UTSA | College of Sciences
One UTSA Circle San Antonio, Texas 78249

college of sciences

GRADUATE PROGRAMS

UTSA
THE UNIVERSITY OF TEXAS AT SAN ANTONIO

a message

FROM THE DEAN

The University of Texas at San Antonio is a leading public university and one of the fastest-growing universities in Texas. Faculty and student researchers in the College of Sciences are engaged in groundbreaking studies in a variety of areas, transforming scientific understanding into ways of enriching human experience in a modern world.

The new $84 million Biotechnology, Sciences and Engineering Building at UTSA is one of the largest research-related educational centers in Texas. The 227,000-square-foot, five-story building includes 70 research and instructional laboratories that facilitate interdisciplinary research and collaboration among scientists and engineers.

The College of Sciences and its students participate in collaborations with local research institutions including the University of Texas Health Science Center at San Antonio, Southwest Research Institute, Brooks City-Base and the Southwest Foundation for Biomedical Research.

The College of Sciences is home to world-class research centers and institutes focusing on areas including neuroscience (Cajal Neuroscience Institute); infectious diseases (South Texas Center for Emerging Infectious Diseases); cell and molecular research in nonhuman primates (San Antonio Institute for Cellular and Molecular Primatology); environmental quality and water resources (Institute for Research in Water and Environmental Resources); biodefense (participation in a Regional Center of Excellence for Biodefense and Emerging Infectious Diseases); and Parkinson's disease (participation in a national Center of Excellence for Parkinson's Disease Research).

Other strong research programs include microbiology, reproductive biology, information security, environmental geochemistry, applied mathematics and math education, astronomy, biophotonics, and analytical and bioinorganic chemistry.

I invite you to join us
and take your own personal voyage
of learning and discovery.

GEORGE PERRY, Ph.D.
Dean, College of Sciences

about UTSA

Biotechnology, Sciences and Engineering Building

UTSA

The University of Texas at San Antonio is on track to become the state's next premier research institution and is supported by funding from many prominent sources, including the National Institutes of Health and the National Science Foundation. UTSA leads the nation in the number of biological science degrees awarded to Hispanics, and ranks ninth in the nation for the number of mathematics degrees awarded to Hispanics. Our research funding for fiscal year 2005 was $26.8 million, and the sum of research awards for the last five years totaled $159.3 million.

STUDENTS

More than half of UTSA's students are members of minority groups: 45 percent Hispanic, 6.7 percent African American, 5 percent Asian-Pacific Islander, .6 percent American Indian and 3 percent international students. Approximately half of our students are the first in their family to attend college, and more than 70 percent receive financial aid.

FACILITIES

The recently completed Biotechnology, Sciences and Engineering Building measures 227,000 square feet and includes 70 laboratories for teaching and research. Another important addition to the campus is the Margaret Batts Tobin Laboratory Building. Named after the third woman to serve on the University of Texas System Board of Regents, this facility contains biology labs, a computer media center and UTSA's second biosafety level 3 laboratory.

RESEARCH

During the past five years, research funding has increased to more than $42 million, putting UTSA in the top third tier of U.S. institutions of higher education. The College of Sciences received 43 percent of those funds. In 2005, $18.8 million funded restricted research, and $13.6 million of that funding came from the NIH. Increased funding will propel UTSA toward reaching its goal of becoming a doctoral and research-intensive institution by 2007 (awarding at least 20 doctoral degrees per year in at least three disciplines) and becoming doctoral and research-extensive by 2015 (awarding at least 50 doctoral degrees per year in at least 15 disciplines).

SAN ANTONIO

San Antonio is a major metropolitan area containing more than 1 million people. Its rich and culturally diverse heritage is symbolized by famous Spanish missions, including the historic Alamo. The unique Riverwalk provides a focus for the city's cultural and social activities. The San Antonio Museum of Art, the McNay Art Museum and the Witte Museum enrich the city, as do other attractions such as SeaWorld San Antonio, Six Flags Fiesta Texas, Brackenridge Park and the San Antonio Zoo. As one of the top 10 zoos in the country, the San Antonio Zoo houses 750 animal species and has the largest collection of bird species. San Antonio is home to both a major symphony orchestra and to the San Antonio Spurs basketball team, three-time NBA champions.

01 Ph.D. in Biology with an emphasis in Neurobiology

PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The doctoral program leading to a Ph.D. in biology with an emphasis in neurobiology provides students with comprehensive education and training. Our neuroscience faculty members are actively researching the function of the nervous system in areas of neuroanatomy, neurophysiology, cognitive neuroscience, neurodevelopment, molecular neurobiology, biophysics, imaging and neural modeling.

RESEARCH FACILITIES

Our state-of-the-art research laboratories and facilities are fully equipped for human brain imaging, protein purification, radioimmunoassay, patch clamping, single cell and extracellular recording, stereotaxic recording, optical imaging using voltage-sensitive dyes, neuronal modeling, three-dimensional computer-generated neuronal reconstruction, brain slice preparations, camera lucida drawings, neuroanatomical tract tracing, cell culture, fluorescence-activated cell sorting, fluorescence microscopy, confocal microscopy, and scanning and transmission electron microscopy.

Facilities also are available for absorption and fluorescence spectrophotometry, phosphorimagery, 500-MHz FT-NMR spectrometry, FT-IR spectrometry, gas chromatography, mass spectrometry, atomic absorption spectrometry, HPLC with photodiodearray detection, ultracentrifugation, DNA cloning and sequencing, peptide and oligonucleotide synthesis, transgenic mice facilities, protein imaging, and scintillation and gamma counting.

DEGREE REQUIREMENTS

Core curriculum: 18 semester credit hours

Colloquia and seminars: 16 semester credit hours

Electives: 13 semester credit hours

Doctoral research: 44 semester credit hours

TOTAL: 91 semester credit hours

FINANCIAL AID

All applicants will automatically be considered for financial support. Research traineeships are available for advanced predoctoral students. Entering students will be encouraged to apply for predoctoral fellowships from both the National Science Foundation and the National Institutes of Health. In addition, the Minority Biomedical Research Support Program supports stipends, tuition and fees, health insurance and travel to scientific meetings.

Please submit your application online at https://apply.embark.com/grad/utsa/33/.

For more information, please contact the Department of Biology at (210) 458-4463.

02 Ph.D. in Biology with an emphasis in Cell and Molecular Biology

PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The Ph.D. in biology with an emphasis in cell and molecular biology offers students the opportunity to pursue research in the principles and technologies of cell and molecular biology and prepares them to conduct original research in a variety of biological and biomedical areas. Graduates of this program will be qualified to undertake positions in areas including academics, biomedical research and industrial biotechnology. A common theme of cell and molecular biology can be pursued in a variety of biological systems, including mammals, insects, plants and microorganisms. Faculty interests include aging, bacterial pathogenesis, biochemistry, bioinformatics, biotechnology, developmental biology, endocrinology, gene regulation, genetics, genomics, immune-based therapeutics, immunology, infectious disease, morphology, mycology, physiology, reproductive biology, stem cell research, tissue engineering, vaccine development and virology.

RESEARCH FACILITIES

Cell and molecular biology research programs are strongly fostered by research and training support. State-of-the-art laboratories are fully equipped with instrumentation for molecular, cellular, genetics, developmental, immunological, microbiological, virological and genomics-based studies.

DEGREE REQUIREMENTS

Core curriculum: 22 semester credit hours

Colloquia: 10 semester credit hours

Electives: 10 semester credit hours

Doctoral research: 49 semester credit hours

TOTAL: 91 semester credit hours

FINANCIAL AID

In 2005–2006, doctoral students received $21,000 of support in the form of research stipends or teaching assistantships. In addition, all tuition and fees were paid. For qualified students, the Minority Biomedical Research Support Program supports stipends, tuition and fees, health insurance, and travel to scientific meetings.

Please submit your application online at https://apply.embark.com/grad/utsa/33/.

For more information, please contact the Department of Biology at (210) 458-4463.

03 Ph.D. in Chemistry

PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The chemistry Ph.D. program offers students opportunities for advanced study and research in one or more areas of contemporary chemistry that may incorporate aspects of biological chemistry, biotechnology and biomedical applications. Graduates of this program will be qualified to undertake positions in private companies and research institutions at local, state and national levels. Students will receive a firm foundation in advanced chemistry that will allow them to continue to develop research skills while working in any area of chemistry. These areas of research emphasis include traditional fields such as biochemistry and analytical, inorganic, organic and physical chemistry, as well as multidisciplinary fields such as bioinorganic chemistry, crystal engineering, environmental chemistry, nanochemistry, polymer chemistry and theoretical chemistry.

DEGREE REQUIREMENTS

Core curriculum: 12 semester credit hours in analytical chemistry, biochemistry, inorganic or organic chemistry, and physical chemistry

Colloquia and seminars: a maximum of 12 semester credit hours

Electives: 9 semester credit hours determined by the student in conjunction with a dissertation adviser or committee

Doctoral research: 41 semester credit hours of doctoral research and 12 semester credit hours of doctoral dissertation

TOTAL: 86 semester credit hours

FINANCIAL AID

The department offers each qualified applicant a competitive stipend of $20,000 per year in the form of a teaching assistantship (T.A.) and a research assistantship (R.A.). In addition to this, the department covers all student tuition and fees at an estimated cost of $7,500 per year.

Please submit your application at https://apply.embark.com/grad/utsa/33/.

For more information on this program, please contact Dr. Edward R.T. Tiekink, graduate adviser of record, at edward.tiekink@utsa.edu.

http://www.utsa.edu/chem/index.htm

04 Ph.D. in Computer Science

PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The Ph.D. program in computer science aims to educate future researchers and teachers so that they will be well prepared for leadership in academia and industry. The Department of Computer Science comprises 20 faculty who offer research opportunities in a variety of areas, such as software engineering, algorithms, databases, image processing and programming languages. Research focuses include computer security, bioinformatics, machine learning and artificial intelligence, visualization and multimedia, architecture and compilers, and networks and distributed systems.

RESEARCH FACILITIES

The Department of Computer Science operates several state-of-the-art computer laboratories for instructional and research purposes. A Linux cluster, a cluster of Cisco routers and switches, and a wireless cluster support research on distributed computing, high-speed networks and wireless networks. Specialized resources include high-end multimedia equipment for research in visualization and multimedia, dedicated equipment for real-time computing and intrusion detection, a computer security laboratory with an isolated workstation cluster, and several other multiprocessor computers to support research on parallel processing and bioinformatics.

Each Ph.D. student is provided a cubicle equipped with a workstation.

DEGREE REQUIREMENTS

Core curriculum: 12 semester credit hours

Electives: 36 semester credit hours

Computer science research: 42 semester credit hours comprised of 6 hours of research seminar, 18 hours of doctoral research and 18 hours of doctoral dissertation

TOTAL: 90 semester credit hours

FINANCIAL AID

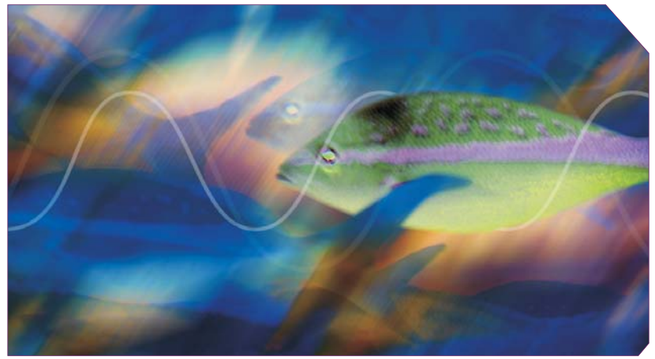
Applicants will automatically be considered for scholarships and teaching and research assistantships, which consist of a generous annual stipend plus paid tuition and fees.

Please submit your application online at https://apply.embark.com/grad/utsa/33/.

For more information, please contact the Department of Computer Science at (210) 458-4436.

http://www.cs.utsa.edu

05 Ph.D. in Environmental Science and Engineering



PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The environmental science and engineering Ph.D. program encompasses two colleges, the College of Sciences and the College of Engineering, and two departments, the Department of Earth and Environmental Science and the Department of Civil and Environmental Engineering. Areas of research emphasis include water resources, environmental quality, environmental remediation, pollution control, conservation ecology, spatial analysis, remote sensing and natural hazards.

DEGREE REQUIREMENTS

Core curriculum: 6 semester credit hours in global change and analysis of environmental problems, and 3 semester credit hours in one of the following: multivariate analysis in environmental science and engineering, risk and decision analysis in civil engineering, or experimental design and analysis

Seminars: minimum of 3 semester credit hours in environmental science and engineering seminars

Electives: 18 semester credit hours determined by the student in conjunction with a dissertation adviser

Doctoral research: 15 semester credit hours of doctoral research and 15 semester credit hours of doctoral dissertation

TOTAL: 60 semester credit hours

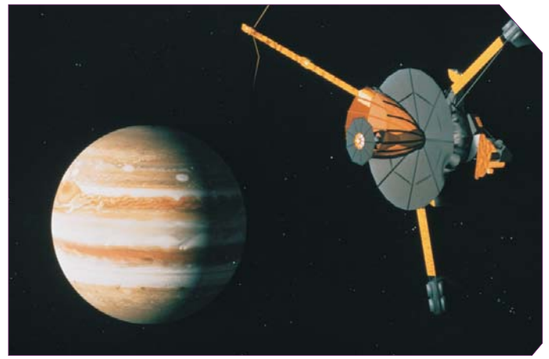
FINANCIAL AID

The department offers qualified applicants teaching and research assistantships and competitive stipends of up to $20,000 per year. Qualified minority students accepted into the program may apply for a Sloan Scholarship in the amount of $30,000. Recipients will be mentored toward successful completion of their degrees. For more information, please contact Dr. Enos C. Inniss at (210) 458-7926 or Enos.Inniss@utsa.edu.

Please submit your application at https://apply.embark.com/grad/utsa/33/.

For more information on this program, please contact Liza Zamudio in UTSA's College of Sciences at (210) 458-4428 or liza.zamudio@utsa.edu.

06 Ph.D. in Physics



PROGRAM DESCRIPTION AND AREAS OF SPECIALIZATION

The physics Ph.D. program is a unique joint initiative between the Department of Physics at The University of Texas at San Antonio and the Southwest Research Institute (SwRI). Since 1977, SwRI has played a key role in NASA space physics and planetary missions with expertise in planetary and space science, instrument design and fabrication and data system development.

The partnership between UTSA and SwRI offers students enrolled in the physics Ph.D. program the opportunity to conduct research in a variety of physics fields, such as condensed matter physics, chemical physics, biophysics, biophotonics, nonionizing radiation physics, theoretical particle physics, cosmology, mathematical and computational physics, semiconductor nanostructures, experimental laser spectroscopy, laser-tissue interactions, plasma physics space weather, ionosphere-thermosphere-mesospheric physics, plasmaspheric physics, magnetospheric physics, heliospheric physics, cometary physics, space physics instrumentation and computational space physics.

The Department of Physics and Astronomy at UTSA currently includes nine faculty members and will expand to 16 tenure and tenure-track faculty in the next few years. Eight selected scientists from the SwRI Space Science and Engineering Division have been appointed as adjoint professors at UTSA. All graduate faculty members will teach advanced graduate courses, serve on committees and supervise Ph.D. dissertations.

Students working with UTSA and/or SwRI scientists will work in world-class laboratories and participate in cutting-edge research sponsored by NASA, the National Science Foundation, National Institutes of Health, the Department of Defense, and other agencies that provide financial support in the form of research assistantships.

RESEARCH FACILITIES

The laboratories at UTSA are equipped with state-of-the-art technology for fabrication and characterization of crystals, as well as nano and biomaterials. Also available on the UTSA campus are facilities for laser-spectroscopy, optical spectroscopy and imaging, pulsed laser ablation and pulsed laser MBE deposition. Two 32-processor SGI Altix supercomputers and a Beowolf cluster with 32 2.8-GHz Xeon CPUs are available for computational physics research in condensed matter, cosmology and particle physics. The SwRI Space Science and Engineering Division has laboratories available for research in space weather, ionosphere-thermosphere-mesospheric physics, plasmaspheric physics, magnetospheric physics, heliospheric physics, cometary physics, space physics instrumentation, and computational space physics.

Ph.D. in Physics *continued*

DEGREE REQUIREMENTS

Core curriculum: 9 semester credit hours

Electives: 18 semester credit hours of general physics and 18 semester credit hours of advanced physics

Doctoral research: at least 36 semester credit hours comprising 3 hours of research seminar, 6 hours of directed research, 15 hours of doctoral research and 12 hours of doctoral dissertation

TOTAL: 81 semester credit hours

FINANCIAL AID

Students accepted into the program may be eligible to receive university support of $25,000 per year, which includes tuition and some fees. This competitive stipend carries with it both research and teaching responsibilities. Students supported by the stipend must be registered full time, taking 9 hours in each long semester and 3 hours each summer. Qualified students can receive the stipend for up to six years. The stipend is paid monthly and is contingent upon satisfactory progress toward the Ph.D. degree.

Some research assistantships and other departmental employment also may be available, pending availability of funds.

Please submit your application online at https://apply.embark.com/grad/utsa/33/.

For more information, please contact the Department of Physics and Astronomy at (210) 458-5451.

http://www.physics.utsa.edu