or in the various modalities of therapy for the individual/family with an addictive problem. Prerequisite: graduate standing.

5386. HEALTH LAW (3-0). Health law as it affects professionals, institutions and entities that deliver and finance health care. Prerequisite: graduate standing.

5387. THE LAW OF HEALTH CARE MALPRACTICE (3-0). The law of health care malpractice as it affects professional relationships of all persons engaged in the provision of health care. Prerequisite: graduate standing.

5393. ADVANCED CLINICAL NURSING PRACTICE I (1-6). Development of advanced knowledge base of specialized clinical concepts and the application of this knowledge in selected clinical areas. Prerequisite: graduate standing. Course Specific Fee: $5.

5394. ADVANCED CLINICAL NURSING PRACTICE II (1-6). Expanded background in a selected clinical area with emphasis on analysis and synthesis of clinical data, clinical judgment and management of patients and families' care. Prerequisite: NURS 5393. Course Specific Fee: $5.

5395. THEORY DEVELOPMENT IN HEALTH CARE (3-0). Implementing strategies for theory development and evaluating the role of theory in nursing and research. Prerequisite: Doctoral graduate standing.

5416. CRITICAL CARE NURSING I (2-6). Focuses on developing advanced knowledge and skill in the provision of care to critically ill adults (with selected problems) and their families. Prerequisites: NURS 5316, NURS 5334 or concurrent enrollment. Course Specific Fee: $5.

5417. CRITICAL CARE NURSING II (2-6). Focuses on collaboration in the provision of care to critically ill adults (with complex problems) and their families. Prerequisite: NURS 5416. Course Specific Fee: $6.

5420. ADULT MANAGEMENT IN ADVANCED NURSING PRACTICE II (2-6). Focus on advanced knowledge of chronic and complex health problems in the primary care management of adults. Prerequisite: NURS 5305 or permission of instructor. Course specific fee: $20. Distance Education Fee: $40.

5421. ADULT NURSING (2-6). Focus on advanced primary care knowledge for managing adults and their families with emphasis on adolescent, women and geriatric primary health care. Prerequisite: NURS 5420. Course specific fee: $20. Distance Education Fee: $40.

5422. GERONTOLOGICAL NURSING (2-6). Focus on advanced knowledge in the management of elders and their families in a variety of settings. Prerequisite: NURS 5420. Course specific fee: $20. Distance Education Fee: $40.

5424. PSYCHIATRIC-MENTAL HEALTH NURSING I (2-6). Foundation for advanced assessment, clinical decision-making, and management of individuals, families, and groups at risk for and experiencing mental illnesses and addictions in selected settings. Prerequisites: NURS 5201 or permission of instructor. Course specific fee: $25. Distance Education Fee: $40.

5425. PSYCHIATRIC-MENTAL HEALTH NURSING II (2-6). Focus on diagnosis, pharmacological and non-pharmacological management, and outcomes of individuals, families, and groups experiencing complex mental illnesses and addictions in a variety of settings. Prerequisite: NURS 5424, NURS 5328 or concurrent enrollment. Course specific fee: $20. Distance Education Fee: $40.

5429. ROLES AND FUNCTIONS OF THE NURSE EDUCATOR (2-6). Investigate the roles and functions of the nurse educator with directed teaching experiences. Prerequisite: NURS 5302. Course Specific Fee: $5.

5431. FAMILY NURSING (2-6). Focus on advanced knowledge in the management of patients and families throughout the lifespan. Prerequisite: NURS 5420. Course specific fee: $25. Distance Education Fee: $40.

5435. ACUTE CARE NURSING I (2-6). Focuses on advanced knowledge of medical-surgical nursing in managing adults with secondary and tertiary health care needs. Prerequisite: NURS 5305. Course specific fee: $25. Distance Education Fee: $40.

5436. ACUTE CARE NURSING II (2-6). Focuses on an interdisciplinary approach to the management and coordination of secondary and tertiary care for adults with complex multisystem dysfunction. Prerequisites: NURS 5435, NURS 5328 or concurrent enrollment. Course specific fee: $20. Distance Education Fee: $40.

5442. ADVANCED NURSING CARE OF THE PEDIATRIC CLIENT I (2-6). Using an ecological framework and building upon primary care management, the major focus is on advanced health promotion, assessment, and management of minor acute and chronic illness of the developing child within the family. Prerequisite: NURS 5306. Course specific fee: $25. Distance Education Fee: $40.

5443. ADVANCED NURSING CARE OF THE PEDIATRIC CLIENT II (2-6). Theory and clinical management of complex pediatric problems. The focus is on developmental disabilities/chronic illness, and social environmental problems in the developing child within the family. Prerequisites: NURS 5442, 5328 or concurrent enrollment. Course specific fee: $20. Distance Education Fee: $40.

5445. GERONTOLOGICAL/ADULT NURSING I (2-6). Theoretical study with applied clinical nursing judgment and management of adult and gerontological clients in health and illness. Prerequisites: NURS 5316, NURS 5334 or concurrent enrollment. Course Specific Fee: $25.

5525. PSYCHIATRIC-MENTAL HEALTH NURSING (3-6). Focus on diagnosis and pharmacological and nonpharmacological management of individuals, families and groups experiencing mental illnesses and addictions. Prerequisite: NURS 5424, NURS 5328 or concurrent enrollment. Course Specific Fee: $20. Distance Education Fee: $40.

5532. FAMILY NURSING II (3-6). A continuation of NURS 5431 with progressive analysis and clinical nursing judgment and management of families in health and illness. Prerequisites: NURS 5431; NURS 5328 or concurrent enrollment. Course Specific Fee: $20. Distance Education Fee: $40.

5536. ACUTE CARE NURSING II (3-6). Focuses on an interdisciplinary approach to the management and coordination of secondary and tertiary care for adults with complex multisystem dysfunction. Prerequisite: NURS 5435, NURS 5328 or concurrent enrollment. Course Specific Fee: $20. Distance Education Fee: $40.

5543. CHILD HEALTH NURSING II (3-6). Theory and clinical management of school age children and adolescents with acute minor illness, development disabilities and social/environmental problems. Prerequisites: NURS 5442, NURS 5328 or concurrent enrollment. Course Specific Fee: $20. Distance Education Fee: $40.

5546. GERONTOLOGICAL/ADULT NURSING II (3-6). Continuation of NURS 5445 with progressive analysis and clinical nursing management of adult and gerontological clients in health and illness. Prerequisite: NURS 5445; NURS 5328 or concurrent enrollment. Course Specific Fee: $20. Distance Education Fee: $40.

5926. PSYCHIATRIC-MENTAL HEALTH NURSING III (0-27). Clinical preceptorship in selected practice settings. Application of theory and research in advanced psychiatric-mental health nursing practice. Prerequisite: NURS 5525. Course Specific Fee: $20. Distance Education Fee: $40.

5933. FAMILY NURSING III (0-27). Clinical preceptorship in selected primary health practice sites with opportunities to apply knowledge and concepts in a guided, progressive context of family nursing practice. Prerequisite: NURS 5432. Graded P/F/R. Course Specific Fee: $20. Distance Education Fee: $40.

5937. ACUTE CARE NURSING III (0-27). Clinical preceptorship in selected practice settings. Application of theory and research in advanced acute medical-surgical nursing practice. Prerequisite: NURS 5536. Course Specific Fee: $20. Distance Education Fee: $40.

5944. CHILD HEALTH NURSING III (0-27). Field study in pediatric primary health care in selected clinical settings with guidance from preceptors and faculty. Major focus is integration of theoretical concepts applied to clinical practice. Prerequisites: NURS 5443. Graded P/F/R. Course Specific Fee: $20. Distance Education Fee: $40.

5947. GERONTOLOGICAL/ADULT NURSING III (0-27). Clinical preceptorship in selected primary health practice sites with opportunities to apply knowledge and concepts in a guided, progressive context of gerontological nursing practice. Prerequisites: NURS 5446. Graded P/F/R. Course Specific Fee: $20. Distance Education Fee: $40.

5170, 5270, 5370. INDEPENDENT STUDY IN NURSING. Detailed in-depth study in a specific topic area. Topic and mode of study are agreed upon by student(s) and instructor prior to registration. May be repeated for credit when topics vary. Graded P/F/R.

5190, 5290, 5390, 5490. TOPICS IN NURSING. Selected topics in advanced nursing. May be repeated for credit as topics change.

5331, 5631, 5931. ADVANCED CLINICAL NURSING PRACTICUM. Clinical preceptorships in selected health practice sites with opportunities to apply knowledge, skills and concepts in a guided, progressive context of advanced nursing practice. The ratio of credit to clinical hours is 1:4. Graded P/F/R. Prerequisite: NURS 5421 or 5422 or 5425 or 5431 or 5436 or 5443 or approval of the Graduate Advisor. Course specific fee: $20. Distance Education Fees: $10 per credit hour.

5398, 5698. THESIS. 5398 graded R/F only, 5698 graded P/F/R.

5696, 5996. INTERNSHIP IN NURSING ADMINISTRATION. Exploration and participation in the role of a nurse administrator in planning, organizing, and analyzing nursing education or nursing service. Graded P/F/R. Prerequisite: approval of the Graduate Advisor.

The Professional Field in Nursing as part of the Ph.D. in Urban and Public Administration

The U.T. Arlington School of Nursing offers a Professional Field in Nursing as part of the Ph.D. in Urban and Public Administration. The courses for the Professional Field are:

5395. THEORY DEVELOPMENT IN NURSING (3-0). Implementing strategies for theory development and evaluating the role of theory in nursing. Prerequisite: doctoral graduate standing.

5396. ETHICS IN HEALTH CARE SYSTEMS (3-0). Inquiry into the values and ethical problems of contemporary health care. Application of ethical reasoning and reflection for the systematic resolution of ethical dilemmas, with special attention to those affecting nursing. Prerequisite: doctoral graduate standing.

5397. EXECUTIVE LEADERSHIP IN HEALTH CARE SYSTEMS (3-0). Implementation of strategies for analysis and design of health care systems to enhance health care outcomes. Emphasis on executive leadership in nursing and health care. Prerequisites: NURS 5395; NURS 5396 or permission of graduate instructor.

5399. QUALITATIVE RESEARCH METHODS FOR HEALTH CARE SYSTEMS (3-0). Application of qualitative design, sampling, and data analysis methods to nursing and health care research. Prerequisite: NURS 5395 or concurrent enrollment or permission of graduate instructor.

6312. INSTRUMENTATION AND MEASUREMENT FOR HEALTH CARE SYSTEMS (3-0). Critique, development, and testing of instruments for use in nursing and health care systems. Prerequisite: NURS 5395 or permission of graduate instructor.

The students will take 12 hours in the Professional Field of Nursing. The three required courses are: NURS 5395, NURS 5396, and NURS 5397. The student may choose either NURS 5399 or NURS 6312. Access to this Professional Field in Nursing requires admission to the doctoral program in Public and Urban Administration. For details on the admission requirements, please see the section of the graduate catalog titled School of Urban and Public Affairs.

The College of Science

Dean: Neal Smatresk, Ph.D.
206 Life Science Bldg. • Box 19047 • 817-272-3491

Mission and Philosophy

The College of Science graduate programs are committed to excellence in graduate education and research and contribute, along with other institutions in this country and throughout the world, to the expansion of scientific knowledge. Graduates of our programs are highly trained and educated scientists who will be able to contribute to the economic and social well-being of our state and nation.

History and Overview

The College of Science was established as a separate academic unit in 1966 and at that time offered master's programs in mathematics and physics. Currently, master's programs are offered in all departments. Doctoral training is offered in the departments of Biology, Chemistry and Biochemistry, Mathematics, Physics and Psychology. The faculty currently numbers 96, with more than 240 graduate students enrolled in master's and doctoral programs. Research is an integral part of the college's graduate training and provides opportunities to generate new knowledge and acquire state-of-the-art investigative techniques. Research within the College of Science is both basic and applied in nature.

In addition to a wide range of research programs represented in each department, the college currently houses centers for research in advanced polymer research, biological macrofouling, colloidal and interfacial dynamics, electron microscopy, fossil fuels chemistry, geoarcheological studies, high energy physics and technology, medicinal chemistry, parasitology, and earth resources and the environment.

Scholastic Activity and Research Interests of the Faculty

Biology

The Department of Biology has a wide array of research programs ranging from molecular through population levels of integration. The program boasts strength in microbiology, molecular biology, aquatic biology, evolution, systematics, animal physiology, ecology and behavior, and has active funding from a variety of private and public agencies. The department also hosts centers for parasitology, biological macrofouling, electron microscopy and a collection of vertebrates. The research program emphasizes quantitative aspects of biology and provides students with strong training in statistics and experimental design.

Chemistry and Biochemistry

Research programs include synthetic work on natural products, medically active agents, novel precursors for semiconductor fabrication, new catalysts, stabilization of reactive intermediates, and electrically conducting polymers. Biochemical research includes studies of enzymology and molecular biology of methylotrophic metabolism. Physical, analytical and electrochemical research includes studies of colloids and surfaces, electrode modification through thin film surface deposition, and characterization of the electrical properties of polymers and other materials. Theoretical studies involve both a major computational program applying molecular orbital theory to a variety of problems and the statistical mechanics of condensed phase systems.

Geology

Department research has a strong orientation toward the application of geochemistry, geophysics and paleobiology to earth resources and the environment. Current research interests include analysis and modeling of geologic deformational structures, landsliding, nautiloid paleobiogeography for Siluro-Devonian terranes, spectral sedimentology, continental faults, environmental and archeological studies, shales, accreted rock formations and plate tectonics.

Mathematics

The department has a large group working in numerical analysis and scientific computing. Specialties include finite element methods, particle models, computational geometry, non-linear dynamical systems with applications in biology and other sciences, game and control theory, statistical research focused on quality control, sampling and systems reliability. Current projects include studies of computer modeling of natural phenomena, dynamical aspects of medicine, volterra operators, neural network modeling, probabilistic methods in quantum mechanics, game theory, analysis of viscous fingering porous media, adaptive estimation in statistics, statistical process control charts, computer modeling of developable surfaces, algebraic geometry, geometry and analysis of Rienmannian manifolds, and least-squares finite elements.

Physics

Current research in the department is primarily in the areas of condensed matter physics, materials science and high energy physics. The theoretical condensed matter group is engaged in cluster, electron transport, electronic structure, molecular dynamics and path integral computations having relevance to the chemical, electrical and

magnetic properties of surfaces, metals and semiconductors. The experimental condensed matter group is engaged in studies of diamond coatings, magnetic multilayers, metals, semiconductors and surfaces using electron, positron, optical and magnetic resonance spectroscopies. The experimental high energy group is involved in collider experiments at Fermilab, Brookhaven Laboratory and CERN to study QCD and to search for supersymmetry and other physics beyond the standard model. Other active research areas include high energy theory, optics, parallel computing and statistical physics.

Psychology

Expertise and research activity include animal behavior, animal and human learning, cognitive processes, social psychology, psychobiology and developmental psychology. Current research interests include group brainstorming, verbal memory and neuropsychology, applied psychological measurement, pain systems, decision processes, naturalistic social cognition, stress, genetic and hormonal determinants of aggressive and defensive behaviors and parent-offspring interactions, sea turtle behavior, and infant mental representation of objects.

Programs

Master's

Biology
Chemistry
Geology
Mathematics
Physics
Psychology

Doctoral

Applied Chemistry
Experimental Psychology
Physics and Applied Physics
Quantitative Biology

In addition, the College of Science offers interdisciplinary master's and doctoral programs with the College of Engineering in Materials Science and Engineering and in Environmental Science and Engineering. The College of Science also participates in the interdisciplinary Mathematical Sciences Program. Entries for the aforementioned interdisciplinary programs are in the Interdepartmental and Intercampus Programs section of this catalog.

Department of Biology

Areas of Study and Degrees
Biology
M.S.
Quantitative Biology
Ph.D.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plans
Thesis and Non-Thesis

Acting Chair
John D. Bacon
337 Life Science, 817-272-2871

Graduate Advisor
Daniel Formanowicz
349 Life Science, 817-272-2422

Graduate Faculty
Professors
Arnott, Bacon, Campbell, Chrzanowski, Hellier, McMahon, Robinson, Smatresk, Stewart, Whitmore

Associate Professors
Formanowicz, Neill

Assistant Professors
Bernard, Burleson, Chippindale, Grover, Payne, Phillips, Smith

Professor Emeritus
Pyburn

Objective

The program leading to the degree of Master of Science in biology is designated to provide graduate education which will prepare students for vocations in industry, government, and teaching, and to pursue further graduate education leading to the doctorate. The doctoral program is designed to train students to apply sophisticated quantitative techniques to solving basic and applied problems in biology. Students in this program will attain substantially greater quantitative skills than in traditional doctoral programs in the biological sciences, providing them with a competitive advantage in business, industry, government, and academia.

Admission

Master of Science

In addition to the general regulations and admission requirements stated elsewhere in this catalog, the student must present to the department a satisfactory score on the Graduate Record Examination. International students whose native language is not English must have a minimum TSE score of 40.

Doctor of Philosophy

In addition to the general regulations and admission requirements stated elsewhere in this catalog, the student must have a combined score of not less than 1200 on the quantitative and analytical sections of the Graduate Record Exam. International students whose native language is not English must have a minimum TSE score of 40.

Degree Requirements

Supporting work outside the student's major area may be taken in botany, chemistry, geology, mathematics, microbiology, physics, and zoology. Approved courses in civil engineering, philosophy, psychology, and sociology may also be taken in support of the student's program. Subject to written approval by the Graduate Advisor and within the limitations stated in the General Graduate School Regulations, a student may take up to nine hours of coursework from among courses listed under Biology at the 3000 or 4000 levels.

Master of Science

Non-thesis and thesis options are offered. The non-thesis option is designed to meet the needs of practicing teachers or those intending to enter the teaching profession. Students enrolled in the non-thesis option are required to complete 36 hours, including 24 hours of formal coursework in biology plus two hours of 5101, 5391, and sufficient additional hours to complete course requirements. Students enrolled in the thesis option are required to complete 30 hours, including 18 hours of formal coursework, two hours of 5101, 5698, and sufficient additional hours to complete degree requirements.

Doctor of Philosophy

The degree of Doctor of Philosophy in Quantitative Biology requires distinguished attainment both in scholarship and in research. In addition to meeting the minimum requirements of a planned course of study, the ultimate basis for conferring the degree must be

the demonstrated ability to do independent and creative work and the exhibition of a profound grasp of the subject matter within the field.

Animal Behavior Option: Study in the area of animal behavior is offered jointly by biology and psychology graduate programs. See Psychology section of the catalog.

Mathematics: Students will be expected to have (or complete during their first year of residence) a strong quantitative background including formal courses in differential and integral calculus, differential equations (or equivalent skills), and computer programming.

Foreign Language: Students will be required to demonstrate proficiency in one foreign language or in computer skills above that required for entry into the program.

Course Requirements: A total of 60 hours of coursework should normally be completed including 18 hours of required courses, 12 hours of electives, and 30 hours of seminar and research courses. All students in the program are required to take BIOL 5314 (Biometry), BIOL 5361 (Advanced Biometry), and BIOL 5362 (Experimental Design and Analysis). Students must take nine hours from among the following courses in quantitative biology: BIOL 5306 (Bioenergetics), BIOL 5316 (Advanced Evolutionary Biology), BIOL 5337 (Behavioral Ecology), BIOL 5365 (Image Analysis), BIOL 5333 (Biological Modeling), BIOL 5363 (Quantitative Approaches to Physiology), BIOL 5367 (Theoretical Systematics), or BIOL 5364 (Population Genetics). Twelve hours of electives may be selected by students under supervision of their dissertation committee from among courses listed below in the department's course offerings that are designated by an asterisk (*) at the end of the course description. Finally, 30 hours of seminars and research, including 9 hours of dissertation in the final semester (BIOL 6999), are required from among the following courses: BIOL 5101, 5200, 5291, 5391, 5193-5693, 5398, 5698, or 5998, or BIOL 6191, 6291, 6391, 6491, 6591, or 6691 (can be repeated for credit).

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Biology (BIOL)

5101. SPECIAL TOPICS IN BIOLOGY (1-0). Seminar on significant biological research. May be repeated for credit. Prerequisite: consent of faculty.*

5102. PRESENTATION METHODS (1-0). Introduction on preparation of scientific talks and poster presentations, including graphics, biological illustration, banner making, preparation of graphics slides and scientific photography.

5103. COMPUTER APPLICATIONS (1-0). An introduction to the software applications needed to collect and analyze data, prepare scientific papers and present research findings. Both Macintosh and PC platform applications will be reviewed.

5104. GRANT PROPOSAL WRITING (1-0). Methods of preparation of research proposals to granting agencies, including: use of library research facilities; standard proposal formats; elements of successful proposals; survey of funding agencies in the biological sciences.

5105. RESEARCH SEMINAR I (1-0). Once during a student's first semester for attending a seminar series of talks by Biology Department faculty and graduate students.

5106. RESEARCH SEMINAR II (1-0). For attending a seminar series of talks by Biology Department faculty and graduate students. Students enrolling in Research Seminar II will be required to present a seminar on the results of their graduate research.

5302. MICROBIAL GENETICS (3-0). Consideration of the nature, expression and regulation of the genetic processes in micro-organisms. Prerequisites: BIOL 2451 and 3315 or consent of instructor.*

5303. MOLECULAR GENETICS (3-0). Study of molecular genetics with emphasis on eucaryotic systems including DNA structure and chromosome arrangement: molecular evolution, and gene regulation and expression. Prerequisites: BIOL 3315 or instructor's permission.

5304. VIROLOGY (3-0). The nature, reproduction and host-cell interactions of viruses and virus-like agents or animals. Emphasizes molecular aspects of viral replication and the molecular basis of pathogenesis. Prerequisite: instructor's permission.

5305. TECHNIQUES IN MICROBIAL AND MOLECULAR GENETICS (1-5). Laboratory based techniques course focusing on current methods in microbial and molecular genetics. Prerequisites: BIOL 4302 or equivalent and instructor's permission. $30 lab fee. $15 equipment fee.

5306. BIOENERGETICS (3-0). The use of quantitative analysis of energy resource partitioning to study the evolution of adaptational strategy at the cellular, individual and population levels, including quantitative analysis of physiological processes and life history adaptations in terms of energetic efficiency. Prerequisite: consent of instructor.

5309. HISTORY OF BIOLOGY (3-0). Trends of thought in the biological sciences with emphasis on notable contributors. Philosophical systems dealing with biological concepts in western civilization are stressed. Prerequisite: consent of instructor.

5310. SELECTED TOPICS IN BIOLOGY (3-0). Topics may vary depending on the needs and interests of the students. May be repeated for credit. Prerequisite: consent of the student's thesis committee and the current course instructor.*

5311. EVOLUTION (3-0). Study of the origin of living systems and the mechanism of their evolution. Prerequisite: BIOL 3315 or equivalent.*

5313. IMMUNITY TO PARASITES (3-0). Immune responses of invertebrates and vertebrates to protozoan and metazoan parasites. Emphasis on mechanisms by which parasites modify immunological responsiveness of hosts. Prerequisite: BIOL 3312.

5314. BIOMETRY (3-0). An examination of statistical methods and procedures in relation to the design of biological experiments and the analysis of their results. Prerequisite: consent of instructor.

5315. COMMUNITY ECOLOGY (3-0). An investigation of the effects of interspecific interactions on the distribution and abundance of organisms. Prerequisite: consent of the instructor.*

5316. ADVANCED EVOLUTIONARY BIOLOGY (3-0). An analysis of existing biological phenomena with regard to their selective advance in biological systems. Prerequisite: BIOL 5311 or consent of instructor.

5320. BIOGEOGRAPHY (3-0). The role of natural and artificial transport, population pressure and limiting agencies are examined in the light of the patterns of distribution of living organisms. Prerequisite: consent of instructor.*

5333. BIOLOGICAL MODELING (3-0). Representation of biological processes with linear and nonlinear differential and difference equations, using examples from physiology, population biology, and ecology. Topics include graphical analysis, simulation, stochastic processes, chaos, and fractals. Prerequisite: consent of instructor.*

5337. BEHAVIORAL ECOLOGY (3-0). Introduction to predictive modeling techniques used in studying behavior and ecology of animals. Includes optimization, dynamic optimization, utility theory, and game theory. Prerequisite: consent of instructor.*

5338. ENDOCRINOLOGY (3-0). An exploration of the vertebrate endocrine system with emphasis on cellular origin of hormones, hormone roles in physiological regulation and hormonal mechanisms of cellular action. Prerequisites: Biology 3301 or 3442 or instructor's permission.

5339. PHYSIOLOGICAL ECOLOGY (3-0). Survey of the physiological adaptations of animals to their environments. Emphasizes physiological variation and acclimation and the evolution of physiological processes. Prerequisite: consent of instructor.*

5340. BIOCHEMICAL ADAPTATIONS (3-0). Exploration of the fundamental ways biochemical functions of living systems are adaptively modified to permit exploration and colonization of diverse environments. Prerequisite: consent of instructor.*

5341. NEUROBIOLOGY (3-0). The structure and function of animal nervous systems will be reviewed, with emphasis on bioelectricity, synaptic transmission, sensory systems, and motor systems. Additional topics will include sensory-motor integration, cellular and network oscillators, neuronal plasticity, and adaptive features of nervous systems. Prerequisites: BIOL 3301, 3442 or consent of instructor.*

5342. ICHTHYOLOGY (2-3). Classification, anatomy, physiology and natural history of fishes. Prerequisite: consent of instructor. $10 lab fee.*

5343. REPTILE BIOLOGY (2-3). Diversity, systematics, distribution and behavior of major groups of reptiles. Laboratory includes museum techniques, identification and anatomical study. Prerequisite: consent of instructor. $10 lab fee, $10 microscope fee.*

5344. AMPHIBIAN BIOLOGY (2-3). Diversity, systematics and behavior of major groups of amphibians. Laboratory includes museum techniques, identification and anatomical study. Prerequisites: instructor's permission. $15 lab fee, $10 microscope fee.

5345. ORNITHOLOGY (2-3). Anatomy, physiology, identification, population dynamics and ethology of birds. Laboratory includes field identification, preparation of specimens, and field study techniques. A weekend field trip is required. Prerequisite: consent of instructor. $20 lab fee.*

5348. ENVIRONMENTAL BIOLOGY (2-3). Examines major environmental problems that affect biological systems with an emphasis on problem solving. Includes a survey of potential employment opportunities for biologists in environment related fields. A weekend field trip is required. Prerequisite: instructor's permission. $20 lab fee.

5353. SCANNING ELECTRON MICROSCOPY (1-4). Principles and operation of the Scanning Electron Microscope (SEM). Training in the use of the JEOL JSM SEM. Specimen preparation for SEM included in the lectures and laboratory. Open to non-biologists. Prerequisite: consent of instructor. $30 lab fee. $25 course specific fee.*

5354. LIMNOLOGY (3-0). The study of biotic and abiotic components of inland waters. Prerequisite: instructor's permission.

5355. AQUATIC BIOLOGY (2-3). Ecological relationships in aquatic ecosystems with emphasis on those of freshwater; laboratory concerned with the pond, stream, and reservoir habitats of the Southwest. Prerequisite: BIOL 4347 or consent of instructor. $30 lab fee. $15 course specific fee.*

5361. ADVANCED BIOMETRY (3-0). Introduction to various computerized statistical application packages. Topics include multiple regression analysis, path analysis, partial correlation, residual analysis, and various techniques useful for data analysis. Prerequisite: BIOL 5314 or consent of instructor.

5362. EXPERIMENTAL DESIGN (3-0). Various analysis of variance models will be explored including hierarchic models, multiway factorial models, Latin square designs, split plots designs, and incomplate block designs. Nonparametric methodologies and analysis of covariance techniques will also be presented. Prerequisite: BIOL 5314 or consent of the instructor.

5363. QUANTITATIVE APPROACHES TO PHYSIOLOGY (2-3). Advanced methodologies for the analysis of physiological systems. Quantitative aspects of transport, respiration, electrophysiology, and cardiovascular physiology. Laboratory will emphasize practical measurement methodologies and principles of physiological measurement and instrumentation. Prerequisite: consent of instructor. $30 lab fee.

5364. POPULATION GENETICS (3-0). The genetics of evolution with emphasis on measuring, predicting, and modeling genetic change in populations. Prerequisite: consent of instructor.

5365. IMAGE ANALYSIS (2-3). Quantitative methods used in the analysis of microscopical and other types of biological images. Images studied will be obtained from light and electron micrographs, energy dispersive electron analysis maps and normal, aerial, and laboratory photography. Prerequisite: consent of the instructor. $25 lab fee. $30 course specific fee.

5367. THEORETICAL SYSTEMATICS (3-0). Overview of diversity and evolutionary relationships of living organisms. Emphasizes quantitative methods for phylogeny reconstruction, and interpretation and application of molecular data. Prerequisites: BIOL 3315 and BIOL 3339 or equivalents, or instructor's permission.

5291, 5391. INDIVIDUAL PROBLEMS IN BIOLOGY. Individual research projects supervised by a staff member. Prerequisite: consent of staff.

5410. BIOLOGICAL TECHNIQUES (1-4). Students will study the basic laboratory and field research techniques utilized in a wide variety of biological research areas. Prerequisite: consent of instructor. $15 lab fee.*

5420. BIOLOGY ROTATIONS (1-4). Students study biological research techniques in detail in the laboratories of three different Biology Department faculty members. Faculty laboratories involved will vary each time that it is offered. Prerequisite: consent of instructor. $15 lab fee. $10 course specific fee.*

5442. EXPERIMENTAL ANIMAL PHYSIOLOGY (3-3). Experimental study of physiological regulation, including: energy metabolism; responses to temperature; water and solute balance; oxygen transport; and acid-base regulation. Topics discussed in relation to current literature. Students required to complete a research project under instructor's supervision. Prerequisite: consent of instructor. $30 lab fee. $10 course specific fee.*

5449. PARASITOLOGY (3-3). Lecture deals with ecology of parasites, morphologic and physiologic adaptations to parasitic way of life, host adaptations to parasitism, and effects of parasites on hosts. Laboratory deals with clinical and veterinary parasitology, animal dissections, diagnosis of parasitic infections, and identification of parasites. Prerequisite: 16 hours of laboratory biology. $30 lab fee. $15 course specific fee.*

5193-5693. RESEARCH IN BIOLOGY. Conference course in which the student undertakes intensive investigation of topics under the supervision of a staff member. Prerequisite: consent of instructor. Graded P/F/R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: consent of faculty.

6191-6691. ADVANCED RESEARCH. Faculty supervised individual research. May be repeated for credit.

6399-6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: admission to candidacy for the degree Doctor of Philosophy in Quantitative Biology.

Department of Chemistry and Biochemistry

Areas of Study and Degrees
Chemistry
M.S.
Applied Chemistry
Ph.D.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plans
Thesis, Thesis Substitute and Non-Thesis

Chair
Ronald L. Elsenbaumer
219 Science Hall, 817-272-3171

Graduate Advisor
R.B. Timmons
234 Science Hall, 817-272-3801

Graduate Faculty
Professors
Bellion, Elsenbaumer, Girardot, Marynick, McDowell, Pomerantz, Rajeshwar, Schelly, Ternay, Timmons

Associate Professor
Dias

Assistant Professors
Kinsel, Lovely, MacDonnell

Objective: Master of Science

The objectives of the Chemistry and Biochemistry Department's program leading to the Master of Science degree include (a) developing the individual's ability to do independent research, (b) preparing students for more advanced study in chemistry and (c) providing advanced training to professional chemists and those employed in technical and business areas in which chemistry at this level is necessary for efficient performance. Research areas include analytical chemistry, biochemistry, bioinorganic chemistry, colloid and surface chemistry, electrochemistry, inorganic chemistry, medicinal chemistry, organic chemistry, physical chemistry, polymer chemistry, and theoretical chemistry.

Master's Degree Requirements

A candidate for graduate study must satisfy the general admission requirements of the Graduate School, and his or her academic record must show preparation for advanced work in chemistry.

Master's Degree with Thesis

A minimum of 18 hours in chemistry from courses listed in the Graduate Catalog will be required. Twelve of these hours should be from Chemistry 5301, 5309, 5311, 5315, 5321, and 5403. Electives may be senior or graduate division courses in a science or engineering subject selected by the candidate with the approval of the Graduate Advisor.

Master's Degree with Thesis Substitute

Admission to the program requires approval of the Graduate Studies Committee. Minimal registration in a project course (CHEM 5391 or 5691 or CHEM 5392 or 5692) is also required. At the time the degree is awarded the candidate is expected to have completed at least five years of suitable professional experience in an industrial, government, or other chemistry laboratory.
All potential applicants MUST contact the Graduate Advisor prior to registration.

Master's Degree Non-Thesis

This option requires a minimum of 36 hours of coursework of which at least 24 hours must be in chemistry. All courses must be approved by the Graduate Advisor.

Objective: Ph.D. in Mathematical Sciences/Chemistry Option

The program leading to the Doctor of Philosophy degree in mathematical sciences/chemistry option is designed primarily to prepare chemists for research and teaching careers which involve the theoretical and mathematical aspects of chemistry. For further details, see Interdepartmental and Intercampus Programs.

Objective: Ph.D. in Applied Chemistry

The program leading to the Doctor of Philosophy degree in Applied Chemistry is designed primarily to prepare doctoral-level chemists for industrial research careers. The student must (1) acquire the practical knowledge of the type of research conducted in industry and of the constraints (both practical and philosophical) under which such research is conducted; and, (2) demonstrate the ability to carry out independent research. The areas of research include analytical chemistry, biochemistry, bioinorganic chemistry, colloid and surface chemistry, electrochemistry, inorganic chemistry, medicinal chemistry, organic chemistry, physical chemistry, polymer chemistry, and theoretical chemistry.

Ph.D. Degree Requirements

To be admitted to the Ph.D. program, an applicant must satisfy the general admission requirements of the Graduate School and his or her academic record must show preparation for advanced work in chemistry.

Each candidate must complete the following program requirements:

1. Core courses for students emphasizing organic chemistry.
   Three from:
   CHEM 5403 Quantum Chemistry
   CHEM 5311 Analytical Chemistry
   CHEM 5315 Inorganic Chemistry
   CHEM 5321 Metabolism and Regulation
   Plus:
   CHEM 5308 Determination of Molecular Structure by Physical Methods
   CHEM 5309 Organic Chemistry I
   CHEM 5310 Organic Chemistry II
   CHEM 5312 Advanced Organic Synthesis
   Plus courses listed in item 6.
2. Core courses for students emphasizing physical or analytical chemistry.
   CHEM 5301 Physical Chemistry I
   CHEM 5302 Physical Chemistry II
   Plus three from:
   CHEM 5309 Organic Chemistry I
   CHEM 5311 Analytical Chemistry
   CHEM 5315 Inorganic Chemistry
   CHEM 5321 Metabolism and Regulation
   Plus courses listed in item 6.
3. Students emphasizing biochemistry who have not had one full year of General Biochemistry must also take the following courses BEFORE taking CHEM 5321, 5325, and 5327:
   CHEM 5319 General Biochemistry I
   CHEM 5320 General Biochemistry II
   Core courses for students emphasizing biochemistry.
   CHEM 5311 Analytical Chemistry
   CHEM 5321 Metabolism and Regulation
   CHEM 5325 Enzymology
   CHEM 5327 Biochemical Genetics
   Plus one from:
   CHEM 5403 Quantum Chemistry
   CHEM 5309 Organic Chemistry I
   CHEM 5315 Inorganic Chemistry
   Plus courses listed in item 6.
4. Core courses for students emphasizing inorganic chemistry:
   CHEM 5315 Inorganic Chemistry
   Plus three from:
   CHEM 5403 Quantum Chemistry
   CHEM 5309 Organic Chemistry I
   CHEM 5311 Analytical Chemistry
   CHEM 5321 Metabolism and Regulation
   Plus courses listed in item 6.
5. Core courses for students emphasizing polymer chemistry:
   a. All core courses for any of the other emphasis areas 1-4
   Plus:
   b. CHEM 5350 Advanced Polymer Chemistry
   Plus courses listed in item 6.
6. Courses required of ALL students.
   CHEM 6201 Unit Operations
   CHEM 6202 Principles of Industrial Chemistry
   CHEM 6203 Regulatory Aspects of the Chemical Industry
   And:
   IE 5327 Information Systems for Engineering Management Decisions
   Or:
   ECON 5309 Economic Analysis I
7. Additional research and elective courses chosen according to the student's dissertation topic and area of specialization under the guidance of the supervising committee.

A course grade may be used to satisfy degree requirements for no more than seven years after the course has been completed.

After admission to the doctoral program the student must successfully complete the appropriate examination(s) required by the faculty of the student's discipline. The candidate must demonstrate proficiency in an approved computer language.

A supplementary set of guidelines, published by the Department of Chemistry and Biochemistry, should be consulted.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Chemistry (CHEM)

5101. SEMINAR IN CHEMISTRY (1-0). Two semesters of registration required of all graduate students. May not be counted for credit toward the degree requirements. Every student is expected to present one seminar to the Chemistry Department during the two-semester period. Includes learning how to prepare, present, and defend an oral presentation. Seminar topics are selected with the assistance of the instructor and may include both pure and applied chemistry. Graded P/F only.

5300. SELECTED TOPICS IN ADVANCED CHEMISTRY (3-0). The area may vary (typically analytical, applied, biological, colloid, environmental, inorganic, organic, physical, polymer, materials, theoretical, etc.) and will be announced in advance. More than one area may be covered simultaneously, in parallel courses offered under different section numbers. May be repeated for credit when area or topics vary. Prerequisite: permission of instructor.

5301. PHYSICAL CHEMISTRY I (3-0). An introduction to the basic principles of quantum mechanics including Schrîdinger and Heisenberg formulations, basic postulates, operator algebra, exact solutions of model problems, approximation methods, group theory, and spin systems. Application of quantum mechanics for spectroscopy including time dependent perturbation theory, selection rules, and a survey of electronic, ESR, NMR, rotational, and vibrational spectroscopies. Emphasis will be placed on relevance to molecular structure, chemical dynamics, and materials science.

5302. PHYSICAL CHEMISTRY II (3-0). Thermodynamics, equilibrium, and introduction to non-equilibrium systems. Kinetics of simple and complex reactions. Theories of rate processes and molecular reaction dynamics. Statistical thermodynamics and its relevance to kinetics and spectroscopy.

5308. DETERMINATION OF MOLECULAR STRUCTURE BY PHYSICAL METHODS (3-0). The use of modern instrumental techniques to determine structure: infrared, ultraviolet, and magnetic resonance spectroscopy, mass spectrometry, optical rotatory dispersion. Emphasis on interpretation of spectra. Prerequisite: CHEM 2322 or equivalent.

5309. ORGANIC CHEMISTRY I (3-0). Bonding, structure, stereochemistry; substituent effects, isotope effects, solvent effects, kinetics, and linear free-energy relationships in determining reaction mechanisms. Acids and bases, orbital symmetry, pericyclic reactions, photochemistry, and nucleophilic substitution reactions. Prerequisites: CHEM 2322 and 3322 or equivalent.

5310. ORGANIC CHEMISTRY II (3-0). A survey of organic reaction mechanisms including addition and elimination reactions, nucleophilic carbon species, carbonyl reactions, electrophilic substitution reactions, rearrangement reactions, electron deficient species, and free radical reactions. Prerequisite: CHEM 5309 or permission.

5311. ANALYTICAL CHEMISTRY (3-0). Survey of sampling theory, practice, and data processing; optical methods of analysis; electroanalytical methodology; miscellaneous analyses including flow systems, x-ray and thermal methods, and surface-sensitive techniques; chromatographic methods. Prerequisite: CHEM 4461 or equivalent.

5312. ADVANCED ORGANIC SYNTHESIS (3-0). Synthetically important reactions, strategy in organic synthesis using retrosynthetic analysis and mechanistic understanding of reactions, synthons, asymmetric synthesis. Prerequisite: CHEM 5310 or permission of instructor.

5315. INORGANIC CHEMISTRY (3-0). Structures, bonding, and properties of main group and transition element compounds including: symmetry, coordination chemistry, reaction mechanisms, organometallic chemistry, and modern characterization techniques. Prerequisite: CHEM 4318 or permission of instructor.

5319. GENERAL BIOCHEMISTRY I (3-0). Amino acids, carbohydrates, nucleic acids, enzymes. Obtaining of energy and cellular material from glucose including glycolysis, the TCA cycle, electron transport and oxidative phosphorylation and the pentose phosphate pathway. Prerequisite: CHEM 2322 or equivalent. A knowledge of physical chemistry is helpful.

5320. GENERAL BIOCHEMISTRY II (3-0). Modes of breakdown and synthesis of fats, oxidative degradation of amino acids and proteins and biosynthesis of carbohydrate, nucleic acids, and protein. Chemical significance of the genetic code. Prerequisite: one semester of approved biochemistry (CHEM 5319 or equivalent).

5321. METABOLISM AND REGULATION (3-0). Biosynthesis of amino acids, purines, pyrimidines, and complex lipids, including terpenes and steroids, with emphasis on regulation of these pathways. Aspects of more complex metabolic regulation by hormones, second messengers and receptor-mediated endocytosis with emphasis on chemical and structural modifications of proteins involved. Prerequisite: CHEM 5320.

5325. ENZYMOLOGY (3-0). A study of enzymes including structures, reaction mechanisms, regulation, and kinetics. Prerequisite: CHEM 5320.

5327. BIOCHEMICAL GENETICS (3-0). Aspects of the biochemistry of gene expression in prokaryotic and eukaryotic organisms, its regulation and control, together with genetic manipulations, and the methodology of recombinant DNA technology. Prerequisite: CHEM 5320.

5333. THERMODYNAMICS OF MATERIALS (3-0). Applications of thermodynamics to the study of materials, thermodynamic properties of liquid and solid solutions and their relationship to surface and crystalline defects. Also offered as MSE 5320. Prerequisite: permission of instructor.

5340. ENVIRONMENTAL CHEMISTRY (3-0). Descriptive chemistry of air, water, and soil systems including pollutants; chemical and physical processes in the environment and their modeling; analytical, disposal, and recycling techniques. Prerequisite: permission of instructor.

5350. ADVANCED POLYMER CHEMISTRY (3-0). Polymer synthesis and reactions including condensation, free-radical, ionic, and coordination polymerizations; principles of polymerization including thermodynamics and kinetic considerations; physical characterizations including determinations of absolute molecular weights, relative molecular weights, morphology, glass transitions, and polymer crystallinity; relationships between macromolecular structure, properties, and uses of polymeric materials. Also offered as MSE 5346. Prerequisites: CHEM 2321 and 2322 or permission of instructor.

5403. QUANTUM CHEMISTRY (3-1). Molecular quantum mechanics. Fundamental principles of quantum mechanics, with a special emphasis on molecular electronic structure theory. Topics covered include molecular mechanics, semi-empirical and ab initio molecular orbital theory, density functional theory, calculation of thermodynamic properties and molecular dynamics. Prerequisite: CHEM 3322 or equivalent.

5461. ANALYTICAL INSTRUMENTATION (2-8). Theory of instrumentation and chemical signal source. Practical experiments utilizing atomic and molecular absorption and emission spectroscopy, chromatographic analysis, and electrochemical techniques. Prerequisite: CHEM 3322 or equivalent. $30 lab fee. $30 course specific fee.

5191-5691. READINGS IN CHEMISTRY. Conference course which may be repeated for credit, with credit granted according to work performed. Graded P/F/R only. Prerequisite: permission of instructor.

5192-5692. RESEARCH IN CHEMISTRY. Conference course with laboratory with credit granted according to work performed. May be repeated for credit. Prerequisite: permission of instructor. Graded P/F/R.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: permission of instructor.

6100. TOPICS IN GRADUATE RESEARCH (1-0). Lectures by departmental and university faculty on current chemical research at U.T. Arlington. All graduate students are required to take this course once. May not be counted toward degree requirements. Graded P/F only.

6101. TOPICS IN THE MODERN CHEMICAL LITERATURE (1-0). This course will survey modern aspects of chemical research by requiring all students to read and critically discuss papers from the recent chemical literature. Areas to be covered will be selected by the instructor to cover a breadth of areas beyond the normal focus of typical dissertation research. May not be counted toward degree. Graded P/F only.

6201. UNIT OPERATIONS (2-0). Survey of measurement and control techniques, and the fundamentals of physical and chemical industrial processes. Prerequisite: CHEM 3322 or equivalent or permission of instructor.

6202. PRINCIPLES OF INDUSTRIAL CHEMISTRY (2-0). Survey of industrial inorganic and organic chemical processes. Prerequisite: permission of instructor.

6203. REGULATORY ASPECTS OF THE CHEMICAL INDUSTRY (2-0). Survey of chemical toxicology, regulatory aspects involved in the chemical industry, industrial safety, patents and patent law.

6304, 6904. CHEMISTRY INTERNSHIP (12-0). Each student is required to spend three months in a nonacademic chemical laboratory; credit may be given for a student's previous industrial research experience. Graded P/F/R only. Prerequisite: permission of Graduate Advisor.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: admission to candidacy for the degree of Doctor of Science in Applied Chemistry.

DISSERTATION—See also Mathematical Sciences.

Department of Geology

Areas of Study and Degrees
Geology
M.S.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)
Environmental Science and Engineering
M.S., Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plan
Thesis and Non-Thesis

Chair
John S. Wickham
107 Geoscience, 817-272-2987

Graduate Advisor
William L. Balsam
107 Geoscience, 817-272-2987

Graduate Advisor, Mathematical Sciences
Merlynd K. Nestell
211 Geoscience, 817-272-2987

Graduate Advisor, Environmental Science and Engineering
Burke Burkart
107 Geoscience, 817-272-2987

Graduate Faculty
Professors
Balsam, Burkart, Crick, Ellwood, Nestell, Reaser, Wickham

Associate Professors
Schieber, Scotese

Professors Emeritus
McNulty, Smith

Objective

The Master of Science program in geology provides a basic geologic background for students interested in a professional career in geology. With the thesis as a focus, the program integrates coursework and research to give the student not only a broad foundation but also a specific area of competence through participation in the research experience. Special course work and research in geology and geophysics which lead to specialization in the areas of environmental geology or natural resource development are available in addition to the more traditional areas of specialization.

The Ph.D. program in Mathematical Sciences is available to students interested in a more quantitative approach to earth science. Emphases in statistics or numerical and computational methods are especially useful when combined with course work in the earth and environmental sciences. For more details on the Ph.D. in Mathematical Sciences, see the section on Interdepartmental and Intercampus Programs.

The M.S. and Ph.D. programs in Environmental Science and Engineering are designed for students interested in applying environmental geoscience in a multidisciplinary setting involving engineering, biology, chemistry and public policy. For more details on these programs, see the Interdepartmental and Intercampus Programs section of this catalog.

Admission

Students entering the graduate program in geology must meet the general Graduate School admission requirements.

Degree Requirements

Applicants with degrees in geology are required to have had the following courses or their equivalents as a part of a bachelor's program: mineralogy (2445), petrology-petrography (2446), paleontology (3441), computers and statistics (2490), stratigraphy (3442), structural geology (3443), field geology (3687), one year of physics, one year of chemistry and math through calculus II.

A program of leveling coursework for students with undergraduate deficiencies will be designed by the graduate studies committee depending on the student's professional interests.

In the first year, a candidate must file a degree plan approved by the graduate studies committee which includes coursework for the program including undergraduate course deficiencies if any. Graduate course credit may be allowed for undergraduate courses with written approval by the graduate studies committee. Enrollment in Technical Sessions, GEOL 5199, is required each semester a student is enrolled in classes.

For the M.S. thesis option, 24 semester hours of approved graduate level courses are required in addition to the thesis. A thesis proposal, written thesis and thesis defense are required.

For the M.S. non-thesis option, a minimum of 36 hours of approved graduate courses are required. Of those 36 hours, six hours are to be in Science, Math, or Engineering; the remaining 30 hours are to be in Geology. Of those 30 Geology hours, a minimum of three and a maximum of six hours are to be taken in GEOL 5381, Research in Geology.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Geology (GEOL)

5301. ENVIRONMENTAL GEOCHEMISTRY AND GEOLOGY (3-0). Geological aspects of environmental problems. Migration of waste materials through geological systems. Geochemical control of migration of hazardous waste materials. Geophysical methods of subsurface hazardous conditions.

5302. TECTONICS (3-0). Regional structural features and their origin and development.

5303. UNDERSTANDING GEOGRAPHIC INFORMATION SYSTEMS (GIS) (2-3). Provides a "hands-on" introduction to GIS technology and methods for creating, maintaining and analyzing spatial data using the ARC/INFO Method. Students will design individual research projects. Prerequisite: consent of instructor.

5304. GEOMETRY AND MECHANICS OF GEOLOGICAL STRUCTURES (2-3). Geometries of structures associated with extensional, shortening, strike-slip, diapiric, and reactivated tectonic environments. Principles of mechanics applied to the formation of these structures. Prerequisites: GEOL 3443; MATH 2325; PHYS 1444.

5306. ENVIRONMENTAL GEOLOGY (3-0). Hydrological systems, water quality, and behavior of pollutants; atmospheric systems, air quality, and effects of pollutants; occurrence, prediction, and amelioration of natural environmental hazards including floods, earthquakes, volcanism, and landslides.

5308. NATURAL ENVIRONMENTAL HAZARDS (3-0). Processes, damage, prediction, and amelioration of volcanism, earthquakes, floods, storms, and landslides. Prerequisites: GEOL 2446, 4405, 4308; MATH 2325, or permission of the instructor.

5309. TRACE ELEMENT AND ISOTOPE GEOCHEMISTRY (3-0). Principles controlling trace element distribution, radiogenic and stable isotopic ratios. Applications to magma genesis, crust and mantle evolution, sediments and paleoclimate. Prerequisite: GEOL 4310 or permission.

5311. REGIONAL STRATIGRAPHY (3-0). Chronologic study of stratigraphic systems, their physical properties and gross facies, their depositional and paleogeographic implications, their correlation and nomenclature, and their biostratigraphy. Coverage given to stratigraphy and geologic development of each major land mass and continent.

5313. CARBONATE PETROLOGY (2-3). Nature and composition of carbonate sediments and rocks in terms of their genesis, depositional environments, and processes involved in transport, deposition, diagenesis, and lithification. Prerequisites: GEOL 4443 or equivalent and 4345 or concurrent enrollment. $2 lab fee. $15 course specific fee.

5315. ORGANIC GEOCHEMISTRY (3-0). Chemistry of carbon compounds. Nature and distribution of organic materials, including petroleum and coal, in sediments. Techniques used for studying petroleum source beds. Chemical evolution of life. Prerequisite: consent of instructor.

5325. PALEOCLIMATOLOGY AND PALEOOCEANOGRAPHY (3-0). In-depth analysis of fluctuations in the earth-atmosphere-ocean system. Synoptic views of climatically significant time periods will be emphasized. Prerequisite: GEOL 5311, concurrent registration or consent of instructor.

5344. DEPOSITIONAL ENVIRONMENTS: TERRIGENOUS CLASTICS (3-0). Depositional processes, physiographic and environmental components, and facies characteristics and relationships of alluvial, eolian, deltaic, clastic shoreline, shallow siliciclastic sea and deep sea clastic depositional systems. Emphasis on interpretation of ancient analogs. Prerequisite: GEOL 4443 or equivalent.

5345. PETROLEUM GEOLOGY (2-3). Origin, generation and migration of petroleum; reservoirs, seals and traps; the subsurface environment; properties of petroleum; exploration and production methods; use of seismic lines and well logs; types of petroleum basins; reserves and resources. $15 instrument user fee.

5348. MARINE GEOLOGY (3-0). Geologic processes of the oceans. Sedimentation in the oceans including biologic processes that relate to sediment production, chemistry of seawater, geochemical cycles in the oceans. Origin of seafloor topography. Seafloor spreading.

5350. METEOROLOGY (3-0). Dynamics and thermodynamics of the atmosphere and its component systems. Prerequisites: MATH 2326, PHYS 1444 or permission of instructor.

5365. TOPICS IN GEOLOGY (2-3). Topics offered depend on student and faculty interest. Such topics might include identification of fossil fragments in thin section; magmatic processes; plate tectonics and sedimentary basin evolution; stratigraphic paleontology; sedimentary or volcanogenic ore deposition; geostatistics; geophysical archeology; and various advanced subjects in sedimentology, stratigraphy, paleontology, geophysics, geochemistry, volcanology and petrology. May be repeated for credit when topic changes.

5407. ENVIRONMENTAL GEOPHYSICS (3-3). Geophysical techniques applied to solving environmental problems. The course will cover fundamentals in geophysics and include a practical field problem. Prerequisite: a physics course and a course in geochemistry or geophysics or permission of the instructor.

5409. APPLIED GEOPHYSICS (3-3). Geophysical Techniques used to determine the presence and extent of deposits of minerals and the subsurface structure of selected localities from field methods. Prerequisites: GEOL 3443 and a course in physics, or permission of the instructor.

5483. GEOARCHAEOLOGY (3-1). Geological, geochemical and geophysical techniques employed in the study of archaeological sites and materials. Also listed as ANTH 5483.

The following research course will be graded either P/F/R or A/B/C/D/F/R as designated by the instructor at the beginning of the semester or session. Only three hours of research course credit may be applied to the degree.

5181, 5281, 5381. RESEARCH IN GEOLOGY. Independent study in various areas of research including paleontology, stratigraphy, tectonics, structural geology, sedimentology, geochemistry, petrology, geophysics, and volcanology. May be repeated for credit. Graded R.

5199. TECHNICAL SESSIONS (1-0). Forum for presentation of results of graduate students and faculty research. Required each semester of all graduate students.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R.

Department of Mathematics

Areas of Study and Degrees
Mathematics
M.S.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plans
Thesis and Thesis Substitute

Chair
R. Kannan
469 Pickard Hall, 817-272-3261

Graduate Advisor
A. Gillespie
440 Pickard Hall, 817-272-3261

Graduate Faculty
Professors
Bernfeld, Dragan, Dyer, Eisenfeld, Fix, Greenspan, Han, Kannan, Ladde, Moore, Nestell

Associate Professors
Gillespie, Hawkins, Heath, Korzeniowski, Liao, Luo, Su, Warren

Assistant Professors
Bochev, Hu, Kribs, Lee, Liu

Professor Emeritus
Corduneanu

Objective

The objectives of the Mathematics Department's program at the master's level are (1) to develop the student's ability to do independent research and prepare for more advanced study in mathematics, and (2) to give advanced training to professional mathematicians, mathematics teachers, and those employed in engineering, scientific, and business areas.

Graduate work will be offered in algebra, complex and real variables, differential equations, functional analysis, geometry, mathematical education, numerical analysis, operations research, probability, statistics and topology.

Degree Requirements

The Department of Mathematics offers master's degree programs in mathematics with additional emphasis in applied mathematics, computer science, mathematical education, pure mathematics, and statistics. All students are to use either the thesis or the thesis-substitute plan.

All students must complete the following:

(a.) **General core requirement:** MATH 5300, 5307, 5308, and 5333;

(b.) **One of the following tracks:**
Applied Mathematics: MATH 5350, 5351, and either 5320 or 5321;
Computer Science: MATH (5348 and 5349) or (5338 and 5339), and either 5371 or 5373, and six approved hours in computer science engineering;
Mathematical Education: Nine hours from MATH 5341, 5342, 5344, 5345, or 5346;
Pure Mathematics: MATH 5317, and two from MATH 5304, 5331, 5334;
Statistics: MATH 5305, 5312, and 5313.

In addition:

1. Those students enrolled in the thesis substitute plan must take MATH 5395, and all except those in the computer science track must take at least six other hours of electives;
2. Those students enrolled in the thesis plan must take at least six hours of MATH 5398-5698, and all except those in the computer science track must take at least three other hours of electives.

Students in every degree plan must pass a final master's exam.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Mathematics (MATH)

5300. COMPUTER PROGRAMMING AND APPLICATIONS (3-0). Introduction to computing techniques utilizing an algorithmic language such as Fortran. Applications from various areas of numerical analysis. Prerequisite: consent of the instructor.

5301. MATHEMATICAL COMPUTER RESOURCES (3-0). Introduction to hardware and software available to the scientific graduate student whose studies involve numerical computations. Utilization of the various mathematic/statistical libraries is emphasized rather than programming of mathematic/statistical routines. Prerequisite: MATH 5300 or its equivalent.

5302. FUNDAMENTALS OF MATHEMATICAL SCIENCES I (3-0). Matrices and operators, linear spaces, multivariable calculus, dynamical systems, applications. Prerequisites: MATH 3318 and 3330 or consent of instructor.

5303. FUNDAMENTALS OF MATHEMATICAL SCIENCES II (3-0). Wave propagation, potential theory, complex variables, transform techniques, perturbation techniques, diffusion, applications. Prerequisite: MATH 5302 or consent of instructor.

5304. GENERAL TOPOLOGY (3-0). Introduction to fundamentals of general topology. Topics include product spaces, the Tychonoff theorem, Tietzes Extension theorem, and metrization theorems. Prerequisite: MATH 4304 or 4335.

5305. STATISTICAL METHODS (3-0). Topics include descriptive statistics, numeracy, and report writing; basic principles of experimental design and analysis; regression analysis; data analysis using the SAS package. Prerequisite: consent of the instructor.

5307. MATHEMATICAL ANALYSIS I (3-0). Elements of topology, real and complex numbers, limits, continuity, and differentiation, functions of bounded variation, Riemann-Stieltjes integrals. Prerequisite: MATH 4335 or consent of Graduate Advisor.

5308. MATHEMATICAL ANALYSIS II (3-0). Analysis in Rn, limits, continuity, Jacobian, extremum problems, multiple integrals, sequences and series of functions, Lebesque integral. Prerequisite: MATH 5307 or consent of Graduate Advisor.

5310. MATHEMATICAL GAME THEORY (3-0). Two person null sum games. Bimatrix games and Nash equilibrium points. Noncooperative games, existence theorem. Cooperative games, core, Shapley value, the nucleolus. Cost allocation. Market games. Simple games and voting. Prerequisite: MATH 3330.

5311. APPLIED PROBABILITY AND STOCHASTIC PROCESSES (3-0). Topics include conditional expectations, law of large numbers and central limit theorem, stochastic processes, including Poisson, renewal, birth-death, and Brownian motion. Prerequisite: MATH 3313 or equivalent.

5312. MATHEMATICAL STATISTICS I (3-0). Basic probability theory, random variables, expectation, probability models, generating functions, transformations of random variables, limit theory. Prerequisite: MATH 5307 or concurrent registration or consent of instructor.

5313. MATHEMATICAL STATISTICS II (3-0). Theories of point estimation (minimum variance unbiased and maximum likelihood), interval estimation and hypothesis testing (Neyman-Pearson and likelihood ratio tests), regression analysis and Bayesian inference. Prerequisite: MATH 5312.

5315. GRAPH THEORY (3-0). Algorithms for problems on graphs. Trees, spanning trees, connectedness, fundamental circuits. Eulerian graphs and Hamiltonian graphs. Graphs and vector spaces, matrices of a graph. Covering and coloring. Flows. Prerequisite: MATH 3314.

5316. COMBINATORIAL OPTIMIZATION (3-0). Shortest paths. Minimum weight spanning trees and matroids. Matchings and optimal assignment. Connectivity. Flows in networks, applications. Prerequisite: MATH 3314.

5317. REAL ANALYSIS FOR THE MATHEMATICAL SCIENCES (3-0). Lebesque measure and integration on Rn. Study of LP spaces. Abstract measure and integration. Prerequisite: MATH 5308.

5318. FUNDAMENTALS OF STOCHASTIC ANALYSIS (3-0). General properties of stochastic processes, processes with independent increments, martingales, limit theorems including invariance principle, Markov processes, stochastic integral, stochastic differential. Prerequisite: MATH 5308.

5319. PROBABILITY THEORY (3-0). Probability spaces, random variables, filtrations, conditional expectations, martingales, strong law of large numbers, ergodic theorem, central limit theorem, Brownian motion and its properties. Prerequisite: MATH 5308.

5320. APPLIED DIFFERENTIAL EQUATIONS (3-0). Fundamentals of the theory of systems of ordinary differential equations: existence, uniqueness, and continuous dependence of solutions on data; linear equations, stability theory and its applications, periodic and oscillatory solutions. Prerequisites: MATH 5307 and 5333.

5321. APPLIED PARTIAL DIFFERENTIAL EQUATIONS (3-0). General first order equations. Basic linear theory for elliptic, hyperbolic, and parabolic second order equations, including existence and uniqueness for initial and boundary value problems. Prerequisites: MATH 5307 and 5333.

5322. COMPLEX VARIABLES I (3-0). Fundamental theory of analytic functions, residues, conformal mapping and applications. Prerequisite: MATH 5307.

5324. APPLIED COMPLEX VARIABLES (3-0). Analytic functions of a complex variable; the line integral, residues, applications; conformal mappings; harmonic functions and applications to physical

problems; elements of transform theory. Prerequisite: MATH 3335 or consent of the instructor.

5327. FUNCTIONAL ANALYSIS I (3-0). Introduction to Hilbert and Banach spaces: Hahn-Banach, Banach-Steinhaus, and closed graph theorems. Riesz representation theorem and bounded linear operators in Hilbert space. Prerequisite: MATH 5308.

5328. FUNCTIONAL ANALYSIS II (3-0). The theory of distributions and Sobolev spaces, with applications to differential equations. Compact operators and Fredholm theory. Spectral theory for unbounded operators. Prerequisite: MATH 5327.

5331. ABSTRACT ALGEBRA I (3-0). Zorn's Lemma, groups, including free groups and dihedral groups. Rings including factorization, localization, rings of polynomials, and formal power series. An introduction to modules. Prerequisite: MATH 3321.

5332. ABSTRACT ALGEBRA II (3-0). Modules, including free, projective, and injective. Exact sequences and tensor products of modules. Chain conditions, primary decomposition, Noetherian rings and modules. Prerequisite: MATH 5331.

5333. LINEAR ALGEBRA AND MATRICES (3-0). Liner spaces, linear transformations, vector norms, Gaussian elimination, Jordan form, eigenvalues, quadratic forms, and related topics. Prerequisite: MATH 3330 or consent of instructor.

5334. DIFFERENTIAL GEOMETRY (3-0). Introduction to the theory of curves and surfaces in three dimensional Euclidean space. Prerequisite: MATH 4334 or 4335.

5335. APPLIED VECTOR AND TENSOR ANALYSIS (3-0). Vector algebra, vector and tensor calculus; applications to differential geometry, engineering sciences, and dynamics including surface theory, geodiscs, minimal surfaces, elasticity, particle dynamics, special relativity, and general relativity. Prerequisite: MATH 5302.

5338. NUMERICAL ANALYSIS I (3-0). Solution of equations, interpolation and approximation, numerical differentiation and quadrature, and solution of ordinary differential equations. Prerequisite: MATH 3345.

5339. NUMERICAL ANALYSIS II (3-0). Rigorous treatment of numerical aspects of linear algebra and numerical solution of boundary value problems in ordinary differential equations: also, an introduction to numerical solution of partial differential equations. Prerequisite: MATH 3345.

5341. MATHEMATICS FOR TEACHERS—GEOMETRY (3-0). Selected materials from geometry.

5342. MATHEMATICS FOR TEACHERS—ALGEBRA (3-0). Selected materials from algebra, including probability, statistics, and theory of equations.

5344. MATHEMATICS FOR TEACHERS—COMPUTER (3-0). Selected materials from the literature on the usage of micro-computers in the classroom.

5345. MATHEMATICS FOR TEACHERS—ANALYSIS (3-0). Selected materials from analysis including concepts and topics consistent with precalculus and elementary calculus.

5346. MATHEMATICS FOR TEACHERS—PROBLEM SOLVING (3-0). Instruction in the application of various heuristics or general problem strategies.

5348. ANALYSIS OF NUMERICAL METHODS I (3-0). Rigorous treatment of topics in numerical analysis including roundoff error effects, solution of linear and nonlinear systems, interpolation, and numerical integration. Emphasis on analysis of methods as well as computation. Prerequisites: MATH 3335 and 3345.

5349. ANALYSIS OF NUMERICAL METHODS II (3-0). Continuation of MATH 5348. Topics include QR decomposition, eigenvalue approximation, singular value decomposition, least squares problems, numerical approximation of ODE's and PDE's, and iterative methods for large sparse systems. Emphasis on analysis of methods as well as computation. Prerequisite: MATH 5348.

5350. APPLIED MATHEMATICS I (3-0). Development of models arising in the natural sciences and in engineering. Emphasis will be on the mathematical techniques and theory needed to analyze such models; these include aspects of the theory of differential and integral equations, boundary value problems, theory of distributions and transforms. Prerequisites: MATH 5307 and 5333.

5351. APPLIED MATHEMATICS II (3-0). Continuation of MATH 5350; models arising in the physical sciences whose analysis includes such topics as the theory of operators in a Hilbert space, variational principles, branching theory, perturbation and stability analysis. Prerequisite: MATH 5350.

5355. STATISTICAL THEORY FOR RESEARCH WORKERS (3-0). Designed for graduate students not majoring in mathematics. Topics include basic probability theory, distributions of random variables, point estimation., interval estimation, testing hypotheses, regression, and an introduction to analysis of variance. Graduate credit not given to math majors. Prerequisite: MATH 2325.

5356. APPLIED MULTIVARIATE STATISTICAL ANALYSIS (3-0). Statistical analysis for data collected in several variables, topics including sampling from multivariate normal distribution, Hotelling's T'2, multivariate analysis of variance, discriminant analysis, principal components, and factor analysis. Prerequisite: MATH 5312 or consent of instructor.

5357. SAMPLE SURVEYS (3-0). A comprehensive account of sampling theory and methods, illustrations to show methodology and practice, simple random sampling, stratified random sample, ratio estimates, regression estimates, systematic sampling, cluster sampling, and nonsampling errors. Prerequisite: MATH 5312 or consent of instructor.

5361. APPLIED CALCULUS OF VARIATION (3-0). Functionals, variation, extremization, Euler's equation, direct and indirect approximation methods; applications to mechanics and control theory. Prerequisite: MATH 5302.

5362. MATHEMATICS OF LINEAR PROGRAMMING (3-0). The simplex method and the revised simplex method. Linear algebra for polyhedra and polytopes. Duality theory. Sensitivity analysis. Applications to transportation problems, network flow problems, matrix-games and scheduling problems. Integer programming. Quadratic programming. Prerequisite: MATH 3330.

5363. OSCILLATIONS AND WAVES (3-0). Development of methods and results related to phenomena in nature that exhibit oscillatory motion; mathematical techniques include Fourier series, ordinary and partial differential equations, and the theory of almost periodic functions. Prerequisite: MATH 3318.

5364. INTRODUCTION TO MATHEMATICAL CONTROL THEORY (3-0). Systems in science, engineering, and economics and their mathematical description by means of functional equations (ordinary, partial, integral, delay-type). Basic properties of various classes of systems: observability, controllability, stability, and oscillating systems; optimal control problems and applications. Prerequisite: MATH 3318 or 4320.

5365. BIOMATHEMATICS (3-0). Mathematical techniques used in modeling such as perturbation theory, dimensional analysis, Fourier analysis, and differential equations. Applications to morphogenetics, population dynamics, compartmental systems, and chemical kinetics. Prerequisite: consent of instructor.

5366. INTRODUCTION TO NEURAL AND COGNITIVE MODELING (3-0). Principles of neural network modeling; application of these principles to the simulation of cognitive processes in both brains and machines; models of associative learning, pattern recognition, and classification. Prerequisite: consent of instructor.

5371. NUMERICAL LINEAR ALGEBRA (3-0). Methods and theory related to the numerical solution of linear algebraic systems and eigenvalue-eigenvector problems. Both direct and iterative techniques are developed and discussed for full and sparse systems. Convergence, convergence rates, and error analysis. Prerequisites: MATH 3330 and 3345.

5372. NUMERICAL FUNCTIONAL ANALYSIS (3-0). Numerical implementation of abstract operator methods, including Newton's method for linear and nonlinear algebraic, transcendental, differential, integral, and functional equations; some aspects of approximation theory. Prerequisite: MATH 5308.

5373. NUMERICAL SOLUTION OF ORDINARY DIFFERENTIAL EQUATIONS (3-0). Theoretical analysis of methods for approximating solutions of initial value problems, boundary value problems, and problems with periodic solutions; existence, uniqueness, convergence, stability, and error analysis are stressed for both single equations and for systems. Prerequisite: MATH 5338 or consent of instructor.

5374. NUMERICAL SOLUTION OF PARTIAL DIFFERENTIAL EQUATIONS (3-0). Theoretical analysis for numerical methods for approximating solutions of elliptic, parabolic, hyperbolic, mixed, and systems of partial differential equations problems; existence, uniqueness, convergence, stability, and error analysis are stressed. Prerequisite: MATH 5339 or consent of instructor.

5380. SEMINAR (3-0). Current topics in mathematics, may be repeated for credit twice. Prerequisite: consent of instructor.

5391. SPECIAL TOPICS IN MATHEMATICS (3-0). Topics in mathematics assigned individual students or small groups. Faculty members closely supervise the students in their research and study. In areas where there are only three hours offered, the special topics may be used by students to continue their study in the same area. Graded P/F/R. Prerequisite: permission of instructor.

5392. SELECTED TOPICS IN MATHEMATICS (3-0)/(3-1). May vary from semester to semester depending upon need and interest of the students. May be repeated for credit. Prerequisite: permission of instructor.

5395. SPECIAL PROJECT. Graded P/F/R. Prerequisite: permission of Graduate Advisor.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisite: permission of Graduate Advisor.

6313. TOPICS IN PROBABILITY AND STATISTICS (3-0). May be repeated for credit when the content changes.

6391. SPECIAL TOPICS IN MATHEMATICS (3-0). Faculty directed individual study and research. May be repeated for credit when the content changes. Graded P/F/R.

DISSERTATION—See Mathematical Sciences.

A limited number of undergraduate mathematics courses may be applicable to a graduate program in mathematics if approved by the Graduate Advisor. These must be chosen from the following list and shall not exceed six hours total credit.

4303. INTRODUCTION OF TOPOLOGY
4313. APPLICATIONS OF MATHEMATICAL STATISTICS
4314. ADVANCED DISCRETE MATHEMATICS
4320. ADVANCED DIFFERENTIAL EQUATIONS
4321. INTRODUCTION TO ABSTRACT ALGEBRA II
4322. INTRODUCTION TO COMPLEX VARIABLES
4324. INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS
4334. ADVANCED MULTIVARIABLE CALCULUS
4335. ANALYSIS II
4345. NUMERICAL ANALYSIS AND COMPUTER APPLICATIONS II

Department of Physics

Areas of Study and Degrees
Physics
M.S.
Physics and Applied Physics
Ph.D.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plans
Thesis and Non-Thesis

Acting Chair
John L. Fry
108 Science Hall, 817-272-2266

Graduate Advisor (M.S. Programs)
John L. Fry
108 Science Hall, 817-272-2461

Graduate Advisor (Ph.D. Programs)
A. Weiss
108 Science Hall, 817-272-2459

Graduate Faculty
Professors
Black, Fry, Ray, Rosen, Rubins, Sharma, Weiss, West, White

Associate Professors
De, Howard, Koymen

Assistant Professors
Draper, Gelb, Stephens, Zhang

Objective

The objective of graduate work in physics is to prepare the student for continued professional and scholarly development as a physicist. The Physics MS Degree Programs are designed to give the student advanced training in all fundamental areas of physics through formal courses and the options of some degree of specialization or participation in original research in one of a variety of projects directed by the faculty.

The Doctor of Philosophy in Physics and Applied Physics Program combines the traditional elements of a science doctoral program with courses in specifically applied topics and internship in a technological environment. It is designed to produce highly trained professionals with a broad perspective of the subject which may prepare them equally well for careers in academic or in government or industrial laboratories. Current research in the department is predominantly in the areas of condensed matter physics, materials science, and high-energy physics and includes a wide range of theoretical work in solid state physics and experimentation in laser physics, optics, positron physics, solid state and surface physics, and high-energy physics.

Degree Requirements: Master of Science

For admission to the Master of Science program in physics, the candidate must satisfy the general admission requirements of the Graduate School. In addition, the candidate must have satisfactorily completed at least 24 undergraduate hours of advanced physics and supporting courses.

A minimum of 30 hours is required for the Master of Science degree, of which 24 hours, including a six hour thesis (minimum registration), will be in physics, and six hours may be selected from physics, mathematics, chemistry, geology, biology, or engineering as approved by the Graduate Advisor.

Degree Requirements: Doctor of Philosophy

To be admitted to the Doctor of Philosophy program, an applicant must satisfy the general admission requirements of the Graduate School. Each candidate must complete the following program requirements:

1. Demonstration of competence in a minimum of 42 credit hours of core courses chosen under the guidance of the supervising committee from the following (or from courses approved in advance by the Graduate Studies Committee):
   Traditional core courses:
   PHYS 5306 Classical Mechanics
   PHYS 5307, 5308 Quantum Mechanics I, II
   PHYS 5309, 5313 Electromagnetic Theory I, II
   PHYS 5310 Statistical Mechanics
   PHYS 5311, 5312 Mathematical Methods in Physics I, II
   PHYS 5315, 5316 Solid State I, II

Applied Physics core courses:
PHYS 5314 Advanced Optics
PHYS 5319 Mathematical Methods in Physics III
PHYS 6301, 6302, 6303 Methods of Applied Physics I, II, III
Computer Science as required by the supervising committee.

2. Internship: PHYS 6304, 6604, 6904
3. Dissertation and additional research and elective courses chosen under the guidance of the supervising committee.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Physics (PHYS)

5190. PHYSICS COLLOQUIUM (1-0). Lectures by students, faculty and invited speakers on current topics in physics. May be repeated for credit. Graded P/F/R only.

5301. PHYSICS OF MATERIALS (3-0). Crystal structure, lattice vibrations, and band theory of electrons as they relate to the understanding of the electrical, magnetic, and mechanical properties of materials. Also offered as MSE 5301. Prerequisite: PHYS 3313 or permission of instructor.

5306. CLASSICAL MECHANICS (3-0). General principles of analytical mechanics, the kinematics of rigid bodies, canonical transformation, Hamilton-Jacobi theory. Prerequisite: PHYS 4319 or permission of Graduate Advisor.

5307. QUANTUM MECHANICS I (3-0). Matrix formulation, theory of radiation, angular momentum, perturbation methods. Prerequisite: permission of Graduate Advisor.

5308. QUANTUM MECHANICS II (3-0). Approximate methods, symmetry and unitary groups, scattering theory. Prerequisite: PHYS 5307 or permission of Graduate Advisor.

5309. ELECTROMAGNETIC THEORY I (3-0). Boundary value problems in electrostatics and magnetostatics, Maxwell's equations. Prerequisite: permission of Graduate Advisor.

5310. STATISTICAL MECHANICS (3-0). Fundamental principles of statistical mechanics, Liouville theorem, entropy, Fermi-Dirac distribution, Bose-Einstein distribution, Einstein condensation, density matrix, quantum statistical mechanics, kinetic methods, and transport theory. Prerequisite: PHYS 4315 or permission of Graduate Advisor.

5311. MATHEMATICAL METHODS IN PHYSICS I (3-0). Algebraic and analytical methods used in modern physics. Algebra: matrices, groups, and tensors, with application to quantum mechanics, the solid state, and special relativity. Analysis: vector calculus, ordinary and partial differential equations, with applications to electromagnetic and seismic wave propagation. Prerequisite: permission of Graduate Advisor.

5312. MATHEMATICAL METHODS IN PHYSICS II (3-0). Continuation of PHYS 5311 with a selection from the following topics. Algebra: matrix representations of the symmetric and point groups of solid state physics, matrix representations of the continuous groups O(3), SU(2), SU(3), SL(2,C), general covariance. Analysis: further study of analytic functions, Cauchy's theorem, Green's function techniques, orthogonal functions, integral equations. Prerequisite: PHYS 5311 or permission of Graduate Advisor.

5313. ELECTROMAGNETIC THEORY II (3-0). Modern tensorial treatment of classical electrodynamics, force on and field of a moving charge, derivation and application of 4-vector potential, Maxwell's equations in tensor form, field momentum and radiation. Prerequisite: PHYS 5309 or PHYS 5311 or permission of Graduate Advisor.

5314. ADVANCED OPTICS (3-0). Electromagnetic wave equations, theory of diffraction, radiation scattering and dispersion, coherence and laser optics. Additional advanced topics of current interest. Prerequisite: permission of Graduate Advisor.

5315. SOLID STATE I (3-0). Crystal structure, lattice vibration, thermal properties, and band theory of solids. Prerequisite: permission of Graduate Advisor.

5316. SOLID STATE II (3-0). Electrical and magnetic properties of crystalline solids, magnetic resonance, and optical phenomena. Prerequisite: permission of Graduate Advisor.

5317. STATISTICAL MECHANICS II (3-0). Methods in applied statistical mechanics. Topics may include fluctuations and critical phenomena, the Ising model, the master equation, transport in solids, and chaos. Prerequisites: PHYS 5310 and PHYS 5307, or permission of instructor.

5319. MATHEMATICAL METHODS IN PHYSICS III (3-0). Numerical methods for applied physics; computer techniques, numerical differentiation, integration, interpolation, extrapolation; differential equations, integral equations, statistical analysis; scientific computer library; artificial intelligence programming. Prerequisite: permission of instructor.

5320. QUANTUM MECHANICS III (3-0). Quantum theory of radiation; relativistic equations; elements of quantum field theory; symmetries and gauge theories. Applications in elementary particle physics and solid-state physics. Prerequisites: PHYS 5308 and PHYS 5312.

5325. INTRODUCTION TO ELEMENTARY PARTICLES I (3-0). An overview of particles and forces. Particle detectors and accelerators. Invariance principles and conservation laws. Standard model. Electromagnetic, weak, strong, and unified interactions. Prerequisite: basic quantum mechanics, special relativity.

5326. INTRODUCTION TO ELEMENTARY PARTICLE PHYSICS (3-0). Systematics of the quark model; the fundamental interactions of elementary particles; spin and relativistic kinematics; Dirac Equation; the standard electroweak model. Prerequisite: knowledge of quantum mechanics, special theory relativity.

5328. SURFACE PHYSICS (3-0). Experimental and theoretical methods for the study of solid surfaces. Geometric and electronic structure of metals and semiconductors. Surfaces as model systems of reduced dimensionality. Adsorption phenomena and film growth.

5391. SPECIAL TOPICS IN PHYSICS (3-0). Topics in physics, particularly from areas in which active research is being conducted, are assigned to individuals or small groups for intensive investigations. May be repeated for credit. Graded R. Prerequisite: permission of Graduate Advisor.

5193-5393. READINGS IN PHYSICS. Conference course. May be repeated for credit. Graded R. Prerequisite: permission of instructor.

5194, 5294, 5394, 5694. RESEARCH IN PHYSICS. Conference course with laboratory. May be repeated for credit. Graded P/F/R. Prerequisite: permission of instructor.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisite: permission of Graduate Advisor.

6301. METHODS OF APPLIED PHYSICS I—ELECTRONICS (3-0). The analysis and design of electronic circuits for use in the laboratory. Transistors and integrated circuits in analog instrumentation. Digital logic. Information theory and signal processing.

6302. METHODS OF APPLIED PHYSICS II—COMPUTERS IN PHYSICS (3-0). Applications of computers in physics. Acquisition and analysis of experimental data. Vector and parallel processing, image processing, simulation.

6303. METHODS OF APPLIED PHYSICS III—SPECTROSCOPY (3-0). The principles (interactions, cross-sections, elastic and inelastic scattering, diffraction, coherence), the methodologies (sources, detectors, visualization), and applications (structure, dynamics, composition, excitations) of neutral and charged particle spectroscopies to condensed matter physics and materials science.

6304, 6604, 6904. APPLIED PHYSICS INTERNSHIP. Applied physics and engineering research and training in industry or other science or engineering departments of U.T. Arlington or other institutions requiring applied physicists. Faculty supervision and submission of technical progress reports required. Graded P/F only. Prerequisite: permission of Graduate Advisor.

6391. SELECTED TOPICS IN APPLIED PHYSICS (3-0). Topics chosen from research areas in the Department of Physics or at one of the institutions or corporations participating in the traineeship program in applied physics; emphasis on industrial and engineering applications. May be repeated for credit. Prerequisite: permission of instructor.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: admission to candidacy for the Degree of Doctor of Science in Applied Physics.

DISSERTATION—See also Mathematical Sciences.

Objective

The objective of graduate work in psychology is to educate the student in the methods and basic content of the discipline and to provide an apprenticeship in the execution of creative research.

Graduate work in the doctoral and master's programs will be offered in general experimental psychology. Students' individual programs may be arranged to give emphasis to a particular aspect of the general program.

Within this framework, options include, but are not limited to, **Cognition and Perception, Developmental, Physiological**, and **Social-Personality Psychology.** An interdisciplinary option, **Animal Behavior,** is offered jointly with the Biology Department (see Animal Behavior Option). Students specializing in Cognition and Perception may include, in addition to their area C courses (described below), advanced topical seminars in their area of specialty. Recent advanced seminars in Cognition include: Issues in Cognition, Cognitive Development and Expertise. Students specializing in Developmental Psychology have taken seminars in Developmental Psychobiology and Visual Cognition and Infancy. In addition to core courses (see area A) for those interested in Physiological Psychology, seminars offered in the recent past include Aggression and Nociception. For those seeking expertise in the Social-Personality area, in addition to the area B courses, seminars have included topics such as Group Processes and Empathetic Accuracy Intersubjectivity.

Animal Behavior Option: Study in the area of animal behavior is offered jointly by the biology and psychology graduate programs. Students specializing in animal behavior may initially enroll in the Master of Science program in either biology or psychology. There are a number of biology and psychology courses offered within this specialization. In addition to the courses specified in the catalog, advanced courses in Animal Behavior are often offered under enrollment in BIOL 5310 (Special Topics in Biology), PSYC 5389 (Contemporary Problems in Psychology), and PSYC 6300 (Seminar in Psychology). Recent courses offered under these titles include Animal Cognition, Behavioral Ecology, Behavioral Genetics, Developmental Psychobiology, Nociception, and Predator-Prey Interactions.

Research Involvement—Since the Psychology Department believes that graduate training should involve the student continuously in the research process, students are encouraged to make personal contacts by letter or E-mail with faculty members of their choice. A description of the faculty and their areas of research may be obtained by consulting the department web page at www.uta.edu/psychology/psych/html or by writing to or calling the department at 817-272-2281. Every effort will be made to assign the incoming student to a faculty member of choice, but priority is given to those who have discussed their placement in advance.

Deadline for Financial Aid Applications—Students who wish to be considered for assistantships should have their applications and departmental forms sent to The University of Texas at Arlington by April 1 for the Fall Semester and November 1 for the Spring Semester. Students who do not desire financial aid may apply at any time up to the deadline listed by the Graduate School.

Department of Psychology

Areas of Study and Degrees

General Experimental Psychology
M.S., Ph.D.
Mathematical Sciences
Ph.D.
(See Interdepartmental and Intercampus Programs.)

Master's Degree Plans

Thesis

Chair

Roger Mellgren
315A Life Science, 817-272-2281

Graduate Advisor

William Ickes
510 Life Science, 817-272-3229

Graduate Faculty

Professors
Amster, Bernstein, Erickson, Ickes, Levine, Mellgren, Paulus

Associate Professors
Jackson, Kopp, Mann

Assistant Professor
Wilcox

Adjunct Professor
Gorfein

Professor Emeritus
McCain

Degree Requirements

In addition to the requirements outlined elsewhere, the Department of Psychology will require undergraduate courses in statistics and in experimental methods. These courses may be taken as deficiency courses.

Degree requirements for the Department of Psychology are established by the Committee on Graduate Studies in Psychology and supplement those established by the University (see general requirements of the Graduate School as stated under the section entitled "Admission Requirements and Procedures").

Each entering graduate student will be furnished a copy of the departmental rules which will serve as guidelines for departmental actions and recommendations.

Each student must adhere to the code of ethics of the American Psychological Association.

Master of Science Degree

Thirty hours, including six hours of thesis, are required for the Master of Science degree. The program is designed to form the basis for the doctoral program. It is, however, open to those seeking a terminal master's degree. PSYC 5405, 5406, and 12 hours among 5312, 5313, 5321, 5322, 5331, 5333, 5335, 5341, and 5345 are required, including at least three hours from each of area A, B, and C. (See below).

As soon as is feasible, a student should decide on an area for concentration and research. After discussion with and consent of the involved faculty members, the student selects a supervising professor and a thesis committee. No student may enroll in PSYC 5398 or 5698 until the thesis committee has approved a proposal for the thesis project.

Doctor of Philosophy

The degree of Doctor of Philosophy in experimental psychology requires distinguished attainments both in scholarship and original research, and the deep understanding of the strategic role of thoughtful experimentation in the development of an empirical science. Although the student must meet the minimum requirements of a planned course of study, the ultimate basis for conferring the degree must be the demonstrated ability to do independent and creative work and the exhibition of a profound grasp of the subject matter of the field.

Mathematics—Experimental psychology requires sophistication in mathematics. Prospective students are encouraged to recognize this trend and prepare themselves as well as possible. Mathematics from College Algebra through Calculus is desirable.

Computer Knowledge Requirement—Because of the fundamental and varied ways in which computers are applied in psychology, students are expected to understand their use and application in psychological research. Specifically, students are expected to demonstrate competence in the use of operating systems such as Windows or Macintosh System 7, e-mail and other aspects of the Internet, standard office packages, data bases, programming languages (with specific reference to the programming of psychological experiments) and statistical packages such as SAS. This computer knowledge requirement has been established in lieu of the foreign language requirement. It may be satisfied by successful completion of PSYC 5348. If you feel that you already have the prerequisite knowledge to satisfy this requirement, see the graduate advisor to arrange a proficiency examination.

Course requirements—Entering graduate students will be required to take the following courses during their first four semesters of enrollment. Exceptions may be made only with written permission of the Committee on Graduate Studies.

Current Topics in Experimental Psychology (5110)
Statistics I (5405)
Statistics II (5406)
Experimental Design (5407)

Four of the following courses, at least one from each area A, B, and C:

Area A: 5312 Animal Learning, 5333 Physiological Psychology, 5335 Animal Behavior
Area B: 5321 Personality, 5322 Social Psychology
Area C: 5313 Cognitive Processes, 5331 Perceptual Processes, 5341 Decision Making, 5345 Human Learning and Memory

Students with prior graduate work may be exempted from any of the above requirements by taking a departmental test which is the equivalent of the final examination in that course. Having fulfilled the above, the following are required:

1. An additional five courses (15 hours) from among those numbered PSYC 5310 through 5347.
2. Two six-hour research courses. These may be taken from PSYC 5698 or PSYC 5600. Students who plan to obtain the MS should elect PSYC 5698 as one of the research courses and students who do not plan to obtain the MS should select two sections of PSYC 5600. If the student does not elect to obtain the MS, one of the research courses must result in a formal thesis-equivalent paper, which will be evaluated by a committee and defended in an oral examination. The two research courses are a minimum requirement. Students are strongly encouraged to take PSYC 5391 before taking PSYC 5600 and 5698.
3. Nine hours of PSYC 6300.
4. Additional hours of coursework to be determined by the Graduate Advisor and dissertation committee. The student should plan to take approximately 90 hours including 6999. No student may enroll in a dissertation course until the dissertation committee has approved a proposal for the dissertation project.

A student has completed the course requirements when he or she has:

1. Maintained at least a B average in 5405, 5406, and 5407.
2. Maintained at least a B average in his or her area A, B, and C courses.
3. Received at least a B average in all other courses.

Diagnostic Evaluations—Doctoral students normally take diagnostic examinations in a major and minor area between the fourth and fifth semester of graduate work. Satisfactory completion of the area A, B, and C course requirements by the end of the first four semesters is necessary for achieving satisfactory progress in the graduate program. It is also a condition for taking the diagnostic exams. Exceptions will rarely be made, and then only with the written permission of the Committee on Graduate Studies.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Psychology (PSYC)

5110. CURRENT TOPICS IN EXPERIMENTAL PSYCHOLOGY (1-0). A survey of contemporary topics in experimental psychology. Prerequisite: admission to the graduate program in psychology or permission of the instructor.

5112. TEACHING PSYCHOLOGY (1-0). Required for teaching assistants during first semester of award. Topics will include: selecting appropriate course materials; preparing syllabi, lectures and demonstrations; audiovisual aids; grading; assisting special-needs students; dealing with academic dishonesty.

5310. MATHEMATICAL MODELS IN PSYCHOLOGY (3-0). Elementary probability theory, matrix algebra, and theory of linear difference equations applied to theoretical problems in learning, signal detection, decision processes, and social interactions.

5312. ANIMAL LEARNING (3-0). Survey of contemporary topics in animal learning.

5313. COGNITIVE PROCESSES (3-0). Includes topics such as concept identification, problem solving, reasoning, and knowledge representation.

5314. COGNITIVE DEVELOPMENT (3-0). A survey of current theories of cognitive development. Recent research within topic areas, such as physical reasoning, spatial cognition, memory, and symbol use, will be used to evaluate the theories presented.

5315. OPERANT PSYCHOLOGY (3-0). Overview of operant theory with an emphasis upon contemporary problems. Basic concepts that are covered include: reinforcement and stimulus control, punishment, compound schedules, response topography, and chaining. Other topics include complex human operants, verbal behavior, behavior modification, and contingency management.

5316. HISTORY AND SYSTEMS (3-0). Consideration of the origins of psychology in the development of Western thought. Early conceptualization of problems and their modification with changes in evidence is emphasized.

5317. PHYLOGENY AND ONTOGENY OF BEHAVIOR (3-0). Selection contingencies as they operate to modulate behavior between phylogenic and reproductive cycles. Topics such as learning, conditioning, reinforcement, foraging, imprinting, modeling, social behavior, group selection, and cultural behavior will be treated as varieties of phyletic adaptation in the evolution of hominids.

5320. BEHAVIORAL PHARMACOLOGY (3-0). Survey of the basis of behavioral pharmacology including mechanisms and theories of drug actions, techniques and strategies of research, common psychoactive drugs, and the uses of drugs in clinical practice.

5321. PERSONALITY PSYCHOLOGY (3-0). A survey of contemporary topics in personality psychology, including personality assessment, strategies for studying personality, temporal stability and cross-situational consistency in behavior, and personality influence on social behavior.

5322. SOCIAL PSYCHOLOGY (3-0). A survey of contemporary topics in social psychology, including interpersonal attraction, altruism and aggression, attribution and social cognition, social influence, group dynamics, and social motivation.

5323. GROUP PROCESSES (3-0). Survey of the major topics in group dynamics. Among the issues covered will be performance, motivation, goal setting, decision making, creativity, social influence, memory, leadership, teamwork, and collective behavior.

5325. THEORIES OF MOTIVATION (3-0). Surveys the current literature and theory on emotion and the neural and physiological basis for motivation. Material to be covered will include both biological drives, such as hunger and thirst, and interpretations of drives less immediately related to the underlying biological processes.

5331. PERCEPTUAL PROCESSES (3-0). Survey of methods and findings dealing with perception; emphasis will be upon behavioral rather than physiological considerations; particular topics include signal detection theory, form and pattern recognition, and attentional mechanisms.

5333. PHYSIOLOGICAL PSYCHOLOGY (3-0). A survey of biological and physical processes underlying behavior. Emphasis on neural, hormonal, and genetic determinants of behavior. Topics include regulatory behaviors, reward and nociceptive systems, differentiation and sociosexual behaviors, limbic and cortical functions.

5335. ANIMAL BEHAVIOR (3-0). Phylogenetic approach to some basic problems in behavior, with special emphasis on unlearned behavior. Also offered as BIOL 5335; credit will be granted for only one of these courses.

5338. NEURAL AND COGNITIVE MODELING (3-0). Principals of neural network and dynamical systems modeling; application of these principals to the simulation of cognitive processes in both brains and machines; models of associative learning, pattern recognition and classification, and individual and group behavior. Prerequisite: consent of instructor.

5341. DECISION MAKING (3-0). Study of variables that influence judgments and choices.

5343. COGNITIVE NEUROPSYCHOLOGY (3-0). Surveys current experimental and clinical research and theory relating the brain and cognition. Emphasizes selected areas i.e., perception, attention, memory, language, and thinking.

5344. PSYCHOMETRIC THEORY (3-0). Introduction to test construction. Topics include reliability theory, test validation, and item analysis.

5345. HUMAN LEARNING AND MEMORY (3-0). Survey of current approaches to the study of human learning and memory.

5346. SOCIAL BEHAVIOR OF ANIMALS (3-0). Survey of research and theory related to nonhuman social behavior.

5347. ENVIRONMENTAL PSYCHOLOGY (3-0). Survey of the current literature on the impact of various features of the physical and social environment on human behavior. Designed to be of interest to graduate students in architecture, urban studies, engineering, geology, sociology, as well as those in psychology.

5348. EXPOSURE TO CONTEMPORARY PC MICRO-COMPUTERS (3-0). Operating systems, ASCII editors, word processors, spreadsheets, graphics, data bases, programming languages, programming psychological experiments, statistical programming, using networks, the Internet, e-mail, Gopher, FTP, and Telnet.

5151, 5251, 5351. READINGS IN PSYCHOLOGY. Independent readings under the supervision of an individual faculty member. Students wishing to conduct research should sign up for PSYC 5191, 5291, or 5391. May be repeated for credit with consent of the Graduate Advisor. Graded P/F/R. Prerequisite: consent of the instructor.

5353. PSYCHOLOGY EDUCATION I (3-0). Survey of the content of contemporary psychology.

5354. PSYCHOLOGY EDUCATION II (3-0). Survey of the methods of contemporary psychology.

5355. MULTIVARIATE ANALYSIS (3-0). Application of general linear model to special cases such as factor analysis, multiple regression, and discriminant analysis. PSYC 5344 recommended.

5389. CONTEMPORARY PROBLEMS IN PSYCHOLOGY (3-0). Topics vary; may be repeated for credit with consent of Graduate Advisor.

5191, 5291, 5391. RESEARCH IN PSYCHOLOGY. Independent research under the supervision of an individual faculty member; may be repeated for credit with consent of Graduate Advisor. Graded P/F/R. Prerequisite: consent of instructor. $5-$15 lab fee.

5405. ADVANCED STATISTICS I (3-2). Review of essential mathematical ideas and techniques, a survey of the basic concepts of probability theory, mathematical expectation, special distributions; parametric estimation theory.

5406. ADVANCED STATISTICS II (3-2). Statistical hypothesis testing, Bayesian inference, decision theory, linear regression and correlation; analysis of variance; distribution-free techniques.

5407. EXPERIMENTAL DESIGN (3-2). Statistical aspects of complex experimental designs used in psychological research. Prerequisite: PSYC 5406.

5600. ADVANCED RESEARCH. Supervised research. May be repeated for credit. Graded P/F/R. Prerequisite: consent of instructor. $30 lab fee.

5398, 5698. THESIS. 5398 graded R/F only; 5698 graded P/F/R. Prerequisites: 12 hours of advanced psychology and an approved thesis proposal. $30 lab fee.

6300. SEMINAR IN PSYCHOLOGY (3-0). Offered each semester. Topics vary. May be repeated for credit. Prerequisite: consent of instructor.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: approved dissertation proposal. For students in the Ph.D. program in Mathematical Sciences, see Mathematical Sciences entry. $15-$45 lab fee.

The School of Social Work

Dean: Santos H. Hernandez, Ph.D.
211 S. Cooper St., Social Work Complex • Box 19129 • 817-272-3181

Mission and Philosophy

The mission of the School of Social Work is to prepare competent and effective social workers by providing a research-based curriculum guided by professional knowledge, skills, values and ethics. The School of Social Work is committed to lifelong learning through its academic and continuing education programs valuing social and economic justice focused on service to diverse populations.

History and Overview

The School of Social Work was established as the Graduate School of Social Work in 1967 by an act of the Texas Legislature. It became the School of Social Work in 1991 when the University's undergraduate social work program in the College of Liberal Arts merged with the school's graduate program.

Currently, the school offers three programs of study: the Ph.D. in Social Work, the Master of Science in Social Work and the Bachelor of Social Work. The Ph.D. program offers an international dual-degree specialty in comparative social-welfare policy with the Universidad Autonoma de Nuevo Leon, in Monterrey, Mexico.

The school provides training, counseling, consultation and research through its four active adjunct centers: the Judith Granger Birmingham Center for Child Welfare, the Community Service Clinic, the Community Services Development Center and the Center for Research, Evaluation and Technology. Its Professional Development Program conducts training and development seminars for professional social workers that provide the continuing education units necessary for license renewals.

The school attracts and graduates more students than most of the other social work programs in the nation. More than 3,700 students have earned degrees at the school and many hold key management positions in public agencies and nonprofit organizations nationwide. Currently, SSW has a diverse student body of approximately 1,000 students. Many of these students also hold full- or part-time positions in public agencies and nonprofit organizations.

One distinguishing feature of the school is its location in the heart of the Dallas-Fort Worth Metroplex, a rich urban laboratory of more than 150 cities with a total population of approximately 4.5 million. This complex social arena offers a wide array of opportunities for student projects, field placements and employment. Social work faculty, staff and students work on "real-life" social problems in cooperation with city governments, public agencies and nonprofit organizations.

Accreditation

The School of Social Work has one of only four fully accredited MSSW programs in Texas. Its MSSW and BSW programs are both accredited by the Council on Social Work Education, which accredits master's- and bachelor's-level programs. Accreditation is an important consideration for students because many professional social work positions require a degree from a CSWE-accredited program.

Scholastic Activity and Research Interests of the Faculty

School of Social Work faculty engage in research and community-service projects that enhance the effectiveness and justify the programs of public and nonprofit social-service organizations, that promote social justice and equality, and that extend the body of knowledge about social issues. Typical projects include evaluations of state and federal child-welfare and community-service programs, cross-cultural adaptations to mental-health treatments, studies of exceptional social behavior, such as gang violence, and reports on the extent and quality of specific social services in the local community.

Faculty research takes either a direct practice or an administrative/community practice approach. Although much research is done for the benefit of social-service organizations that lack the expertise and resources to conduct their own studies, it also includes applied research that is published in national journals, reference and text books. Research topics span the broad range of social-work issues, including feminist theory, minority rights, child abuse, mental illness, ethics, aging, sexual abuse, community development, lesbians and gay men, marital therapy, violence and social policy, to name a few.

Among the most important faculty accomplishments from 1994-96 were the development of an international doctoral program specialty in comparative social policy with La Universidad Autonoma de Nuevo Leon, in Monterrey, Mexico; appointment of an associate professor as a Child Welfare Fellow by the U.S. Children's Bureau; a two-year federal grant of $255,000 for a community-policing program evaluation; a federal grant of almost $1.2 million for an Americorps program; a federal grant of more than $2.4 million for a child-welfare center; and two four-year grants totaling more than $284,000 from the Texas Department of Protective and Regulatory Services for graduate distance-education programs at West Texas A&M University, in Canyon and at the University of Texas at Tyler.

Special Programs and Opportunities

The School of Social Work offers training, research and service opportunities to faculty and students through its four active centers. The Judith Granger Birmingham Center for Child Welfare provides support and graduate training to current and potential child-welfare workers, and it supports faculty and student research on child-welfare issues. The Community Services Development Center provides organization, planning, evaluation and research services for the surrounding communities. CSDC student interns conduct needs assessments, write grant proposals, design new programs, conduct developmental research and organize action groups. The Community Service Clinic provides affordable counseling, training for graduate students in clinical research and intervention technology, and research opportunities in social work practice. The Center for Research, Evaluation and Technology involves students and faculty in program evaluations for local social service agencies and in the development of new and innovative ways to support human services practice.

The school's Professional Development Program provides continuing education seminars for social work practitioners and other human service professionals. The seminars are taught by professionals and provide the continuing education units necessary for certain license renewals.

Depending upon demand and resources, the school is responsive to requests from the community for MSSW programs taught in cooperation with other universities at remote locations across the state. Generally, these distance education programs allow students to complete two years, part time, at selected remote campuses, and one year, full time, in residency at UTA. More than 300 students have graduated from such programs in the last 20 years. These programs have been taught at seven universities across the state.

The school hosts a Guest Lecture Series which features professors, researchers, clinicians and national program directors, all experts in their fields. The series serves as an educational forum on social-work issues.

Programs

The School of Social Work currently offers three programs of study: the Ph.D. in Social Work, the Master of Science in Social Work and the Bachelor of Social Work. The Ph.D. program offers a specialty in comparative social policy, in collaboration with La Universidad Autonoma de Nuevo Leon, that is taught in both Texas and Mexico and that requires fluency in both English and Spanish. Degrees are awarded from both universities.

The school also participates in dual-degree programs with the School of Nursing, the School of Urban and Public Affairs, the Sociology Program, and the Criminology and Criminal Justice Program.

Ph.D. in Social Work
Master of Science in Social Work
Bachelor of Social Work

Master of Science in Social Work

Objectives

The Master of Science in Social Work degree program's principal objective is to prepare students for advanced social work practice. The program leading to the MSSW degree focuses on developing professional leaders in the areas of direct social work practice and administrative and community practice. The program of instruction includes an intensive academic component integrated with a field work component, allowing the student to learn and apply theory concurrently.

Application and Admission Requirements

Students are admitted for the Fall Semester. Completed applications must be received no later than March 15. Advanced Standing students are also admitted for Summer and Fall Semesters. **Please note that the School of Social Work's deadline for application is different from the published deadlines of the Graduate School.**

Admission to the School requires: (1) a bachelor's degree with a liberal arts perspective including instruction in the behavioral and biological sciences (including human biology) from an accredited college or university; (2) a grade point average of 3.0 or above on the last 60 semester hours of the last two years of a bachelor's degree (approximately 60 hours); (3) if less than a 3.0 grade point average on the last 60 semester hours of undergraduate study, a Graduate Record Examination score which evidences graduate study aptitude; and (4) personal qualifications considered essential to the successful practice of social work including leadership ability, personal maturity, motivation for a human service profession and experience in social work. A personal interview may be required.

Applicants to the School whose native language is not English must take, in addition to the Test of English as a Foreign Language, the Test of Spoken English.

Neither probationary nor provisional admission will be granted to an applicant with less than a 3.0 GPA on the last two years of a bachelor's degree (approximately 60 hours) when the required GRE score is lacking.

Financial Aid

Scholarships awarded annually and administered by the School of Social Work are listed below.

- Roy and Betty Dulak Award
- Lila B. Hagins Scholarship
- Glen W. Rollins Mental Health Graduate Scholarship Fund

A limited number of traineeships are available through Child Protective Services. Other stipends, grants and scholarships are available on a limited basis.

Degree Requirements

The program leading to the degree of Master of Science in Social Work covers a minimum of four semesters for full-time students and requires the completion of 64 semester hours of graduate work including class and field instruction, as well as thesis or completion of the integrative seminar for non-thesis students.

In addition to the requirements of the Graduate School listed elsewhere, each graduate student in the social work program must (1) maintain at least a B (3.0) overall GPA in all coursework; (2) demonstrate suitability for professional social work practice; and,

Social Work

Area of Study and Degrees
Social Work
M.S.S.W., Ph.D.

Master's Degree Plans
Thesis and Non-Thesis

Dean
Santos H. Hernandez
211 Social Work, 817-272-3181

M.S.S.W. Graduate Advisor
Donald K. Granvold
211 Social Work, 817-272-3940

Ph.D. Graduate Advisor and Director
M. Coleen Shannon
211 Social Work, 817-272-3952

Graduate Faculty
Professors
Callicutt, Dangel, Duehn, Elliott, Granvold, Hunter, Jordan, Mayadas, Mindel, Schoech, Watts

Associate Professors
Barrett, Berry, Cobb, Hegar, Hoefer, Quinn, Scannapieco, Shannon, Souflee, Watkins, Yu

Assistant Professors
Corcoran, Lehmann, Menon, Rycraft, Simon, Debra Woody

Adjunct Assistant Professor
David Woody

Specialists
Benavides, Murphy, Pratt

Professor Emeritus
Gaupp

(3) demonstrate knowledge of and adherence to the Code of Ethics of the National Association of Social Workers and the Code of Ethics as currently published by the Texas Council for Social Work Certification.

At such time as questions are raised by Social Work faculty or field instructors regarding a student's violation of any of the above requirements, the student will be notified and will be provided the opportunity to respond to the Academic and Professional Standards Committee. The committee will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision or continuation may be made to the Dean of the School of Social Work.

Advanced Standing

An applicant who has graduated from an accredited undergraduate program in social work may request admission to the graduate program with advanced standing. All regular admission requirements must be met and the bachelor's degree in social work must have been conferred no more than six years prior to the date of enrollment.

Advanced standing students may receive credit hour waivers for some undergraduate social work courses which are considered equivalent to the first and second semester courses, provided the students' grades in those courses are B or better. Policies do not specify a minimum nor maximum number of hours waived. Courses waived are determined by the Graduate Advisor's assessment of individual transcripts.

Dual Degree Program

Students in social work may participate in one of four dual degree programs whereby they can earn a Master of Science in Social Work and 1) a Master of City and Regional Planning, 2) a Master of Public Administration, 3) a Master of Arts in Urban Affairs, 4) a Master of Arts in Criminology and Criminal Justice, or 5) a Master of Arts in Sociology. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs.

To participate in the dual degree program, students must make separate application to each program and must submit a separate Program of Work for each degree. Those interested in a dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement on Dual Degree Programs in the general information section of this catalog.

Part-Time Students

Admission and degree requirements for part-time students are the same as those for full-time students. Likewise, part-time students must maintain the performance level required of full-time students.

The Council on Social Work Education's accreditation standards require that part-time students enroll for a minimum of two courses each semester and take no longer than four years to complete the M.S.S.W. program.

Doctor of Philosophy in Social Work

Objectives

The program leading to the Doctor of Philosophy in Social Work is designed primarily for those preparing for leadership positions in teaching, research, administration and planning, policy analysis, and clinical practice in the social work field. More specifically, the objectives of the program are for students to acquire (1) a broad analytic understanding of major policy and practice trends and issues in the field of social work; (2) substantive knowledge of some field or area of practice (e.g., health, mental health, public social services, aging, settings serving families and children and minority groups) with emphasis on issues and questions in that field which require scientific or scholarly attention; and (3) a competence to conduct independent, empirical research that extends the knowledge base of clinical practice with individuals, families, and small groups and/or administration and planning practice in some area of social work. Graduates of the program are expected to make a significant contribution to the field and to the profession through their own continued research, teaching, writing and practice.

A specialty in comparative social policy is offered in conjunction with the Universidad Autonoma De Nuevo Leon (UANL) Monterrey, Mexico. Students will complete their first year of doctoral courses at the UANL Graduate School of Social Work where they will take 12 hours per semester for two semesters (September-December; and January-May). Classes at UANL will be conducted in Spanish and taught by UANL faculty. Students will complete their second year at UTA where they will take another two semesters (September-May) earning another 24 hours of course credits. Classes will be taught in English by UTA faculty.

Admission Requirements

To be admitted to the Doctor of Philosophy in Social Work program, an applicant must satisfy the general admission requirements of the Graduate School and his or her academic record must show preparation for advanced study in social work. The students accepted for admission are those whose academic achievements, previous experience, and aptitude for research and scholarship indicate the potential for achieving the objectives of the program. In addition, admission to the program requires: (1) a grade point average of 3.0 or above on the last 60 semester hours of undergraduate study, (2) a grade point average of 3.4 on all graduate level work, (3) a Graduate Record Examination score which evidences an ability to do satisfactory graduate work, (4) leadership ability, (5) three satisfactory letters of recommendation, and (6) a score of 550 on the TOEFL Examination if an applicant's first language is not English. Applicants should have a master's degree in social work, or in a related field, and a background in social and behavioral science and research methods is desirable.

An application for admission, transcripts of previous academic work and Graduate Record Examination scores must be submitted to the Graduate School of the University. An additional separate application and supporting materials must be sent to the Graduate Advisor, Ph.D. in Social Work Program.

Degree Requirements

The program leading to the degree Doctor of Philosophy in Social Work covers six semesters (three years) of full-time study and requires the completion of 54 semester hours of graduate work including class, field instruction and a dissertation. Students and their faculty supervisory committee together develop a plan of study geared to the students' interests. Included in this plan are a set of required and elective courses in which students pursue their specialized interests.

a) 18 hours of required core courses. The core comprehensive examinations must be satisfactorily completed before progressing in the program.
b) a minimum of three hours and maximum of nine hours Research Practicum.
c) electives selected in consultation with the student's advisory committee from the graduate program in social work around a topic of interest in either administration planning and community practice, or clinical practice. This is normally some aspect of clinical or administrative and community practice.
d) six hours electives selected from relevant graduate courses offered outside the School of Social Work. Students who specialize in a topic related to comparative social policy and who are planning to take 24 hours of required courses at UANL and complete an additional three hours electives are awarded a Ph.D. from UANL in addition to the UTA degree.
e) on completion of 42 hours course work, the specialty comprehensive examination is taken prior to application for candidacy and registration for dissertation. The comparative social policy specialty requires the completion of 45 hours of coursework prior to the specialty comprehensive examination, application for candidacy and registration for dissertation.

Successful completion of the comprehensive examinations in both core and specialty areas of study advances the student to candidacy at which time he or she devotes time to the completion of the dissertation. The last step before the degree is awarded is the final examination, which is focused on the defense of the dissertation.

Doctoral students must demonstrate knowledge of and adherence to the Code of Ethics of the National Association of Social Workers and the Code of Ethics as currently published by the Texas Council for Social Work Certification.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Social Work (SOCW)

Curriculum: Master of Science in Social Work

The curriculum is organized around five content areas and field instruction. Required and elective courses are offered in each content area. Students must complete all foundation (first year) required courses before taking advanced (second year) courses. First year courses have 5000 numbers; second year courses have 6000 numbers. Master's level students are also allowed to take doctoral level courses with permission of the instructor. The five areas and the courses offered under each are listed below:

Human Behavior and the Social Environment

Students are required to take SOCW 5301 (Human Behavior and the Social Environment) and SOCW 5317 (Race, Ethnicity, and Women). Additionally, students choose one other course from the Human Behavior and the Social Environment content area.

5301. HUMAN BEHAVIOR AND THE SOCIAL ENVIRONMENT I (3-0). Exploration of behavioral and social science knowledge of human behavior and development through the life course. Examines major systems in society: individual, group, family, and community; and the diversity of ethnicity, race, class, sexual orientation, and culture.

5317. RACE, ETHNICITY, AND WOMEN (3-0). Introduction to theoretical, practical, and policy issues related to race, ethnicity, and women. Historical, political, and socioeconomic forces are examined that maintain racist and sexist values, attitudes, and behaviors in society and all levels of organizational behavior.

6307. PRACTICE OF BEHAVIOR THERAPY (3-0). Introduction to the experimental bases and clinical applications of socio-behavioral approaches relevant to social work practice; attention given to different change methods and application made directly to the wide range of behaviors of concern to the social worker. (This course may substitute for a Direct Practice Course.)

6310. SEMINAR IN WOMEN'S ISSUES (3-0). Examines women's development within psychological and sociological contexts; applies theories to understanding roles women take within families and the workplace.

6320. PERSONAL RELATIONSHIPS (3-0). Explores theoretical and empirical material on linkup initiation, maintenance, and termination. Identifies areas for intervention.

6323. PERSPECTIVES IN MENTAL HEALTH (3-0). Examination and analysis of theories of mental health and disorders, perspectives on the etiology and epidemiology of mental disorder and the institutional response to problems in mental health (e.g. "asylums", community mental health programs).

6330. CHILD DEVELOPMENT (3-0). Reviews and analyzes a number of theoretical and empirical approaches to understanding the development of the child through adolescence; implications for practice and policy.

6331. THEORIES OF FAMILY (3-0). Reviews a variety of theoretical approaches useful in understanding the family. Implications for practice at the policy, community, and interpersonal levels are discussed.

6332. ADULT DEVELOPMENT (3-0). Explores selected issues and themes associated with early and middle adulthood. Issues pertinent to practice, such as the developmental change process, are also examined.

6333. AGING IN AMERICAN SOCIETY (3-0). Explores the elderly population in American society. Includes discussion of social gerontology, a description of the aged in the United States and across cultures. Changes among the elderly such as health, finances and social roles are studied.

6337. PSYCHODYNAMICS (3-0). Major aspects of psychodynamics theory derived from Freud and the recent ego psychologists are used in an analysis of the life cycle. Implications for social work practice are drawn, particularly application of the theory for practice with special groups: minorities, women, and lower socioeconomic groups.

6361. STRESS, CRISIS, AND COPING (3-0). The impact of specific crises on individuals and families are examined. Typical crises include life-threatening illness, trauma, physical and mental disability, and death. Assessment and evaluation of an individual's coping ability and appropriate strategies for social work interventions are studied. (May also substitute for Direct Practice course.)

Social Welfare Policy and Services

Students are required to take SOCW 5303 (Foundations of Social Welfare Policy and Services) and one other course from this content area.

5303. FOUNDATIONS OF SOCIAL POLICY AND SERVICES (3-0). Examines how social goals are met by social welfare institutions. Conceptual schemes are developed for analyzing the structure of social welfare institutions and evaluating social welfare sub-systems. The social work profession also is examined in the context of the evolution and function of the contemporary American social welfare system. Required of all first-year students.

6301. POLITICS AND SOCIAL POLICY (3-0). Politics are key to developing social policy. Students learn theory and skills to impact policy processes at local, state and national levels. Examines the role of the social work profession in politics. This course may be chosen as a Policy, Administrative Practice or Community Practice elective. Prerequisite: 5303 or equivalent.

6303. POVERTY, INEQUALITY AND SOCIAL POLICY (3-0). This course examines the nature and extent of poverty and inequality in the United States, their causes and consequences, and the debate concerning the role of government in providing anti-poverty programs. Many points of view are presented, from the radical left to radical right. Prerequisite: SOCW 5303.

6304. ISSUES IN CHILD WELFARE (3-0). Examination of current policies, programs, and practices. Attention given to new perspectives on the delivery system and staffing in child welfare. Through analysis and research, students are provided knowledge for more effective practice in the field of child welfare.

6319. SOCIAL POLICY AND MENTAL HEALTH (3-0). Studies programs and policies in the field of mental health. An analytical model is employed in the process of examining critical issues in the mental health arena.

6321. SOCIAL POLICY AND SUBSTANCE ABUSE (3-0). Examines policies and programs regarding substance abuse. An analytical model is employed in the process of studying critical issues in the substance abuse arena.

6334. WOMEN AND FAMILY POLICY (3-0). Policies affecting women and the family; interaction of women with other social institutions (family, economy, policy); the unique impact of policies upon families and women of color; cross cultural comparisons and political strategies; the role of the social work profession in this policy field.

6338. SOCIAL SERVICES AND SOCIAL POLICY (3-0). Broad acquaintance with, and analysis of, the social services and their role within social welfare policy. A variety of social services examined as well as modes and methods of providing these services, degree of effectiveness of various services in adequately serving clients, service gaps or duplication, and related areas.

6345. HEALTH POLICY (3-0). Historical, current, and projected national and local health policies and roles of providers and consumers of health care examined; service demands, economic, access, and regulatory issues analyzed; relationships between governmental, voluntary, and commercial sectors studied; analytic frameworks for the understanding and development of policies developed.

6349. AGING AND SOCIAL POLICY (3-0). Social welfare policies and programs are examined in terms of the overall impact on the aged and society. Needs and gaps in services to the aged are evaluated, especially concerning minority and low-income aged. Current issues in aging policy are examined.

6354. SOCIALLY OPPRESSED GROUPS, SOCIAL EXCLUSION AND SOCIAL JUSTICE (3-0). Past and present policies are examined related to people with disabilities, substance abusers, lesbians and gay men, juvenile delinquents, women convicted of criminal offenses, sex offenders and others who for various reasons experience social exclusion, stigma and social control. Theoretical bases of societal reaction to these groups and the impact on social policy and social work practice is considered.

Direct Practice

Students are required to take SOCW 5304 (Direct Social Work Practice I) and 5305 (Direct Social Work Practice II). Students who choose a direct practice concentration take two additional courses from those listed below.

5304. DIRECT SOCIAL WORK PRACTICE I (3-0). Introduces the basic skills and knowledge needed for direct social work practice

including basic strategies and techniques involved with developing rapport, interviewing, assessing, and contracting with clients. History, ethics, and values of the social work profession are also emphasized. Required of all first-year students.

5305. DIRECT SOCIAL WORK PRACTICE II (3-0). Further attention given to change theories, intervention strategies and therapeutic techniques employed at the individual, family, and group levels. Emphasis placed on developing criteria for selection among alternative approaches, intervention activities appropriate to the specific goal of intervention and the specific practice context. Prerequisite: SOCW 5304 or equivalent. Required of all first year students, and all advanced standing students.

6302. MULTICULTURAL SOCIAL WORK PRACTICE (3-0). This course is designed to sensitize students to the diversity in cultures in the United States and to enable them to develop practice competencies which are culture sensitive and relevant in work with ethnic minorities, women, people with disabilities, gay men and lesbians, and those at the poverty level.

6306. CLINICAL ASSESSMENT (3-0). Reviews and builds on the fundamentals of clinical assessment. Topics are covered in considerable depth and practiced with social work clients. Advanced topics include behavioral observation, self-anchored rating scales, client surveys, standardized measurement and scales, single-subject designs, family assessment tools and categorical systems.

6307. PRACTICE OF BEHAVIOR THERAPY (3-0). Introduction to the experimental bases and clinical applications of socio-behavioral approaches relevant to social work practice; attention given to different change methods and application made directly to the wide range of behaviors of concern to the social worker. (This course may substitute for a Human Behavior and the Social Environment course.)

6308. ADVANCED CASE MANAGEMENT (3-0). Case management is recognized as a major social work practice strategy. It is essential to effective service delivery in diverse settings. This course examines case management models and functions guiding practice.

6311. SEMINAR IN DIRECT METHODS IN MARITAL COUNSELING (3-0). Examination of various psychological, social and behavioral treatment approaches to the treatment of problems in marital adjustment. Emphasis placed on developing criteria for assessing the sources and patterns of imbalance and conflict, the selection and ordering of treatment strategies, and intervention techniques consistent with determined goals.

6312. GROUP DYNAMICS I AND SOCIAL WORK PRACTICE (3-0). Examines contemporary social-psychological concepts and small group research, with a view to testing their applicability to practice propositions and operational principles, in work with both task and personality satisfaction groups.

6313. GROUP METHODS IN COUNSELING II AND SOCIAL WORK PRACTICE (3-0). Critical investigation of the therapeutic processes which are directed toward behavior change in persons through the structured medium of group interaction, and planful management, by the therapist, of group processes which emerge through interactional patterns between group members. Prerequisite: SOCW 6312.

6316. OUT OF HOME CARE AND TREATMENT (3-0). This course reviews current research and practice relevant to services provided to children and adolescents who reside in foster care, residential treatment, kinship care or psychiatric hospital settings.

6317. DIRECT PRACTICE IN HEALTH CARE (3-0). Explores central contribution of social work to comprehensive health care; social work interventions to assess and ameliorate the psychosocial effects of illness and disability are included along with emerging roles for social work in prevention and health maintenance.

6318. DIRECT PRACTICE WITH AGING (3-0). Course presents an overview of current issues in the care, treatment, and delivery of social services to the aging. Students learn practice procedures designed to equip them with the skills needed for effective social work practice and review major theories on aging.

6343. VIOLENCE IN FAMILIES (3-0). Addresses two areas: Models for effective treatment of violence-prone families and creation of legal and social service systems for treatment. Students undertake field research and learn procedures for conducting their own anger abatement training programs.

6344. TREATMENT OF CHILDREN AND ADOLESCENTS (3-0). Overview of the literature which describes physical, psychological, and cultural characteristics unique to childhood and adolescence. Attention then turned to treatment principles, and the specification of procedures for the amelioration of problems common to children and adolescents.

6350. SEMINAR IN COGNITIVE-BEHAVIORAL INTERVENTION STRATEGIES (3-0). Explores various covert conditioning, cognitive restructuring, and self-instruction therapies. Recent theoretical formulations and relevant research will be investigated as they pertain to the efficacy of cognitive intervention strategies with various clinical problems.

6353. SEMINAR IN FAMILY THERAPY (3-0). Comparison of various approaches to working with the family as a total system; enhancement of cognitive understanding of similarities and differences in theory and goals of family treatment in many fields of practice; integration of strategies and techniques of each method into an individual style of therapy.

6358. SOCIAL WORK SUPERVISION (3-0). Introduction to roles, functions, and contextual dimensions of social work supervision. Administrative and clinical perspectives are examined within contextual framework of social work supervisor as manager, mentor, mediator, and leader in the human service organization.

6360. CHILD ABUSE AND NEGLECT (3-0). Examines knowledge/technique in child physical/emotional/sexual abuse, physical/emotional neglect, and exploitation interventions. Includes interviewing, identification, legal issues, assessment/evaluation, case management, intervention, follow-up.

6361. STRESS, CRISIS, AND COPING (3-0). The impact of specific crises on individuals and families will be examined. Typical crises will include life-threatening illness, trauma, physical and mental disability, and death. Assessment and evaluation of an individual's coping ability and appropriate strategies for social work interventions will be studied. (May also be substituted for a Human Behavior and the Social Environment course.)

6362. STRESS MANAGEMENT (3-0). Stress management is a specialized area of clinical social work practice found in health, mental health, and occupational settings. Course content includes theory, assessment, and intervention methods.

6367. TREATMENT OF THE SELF (3-0). Focuses on understanding and treating client self-experience, especially its major components self-esteem and self-concept. Self psychology is examined both as a

theory of human development and as a model of clinical practice. Prerequisite: Previous or concurrent direct practice field or work experience.

6368. SEXUAL ABUSE OF CHILDREN: IDENTIFICATION, ASSESSMENT, CASE MANAGEMENT AND TREATMENT (3-0). Seminar focused on examination of current knowledge and intervention strategies related to child sexual abuse. Topics addressed include techniques of obtaining information, sexual assault assessment procedures, validation, case management, application of change methods, case monitoring and relapse prevention.

6369. INTRODUCTION TO HUMAN SEXUALITY AND SOCIAL WORK PRACTICE (3-0). Overview of human sexuality as it relates to social work practice. Human sexuality considered from a bio-psychosocial perspective. Emphasis on viewing human sexuality as an interactive process of the total personality. Attention given to various psychological, social and behavioral educational/treatment approaches.

6370. TREATING PARENT-CHILD RELATIONSHIPS (3-0). Treatment strategies and evaluation methods and research findings relevant to the treatment of parent-child relationships; review of existing parent training literature and commercially available parenting programs.

6380. TREATMENT OF ADDICTIVE BEHAVIORS (3-0). Surveys major treatment alternatives, showing addictive behavior patterns such as alcohol/drug abuse or eating disorders. Student conducts field research of 12-step programs, practices interventions, and studies inpatient and outpatient treatment methods with emphasis on relapse prevention.

6382. SELF-REGULATION METHODS: RELAXATION, BIOFEEDBACK, AND HYPNOSIS (3-0). Examines the clinical application of relaxation, biofeedback, and hypnosis for self-regulation of both internal and external behavior for personal growth and clinical treatment. Students will learn how to use specific instruments and techniques of self-regulation. $5 lab fee.

Administrative and Community Practice

All students are required to take SOCW 5306 (Introduction to Administrative and Community Practice) and 5307 (Administrative and Community Practice Skills). Students who choose a concentration in administrative practice are required to take 6314 (Advanced Administrative Practice) and one additional course from those listed below. Students who choose a concentration in community practice are required to take 6315 (Advanced Community Practice) and one additional course from those listed below. Students who choose a concentration in both administrative and community practice are required to take both 6314 and 6315.

5306. INTRODUCTION TO COMMUNITY PRACTICE (3-0). Examines community and community intervention theory, concepts, methods, skills and values. Covers the techniques and skills for conducting a community needs and strengths assessment and designing an intervention strategy. Required of all except advanced standing students.

5307. INTRODUCTION TO HUMAN SERVICES ADMINISTRATION (3-0). Examines organization and management theories, concepts, methods, skills and values. Covers the techniques and skills for conducting an assessment of organizational needs and strengths and for designing a human service program from a grant writing perspective. Required of all except advanced standing students.

5318. SEMINAR IN ADMINISTRATION AND PLANNING FOR ADVANCED STANDING STUDENTS (3-0). Basic and intermediary theories and methodologies, as well as philosophy, purpose, and skills of social work administration and planning. Substitutes for 5306 and 5307.

6314. ADVANCED ADMINISTRATIVE PRACTICE (3-0). Focuses on selected topics, issues, and skills for effective social work administration. Content includes leadership, worker motivation, resource development, interagency relations and managing conflict and diversity in a climate of scarce resources. Prerequisites: SOCW 5306 and 5307.

6315. ADVANCED COMMUNITY PRACTICE (3-0). Focuses on topics, issues, and skills for mobilizing neighborhoods, communities, and client groups to solve collective human problems. Content includes the politics of empowerment, mobilizing coalitions, locating resources, and mediating conflict. Prerequisites: SOCW 5306 and 5307.

6339. PROGRAM EVALUATION (3-0). Presumes basic research competence on part of student. Focus on socio-political aspects of program evaluation as a specialized use of scientific methods and community practice skills. Relationships between program evaluation and program planning or administration stressed.

6355. ADVANCED USE OF COMPUTERS IN HUMAN SERVICES (3-0). Provides the knowledge and skills to assess needs/capacities and develop computer-based solutions to individual, group, family, administrative and community problems. Covers information systems, decision support systems, multimedia, human services software and Internet. Graphical Internet access required for many course activities. Prerequisite: SOCW 5319.

6358. SOCIAL WORK SUPERVISION (3-0). Introduction to roles, functions, and contextual dimensions of social work supervision. Administrative and clinical perspectives are examined within the contextual framework of the social work supervisor as manager, mentor, mediator, and leader in human service organizations.

6363. BUDGETING AND FINANCIAL MANAGEMENT (3-0). Basic overview of financial management applied specifically to human service agencies; emphases on basic concepts and skill building in budgeting, grant writing, and fund raising; accounting principles, financial statements, and computerized financial information systems also covered.

6364. SOCIAL WORK IN HEALTH CARE SETTINGS (3-0). An introductory course for those students interested in medical social work practice; health settings examined from organizational, administrative, and clinical perspectives to provide an understanding of intra/interdisciplinary practice in the health care system.

Research and Evaluation

Students are required to take SOCW 5322 and 6324 (Research and Evaluation Methods in Social Work I and II). Thesis students are required to take 6393 (Thesis Research) and 6398 (Thesis). Non-Thesis students must take 6305 (Integrative Seminar) and one additional elective. Students must be enrolled in Thesis or Integrative Seminar during their final semester.

5319. TECHNOLOGY USE IN SOCIAL WORK PRACTICE (3-0). Introduces basic computer concepts, spreadsheets, word processing, assessment and intervention software, graphics packages and statistical packages and their applications in social work. Required of all students. Graded P/F.

5322. RESEARCH AND EVALUATION METHODS IN SOCIAL WORK I (3-0). Introduction to the methods of scientific inquiry and their relevance to social work. Topics include problem formulation, single subject and group research design, elementary statistics such as chi squares, correlations, analyses of variance, and report writing. Required of all students.

6324. RESEARCH AND EVALUATION METHODS IN SOCIAL WORK II (3-0). Advanced course in the application of research principles and techniques. Topics include regression and statistical control, analysis of variance, questionnaire construction, evaluation research, and computerized tabulation and analysis of data. Mini-projects require the student to apply these techniques in the context of social work practice. Prerequisite: SOCW 5322. Required of all students.

6393. THESIS RESEARCH. Initial research in the student's area of concentration, leading to thesis. Graded P/F/R. Prerequisite for 6398.

6395. APPLIED RESEARCH. Individual or small group research project in the student's major area of concentration with emphasis on applying research principles and procedures. A substantial research report is due at the conclusion of the course. May be taken as an elective only. Graded P/F/R.

6398. THESIS. Requires an individual research project in the individual's area of concentration, with a minimum of six semester hours total needed for the project. Satisfactory completion requires approval of the instructor in charge, a supervising committee appointed by the Dean of the Graduate School. Defense in a final oral examination is required. Graded P/F/R. Prerequisite: permission of Graduate Advisor and the instructor in charge.

General

6305. INTEGRATIVE SEMINAR (3-0). Focuses on issues and aspects of practice of broad concern to the profession of social work. Faculty members serve as consultants and resource persons to seminar members. Required of all non-thesis students in their final semester of coursework. Grade of B or better must be earned in this seminar. Graded R.

6329. SOCIAL WORK, LAW, AND THE FAMILY CODE (3-0). Overview of legal principles and procedures as they apply to social workers and their interaction with clients. Particular attention given to the broad area of family law. Areas of mental health law, children's rights, consumerism, malpractice, courtroom testimony, criminal law, estates, and community legal services covered. This course is an elective only; does not meet the requirements for a second year policy course.

Tutorials

6190, 6290, 6390. TUTORIAL. Arrangements may be made for a directed and supervised tutorial in a select area of special interest to the student. Prerequisite: permission of the Graduate Advisor. May be repeated for credit.

Special Seminars

6292, 6392. SELECTED TOPICS IN SOCIAL WELFARE. Topics vary from semester to semester depending on the needs and interest of the students. Prerequisite: permission of Graduate Advisor. May be repeated for credit.

Field Instruction

Field instruction is an essential component of professional education for social work practice. Its purpose is to provide adequate opportunity and support for the application of social work knowledge and skills gained by the student in the classroom and to acquaint students with the realities of practice in organizational settings.

Students are assigned to affiliated agencies where they are administratively responsible to an agency supervisor, the field instructor. A campus professor or a community-based social worker acts as liaison and consultant to the agency field instructor and to the student in regard to the educational experience, to insure that classroom and field curricula are related and integrated.

Students are assigned to two different agency- or campus-based placements for field instruction and complete a total of 13 credit hours and 900 clock hours. First year students must complete 400 clock hours of generalist practice in one agency during one semester. Students should have completed at least 12 credit hours before enrolling for the first field placement. Students must complete Direct Practice I, ACPI, HBSE, and Policy prior to applying for first year field. Direct Practice II and Administration and Planning II must be taken either prior to or during the first field placement.

Second year students normally complete field instruction in two consecutive semesters at the same agency for a total of 500 clock hours in their method of concentration (250 clock hours each semester) and receive a total of 8 credit hours. Before enrolling for second year field instruction, a student must have completed all first year coursework and be taking a second year methods course with each semester of field instruction. Students may do second year field instruction in one semester (called a block placement) if approved by the Director of Field Instruction.

Field Placements cannot be provided totally at night and on weekends. Students must have flexibility in scheduling time for classes and field instruction. Students must meet the requirements of the field agency including but not limited to the days and times required for initial screening procedures, orientation, training, and supervision.

Students are permitted to do one of their field placements in an agency where they have been employed provided that the agency is affiliated with the School of Social Work for the provision of field instruction, that the agency has a qualified field instructor who is not the employment supervisor, and that the proposed educational experience is approved by the Director of Field Instruction. A proposal must be submitted to the Director of Field Instruction for review and approval.

Out of Dallas/Fort Worth Metroplex Field Placements

The School affiliates with social service agencies in the Dallas/Fort Worth Metroplex for provision of both first and second year field instruction. Occasionally other field placements are arranged outside the Metroplex dependent upon the resources of the School and at the discretion of the Director of Field Instruction. Placements that are arranged outside of the Metroplex for the sole benefit and convenience of students will require that actual expenses for site visits and liaison visits be reimbursed by the student in accordance with the official travel reimbursement guidelines of the State of Texas.

Requirement for Liability Insurance

All social work students enrolling in field instruction courses will be assessed a fee in order to include them in the School's group professional liability insurance policy. Coverage is for $250,000 limit each claim and $500,000 limit aggregate.

The first field placement is generalist. The second field placement must be taken in the student's method of concentration. The number of field placements is not unlimited. Courses may sometimes be repeated for credit. Graded P/F/R only.

5151, 5251, 5351, 5551. APPLIED SOCIAL WORK PRACTICE I. Graded P/F/R. $15.50 course specific fee.

6151, 6251, 6351, 6451, 6452, 6551, 6651, 6751,6851, 6951. APPLIED SOCIAL WORK PRACTICE II. Prerequisite: Applied Social Work Practice I. Graded P/F/R. $6 course specific fee.

6152, 6252, 6352, 6452, 6552, 6651, 6652, 6752, 6852, 6952. APPLIED SOCIAL WORK PRACTICE III. Prerequisite: Applied Social Work Practice II. Graded P/F/R. $6 course specific fee.

Core Curriculum: Doctoral Program

The Ph.D. core curriculum provides an overview of relevant social science theories and emphasizes research methods and statistical procedures necessary for conducting research in the student's area of specialization. Courses that constitute the core curriculum are described below.

6340. ADVANCED RESEARCH METHODS IN HUMAN SERVICES (3-0). Acquaints students at an advanced level with research methodology as it applies to the human services. Includes techniques and tools of research, problem conceptualization, measurement, research and instrument design and data collection methods. Prerequisites: SOCW 5322 and 6324 or equivalent within the last five years.

6341. ADVANCED STATISTICAL METHODS IN HUMAN SERVICES (3-0). Advanced statistical applications in the human services. Emphasis on multivariate statistical approaches including multiple regression analysis, logistic regression, structural model analysis using LISREL or EQS. Prerequisites: SOCW 5322 and 6324 or equivalent within the last five years.

6347. INTERMEDIATE STATISTICS (3-0). Statistical applications for doctoral social work students. Emphasizes both parametric and non-parametric techniques, including t-tests, ANOVA, correlation and regression, chi-square, and other non-parametrics. Designed to provide a foundation for advanced multivariate statistical techniques. Prerequisite: SOCW 6324 or equivalent.

6348. SEMINAR IN QUALITATIVE RESEARCH METHODS (3-0). Explores a variety of qualitative approaches to knowledge building and research. Designed to prepare students to carry out research projects within their areas of interest. Content includes discussions of knowledge development, study designs, data collection, analysis, and report writing.

6356. SEMINAR IN PROGRAM AND PRACTICE EVALUATION (3-0). This course provides hands on opportunities to develop program and clinical evaluation plans for social work/welfare agencies. Educational principles and theoretical foundations are discussed as the actual plans are developed. Students work with agency decision makers and the instructor to generate a plan acceptable to the agency for implementation.

6373. SCIENCE AND ADVANCED SOCIAL WORK PRACTICE (3-0). Involves the study of the philosophy of science and an examination of the contributions and limitations of science in the shaping of social work practice; involves as well the identifications and considerations of other factors which have a systemic effect on the epistemology and technology of the profession.

Ph.D. Elective Courses

6309. PROSEMINAR IN ADMINISTRATION, MANAGEMENT, AND POLICY (3-0). Provides an orientation to and overview of human services administration, management, and policy. Embracing a philosophical and historical perspective, it also focuses on some theoretical and conceptual approaches to human services administration. Selected research in the field is reviewed. The goal of the seminar is to provide a foundation for further study and research in this area. Required for all doctoral students concentrating in administration as well as all doctoral students who do not possess a master's degree in social work.

6322. SEMINAR IN SOCIAL SYSTEMS (3-0). Concepts and models of general and social systems theory; examination of the origins, elements, and application of the systems approach to problem solving and the planning of change.

6328. SOCIAL POLICY RESEARCH AND ANALYSIS (3-0). Seminar on methods of analyzing social welfare policies and the programs through which they are implemented and policy objectives achieved. Inquiries and investigations regarding control or management of policy considered, as well as more formal research designed to add to professional knowledge concerning intervention in macro-systems. Prerequisites: SOCW 5322 and 6324 or equivalents and permission of the instructor. Required of all doctoral students concentrating in Human Services Administration.

6335. ADVANCED SEMINAR IN THE THEORY AND PRACTICE OF SOCIAL WORK ADMINISTRATION (3-0). Examines theories and concepts of administration; critically explores the utility of these theories to social work administrative practice; provides a forum for students to analyze the fit of administrative theories to the ethical and philosophical bases of social work.

6357. PRINCIPLES OF ADMINISTRATION: A DOCTORAL SEMINAR (3-0). Focuses on applications of administrative principles; attention is directed at examining effective administrative practices; explores the students' development of professional ethics and their application to administrative practice.

6359. THEORIES OF PLANNING (3-0). Provides a basic understanding of community practice to allow students to teach, practice, or consult about human service problems using a community approach. Examines the goal of community practice (a community that promotes community, family, and individual well being) and approaches that help communities achieve this goal.

6374. COMPARATIVE SEMINAR ON TREATMENT MODALITIES (3-0). In-depth review of the major empirically based treatment modalities; attention given to efficacy with various populations and problems as well as to theoretical underpinnings, analysis of empirical validation and relationship to alternate theories of human behavior.

6375. CLINICAL ASSESSMENT (3-0). A critical examination of selected assessment approaches in clinical social work. Included are social treatment models, psychometric methods, DSM III-R assessment and review of selected family models.

6377. INTERPERSONAL MANAGEMENT IN HELPING PROFESSIONS (3-0). Focuses on the examination and analysis of research and theories in the area of interpersonal communication. The rationale for the course is based on identifying key interactional factors in dyadic and group situations which enhance worker effectiveness in the interest of client outcomes.

6378. CLINICAL AND RESEARCH APPLICATIONS OF SELF-REGULATION METHODS (3-0). Focuses on biofeedback as a method of intervention. Content includes theoretical perspectives from human systems, and behavior change as well as evaluation methods, psychophysiology, and instrumentation. A wide range of clinical applications are examined. $10 lab fee. $6 course specific fee.

6379. SEMINAR IN ADVANCED MARITAL/DIVORCE INTERVENTION (3-0). Addresses cognitive and behavioral assessment and treatment methodologies as applied to the maritally distressed (intact and separated) and divorced.

6381. ADVANCED CLINICAL ASSESSMENT (3-0). Advanced topics include statistical tools for the development and validations of scales, behavioral observation and analysis, survey construction, and in-depth assessment of mental health categorical systems. Knowledge of basic clinical assessment skills is required. Clinical assessment is an advanced course for doctoral students.

6383. COMPUTER-SUPPORTED PRACTICE (3-0). Examines the data/information/knowledge basis of social work and the computer-based tools and techniques to support micro and macro practice. Tools examined include databases, spreadsheets, multimedia, expert systems, performance support systems, neural networks, and electronic networks. Prerequisite: SOCW 5319, or equivalent, or instructor's permission.

6396. SOCIAL WORK EDUCATION: PRINCIPLES AND SKILLS (3-0). Considers a range of ideas in educational thought relevant to the formulation of an analytical appraisal of social work education and training. Educational methods and skills relevant to social work are addressed and practice opportunities offered.

6397. ADVANCED FAMILY THERAPY (3-0). Advanced theory and practice methods are presented for family therapy. Students also practice and evaluate advanced assessment and intervention techniques.

6399, 6699, 6999. DISSERTATION. Preparation and submission of a doctoral dissertation in an area in social work. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prerequisite: admission to candidacy for the Ph.D. in social work.

Teaching Practicum

6346. TEACHING PRACTICUM (3-0). Introduces students to the academic role through teaching practice at graduate and/or undergraduate level supervised by a full-time faculty member.

Research Practicum

6394, 6694, 6994. APPLIED RESEARCH PRACTICUM. Students engage in an active program of applied research under direct supervision of a faculty member.

The School of Urban and Public Affairs

Dean: Richard L. Cole, Ph.D.
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Mission and Philosophy

The mission of the School of Urban and Public Affairs is to conduct basic and applied research into urban problems and public policy, to provide services in support of public and nonprofit agencies, and to educate and train students for public service careers.

History and Overview

SUPA was established in 1967 as the Institute of Urban Studies by an act of the Texas Legislature. The institute's mandate was to offer Texas city and county governments and other public agencies high-caliber, university-based research, training and other technical services. In 1990, after significant expansion of its staff and programs, the organization became the School of Urban and Public Affairs. The institute continues to operate as a vital part of the school.

SUPA is the state's only university-based center for applied research and service in urban affairs. It is called upon routinely to study and recommend solutions for problems confronting government agencies, nonprofit organizations and private industry.

During its more than 30 years of existence, SUPA has conducted hundreds of studies on such topics as transportation, housing, child care, public safety, corrections, education, human services and regional governance. Its reports are included in the collections of virtually every major library in Texas and have been adopted as texts at many colleges and universities.

Urban officials view the school, its institute and its Center for Economic Development Research and Service (CEDRAS) as a primary source of information and advice in such matters as computer applications in urban management, home rule charters, redistricting, interlocal contracting, economic development, personnel management, revenue administration, land appraisal, zoning and land-use issues.

SUPA is active in training local government officials and in consulting on service projects for governmental agencies worldwide. Urban professionals rely on SUPA for consultation and guidance in accomplishing such goals as urban revitalization, pollution control, conservation, and facility planning and siting.

Though much of its research is done in response to specific requests by particular entities, SUPA makes the results available through its publications to others who find themselves confronting similar situations.

SUPA uses the most advanced computer equipment, data collection and analysis techniques in conducting its research, and its team of more than 20 faculty and staff have rich and diverse educational and cultural backgrounds to draw upon.

One distinguishing feature of SUPA is its location in the heart of the Dallas-Fort Worth Metroplex, a rich urban laboratory of more than 150 cities with a total population of approximately 4.5 million. This complex urban arena offers a wide array of opportunities for student projects, internships and employment. SUPA faculty, staff and students work on "real-life" urban and public affairs projects in cooperation with city governments, public agencies and nonprofit organizations through the school's institute, CEDRAS, and the national Coalition to Improve Management in State and Local Government, which is head-quartered at SUPA.

More than 500 students have earned graduate degrees at SUPA, and many hold key management positions in local governments, public agencies and nonprofit organizations nationwide. Currently, SUPA has a diverse student body of approximately 250 students. Many of these students also hold full- or part-time positions in government, private or nonprofit organizations.

In 1992 a nationwide poll of similar programs conducted by the Urban Affairs Association ranked SUPA as having the nation's fourth best program of higher education in urban affairs.

Accreditation

The School of Urban and Public Affairs is one of only approximately 20 in the country having both its Master of Public Administration and its Master of City and Regional Planning programs fully accredited by their respective accrediting agencies.

The Master of City and Regional Planning is accredited by the Planning Accreditation Board which requires graduate planning programs to meet high professional and academic standards. Students enrolled in accredited programs are eligible for certain national APA scholarships, and graduates of accredited programs may qualify for certification by the American Institute of Certified Planners after fewer years of experience than graduates of nonaccredited programs. Also, accreditation qualifies a CIRP program for representation on the board of the Educational Foundation of the Texas Chapter of the American Planning Association which provides annual scholarships and other benefits to students in accredited planning programs.

The Master of Public Administration degree is accredited by the National Association of Schools of Public Affairs and Administration which requires public administration programs to meet strict standards for faculty qualifications, curriculum content, admissions and program requirements, student composition and services, budget and facilities. Accreditation enhances the program's national recognition and will open doors and provide opportunities for students applying for Texas-based scholarships and nationwide positions.

Scholastic Activity and Research Interests of the Faculty

The SUPA faculty are actively engaged in research and community service projects that benefit local jurisdictions, public and nonprofit agencies with expertise that is beyond the normal scope of their particular services and resources. Typical projects include revitalization studies for inner-city neighborhoods, development plans for central business districts, economic development strategies for municipalities, interlocal contracting studies, and assessments of service delivery alternatives in communities and school districts.

The broad range of faculty research interests primarily focuses on local issues and provides support for local officials and urban professionals, but it also includes basic research into urban problems and public policy that is published in national journals and used in university texts. Research topics include such urban affairs issues as urban theory, development, management, politics, social welfare policy, social service administration and minority relations; such planning issues as urban design, land use analysis, environmental planning, community service and development, focus group research and group facilitation; and such public administration issues as public management, intergovernmental relations, entrepreneurship in government, education and economic development.

Ten of the most significant faculty accomplishments from 1993-95 were publication of an in-depth study of privatization in public schools which was presented to Texas Gov. George Bush and the Texas State Board of Education; supervision of a study of the Civic Center District in Dallas that will probably affect the development and future profile of that area; supervision of a study of a neighborhood in Dallas for the Dallas Neighborhood Renaissance Partnership program to ensure that the residents get the improvements they want and need; publication of a collection of essays on economic development strategies appropriate for Texas urban settings; a grant from the Economic Development Administration for a university center; completion of a study for Habitat for Humanity to be used in the revitalization of a Fort Worth inner-city neighborhood; preparation of two sets of manuals for the training of trainers of elected officials in Third World countries for the United Nations; supervision of an APA award-winning student project to help a local community with the development of a central business corridor; assistance to the Fort Worth City Council in reaching consensus on annual budget deliberations; and assistance as an expert witness in a recent federal voting rights case in Tennessee.

Special Programs and Opportunities

SUPA hosts a monthly Guest Lecture Series which features public administrators, city planners, elected officials and other urban professionals. The series serves as a forum for urban affairs information and events. The school also conducts an informal visitors program through which urban professionals from around the world visit the school and share with students a wide body of urban knowledge and experience.

Located on the fifth floor of University Hall on the main UTA campus, SUPA has modern classrooms and its own state-of-the-art computer laboratory with GIS database management and spreadsheet capabilities as well as access to the Internet and World Wide Web. It offers courses in the afternoons, evenings and on weekends to accommodate working professionals.

Programs

SUPA currently offers four programs of graduate-level study: the Ph.D. in Public and Urban Administration, the Master of Arts in Urban Affairs, the Master of City and Regional Planning and the Master of Public Administration.

SUPA participates in dual-degree programs with the schools of Architecture, Nursing and Social Work. It cooperates with the colleges of Engineering and Science in an interdisciplinary program leading to master's and doctoral degrees in environmental science and engineering.

Ph.D. in Public and Urban Administration
Master of Arts in Urban Affairs
Master of City and Regional Planning
Master of Public Administration

Program in Urban Affairs (M.A.)

Program in Urban and Public Administration (Ph.D.)

Areas of Study and Degrees
Urban Affairs
M.A. (See below)
City and Regional Planning
M.C.R.P.
(See Interdepartmental and Intercampus Programs)
Public Administration
M.P.A.
(See Interdepartmental and Intercampus Programs)
Public and Urban Administration
Ph.D. (See below)

Master's Degree Plans
Thesis and Thesis Substitute

Dean
Richard L. Cole
512 University Hall, 817-272-3071

Graduate Advisor and Program Coordinator (M.A.)
Paul N. Geisel
551 University Hall, 817-272-3071

Graduate Advisor and Program Coordinator (Ph.D.)
Rodney V. Hissong
507 University Hall, 817-272-3071

Graduate Faculty
Professors
Anjomani, Cole, Cornehls, Geisel, Goldsteen, Taebel

Associate Professors
Barrett, Bright, Hissong, Tees, Wegner, Wyman

Assistant Professors
Arvidson, Li, Salazar, Vazquez

Master of Arts in Urban Affairs

The Master of Arts degree in urban affairs is organized around a subject matter area, city or urban phenomena, rather than one of the traditional disciplines. Emphasis is placed on issues, problems, and public policy questions related to life in urban communities. Urban problems are viewed as complex and requiring the understanding and skills of many disciplines. Therefore, the program is interdisciplinary in character, curriculum content, teaching staff, and enrollment of students.

Broad and intensive graduate education in urban affairs can introduce graduates to a variety of rewarding and profitable careers and positions. With the increased urbanization of Texas and the nation, new career opportunities, many of them recent in origin, are becoming available.

By educating young men and women for urban affairs careers, the program seeks to help provide society with the "brain power" needed to deal with increasingly complex and urgent city problems.

Degree Requirements

The Master of Arts degree in Urban Affairs seeks to provide students with an understanding of cities in five general and interrelated areas of knowledge:

1. Urban Common Courses (nine hours)
2. Urban Institutions (six hours)
3. Urban Issues (nine hours)
4. Professional Development (six-nine hours)
5. Research and Analysis (nine hours)

A total of 39 to 42 hours is required for completion of the program, depending on the prior academic degree of the student, and prior professional experience.

In the Research and Analysis field, all students are required to take URPA 5343. Students then have the option of taking one or the other of these sequences:

a. URPA 5341, Professional Report Writing, and URPA 5396, Project Report;
b. URPA 5342, Strategies for Urban Research, and URPA 5397, Research Report.

A student may select URPA 5698, Thesis, in lieu of either URPA 5396, Project Report, or URPA 5397, Research Report.

Professional Development Fields

Students can specialize in one of four professional development fields as described below. As an alternative, they can petition to substitute another professional filed, such as criminal justice, social work, engineering or business administration.

Urban Management: The Urban Management field is designed for students interested in public service careers or other managerial or administrative staff positions, such as finance and personnel. Student selecting Urban Management must fulfill the requirements as specified above.

Urban and Social Planning: The Urban and Social Planning field is designed for students interested in planning careers in non-profit and public agencies. Students selecting Urban and Social Planning must fulfill the requirements specified above.

Urban Journalism: The Urban Journalism field is designed for students who are interested in careers in the media with a specialization in urban and community affairs. Students selecting Urban Journalism must complete the course requirements specified above. Courses in the professional field are taken in Journalism from the Department of Communication (see the department listing). In addition, students must take the Project Report sequence in the Research and Analysis field, but the course requirements are reduced from 12 to 9 hours because URPA 5341 is not required.

Environmental Policy and Planning: The Environmental Policy and Planning Field is designed for students interested in careers in the public and private sector which focus on environmental concerns. Students selecting Environmental Policy and Planning must complete the course requirements specified above. Courses in the professional field will be drawn from Civil Engineering, City and Regional Planning and other programs. (See appropriate departments for course listings.)

Dual Degree Program

Students in Urban Affairs may participate in a dual degree program whereby they can earn a Master of Arts in Urban Affairs and a Master of Science in Social Work. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs. To participate in the dual degree program, students must make separate application to each program and must submit a separate Program of Work for each degree. Those interested in the dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement on "Dual Degree Programs" in the general admission section of this catalog.

Ph.D. in Urban and Public Administration

The Ph.D. Program in Urban and Public Administration is based on a unique interdisciplinary approach in preparing students for a variety of academic and senior public management positions.

Students in the program are required to take two core fields of study and two support fields of study. One of the core fields of study is public administration and the other is urban policy. The support fields of study from which students can choose are listed below.

Admission

A Master's degree is required for admission. In addition, a student must have a GPA of 3.4 on all previous graduate work and a GRE score above 1000 in order to qualify for unconditional admission.

Program

Core fields: Students generally take 18 hours of course work in each of the two core fields of study. Appropriate courses in the public administration field are listed below under "Urban Management" and also in the Public Administration section of this catalog under the heading of "Administrative Theory, Practices and Processes." Appropriate courses in the urban policy field are listed below under "Urban Institutions" and under "Urban Issues." Courses from other programs, including social work, city and regional planning, criminal justice, and education may also be applied to the core fields, if appropriate.

Support Fields: Students generally take 12 hours of coursework in the two support fields. Research is one of the required support fields. Appropriate courses for this field are listed below under "Research and Analysis." A proficiency examination is also required in this field of study by all students.

Students can select the other support field from among the following:

Professional Fields: City and Regional Planning, Criminal Justice, Social Work, Education, Nursing

Disciplinary Fields: Political Science, Sociology, Economics, History

Courses drawn from either the professional or disciplinary fields should be related to the overall objective of the program. To assist students in selecting courses, many courses in the urban and public affairs inventory have been cross-listed with the courses in the above fields. A student may also petition to have some other field of study substitute for one of those listed above.

Examinations

Diagnostic Examination: A diagnostic examination will be taken by each student after completing 12 hours of coursework. The examination will evaluate the student's progress in the program, and, if the faculty recommends continuation, the tentative program of work will be established.

Research Proficiency Examination: All students are required to pass a proficiency examination in research.

Comprehensive Examinations: Students must successfully pass a comprehensive examination in each of the core fields during or after the semester in which they complete coursework in the field. The examination can be taken over a two-semester period.

Dissertation

Students who pass the proficiency and comprehensive examinations are elevated to candidacy for the Ph.D. and may register for the dissertation. The dissertation is the culmination of the Ph.D. program and represents a distinct contribution to the field of knowledge. A dissertation defense is required.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Urban and Public Affairs (URPA)

Urban Common Courses

5300. THE URBAN COMMUNITY (3-0). How urban communities develop as human settlements, their life cycles, expansion, and decay. Special consideration is given to social policy. Topics such as poverty, race, neighborhoods, and environment.

5301. FOUNDATIONS OF URBAN POLITICS AND ECONOMICS (3-0). Examines the major political and economic institutions and processes in urban communities and their effect on urban policy.

5302. URBAN RESEARCH AND ANALYSIS (3-0). An introduction to research methodologies, both quantitative and qualitative, and statistical techniques useful in the analysis of urban trends, planning projects and administrative programs.

Urban Institutions

5303. THE METROPLEX: SURVEY OF URBAN AFFAIRS, PLANNING, ADMINISTRATION: (3-0). The Metroplex provides an ideal laboratory for study with more than 100 cities and other governmental units, thousands of neighborhoods and business enterprises, major concentration of minorities and dozens of ethnic groups. An in-depth orientation on urban dynamics utilizing senior faculty members, governmental and community leaders, and current research reports and studies.

5304. THE URBAN POLITICAL SYSTEM (3-0). Examination of the city as a political system, including the impact of urbanization and fragmentation on policies; input dimensions, including voting patterns and interest group development; decision-making structures, especially types of community power structures and the impact of the reform movement on structural processes. Also offered as POLS 5305; credit will be granted only once.

5305. THEORIES OF URBAN SOCIETY (3-0). Several theoretical perspectives of the community and community organization examined. Special emphasis given to theories from human ecology, organization and stratification, and social welfare.

5306. THE URBAN ECONOMY (3-0). Internal dynamics of the growth and development of the urban system and its relation to the national economy. National and urban economic policy, urban growth and land use, market imperfections, urban financial issues, and the environmental implications of urban growth studied through lecture, game simulation and policy debates.

5307. URBAN GEOGRAPHY (3-0). Emphasizes areal aspects associated with urban physical environments and social, behavioral and financial processes that shape these environments.

5308. URBAN HISTORY (3-0). Extensive reading primarily in the history of the urbanization and metropolitanization of the people of the United States. Historical methods as exemplified in the works of leading historians analyzed; examples of the scholarship of selected historians and treatises on selected cities, regions, and urban institutions studied. Also offered as HIST 5303; credit will be granted only once.

5309. INTERGOVERNMENTAL RELATIONS (3-0). Critical analysis of the implications of federalism, and the changing nature of intergovernmental relations on state and local management, administration, planning, and policy making.

5390. TOPICS IN URBAN THEORY (3-0). Different topics explored on an intensive basis, especially recent theoretical approaches. May be repeated for credit as topic changes.

Urban Issues

5310. URBAN POLICY (3-0). Critical analysis of federal government and selected state and local government policies and programs designed to influence the course of change and the future development of cities and urban areas. The role of "private" governments in affecting policy explored.

5311. SOCIAL POLICY FORMATION (3-0). Utilization of a sociological approach in the study of policy formation in such areas as aging, social planning, and community problem solving.

5312. ECONOMIC POLICY (3-0). Examines structure of the U.S. economic system and its impact on welfare of consumers, workers, and industry; public policy efforts to provide for management of critical economic variables are evaluated for effectiveness and equity as they impact different interest groups.

5313. COMMUNITY DEVELOPMENT (3-0). Focuses on problems of neighborhood development and revitalization. Decline of economic opportunity in central cities and deterioration of housing and neighborhoods analyzed. Federal, state and local policies, with grass roots initiatives evaluated for effectiveness in promoting community stability.

5314. HEALTH POLICY (3-0). Current health policy and programs, examination of historical development, economic and legal aspects, interest groups and health constituencies.

5316. HUMAN SERVICES (3-0). Social welfare institutions—private and public; needs assessment, resource allocation, procedures, city/state/federal/private policy review; highlights of current system demands and changes.

5317. URBAN ENVIRONMENTAL POLICY (3-0). Focuses on the physical environmental dimensions of urbanization including such factors as pollution, waste disposal, and land use; stresses the role of economics, social, and political institutions as these affect environmental quality. Policy alternatives for dealing with urban environmental problems.

5391. TOPICS IN URBAN POLICY (3-0). Different topics and approaches in analysis of urban problems. May be repeated for credit as topic changes.

Other courses appropriate for the "Urban Issues" area include CIRP 5302, Housing Policies, Programs and History; CIRP 5315, Transportation Policies, Programs and History; CIRP 5313, Urban Growth Policies; and CIRP 5347, Urban Problems.

Professional Development

Urban Management

5320. ORGANIZATION THEORY AND DEVELOPMENT (3-0). Historical evolution of administrative theory including classical, sociological and social-psychological dimensions; decision-making theory; implications of public interest theory for public management; basic concepts of organization development and impact on public administration paradigms; new public administration; and future of public urban organization. Also offered as CRCJ 5309 and POLS 5303; credit will be granted only once.

5321. URBAN MANAGEMENT (3-0). Focuses through lectures, readings, and exercises on major administrative process: personnel and policy development and analysis; management styles and key contemporary management problems explored through presentations by prominent local practitioners. Also offered as POLS 5331; credit will be granted only once.

5322. URBAN BUREAUCRACY AND THE POLICY PROCESS (3-0). Development of theory of bureaucracy; bureaucracy as social issue; ethics and morality in public bureaucracy; mobilization of special interest support; power differentials in urban agencies; policy process in bureaucracy; new bureaucratic structures and processes for urban policy making.

5323. PUBLIC ORGANIZATIONAL CHANGE (3-0). Current theories and concepts of public organizational change with particular emphasis on organization development and action research; theoretical roots of contemporary change literature traced through readings and discussion of classical organization theory, public administration including New Public Administration decision making, public interest, phenomenology, learning theory and general systems. Prerequisite: basic organization theory course or permission of instructor.

5324. URBAN PUBLIC FINANCE (3-0). Tax, revenue, and fiscal problems of cities and local governments in metropolitan areas; problems of matching costs and benefits in providing public services among different local governments; increasingly complex dimensions of intergovernmental fiscal relations and public budgeting systems.

5325. URBAN AND ADMINISTRATIVE LAW (3-0). Examines scope and role of administrative regulation of and by governmental agencies; explores constitutional principles which limit administrative power and administrative law which governs classical areas of conflict between administrative agencies and their constituencies; rule-making, judicial review and informed regulatory processes of importance to public officials.

5326. PUBLIC BUDGETING (3-0). Rationale of public budgeting including legal, political, social, and administrative perspectives; history of budgeting techniques and such approaches as Management by Objectives, and Program and Mission Budgeting.

5327. COMPARATIVE ADMINISTRATION AND DEVELOPMENT (3-0). Extensive, multidisciplinary exposure to concepts and models of administration in developed and modernizing countries; role of the military, bureaucracy and traditional elites in development; practices and concepts of strategies for effective change.

5328. SMALL CITY MANAGEMENT (3-0). This course will focus on problems peculiar to small cities, including administrative law; personnel, planning; public works, public safety; human services; budget and finance; public relations and parks and recreation.

5329. FINANCIAL MANAGEMENT IN THE PUBLIC AND NON-PROFIT SECTORS (3-0). Overview of the principles of finance as they apply to the public and non-profit sectors, financial reporting for state and local governments and non-profit organizations and evaluation.

5351. PERSONNEL AND HUMAN RESOURCES IN THE PUBLIC SECTOR (3-0). Structure, role, and evolution of the Civil Service, current personnel policies, formal tasks e.g. examination, recruitment, position classification, and collective bargaining.

5352. PERSONNEL MANAGEMENT AND CONFLICT RESOLUTION IN THE PUBLIC SECTOR (3-0). Labor management at all levels of government, ability to work together to solve problems. Emphasis on collective and interest based bargaining, mediation, labor management partnership. Simulation exercises teach dynamics of bargaining, negotiation, problem solving, and small group dynamics.

5392. TOPICS IN URBAN MANAGEMENT (3-0). Selected topics on current management problems including small city management, community-neighborhood relations, citizen involvement programs and techniques, personal and professional effectiveness as a total person, intergovernmental strategies and styles, public-private sector collaboration and co-planning, privatization, and other alternatives to economic service delivery. May be repeated as topic changes.

Professional Development

Urban and Social Planning

5330. COMMUNITY AND NEIGHBORHOOD ORGANIZATION (3-0). Structures and processes in the analysis and development of community and neighborhood organizations; special emphasis given to poverty and minority communities and neighborhoods.

5331. LAND USE PLANNING AND THE LAW (3-0). Examines the relationship between land use in urban areas and the legal system; covers traditional land use planning tools of zoning, subdivision regulation, and the special permit system; assessment of some of the more exotic, modern tools for managing urban growth for their legality and scope as interpreted by the judicial system. Also offered as CIRP 5316. Credit will be granted only once.

5393. TOPICS IN URBAN PLANNING (3-0). Focuses on selected areas in urban and social planning. May be repeated for credit as topic changes.

Other courses for the Urban and Social Planning professional field may be taken from the City and Regional Planning program with the consent of the graduate advisor.

Research and Analysis

5341. PROFESSIONAL REPORT WRITING (3-0). Provides students entering public sector employment with writing, management information, data retrieval skills to communicate ideas and information within and outside an agency; basic writing skills reviewed, including organization of reports and grammatical construction; assignments based on actual internship position of students in public agencies.

5342. STRATEGIES FOR URBAN RESEARCH (3-0). Intermediate level examination of statistical and research techniques appropriate to urban and social analysis. Special attention paid to use of micro computers in social science research. Prerequisite: URPA 5302.

5343. APPLIED URBAN ANALYSIS (3-0). Group and individual projects to develop research studies or strategies, data reports for local government, agency or citizen group; techniques appropriate to task utilized. P/F only.

5345. EVALUATIONS RESEARCH (3-0). Methodological issues in evaluating public programs; identification of variables, indicators and analyses formats presented. Prerequisite: URPA 5302.

5346. ADVANCED DATA ANALYSIS (3-0). Issues addressed include problems presented by cross-section and time series data in regression analysis. Time Series Analysis methods and econometric regional models are also explored. Prerequisite: URPA 5342 or equivalent.

5347. DEMOGRAPHIC METHODS (3-0). Examination of sources of data-census, vital statistics, special surveys, reports, special studies; techniques of analysis with particular emphasis on growth and projection models, interpretation of findings as a major policy area in urban analysis.

5348. COST BENEFIT ANALYSIS (3-0). Reviews theory of cost-benefit and cost-effective analyses; explores the research, measurement and methodological requirements for the assessments of costs and benefits. It is recommended that students have completed at least one graduate course in research and one graduate class in public finance.

5349. INTRODUCTION TO MICROCOMPUTERS IN PLANNING AND ADMINISTRATION (3-0). Computer techniques studied as a basis for advanced analysis and data manipulation. Topics include spreadsheet (LOTUS 1-2-3), Data Base Management Systems, Word Processing, Computer Graphics and Mapping, etc. Also offered at CIRP 5320. Credit will be granted only once.

5394. SPECIAL TOPICS IN URBAN RESEARCH (3-0). Different topics each semester concentrate on a variety of methodological techniques and research strategies, such as demographic research and survey techniques. May be repeated for credit as topic changes.

5395. CONFERENCE COURSE IN URBAN AFFAIRS (3-0). Reading and research in a specialized area of urban affairs under the direction of a member of the graduate faculty.

5396. PROJECT REPORT (3-0). Student prepares report focusing on specific policy or professional issue, utilizing appropriate research techniques; subject area and design of project report with consent of instructor. Graded P/F/R only. Prerequisite: URPA 5341.

5397. RESEARCH REPORT (3-0). Student prepares report comparable to a journal article focusing on research issue, utilizing appropriate theory and research techniques; subject area and design of research report with consent of instructor. Graded P/F/R only. Prerequisite: URPA 5342.

5398, 5698. THESIS. A thesis conforming to University and departmental requirements may be prepared by graduate students in urban affairs. Graded P/F/R.

Professional Field Experience and Administrative Practices

5350. URBAN MANAGEMENT/PLANNING INTERNSHIP (1-0). Designed to integrate work experience and coursework through a series of brief work-related assignments; presentations by local planning and management practitioners and class discussions and exercises. Enrollment is open to both pre-entry and in-career students. Formal internship placements with agency mentors will be arranged. P/F only.

Administration (Ph.D. Level Courses)

6305. SEMINAR IN URBAN POLICY PROCESSES (3-0). Final course in urban policy field ; may be used for the purpose of completing the comprehensive examination; focus on the political, economic, and sociological institutions in the policy process, including various theoretical approaches, and application of these multidisciplinary perspectives in the analysis of specific policy issues.

6306. SEMINAR IN PUBLIC ADMINISTRATION (3-0). Final course in the public administration field, focuses on review and integration of the theories and principles of public administration.

6310. MONETARY AND FISCAL POLICY: THE FEDERAL ROLE (3-0). Examination of the role of the federal government in maintaining economic stability, ensuring full employment and controlling inflation; exploration of liberal interventionist, conservative and radical theories of state economic management to assess the various policy alternatives and the importance of interest groups.

6340. RESEARCH DESIGN (3-0). Advanced course especially for Ph.D. students; covers logic of research design and problems of structure. Emphasis on empirical and quantitative studies.

Public and Urban Administration (PUAD)

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

Mission

The mission of the Master's degree program in City and Regional Planning (CIRP) is to prepare students for successful careers as professional planning practitioners in responsible positions with public, private and nonprofit organizations; to conduct basic and applied research into community planning and development issues, problems and opportunities, and publish the results thereof; and to deliver planning-related training and services to enhance the effectiveness of public, non-profit and private organizations.

Program Philosophy

In this program, graduate students study the scope and issues as well as the interdisciplinary relationships involved in city and regional planning. The program equips students with an understanding of the dynamics of change, knowledge of problem solving techniques, planning theory and concepts, plan implementation methods, and design controls. Students acquire practical skills in empirical research and analysis, communications and computer applications, and evaluation of the implications of alternative solutions.

Practical Application: An important aspect of the planning curriculum--the practical application of theory and research--is facilitated by research activities and centers within the School and University. Research centers are equipped to investigate planning problems and opportunities with staff recruited from the faculty and student body. These centers, which allow students to exercise professional responsibilities in collaborative endeavors, include: Center for Economic Development Research and Service; Center for Criminal Justice Research and Training; Environmental Research and Design Center; Center for Social Research; Construction Research Center; Environmental Institute for Technology Transfer; and Center for Geoenvironmental and Geoarcheological Studies.

The application of planning theory, knowledge and skills to "real world" planning problems in the Dallas/Fort Worth Metroplex gives students practical experience and field orientation to the profession of planning in a variety of planning subject areas.

Unique Planning Emphasis and Specialization: Since students' interests and academic backgrounds will vary, the MCRP Program encourages them to select emphasis areas that fit their own personal needs and goals. They may choose an emphasis in either 1) Environmental and Land Development Planning; 2) Policy Planning; 3) Urban Analysis, Regional, and Transportation Planning; or in another area subject to approval by the Graduate Advisor.

Curricular requirements of substantive planning coursework, analytical methods, areas of emphasis and specialization, and practical experience combine to provide the skills needed for guiding development of the future city, region, and nation.

Program in City and Regional Planning

Area of Study and Degree
City and Regional Planning
M.C.R.P.

Master's Degree Plans
Thesis and Thesis Substitute

Program Coordinator
Robert L. Wegner, Sr.
513 University Hall, 817-272-3366

Graduate Advisor
Elise M. Bright
549 University Hall, 817-272-2067

Program Graduate Faculty
Professors
Anjomani, Cornehls, Goldsteen

Associate Professors
Bright, Wegner

Assistant Professors
Arvidson, Li, Vazquez

Interdisciplinary Graduate Faculty
Professors
Cole, Geisel, Taebel

Associate Professors
Barrett, Hissong,
Tees, Wyman

Assistant Professor
Salazar

And graduate faculty representatives from Architecture, Landscape Architecture, Sociology, Civil Engineering, Geology, Economics, and Finance and Real Estate.

Fax: 817-272-5008

E-mail: lgordon@uta.edu

Program in City and Regional Planning,
UTA Box 19588, Arlington, TX 76019-0588

Degree Requirements

A 48 credit hour program is composed of:

- 9 hours of common courses
- 18 hours of planning core courses
- 12 hours of area of emphasis and subject area courses
- 9 hours of electives and the required hours for thesis or thesis substitute (professional report or final exam) which will include six hours for thesis or a maximum of three hours for a professional report, and practicum or work experience. The practicum, as a working experience in an agency, center, research group, or office, must be approved by the Graduate Advisor.

Common Courses

These courses are required for all students entering the City and Regional Planning Program:

URPA 5300 The Urban Community
URPA 5301 Foundations of Urban Politics and Economics
URPA 5302 Urban Research and Analysis

Planning Core Courses

These courses are required for all CIRP students:

CIRP 5301 Planning Theory
CIRP 5310 Urban Structure and Economic Methods, Models and Simulation
CIRP 5314 Advanced Studies in Planning Communication Skills
CIRP 5318 Techniques of Planning Analysis
And two Project Planning courses from CIRP 5330, CIRP 5331, CIRP 5332, and CIRP 5333.

Emphasis/Subject Area Courses

The MCRP Program permits three major areas of emphasis: Environmental and Land Development Planning; Policy Planning; and Urban Analysis, Regional, and Transportation Planning. Each area of emphasis includes a number of subject areas which allows students to develop a study plan tailored to individual interests within the broader field and profession of City and Regional Planning. Other areas of emphasis are encouraged with approval of the Graduate Advisor. This includes a generalized plan of study with no emphasis.

The **Environmental and Land Development Planning** emphasis is focused on the planning and development of land and structures in urban areas of the United States. Specific subject areas within this emphasis are concerned with land-use planning, urban design, real estate and land development, growth management, and environmental management and planning.

In addition to the required courses and the thesis or thesis substitute, two courses will be required in this area of emphasis: 5304 (Plan Implementation and Legal Controls); and 5305 (Land Use Management and Development). The student in consultation with the Graduate Advisor will select two additional courses from:

CIRP 5302 Housing Policies, Programs, and History
CIRP 5306 Urban Redevelopment
CIRP 5307 Planning for Developing Countries
CIRP 5308 Special District Planning
CIRP 5309 Transportation/Land Use Methods, Models, and Simulation
CIRP 5311 Elements of Urban Design
CIRP 5312 Strategic Planning and Management
CIRP 5313 Urban Growth Policies
CIRP 5315 Transportation Policies, Programs, and History
CIRP 5316 Planning Law and Regulatory Systems
CIRP 5319 Agencies of Planning and Administration
CIRP 5320 Introduction to Microcomputers for Planning and Policy Analysis
CIRP 5340 Land Suitability Analysis
CIRP 5341 Environmental Regulations: Laws and Planning
CIRP 5342 Urban Environmental Policy
CIRP 5343 Site Planning
CIRP 5345 Planning and Real Estate Development
CIRP 5350 Environmental Planning
CIRP 5351 Environmental Impact Assessment
CIRP 5352 Advanced Techniques of Planning Analysis
CIRP 5354 Housing Finance and Planning
CIRP 5355 Comparative Housing Studies
CIRP 5363 Communication Skills in Planning and Management
CIRP 5364 Economic Base and Industrial Development

The **Policy Planning emphasis** is devoted to the field of public agency planning in a number of policy areas. Subject areas include social policy, economic development, housing and community development, and transportation.

In addition to the required courses and the thesis or thesis substitute, two courses will be required in this area of emphasis: 5316 (Planning Law and Regulatory Systems); and 5322 (Urban and Regional Economic Development). The student in consultation with the Graduate Advisor will select two additional courses from:

CIRP 5302 Housing Policies, Programs, and History
CIRP 5305 Land Use Management and Development
CIRP 5306 Urban Redevelopment
CIRP 5307 Planning for Developing Countries
CIRP 5308 Special District Planning
CIRP 5312 Strategic Planning and Management
CIRP 5313 Urban Growth Policies
CIRP 5315 Transportation Policies, Programs, and History
CIRP 5319 Agencies of Planning and Administration
CIRP 5320 Introduction to Microcomputers for Planning and Policy Analysis
CIRP 5324 Community Development
CIRP 5340 Land Suitability Analysis
CIRP 5341 Environmental Regulations: Laws and Planning
CIRP 5343 Site Planning
CIRP 5344 Human Service Planning
CIRP 5345 Planning and Real Estate Development
CIRP 5347 Urban Problems
CIRP 5354 Housing Finance and Planning
CIRP 5362 Urban Diversity
CIRP 5363 Communication Skills in Planning and Management
CIRP 5364 Economic Base and Industrial Development
CIRP 5365 Gender, Space, and Planning

The **Urban Analysis, Regional, and Transportation Planning** emphasis is oriented toward information management and utilization of computers in all aspects of planning. This prepares interested students for data management, urban modeling, economic analysis,

and other careers in the quantitative aspects of planning. Subject areas include regional planning, regional science, transportation and land use modeling, and computer applications in planning.

In addition to the required courses and the thesis or thesis substitute, two courses will be required in this area of emphasis: 5317 (Research and Forecasting Methods in City and Regional Planning); and 5352 (Advanced Techniques of Planning Analysis). The student in consultation with the Graduate Advisor will select two additional courses from:

CIRP 5302 Housing Policies, Programs, and History
CIRP 5309 Transportation/Land Use Methods, Models, and Simulation
CIRP 5311 Elements of Urban Design
CIRP 5312 Strategic Planning and Management
CIRP 5315 Transportation Policies, Programs, and History
CIRP 5319 Agencies of Planning and Administration
CIRP 5320 Introduction to Microcomputers for Planning and Policy Analysis
CIRP 5321 Computer Graphics and Mapping for Urban Analysis
CIRP 5322 Urban and Regional Economic Development
CIRP 5340 Land Suitability Analysis
CIRP 5345 Planning and Real Estate Development
CIRP 5356 Geographic Information Systems
CIRP 5357 Intermediate Geographic Information Systems

A study plan (listed with subject area classification) must be submitted to the Graduate Advisor. The study plan will be the student's degree plan and will be placed in the student file.

M.C.R.P. and M.Arch. Dual Degree Program

Students in this dual program may earn both the Master of City and Regional Planning and the Master of Architecture degrees in a curriculum of 87 semester hours. Applicants must meet the admission requirements of both the MCRP and the M.Arch programs. City and Regional Planning students wishing to earn the M.Arch degree will be required to take Path A in the architecture program unless they have earned an undergraduate degree in architecture which will allow CIRP applicants to take Path B. Programs of study will follow both master's programs, with all of the 15 credit hours of electives in the M.Arch program to be taken in the MCRP program. In addition to the 36 credit hours of architectural core courses, the remainder of coursework will be in the City and Regional Planning program with a required thesis proposal and programs of work to be jointly approved by the City and Regional Planning program and the Architecture Program. A thesis supervisor should be selected from CIRP or the School of Architecture, and committee members should be selected from both faculties.

Course selection and programs of study should be designed with the assistance of the Graduate Advisors in both programs. Only in special instances may students select the thesis substitute plan of the MCRP program. The successful candidate will be awarded both degrees rather than one joint degree.

Other Dual Degree Programs

Students in city and regional planning may participate in one or another of two other dual degree programs whereby they can earn a Master of City and Regional Planning and 1) a Master of Science in Social Work, or 2) a Master of Public Administration. By participating in a dual degree program, students may apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours subject to the approval of Graduate Advisors from both programs. To participate in the dual degree program, students must make separate application to each program and must submit a separate Program of Work for each degree. Those interested in the dual degree program should consult the appropriate Graduate Advisors for further information on course requirements. See also the statement on Dual Degree Programs in the general information section of the catalog.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

City and Regional Planning (CIRP)

5300. INTRODUCTION TO URBAN PLANNING (3-0). Overview of contemporary city and regional planning activities. Reviews the broad range of theoretical and practical skills and knowledge required of the professional planning practitioner.

5301. PLANNING THEORY (3-0). Various theories of planning. Planning as: an individual phenomenon (individual rationality, decision theory), an organizational phenomenon (the planning process, organization theory, communications theory), a social phenomenon (utopias, ideologies and systems, social planning and social reform, general systems theory), local planning in the United States (politics and policies, professional planning).

5302. HOUSING POLICIES, PROGRAMS, AND HISTORY (3-0). Examines the development of housing policies and programs to implement those policies, as well as private sector activities that affect the provision of housing.

5304. PLAN IMPLEMENTATION AND LEGAL CONTROLS (Zoning, Subdivision Ordinances, Capital Budgets) (3-0). Development of skills in document preparation including proper methods in preparing the usual development controls of zoning ordinances, subdivision regulations, and capital budgets and other municipal codes and regulations.

5305. LAND USE, MANAGEMENT AND DEVELOPMENT (3-0). Assesses land use, management and development and considers new directions. Relates comprehensive planning, environmental management, and land use.

5306. URBAN REDEVELOPMENT (3-0). Study of the problems and achievements of the public and private sectors in urban redevelopment.

5307. PLANNING FOR DEVELOPING COUNTRIES (3-0). Comparative international planning: history, theories, methods, and processes of development planning at regional and national scale, including analysis of case studies to illustrate successes and failures.

5308. SPECIAL DISTRICT PLANNING (3-0). Study of special purpose districts (e.g., economic development and tax increment financing districts, as well as arts, environmental, central business, historic, industrial, utility and others).

5309. TRANSPORTATION/LAND USE METHODS, MODELS, AND SIMULATION (3-0). Overview of transportation/land use with specific transportation models and simulation methods; topics include economic theory of travel demand, land use models, UTPS framework for travel demand estimation, disaggregated travel demand models and abstract mode models.

5310. URBAN STRUCTURE, ECONOMIC METHODS, AND MODELS (3-0). Overview of urban economics, spatial structure, regional science, urban geography, planning functional areas (e.g., housing, transportation, etc.), and fiscal impact analysis. Application of social and economic principles and models to urban planning issues and problems.

5311. ELEMENTS OF URBAN DESIGN (3-0). Study of contemporary urban form and environmental design, emphasizing visual-spatial qualities, social needs and economic linkages. Examination of processes, methods and techniques for solving urban design problems.

5312. STRATEGIC PLANNING AND MANAGEMENT (3-0). Readings and case studies of strategic planning and management in the public and non-profit sectors; application of principles to an actual situation, involving stakeholder identification, environmental scanning, and formulation of mission statements, goals, and strategies.

5313. URBAN GROWTH POLICIES (3-0). Study of the political, societal and physical policies involved in urban growth management.

5314. ADVANCED STUDIES IN PLANNING COMMUNICATION SKILLS (3-0). Techniques of presentation, use of graphic tools, and review of recent media advances.

5315. TRANSPORTATION POLICIES, PROGRAMS AND HISTORY (3-0). Transportation and related programs and policies in relation to city development and housing patterns. Interdependencies of land use, building development, and social change are explained as transportation-related.

5316. PLANNING LAW AND REGULATORY SYSTEMS (3-0). Presentation of planning law in relation to the American political system. Examination of case briefs for their content, applicability, and background. Overview of legal and political aspects of planning. Also offered as URPA 5331; credit will be granted only once.

5317. RESEARCH AND FORECASTING METHODS IN CITY AND REGIONAL PLANNING (3-0). Context and role of data analysis, computers and descriptive and inferential statistical techniques in planning. Application to real world planning problems of probability and sampling theory, hypothesis testing, Chi square, variance analyses, and bivariate and multivariate regression analysis.

5318. TECHNIQUES OF PLANNING ANALYSIS (3-0). The use of quantitative and qualitative analysis techniques in urban and regional planning, including population projection, project evaluation, land use and transportation models, economic base analysis, input-output, and shift and share.

5319. AGENCIES OF PLANNING AND ADMINISTRATION (3-0). Contemporary managerial functions involved in running public, private, or non-profit organizations: goal setting, planning, organizing, delegating and motivating others, personal productivity and motivation, time and stress management, controlling, and project management.

5320. INTRODUCTION TO MICROCOMPUTERS FOR PLANNING AND POLICY ANALYSIS (3-0). Computer techniques studied as basis for advanced analysis and data manipulation. Topics include spreadsheet (LOTUS 1-2-3), data base management systems, word processing, computer graphics and mapping. Also offered as URPA 5349; credit will be granted only once.

5321. COMPUTER GRAPHICS AND MAPPING FOR URBAN ANALYSIS (3-0). This laboratory course provides an introduction to the techniques and applications of computer graphics and mapping for presenting socioeconomic information and graphic and spatial form. Included are bar and pie charts and methods of producing maps of social data through utilization of computer packages such as AUTOCAD, SASGRAPH, etc.

5322. URBAN AND REGIONAL ECONOMIC DEVELOPMENT (3-0). Seminar in subnational economic development programs in the U.S. These programs and their criticisms examined in depth with emphasis on a search for viable solutions via focus on national concerns and individual case studies.

5324. COMMUNITY DEVELOPMENT (3-0). Focuses on problems of neighborhood development and revitalization. Decline of economic opportunity in central cities and deterioration of housing and neighborhoods analyzed. Federal, state, and local policies, with grass roots initiative evaluated for effectiveness in promoting community stability. Also offered as URBA 5313; credit will be granted only once.

5330. PROJECT PLANNING (0-9). Skills, practical experience, problem-solving methods and techniques in mapping, design, planning, and research projects. Studio and seminar for field studies in the practical application of city and regional planning. May be repeated as topic changes. $5 lab fee.

5331. PROJECT PLANNING (0-9). Skills, practical experience, problem-solving methods and techniques in mapping, design, planning, and research projects. Studio and seminar for field studies in the practical application of city and regional planning. May be repeated as topic changes. $5 lab fee.

5332. PROJECT PLANNING (0-9). Skills, practical experience, problem-solving methods and techniques in mapping, design, planning, and research projects. Studio and seminar for field studies in the practical application of city and regional planning. May be repeated as topic changes. $5 lab fee.

5333. PROJECT PLANNING (0-9). Skills, practical experience, problem-solving methods and techniques in environmental planning, pollution and contamination studies, mapping, design, planning and research projects. Studio and seminar for field studies in the practical application of city and regional planning. Required for the Hazardous Materials Management Certificate Program in the Environmental Institute for Technology Transfer. May be repeated as topic changes. $5 lab fee.

5340. LAND SUITABILITY ANALYSIS (3-0). Acquaints students with the land suitability analysis process. How to incorporate environmental and ecological factors into the determination of land development potential, including soils, slope, drainage, vegetation, computer models, and related factors.

5341. ENVIRONMENTAL REGULATIONS: LAWS AND PLANNING (3-0). Federal, state, and local environmental regulations which have effect on the practice of city and regional planning. Specific articles, laws, and directives contrasted and compared to local city design and development controls. Subjects include CERCLA, RCRA, SARA, TSCA, OSH Act, among others.

5342. URBAN ENVIRONMENTAL POLICY (3-0). Focuses on the physical environmental dimensions of urbanization including such factors as pollution, waste disposal, and land use; stresses the role of economic, social, and political institutions as these affect environmental quality of the city. Also offered as URPA 5317; credit will be granted only once.

5343. SITE PLANNING (3-0). Acquaints students with site planning processes. Inventory and analysis of environmental, economic, esthetic, legal, political, social, and related factors affecting potential development sites.

5344. HUMAN SERVICE PLANNING (3-0). Needs assessment, funding, agency management, priority setting, service providers, long range planning, and federal, state, local, private, public, and volunteer roles.

5345. PLANNING AND REAL ESTATE DEVELOPMENT (3-0). The goals, strategies, methods, and achievements of major participants in the urban land and building markets are examined. Land owners, speculators, real estate brokers, developers, bankers, lawyers, non-profit builders, and government agencies are studied, as well as such business tools as: market and feasibility analysis, appraisal techniques, proforma analysis, and others.

5347. URBAN PROBLEMS (3-0). Specific urban problems examined in depth, traced to their historical origins to see how they or similar problems have been dealt with in other times and places. Students will then propose possible solutions to the problems in their contemporary form.

5350. ENVIRONMENTAL PLANNING (3-0). Environmental issues and problems. Topics include basic ecological principles; development of the chemical industry and its effects on the environment; and the issues of quantitative risk assessment and human health effects.

5351. ENVIRONMENTAL IMPACT ASSESSMENT (3-0). Analysis of impact assessment documents from a variety of projects; study of federal laws and regulations which govern the assessment process.

5352. ADVANCED TECHNIQUES OF PLANNING ANALYSIS (3-0). An introduction to selected advanced techniques of planning analysis. Subjects include land use and transportation models, advanced regression analysis using simultaneous-equation models, multivariate logit analysis and projection techniques.

5354. HOUSING FINANCE AND PLANNING (3-0). Evaluation of the effect of state, local, and federal housing policy on the urban arena. Topics will be selected from federal subsidy programs, tax subsidies, operations of financial intermediaries, and related areas.

5355. COMPARATIVE HOUSING STUDIES (3-0). Examination of housing policies and programs in developing and developed nations internationally.

5356. GEOGRAPHIC INFORMATION SYSTEMS (3-0). Introduction to GIS and the application of computer graphics systems in the storage, processing, and retrieval of geographic urban and regional information; case examples and related projects and issues of system management.

5357. INTERMEDIATE GEOGRAPHIC INFORMATION SYSTEMS (3-0). Applications of GIS to typical urban and regional geographic information problems and projects. Prerequisite: CIRP 5356 or consent of instructor.

5362. URBAN DIVERSITY (3-0). Examines the growing spatial and social diversity of cities; how physical as well as socioeconomic urban structures have fostered race, class, and gender inequalities; how urban policies have dealt with these inequalities; and what can be done to address these problems and the needs of traditionally disempowered groups.

5363. COMMUNICATION SKILLS IN PLANNING AND MANAGEMENT (3-0). Principles of and practical communication skills for planners and administrators: interpersonal communications, critical analyses, effective writing, oral presentations, creative thinking, team building, participative decision making, and conflict management.

5364. ECONOMIC BASE AND INDUSTRIAL DEVELOPMENT (3-0). Theories and methods of local and regional economic base analyses; techniques for inventorying strengths, weaknesses, opportunities and threats of local capital, labor and land resources; alternative policy responses to industrial development issues arising from economic base analysis.

5365. GENDER, SPACE, AND PLANNING (3-0). Theoretical and professional issues, including: expression and reinforcement of gender roles through urban spatial organization; critiques of rational planning paradigm; contributions of women to the planning profession; threats and opportunities facing women planners today.

5191, 5291, 5391. CONFERENCE COURSE. Special subjects and issues as arranged by individual students and faculty members. May be repeated for credit. Graded P/F/R.

5193. MASTER'S COMPREHENSIVE EXAMINATION (1-0). Directed study, consultation and comprehensive examination over coursework leading to thesis substitute for MCRP degree. Required of all thesis substitute students not enrolled in other courses during semester in which they plan to graduate. Graded P/F/R only.

5195-5695. SPECIAL TOPICS IN PLANNING. Selected topics in City and Regional Planning. May be repeated for credit.

5397. PROFESSIONAL REPORT. Final report.

5398, 5698, 5998. PLANNING THESIS. 5398 graded R/F only. 5698 and 5998 graded P/F/R.

Program in Public Administration

Area of Study and Degree
Public Administration
M.P.A.

Master's Degree Plan
Non-Thesis

Graduate Advisor
Sherman Wyman
509 University Hall, 817-272-3071

Program Faculty
School of Urban and Public Affairs
Arvidson, Barrett,
Cole, Cornehls, Geisel,
Salazar, Taebel (Chair),
Tees, Wegner, Wyman

Department of Political Science
Clark (Vice-Chair),
Gutierrez, Knerr

General

Public Administration is concerned with the formulation, analysis and implementation of public policy. With an interdisciplinary focus, this program gives special emphasis to the urban community and the special problems of public managers who serve the urban arena. The curriculum is designed to develop leadership skills while providing a thorough understanding of the political, social, and economic environment in which public managers operate. The MPA serves the educational needs of current public service professionals interested in upgrading their skills and those who are preparing for management careers in government, especially local government. The program is of value to general managers as well as the departmental managers. The Masters of Public Administration is a joint program of the School of Urban and Public Affairs and the Department of Political Science.

In addition, the program utilizes the resources of several distinguished professionals in the field of public administration who serve as special lecturers and adjunct professors, including Levi Davis, assistant city manager of Dallas; George Campbell, city manager of Arlington and former president of the Texas City Managers Association; Curtis Hawk, city manager of Southlake; Jim Kunde, director of the Coalition for the Improvement of State and Local Government Management; Richard Greene, former mayor of Arlington; Gary Gwynn, city manager of Grand Prairie and president of the International City/County Management Association; and Charles Boswell, assistant city manager of Fort Worth.

Objectives

The program includes two essential educational objectives. The first is to teach the skills needed for effective public leadership and management, including planning and decision making; managing people, resources and programs; and representing the public interest in the highest ethical traditions.

The second objective is to provide students with an intensive understanding of urban institutions, processes, and policy. Since the urban environment impacts on public programs, a thorough understanding is an essential key for effective public administration.

Degree Requirement and Courses

The total numbers of semester credit hours will range from a minimum of 45 to a maximum of 48 as follows: (See departmental listings for course descriptions in other sections of the catalog as follows: URPA: Urban and Public Affairs; POLS: Political Science; CRCJ: Criminal Justice; SOCI: Sociology; ECON: Economics; HIST: History; ACCT: Accounting.)

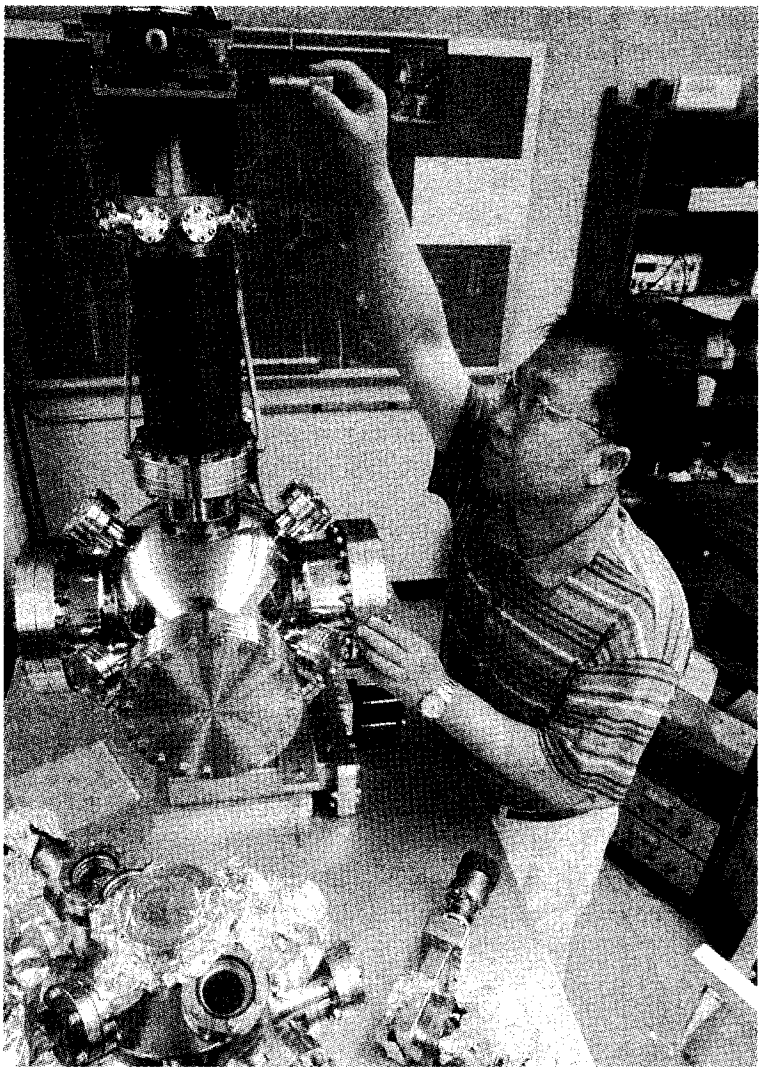
1. **Basic Common Courses** (12 hours).
   URPA 5300 The Urban Community
   URPA 5301 Foundations of Urban Politics and Economics
   URPA 5302 Urban Research and Analysis
   URPA 5343 Applied Urban Analysis

2. **Political, Legal, Economic and Social Institutions and Processes** (6 hours).
   URPA 5303 The Metroplex: A Survey of Urban Affairs, Planning and Administration
   URPA 5304 The Urban Political System or
   POLS 5305 State and Local Politics
   URPA 5305 Theories of Urban Society
   URPA 5306 The Urban Economy
   URPA 5308 Urban History
   URPA 5309 Intergovernmental Relations or
   POLS 5310 Federalism and Intergovernmental Relations
   URPA 5325 Urban and Administrative Law
3. **Urban Public Policy** (6 hours).
   URPA 5310 Urban Policy
   URPA 5311 Social Policy Formation
   URPA 5312 Economic Policy
   URPA 5313 Community Development
   URPA 5314 Health Policy
   URPA 5316 Human Services
   URPA 5317 Urban Environmental Policy
   POLS 5356 Topics in Public Administration and Policy Studies
   URPA 5391 Topics in Urban Policy
   Other policy courses from other departments as appropriate. Students may petition the graduate advisor to have a professional field, such as planning, substitute for the "Urban Public Policy" field.
4. **Administrative Theory, Practices and Processes** (15 hours).
   URPA 5320 Organization Theory and Development
   URPA 5321 Urban Management or
   POLS 5331 Urban Government Administration
   URPA 5322 Urban Bureaucracy and the Policy Process
   URPA 5323 Public Organizational Change
   URPA 5392 Topics in Urban Management
   URPA 5352 Personnel Management and Conflict Resolution in the Public Sector
   POLS 5356 Topics in Public Administration and Policy Studies
   CRCJ 5318 Criminal Justice Personnel Administration
   URPA 5324 Urban Public Finance or
   ECON 5304 Advanced Public Finance
   URPA 5326 Public Budgeting
   URPA 5327 Comparative Administration and Development
   URPA 5328 Small City Management
   ACCT 5320 Governmental and Nonprofit Accounting
   URPA 5329 Financial Management in the Public and Non-Profit Sectors
   URPA 5351 Personnel and Human Resources in the Public Sector
5. **Techniques of Analysis** (6 hours).
   URPA 5342 Strategies for Urban Research or
   SOCI 5304 Social Statistics
   URPA 5348 Cost Benefit Analysis
   URPA 5345 Evaluation Research
   URPA 5349 Introduction to Microcomputers for Planning and Administration
   URPA 5341 Professional Report Writing
   URPA 5395 Conference Course in Urban Affairs
   POLS 5332 Public Policy Analysis
6. **Internship** (URPA 5350) for students with less than one year of appropriate work experience.

Dual Degree Programs

Students in public administration may participate in one of four dual degree programs whereby they can earn a Master of Public Administration and 1) a Master of City and Regional Planning, 2) a Master of Science in Social Work, 3) a Master of Science in Nursing, 4) a Master of Arts in Criminal Justice, or 5) a Master's of Sociology. By participating in a dual degree program, students can apply a number of semester hours jointly to meet the requirements of both degrees, thus reducing the total number of hours which would be required to earn both degrees separately. The number of hours which may be jointly applied ranges from nine to 18 hours, subject to the approval of Graduate Advisors from both programs. To participate in the dual degree program, students must make separate application to each program and must submit a separate Program of Work for each degree. Those interested in the dual degree program should consult the appropriate Graduate Advisor(s) for further information on course requirements. See also the statement of Dual Degree Programs in the general information section of this catalog.

Interdepartmental and Intercampus Programs



This catalog is a general information publication only. It is not intended to nor does it contain all regulations that relate to students. The provisions of this catalog do not constitute a contract, express or implied, between any applicant, student, or faculty member and The University of Texas at Arlington or The University of Texas System. The University reserves the right to withdraw courses at any time, change fees, rules, calendar, curriculum, degree programs, degree requirements, graduation procedures, and any other requirements affecting students. Changes will become effective whenever the proper authorities so determine and will apply to both prospective students and those already enrolled.

Students are held individually responsible for complying with all requirements of the rules and regulations of the University and the Board of Regents of The University of Texas System. Failure to read and comply with policies, regulations and procedures will not exempt a student from whatever penalties he or she may incur.

Program in Biomedical Engineering

The entry for the Program in Biomedical Engineering is located in the College of Engineering section of this catalog.

Program in Business Administration

The entry for the Program in Business Administration is located in the College of Business Administration section of this catalog.

Program in City and Regional Planning

The entry for the Program in City and Regional Planning is located in the School of Urban and Public Affairs section of this catalog.

Program in Criminology and Criminal Justice

The entry for the Program in Criminology and Criminal Justice is located in the College of Liberal Arts section of this catalog.

Program in Environmental Science and Engineering

Area of Study and Degrees
Environmental Science and Engineering
M.S., Ph.D.

Master's Degree Plans
Thesis and Non-Thesis

Program Director
John S. Wickham
107 Geoscience, 817-272-2987

Graduate Advisor
Andrew P. Kruzic
433 Nedderman Hall, 817-272-3822

Graduate Faculty
Graduate faculty from participating departments in the College of Engineering, College of Science and the School of Urban and Public Affairs are involved in teaching and supervising graduate students' research. Faculty contacts within these areas include:

Biology
Chrzanowski, Grover, McMahon, Smatresk

Chemistry and Biochemistry
Bellion, Girardot, Rajeshwar, Schelly

Civil Engineering
Crosby, Kruzic, Parker, Qasim

Geology
Balsam, Burkart Ellwood, Reaser

Urban and Public Affairs
Anjomani, Bright, Cornehls, Goldsteen, Vazquez

Objective

The program in Environmental Science and Engineering is designed to provide a graduate student an integrated, multidisciplinary education, nurtured through a carefully tailored degree program requiring a breadth of understanding and mastery of a spectrum of scientific and engineering principles. Among the goals is to provide students who have earned engineering or science undergraduate degrees a common ground for interdisciplinary communication, an understanding of the environment, and competence in a discipline that will enable him or her to evaluate and solve complex environmental problems.

Admission

All admission requirements established by the graduate School at U.T. Arlington and published in the Graduate Catalog are general requirements for all admissions. In addition, students without prior interdisciplinary work may be required to take appropriate leveling courses by the Graduate Studies Committee. Admission requirements are listed below. Applicants not meeting these requirements may be admitted on probation.

Master's Degree

Unconditional admission:

1. A B.S. degree in science, math, or engineering
2. An overall GPA in the final 60 hours of undergraduate coursework of at least 3.0 on a 4.0 scale.
3. A minimum total score of 1000 on the verbal and quantitative portions of the Graduate Record Examination
4. For applicants whose native language is not English, a minimum score of 550 on the Test of English as a Foreign Language (or an equivalent score on the computer-based test), or a score of 40 on the Test of Spoken English.
5. Favorable letters of recommendation from people familiar with the applicant's academic work.

Doctoral Degree

Unconditional admission:

1. A master's degree or at least 30 hours of graduate work in Environmental Science and Engineering, or one of the sciences, engineering or mathematics.
2. A minimum of 3.5 GPA on a 4.0 scale in graduate coursework.
3. A minimum total score of 1200 on the verbal and quantitative portions of the Graduate Record Examination.
4. For applicants whose native language is not English, a minimum score of 550 on the Test of English as a Foreign Language (or an equivalent score on the computer-based test), or a score of 40 on the Test of Spoken English.
5. Favorable letters of recommendation from people familiar with the applicant's academic and/or professional work.

Degree Requirements

Master's Degree

For the Master of Science in Environmental Science and Engineering, all students take a 21 semester hour core of courses as follows on page 231.

The following engineering courses*:
CE 5318 Physical-Chemical Processes I
CE 5319 Physical-Chemical Processes II
CE 5325 Biological Processes
* Students without an undergraduate course in environmental engineering will need to take CE 3331 as a deficiency.

Two of the following three environmental systems courses**:
EVSE 5309 Environmental Systems-Biological Aspects
EVSE 5310 Environmental Systems-Chemical Aspects
EVSE 5311 Environmental Systems-Geological Aspects
** Students with less than 20 undergraduate hours in biology, chemistry or geology will need to take a third environmental systems course as a deficiency.

CIRP 5341 Environmental Regulations: Laws and Planning, or
CIRP 5340 Land Suitability Analysis
CIRP 5350 Environmental Planning, or URPA 5317 Urban Environmental Management and Policy

In addition to the core courses, the minimum requirements for the master's degree with thesis include:

9 hours of electives
2 hours of EVSE seminar
6 hours thesis

In addition to the core courses, the minimum requirements for the master's degree without thesis include:

15 hours of electives
2 hours of EVSE seminar

Doctoral Degree

Core requirements for the master's degree listed above (or equivalents) will be required for all doctoral students. In addition, six hours of Engineering and three hours of Policy and Planning courses are required. These courses must be approved by the student's supervising committee and the engineering courses are to be selected from the following list:

CE 5320 Solid Waste Management
CE 5326 Environmental Toxicology for Engineers
CE 5328 Air Pollution Control - Particulates
CE 6324 Dispersion Modeling

Additional coursework will normally be required by the graduate studies committee and the student's dissertation committee. The course program will be designed to meet the student's professional and research goals.

Other requirements include:

1. Successful completion of the Diagnostic Examination at the end of the first year of residence.
2. Successful completion of the Comprehensive Examination, an oral defense of a research proposal to be pursued for the dissertation, and a specialization examination over areas of the student's proposed research.
3. Demonstration of proficiency in one foreign language or a research tool such as advanced computer skills, statistics, or operations research.
4. Successful defense of the dissertation and acceptance of the dissertation by the supervising committee.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Environmental Science and Engineering (EVSE)

5100, 5200, 5300. SELECTED TOPICS IN ENVIRONMENTAL SCIENCE AND ENGINEERING. May be repeated for credit when topic changes.

5309. ENVIRONMENTAL SYSTEMS-BIOLOGICAL ASPECTS (3-0). An introduction to the biological components of environmental systems. Population dynamics, species interactions, community structure, biodiversity, bioenergetics, nutrient cycling and human impacts are reviewed. Focus will be on natural processes and their engineering applications.

5310. ENVIRONMENTAL SYSTEMS-CHEMICAL ASPECTS (3-0). An introduction to the chemistries of air at different altitudes, of water systems and of soils. Chemical and physico-chemical processes at phase boundaries, modeling for kinetics and mass transport, analytical techniques and disposal and recycling are included as well as their impact on engineering decisions.

5311. ENVIRONMENTAL SYSTEMS-GEOLOGICAL ASPECTS (3-0). Introduction to the tectonic, volcanic, atmospheric, climatic, hydrologic and geochemical processes and natural hazards of the earth, and their interaction with political, economic and engineering decisions.

5193. MASTER'S COMPREHENSIVE EXAMINATION (1-0). Directed study, consultation, and comprehensive examination over coursework leading to the non-thesis Master of Science degree. Taken in the final semester. Graded P/F/R.

5398, 5698, 5998. THESIS. Graded R/F only.

5395, 5695. MASTER'S PROJECT. May be used as elective for students in non-thesis program. Graded P/F.

6100. SEMINAR IN ENVIRONMENTAL SCIENCE AND ENGINEERING. Topics presented by faculty, students, and invited lecturers. Graded P/F.

6197, 6297, 6397. RESEARCH IN ENVIRONMENTAL SCIENCE AND ENGINEERING. Individually approved research projects. May be repeated for credit. Graded P/F/R.

6399, 6699, 6999. DISSERTATION. Graded R/F only.

Program in Humanities

The entry for the Program in Humanities is located in the College of Liberal Arts section of this catalog.

Program in Interdisciplinary Studies

Area of Study and Degrees
Interdisciplinary Studies
M.A., M.S.

Master's Degree Plans
Thesis, Thesis Substitute, Non-Thesis

Program Coordinator
Gloria W. Eyres
333 Davis Hall, 817-272-2681

Graduate Faculty
The Graduate Faculty of
The University of Texas at Arlington

Objective

The purpose of the degree program is to allow individuals to pursue studies in multiple disciplines, to upgrade their formal education in their fields of specialization, and to develop professional skills. The program is intended for persons having professional experience beyond the baccalaureate degree and clear, well-developed academic and professional goals.

Admission

An applicant to this program must satisfy the requirement for admission to the Graduate School and ordinarily will have professional experience in areas related to the graduate coursework proposed. The applicant should submit a tentative program of work and an academic goals statement to the program coordinator as part of the application for admission process. Applicants will ordinarily not be admitted to interdisciplinary studies until a tentative program of work has been reviewed and approved by the Committee on Graduate Studies.

Degree Requirements

Programs of Work in interdisciplinary studies involve courses in several departments and should be designed in consultation with the appropriate graduate faculty members of those departments. Students entering the interdisciplinary studies program must consult with the program coordinator prior to registration for the first semester and each succeeding semester in which the student plans to enroll. The Committee on Graduate Studies is not responsible for selection of courses taken prior to program of work approval and cannot guarantee that such courses will apply to degree credit.

Interdisciplinary studies allows the student maximum flexibility in designing an academic program to meet specific professional and educational objectives. The student must complete work in at least two departments and may take courses in more than one of the schools or colleges of the University. The primary emphasis is on the individual needs and aspirations of the student. A supervising committee composed of members of the graduate faculty will be appointed to supervise the completion of an individual program of work and the final examination. General oversight will be provided by the Committee on Graduate Studies and the Vice Provost for Research and Graduate Studies.

No more than 50 percent of the credit hours in a student's program may be taken in an area in which the University does not offer an advanced degree, or in the College of Business Administration. A maximum of nine hours of advanced (junior/senior) undergraduate courses may be applied to an interdisciplinary studies program; for the purpose of this policy, graduate foundation courses in the College of Business Administration are considered equivalent to advanced undergraduate courses and apply toward the nine hour maximum. In addition, the Committee on Graduate Studies has adopted other policies which govern the general design and content of programs of work in interdisciplinary studies. Information about these policies should be requested from the program coordinator.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Interdisciplinary Studies (INDS)

5193. MASTER'S COMPREHENSIVE EXAMINATION (1-0). Directed study, consultation, and comprehensive examination over coursework, leading to the Master's degree in Interdisciplinary Studies. Graded P/F/R.

5398, 5698. THESIS. Research and preparation pertaining to the master's thesis. 5398 graded R/F only; 5698 graded P/F/R.

Program in Management of Technology

Area of Study and Degree
Management of Technology
M.S.

Master's Degree Plan
Non-Thesis

Graduate Advisor
G.T. Stevens Jr.
420 Woolf Hall, 817-272-3092

Graduate Faculty
The Graduate Faculty of the colleges of Business Administration and Engineering

Objective

Management of Technology is an interdisciplinary field that integrates engineering and business concepts. The curriculum prepares an experienced professional engineer or scientist for a leadership role in planning, developing and implementing a firm's technological capabilities.

Admission

Applicants must hold a baccalaureate degree in science, mathematics, engineering or other appropriate field and have a minimum of three years full-time professional-level work experience, although five years experience is recommended. Students also must meet Graduate School requirements regarding grade average and scores on the Graduate Record Examination (GRE) and the Test of English as a Foreign Language (TOEFL). The TOEFL is not required of applicants who hold a degree from a college or university in the United States.

Degree Requirements

The M.S. degree in Management of Technology requires 36 hours of coursework. The coursework is divided between the College of Business Administration and the Department of Industrial and Manufacturing Systems Engineering. The program includes such areas as:

Accounting Analysis
Information Systems
Application of Computer Models in Management Sciences
Management
Engineering Economics
Management of Technology
Product Management
Industrial Automation
Concurrent Engineering Producibility and Reliability
Engineering Management
Electives

Program in Materials Science and Engineering

Area of Study and Degrees
Materials Science and Engineering
M.S., M.Engr., Ph.D.

Master's Degree Plans
Thesis (M.S.), Thesis Substitute (M.Engr.) and Non-Thesis (M.Engr.)

Director
Ronald L. Elsenbaumer
325 Woolf Hall, 817-272-2398
elsenbaumer@uta.edu

Graduate Advisor
Pranesh B. Aswath
325D Woolf Hall, 817-272-2008
aswath@uta.edu

Graduate Faculty
Professors
Chan, Elsenbaumer, Goolsby, Johnson

Associate Professor
Aswath

Assistant Professor
Kim

Professor Emeritus
Wiseman

Graduate faculty from participating departments and programs in the College of Engineering and the College of Science are involved in teaching and supervising materials science and engineering graduate students' research. Specific faculty contacts within these areas include:

Aerospace Engineering: Professor Joshi, 215 Woolf Hall, 817-272-3746
Biomedical Engineering: Professor Eberhart, 220 Engineering Lab, 817-272-2053
Chemistry: Professor Elsenbaumer, 219 Science, 817-272-3171
Civil Engineering: Professor Yuan, 408 Nedderman Hall, 817-272-2550
Electrical Engineering: Professor Alavi, 540 Nedderman Hall, 817-272-5633
Mechanical Engineering: Professor Chan, 325G Woolf Hall, 817-272-5638
Physics: Professor Weiss, 107D Science, 817-272-2459

Participating faculty of the colleges of Engineering and Science
Aerospace Engineering: Joshi
Biomedical Engineering: Eberhart, Nelson
Chemistry: Dias, Marynick, McDowell, Pomerantz, Rajeshwar, Schelly, Timmons
Civil Engineering: Yuan
Electrical Engineering: Alavi, Carter, Davis, Magnusson, Maldonado
Mechanical Engineering: Chan, Haji-Sheikh, Nomura, Wang
Physics: Black, Fry, Koymen, Ray, Sharma, Weiss, West

Objective

The graduate program in materials science and engineering is designed to provide students with a fundamental understanding of phenomena occurring in materials and their associated chemical, electrical, mechanical, and physical properties. The master's program prepares students for professional careers in materials science and engineering or for additional studies at the doctoral level.

Candidates for a master's or doctoral degree may elect programs emphasizing metals, polymers, ceramics, composite materials, or electronic materials, as well as a number of other areas. Although the program is administered through the College of Engineering, it is broadly interdisciplinary, actively involving faculty in both the College of Science and the College of Engineering. In addition to materials science and engineering courses, applicable courses are in the disciplines of aerospace engineering, biomedical engineering, chemistry, civil engineering, computer science engineering, electrical engineering, mathematics, mechanical engineering, and physics.

Admission

Master's Degree

Applicants for the master's degree who hold a baccalaureate in engineering or science must meet the general requirements of the Graduate School as stated in the section of this catalog entitled "Admission Requirements and Procedures." Applicants not meeting all criteria may be admitted on a provisional or probationary basis.

For applicants with no prior training in engineering or with insufficient undergraduate materials coursework, the same minimum criteria will apply. Additionally, their records will be reviewed in relation to their materials backgrounds, and probationary status with specific remedial work required may be a basis for acceptance of such applicants.

The acceptance of applicants who hold a master's degree in engineering will be based on the above-mentioned minimum criteria and results of graduate work, including the master's thesis.

Doctoral Degree

Applicants for the doctoral degree must have either a baccalaureate or master's degree in engineering or science and meet all requirements stated above in both graduate and undergraduate work. Students without a master's degree will enter the program as master's candidates and must complete a minimum of 30 graduate semester hours (at least 24 hours of which must be coursework) with distinction prior to advancement to doctoral candidacy. Doctoral candidates shall also demonstrate through previous academic preparation the potential to carry out independent research in materials science and engineering.

Continuation

The Materials Science and Engineering Graduate Program, in fulfillment of its responsibility to graduate highly qualified professional engineers and scientists, has established certain policies and procedures. In addition to the requirements of the Graduate

School listed elsewhere in this catalog, to continue in the program each materials science and engineering graduate student must:

1. Maintain at least a B (3.0) overall GPA in all coursework, and
2. Demonstrate suitability for professional practice.

At such time as questions are raised by materials science and engineering graduate faculty regarding either of the above, the student will be notified and will be given the opportunity to respond to the Committee on Graduate Studies for Materials Science and Engineering. The Committee on Graduate Studies will review the student's performance and make a recommendation concerning the student's eligibility to continue in the program. Appeal of a decision on continuation may be made through normal procedures outlined in the section of this catalog entitled "Grievances Other Than Grades."

Degree Requirements

Master's Degrees

Master of Science in Materials Science and Engineering: The Master of Science degree is a research-oriented degree in which completion of a thesis is mandatory. The program consists of a minimum of 24 credit hours of coursework and an acceptable thesis (minimum of six credit hours).

Master of Engineering in Materials Science and Engineering: The Master of Engineering degree is an engineering practice-oriented program requiring a minimum of 36 credit hours. A maximum of six hours may be a special project. A final program examination is required of all master's degree candidates. Non-thesis degree candidates will fulfill the program examination requirement upon the successful completion of MSE 5192, Master's Comprehensive Examination. Candidates must enroll in MSE 5192 in the semester they intend to graduate.

Doctor of Philosophy

The Ph.D. degree program involves an interdisciplinary and multidisciplinary approach which requires students to complete a set of Materials Science and Engineering core courses augmented by elective offerings in aerospace engineering, biomedical engineering, chemistry, civil engineering, electrical engineering, materials science, mechanical engineering and physics. The degree is a research degree which requires the candidate successfully to carry out independent research in an area acceptable to the Committee on Graduate Studies for Materials Science and Engineering. A student's research is directed by a faculty member from any of the departments or programs participating in the Materials Science and Engineering Program.

The Ph.D. degree program requires successful completion of the following curriculum components:

1. A minimum of 24 semester hours of graduate coursework is expected for students entering with an appropriate master's degree or, for highly qualified students, a minimum of 42 semester hours of graduate coursework is expected for student's entering with a bachelor's degree, as approved by the Committee on Graduate Studies for Materials Science and Engineering. Additional coursework may be required by the student's doctoral dissertation committee.
2. Six core courses or their equivalent are required for all doctoral students:

   MSE 5301 Physics of Engineering Materials (PHYS 5301)
   MSE 5302 Fundamentals of Materials Science and Engineering I
   MSE 5303 Fundamentals of Materials Science and Engineering II
   MSE 5304 Analysis of Materials
   MSE 5312 Mechanical Behavior of Materials
   MSE 5320 Thermodynamics of Materials (CHEM 5333)
3. Three of the following supplemental courses must be taken by all doctoral students, as approved by the Committee on Graduate Studies for Materials Science and Engineering.

   MSE 5310 Dislocation Theory
   MSE 5314 Fracture Mechanics
   MSE 5315 Fatigue of Engineering Materials
   MSE 5321 Phase Transformations of Materials
   MSE 5335 Integrated Circuit Materials and Processing
   MSE 5336 Electrical Properties of Materials
   MSE 5337 Magnetic and Optical Properties of Materials
   MSE 5344 Electrical and Bioceramics
   MSE 5345 Ceramic Materials
   MSE 5346 Contemporary Polymer Chemistry
   MSE 5347 Polymer Materials Science
   MSE 5348 Fundamentals of Composites
   MSE 5349 Applied Composites
   BME 5335 Biological Materials, Mechanics and Processes
   BME 5361D Biomaterials and Blood Compatibility
   CHEM 5309 Organic Chemistry I
   CHEM 5350 Advanced Polymer Chemistry
   CHEM 5461 Analytical Instrumentation
   CHEM 6305 Special Topics in Applied Chemistry
   EE 5340 Semiconductor Device Theory I
   EE 5343 Integrated Circuit Techniques
   EE 5349 Topics in Integrated Circuit Technology
   EE 6342 Advanced Quantum Devices
   EM 5311 Theory of Elasticity
   ME 5312 Continuum Mechanics
   ME 5314 Fracture Mechanics in Structural Design
   ME 5339 Structural Aspects of Design
   PHYS 5316 Solid State II
   PHYS 6302 Methods of Applied Physics II
4. Elective courses will be taken by all doctoral students which will allow specialization within a particular academic discipline. Graduate courses in chemistry, physics and engineering will be selected for this purpose in consultation with the student's research advisor, subject to approval by the Committee on Graduate Studies for Materials Science and Engineering.

After completion of the first year's coursework (i.e., core courses), students must satisfactorily complete diagnostic examinations which may be written or oral or written and oral with a supplemental interview with faculty members, as determined by the Committee on Graduate Studies in Materials Science and Engineering.

Upon completion of all or nearly all of the coursework requirements and after having demonstrated research ability through partial

completion of dissertation research, a student must satisfactorily complete a comprehensive examination.

The dissertation research will be formulated in conjunction with the student's faculty research advisor who may be associated with any of the following academic disciplines participating in the Materials Science and Engineering Program: aerospace engineering, biomedical engineering, chemistry, civil engineering, electrical engineering, materials science, mechanical engineering, and physics. The dissertation research represents the culmination of the student's academic efforts and is expected to demonstrate original and independent research activity and be a significant contribution to knowledge in the field.

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Materials Science and Engineering (MSE)

5301. PHYSICS OF ENGINEERING MATERIALS (3-0). Crystal structure, lattice vibrations, and band theory of electrons as they relate to the understanding of the electrical, magnetic, and mechanical properties of materials. Also offered as PHYS 5301. Prerequisite: permission of instructor.

5302. FUNDAMENTALS OF MATERIALS SCIENCE AND ENGINEERING I (3-0). Interatomic and intermolecular forces, crystal structures, x-ray diffraction, electron theories of metals, defects and imperfections, dislocation and slip phenomena, solid solutions, diffusion, phase diagrams, precipitation. Prerequisite: ME 2321 or permission of instructor.

5303. FUNDAMENTALS OF MATERIALS SCIENCE AND ENGINEERING II (3-0). Ferrous metals systems, solidification, ceramic materials and processing, polymeric materials and processing, electrical conduction, semiconductors, magnetic properties, martensitic reactions, composite materials. Prerequisite: MSE 5302 or permission of instructor.

5304. ANALYSIS OF MATERIALS (3-0). Theoretical foundations and the practical applications of materials' analysis techniques are discussed. Topics and equipment covered include x-ray and electron diffraction and spectroscopy, optical and electron microscopy, magnetic resonance, thermal and surface analysis. Prerequisite: permission of instructor.

5310. DISLOCATION THEORY (3-0). Theory of dislocations and their reactions and interactions in crystalline materials developed and extended into a basic understanding of mechanical properties of crystalline materials. Prerequisite: permission of instructor.

5312. MECHANICAL BEHAVIOR OF MATERIALS (3-0). Concepts of stress and strain, theory of plasticity. Elementary dislocation theory. Deformation of single crystals. Strengthening mechanisms like solid solution strengthening, precipitation hardening, etc. Elementary concepts in fracture mechanics. Microscopic aspects of fracture, fatigue, and creep of materials. Prerequisite: ME 3321 or permission of instructor.

5314. FRACTURE MECHANICS (3-0). Theory and applications of linear elastic fracture mechanics. Topics include stress analysis of cracks, crack-tip plasticity, fatigue and stress corrosion. Applicability to materials selection, failure analysis and structural reliability reviewed. Prerequisite: permission of instructor.

5315. FATIGUE OF ENGINEERING MATERIALS (3-0). Cyclic deformation, fatigue crack initiation and growth in ductile solids. Application of fracture mechanics to fatigue. Mechanisms of crack closure. Variable and multiaxial fatigue and corrosion fatigue. Fatigue of brittle solids. Prerequisite: permission of instructor.

5320. THERMODYNAMICS OF MATERIALS (3-0). Applications of thermodynamics to the study of materials, thermodynamic properties of liquid and solid solutions and their relationships to surfaces and crystalline defects. Also offered as CHEM 5333. Prerequisite: permission of instructor.

5321. PHASE TRANSFORMATIONS OF MATERIALS (3-0). The theory of homogeneous and heterogeneous transformations, nucleation and growth, martensitic transformations, heat treatment and control of microstructure. Prerequisite: MSE 5320, CHEM 5333, or permission of instructor.

5330. CORROSION (3-0). Quantitative application of electrochemical principles to corrosion reactions. Effects of metallurgical factors and environmental conditions on oxidation, erosion, and cracking discussed along with materials selection. Prerequisite: permission of instructor.

5335. INTEGRATED CIRCUIT MATERIALS AND PROCESSING (3-0). Fundamental properties of conductors, semiconductors, insulators, and polymers. Basic device operating principles for the pn junction, MOSFET, and Schottky diode. Materials processing for oxidation, annealing, thin film deposition, wet chemical etching, reactive ion etching, ion implantation, planarization, and photolithography. Prerequisite: permission of instructor.

5336. ELECTRICAL PROPERTIES OF MATERIALS (3-0). Advanced discussion of electronic structure, transport mechanisms in metals, semiconductors and superconductors, with applications to materials used in various electronic devices. Prerequisite: permission of instructor.

5337. MAGNETIC AND OPTICAL PROPERTIES OF MATERIALS (3-0). Classical and quantum mechanical understandings of magnetic and optical properties and phase transition phenomena. Specific applications of these properties to various devices are discussed. Prerequisite: permission of instructor.

5341. TRANSMISSION ELECTRON MICROSCOPY IN MATERIALS SCIENCE (3-0). Crystallography, stereographic projections, and reciprocal lattice. Specimen preparation in transmission electron microscopy. Dynamical and kinematical theories of electron diffraction. Interpretation of diffraction patterns and transmission electron micrographs. Use of the transmission electron microscope. Prerequisites: MSE 5302, MSE 5304 or permission of instructor. $15 lab fee. $25 course specific fee.

5344. ELECTRICAL AND BIOCERAMICS (3-0). Processing of ceramics. Electric, dielectric and piezoelectric properties of ceramics. Superconductivity. Requirements of bioceramics. Types and applications of bioceramics. Prerequisite: permission of instructor.

5345. CERAMIC MATERIALS (3-0). Crystal structure of ceramic materials. Phase equilibria in ceramic materials. The processing of ceramics and ceramic matrix composites. Strengthening mechanisms and mechanical properties of ceramics and ceramic matrix composites including flexure, tensile, fracture toughness, fatigue, and creep. Prerequisites: MSE 5302 and 5303 or permission of instructor.

5346. CONTEMPORARY POLYMER CHEMISTRY (3-0). Polymer synthesis and reactions. Principles of polymerization including thermodynamics and kinetic considerations. Physical characterizations including determinations of absolute and relative molecular weights, morphology, and glass transitions. Relationships between macromolecular structure, properties, and uses of polymeric materials. Also offered as CHEM 5350. Prerequisites: CHEM 2321 and CHEM 2322 or permission of instructor.

5347. POLYMER MATERIALS SCIENCE (3-0). Intermolecular forces of attraction in high polymers, polymer synthesis, morphology and order in crystalline polymers, mechanics of amorphous polymers, time-dependent mechanical behavior, transitional phenomena, mechanical behavior of semicrystalline polymers. Prerequisite: permission of instructor.

5348. FUNDAMENTALS OF COMPOSITES (3-0). Fundamental mechanics concepts of fiber-reinforced composites; relationships between the properties of the constituents and those of the unit composite ply; lamina and laminate anisotropic behavior; structural characteristics of A, B, and D matrices; lamination theory; strength criteria; hygrothermal analysis; interlaminar stress analysis. Also offered as ME 5348 and EM 5333. Prerequisite: permission of instructor.

5349. APPLIED COMPOSITES (3-0). Review of current state-of-the-art applications of composites; structural properties including section property; laminate sizing in preliminary design; notched sensitivity; delamination; fatigue characteristics; composite material testing; characteristics of composite joints. Also offered as ME 5349. Prerequisite: MSE 5348, ME 5348, or EM 5333.

5350. EXPERIMENTAL CHARACTERIZATION OF COMPOSITES (2-3). Laminate processing, NDI, and physical characterization procedures; thermal analysis methods for composites; composite materials tensile, compressive, shear, flexure, thermoelastic, and interlaminar fracture characterizations. Prerequisite: MSE 5348, ME 5348, or EM 5333 or concurrent enrollment or permission of instructor. $15 lab fee.

5141. TRANSMISSION ELECTRON MICROSCOPY LAB (0-1). Specimen preparation. Operation of the Transmission Electron Microscope. Beam alignment and rotation calibration. Bright field and dark field imaging. Weak beam imaging. Examination of defects. Prerequisites: MSE 5302 and MSE 5304. Co-requisite: MSE 5341. $30 course specific fee.

5190, 5290, 5390. SPECIAL TOPICS IN MATERIALS SCIENCE AND ENGINEERING. May be repeated for credit when topic changes. Prerequisite: Consent of instructor.

5191, 5291, 5391. ADVANCED STUDIES IN MATERIALS SCIENCE AND ENGINEERING. Topics selected from various areas of materials science and engineering. Work performed as a thesis substitute normally will be accomplished under the course number 5391, with prior approval of the Committee on Graduate Studies. Graded R.

5192. MASTER'S COMPREHENSIVE EXAMINATION. Directed study, consultation, and comprehensive examination over coursework leading to the Master of Engineering degree in Materials Science and Engineering. Required of all Master of Engineering students in the semester they plan to graduate. Graded P/F/R.

5193. SEMINAR IN MATERIALS SCIENCE AND ENGINEERING (1-0). Selected topics in materials science and engineering presented by faculty, students, and invited lecturers.

5398, 5698, 5998. THESIS. 5398 graded R/F only; 5698 and 5998 graded P/F/R. Prerequisite: approval of Graduate Advisor.

6301. ADVANCED PHYSICAL METALLURGY (3-0). Theory of phase stability in crystalline solids with special topics such as Long Period Superlattice formation and superplasticity. Prerequisites: MSE 5303 or permission of instructor.

6302. ADVANCED DISLOCATION THEORY (3-0). Development of the theories of work hardening, fatigue, and creep of crystalline materials based on the generation, movement, and interactions of dislocations with themselves and other crystalline defects. Prerequisites: MSE 5310 and permission of instructor.

6390. ADVANCED TOPICS IN MATERIALS SCIENCE AND ENGINEERING (3-0). Topics of special interest in the field of materials science and engineering. The subject title listed in class schedule and in student record. May be repeated for credit when topic changes. Prerequisite: permission of instructor.

6197, 6397. ADVANCED STUDIES IN MATERIALS SCIENCE AND ENGINEERING. May be repeated for credit. Prerequisite: approval of Graduate Advisor. Graded R.

6198-6998. RESEARCH IN MATERIALS SCIENCE AND ENGINEERING. Individually approved research projects in materials science and engineering. May be repeated for credit. Graded P/F/R.

6399, 6699, 6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R.

Program in Mathematical Sciences

Objectives

A program leading to the Doctor of Philosophy degree in the mathematical sciences will aim at both real and demonstrated competency on the part of the student over material from various branches of mathematical sciences. The nature of the dissertation will range from research in mathematics to the discovery and testing of mathematical models for analyzing given problems in sciences and in locating and developing mathematical and computational techniques for deducing the properties of these models so as to solve these problems both effectively and efficiently. Such dissertations will be concerned with research problems from such areas as pure mathematics, applied mathematics, probability, statistics, computer science, biology, biometry, chemistry, engineering, geology, information systems, physics, management sciences, and operational sciences.

Degree Requirements

Upon entering Graduate School, the student has the responsibility to consult with the Graduate Advisor in the appropriate department on a continuing basis.

The student must satisfactorily complete all deficiency courses.

In addition to the Graduate School requirements for the Doctor of Philosophy degree, students must satisfactorily demonstrate competence in 30 graduate hours of core areas as specified by the Committee on Graduate Studies for Mathematical Sciences (CGSMS). Furthermore, the student must complete additional graduate coursework beyond these core areas as approved by the Committee on Graduate Studies for Mathematical Sciences.

Of the 30 hours of core courses, each student is expected to complete a minimum of 15 graduate hours in the Mathematics Department. However, the 30 hours of core courses will vary depending on the student's area of interest and background and will be determined on an individual basis by the student's supervisory committee subject to approval by the Committee on Graduate Studies for Mathematical Sciences.

Normally each candidate is required to be in residence as a full-time student for one year or three consecutive semesters including summer term. Exceptions to this requirement may be approved if the student has demonstrated continuous degree progress while working as a part-time student.

In addition to meeting the specific requirements listed above, each student's program of work must be approved by the Dean of the Graduate School.

Ordinarily, after 40 semester hours of graduate work and with the approval of the Committee on Graduate Studies for Mathematical Sciences, a comprehensive examination (usually oral) will be administered. To pass, the student must exhibit outstanding intellectual capacity and sufficient knowledge to continue doctoral studies and a program of research. A student who has failed the comprehensive examination may be allowed a single re-examination by the Committee on Graduate Studies for Mathematical Sciences on the recommendation of the examining committee. The student must be enrolled in the Graduate School at the time of the comprehensive examination.

Area of Study and Degree

Mathematical Sciences
Ph.D.

Graduate Advisors

Biology
John Bacon
237 Life Science, 817-272-2400

Chemistry
Z.A. Schelly
238 Science Hall, 817-272-3803

Computer Science
Roger S. Walker
236 Nedderman Hall, 817-272-3640

Geology
Merlynd K. Nestell
211 Geoscience, 817-272-2983

Information Systems and Management Sciences
R.C. Baker
132 Business, 817-272-3547

Mathematics
Alan Gillespie
440 Pickard Hall, 817-272-6585

Physics
Alexander Weiss
107D Science Hall, 817-272-2459

Psychology
James R. Erickson
303 Life Science, 817-272-3228

Graduate Faculty

Appropriate Graduate Faculty of various branches of mathematical sciences which include Biology, Chemistry, Computer Science, Geology, Information Systems, Mathematics, Physics and Psychology

The grade of R (research in progress) is a permanent grade; it cannot be changed by completing course requirements in a later semester. To receive credit for an R-graded course, the student must continue to enroll in the course until a passing grade is received.

An incomplete grade (the grade of X) cannot be given in a course that is graded R, nor can the grade of R be given in a course that is graded X. To receive credit for a course in which the student earned an X, the student must complete the course requirements no later than mid-semester of the next semester (excluding summer). A grade of X cannot be changed by enrolling again in the course in which an X was earned. An incomplete grade that is not removed by the specified deadline will be automatically converted to an F. (See the Graduate School calendar for specific deadlines.)

Three-hour thesis courses and three- and six-hour dissertation courses are graded R/F/W only (except social work thesis courses). The grade of P (required for degree completion for students enrolled in thesis or dissertation programs) can be earned only in six- or nine-hour thesis courses and nine-hour dissertation courses. In the course listings below, R-graded courses are designated either "Graded P/F/R" or "Graded R." Occasionally, the valid grades for a course change. Students should consult the appropriate Graduate Advisor or instructor for valid grade information for particular courses. (See also the sections titled "R" Grade, Credit for Research, Internship, Thesis or Dissertation Courses and Incomplete Grade in this catalog.)

Mathematical Sciences (MSCI)

6399,6699,6999. DISSERTATION. 6399 and 6699 graded R/F only; 6999 graded P/F/R. Prequisite: admission to candidacy for the Doctor of Philosophy degree in mathematical science.

Program in Public Administration

The entry for the Program in Public Administration is located in the School of Urban and Public Affairs section of this catalog.

Administration and Graduate Faculty

Administration

The University of Texas System

William Cunningham, Ph.D., *Chancellor*
Charles B. Mullins, M.D., *Executive Vice Chancellor for Health Affairs*
R.D. Burck, B.B.A., *Executive Vice Chancellor for Business Affairs*
Edwin R. Sharpe, Jr., Ph.D., *Vice Chancellor for Academic Affairs*

The University of Texas at Arlington

Executive Officers

Robert E. Witt, Ph.D., *President*
George C. Wright, Ph.D., *Provost and Senior Vice President for Academic Affairs*
Dale Anderson, Ph.D., *Vice President for Research and Dean of Graduate Studies*
Mary E. Ridgway, Ph.D., *Vice President for Undergraduate Academic and Student Affairs*
M. Dan Williams, M.B.A., M.Ed., *Senior Vice President for Finance and Administration*
Shirley F. Binder, M.Ed., *Vice President for Student Enrollment Services*
M. Ann Abbe, M.A., *Vice President for Development*
Elwood J. Preiss, M.A., *Executive Director of Administrative Services*
Judith Stout Smith, B.S., *Executive Assistant to the President*

Administrative Officers of Academic Units

Edward M. Baum, M.Arch., *Dean, School of Architecture*
Lawrence L. Schkade, Ph.D., *Dean, College of Business Administration*
J. Ronald Bailey, Ph.D., *Dean, College of Engineering*
Ruth V. Gross, Ph.D., *Interim Dean, College of Liberal Arts*
Elizabeth Poster, Ph.D., *Dean, School of Nursing*
Neal Smatresk, Ph.D., *Dean, College of Science*
Santos H. Hernandez, *Dean, School of Social Work*
Richard L. Cole, Ph.D., *Dean, School of Urban and Public Affairs*
Jeanne M. Gerlach, Ph.D., Ed.D., *Director, Center for Professional Teacher Education*

The Graduate School

Dale Anderson, Ph.D., *Vice President for Research and Dean of Graduate Studies*
Karl M. Petruso, Ph.D., *Associate Vice President for Research and Graduate Studies*
Gloria W. Eyres, M.A., *Assistant Vice President for Graduate Studies*

Graduate Faculty

(Year in parentheses indicates year of initial employment to the faculty of The University of Texas at Arlington.)

ADAMS, PHYLLIS, Assistant Professor of Nursing (1995). B.S.N., Dillard University, 1969; M.S.N., Ohio State University, 1972; Ed.D., Texas Southern University, 1989. Registered Nurse, Certified Nurse Practitioner.

AGGER, BEN, Professor of Sociology (1994). B.A., York University, 1973; M.A., 1974; Ph.D., University of Toronto, 1976.

ALAIMO, STACY, Assistant Professor of English (1994). B.A., Gustavus Adolphus College, 1985; M.A., University of Wisconsin, 1986; Ph.D., University of Illinois, 1994.

ALAVI, KAMBIZ, Professor in Electrical Engineering (1988). B.S., Massachusetts Institute of Technology, 1972; M.S., 1977; Ph.D., 1981.

ALMORE, MARY G., Associate Professor of Sociology (1973). B.S., Florida State University, 1955; M.A., 1956; M.S., 1958; Ph.D., Texas Christian University, 1971.

AMACHER, RYAN C., Professor of Economics (1992). A.B., Ripon College, 1967; Ph.D., University of Virginia, 1971.

AMSTER, HARRIETT, Professor of Psychology (1973). A.B., Bryn Mawr College, 1950; M.A., Clark University, 1954; Ph.D., 1957.

ANDERS, EVAN M., Associate Professor of History (1982). B.A., The University of Texas at Austin, 1968; M.A., 1970; Ph.D., 1978.

ANDERSON, DALE A., Professor of Aerospace Engineering and Vice President for Research and Dean of Graduate Studies (1984). B.S., St. Louis University, 1957; M.S., Iowa State University, 1959; Ph.D., 1964. Professional Engineer.

ANDERSON, R. BRUCE W., Associate Professor of Sociology (1973). A.B., Stanford University, 1961; M.A., Northwestern University, 1965; Ph.D., Duke University, 1970.

ANDRESEN, EARL, Professor of Communication (1991). A.B., Columbia College, 1969; A.M., University of Illinois, 1972; Ph.D., Texas A&M University, 1988.

ANJOMANI, ARDESHIR, Professor of City and Regional Planning (1979). M.Arch., University of Tehran, Iran, 1968; M. Planning, University of Southern California, 1976; Ph.D., 1979.

APILADO, VINCENT P., Professor of Finance and Real Estate (1980). B.S., University of Portland, 1959; M.B.A., University of Oregon, 1966; Ph.D., University of Michigan, 1970.

ARDEKANI, SIAMAK A., Professor of Civil and Environmental Engineering (1989). B.S., The University of Texas at Austin, 1980; M.S., 1981; Ph.D., 1984. Professional Engineer.

ARGENTO, VITTORIO K., Associate Professor of Civil and Environmental Engineering (1977). B.S., San Diego State College, 1964; M.S., The University of Texas at Dallas, 1976; Ph.D., 1989. Professional Engineer.

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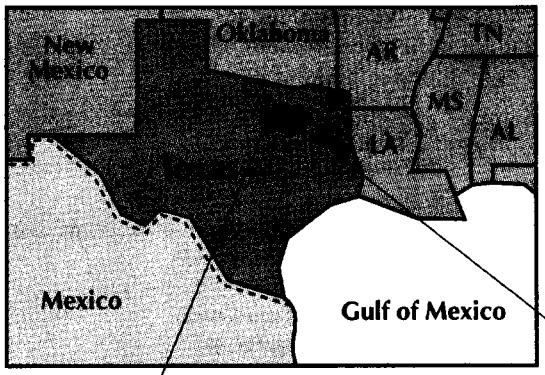
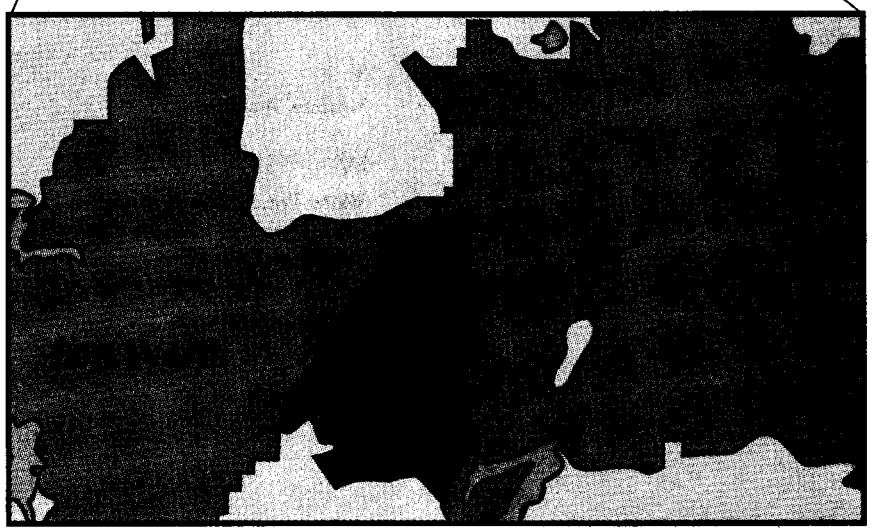
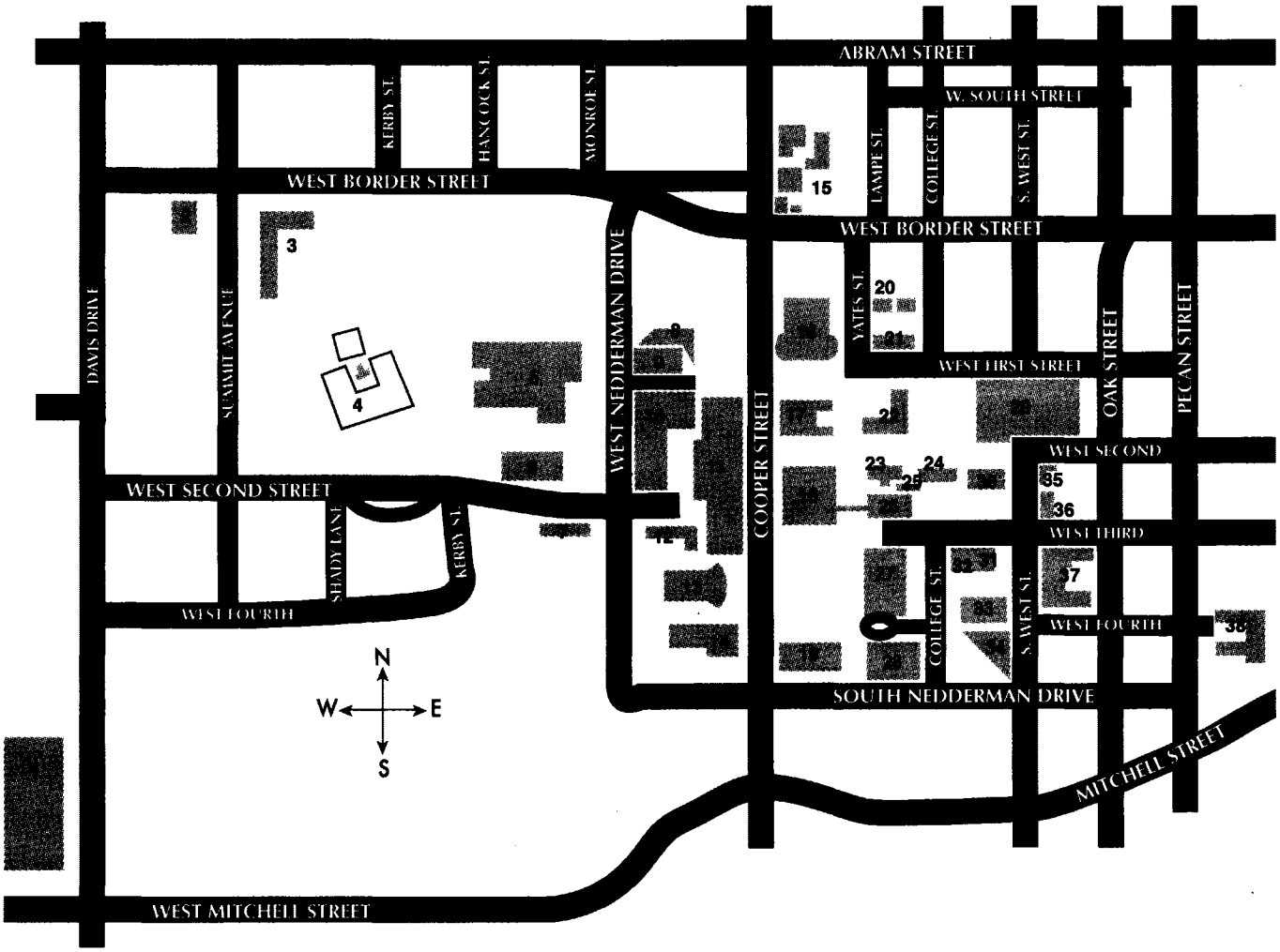


Dallas/Fort Worth Metroplex Area



University of Texas at Arlington Campus Map



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3 Swift Center
4 Tennis Center
5 Activities Building
6 Physical Education Building
7 Trinity House (coed)
8 UTA Bookstore
9 Campus Center
10 Architecture Building
11 Fine Arts Building
12 Pachl Hall (men)
13 Texas Hall
14 Davis Hall
15 Social Work Complex
16 Nedderman Hall
17 Geoscience Building
18 Science Hall
19 University Hall
20 Engineering Annex
21 Engineering Lab Building
22 Woolf Hall
23 Preston Hall
24 Ransom Hall
25 Carlisle Hall
26 Chemistry Research Building
27 Central Library
28 Life Science Building
29 E.H. Hereford University Center
30 College Hall
31 Trimble Hall
32 Hammond Hall
33 Maverick Parking Garage
34 Pickard Hall
35 Brazos House (coed)
36 Health Center
37 Business Building
38 Lipscomb Hall (South: women; North: coed)

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Notes