The School of Engineering

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MISSION STATEMENT

The mission of the Tulane School of Engineering is to provide outstanding opportunities for learning and discovery in engineering and computer science and to foster an environment that is student focused, research intensive, entrepreneurial and responsive to the needs of the community.

INTRODUCTION

Engineering and Computer Science are professions where knowledge of Math and Science is applied to solve problems to address the needs of society in an economically efficient manner. Engineers and computer scientists are applied mathematicians, applied scientists, designers, and builders.

Engineering at Tulane has a long and distinguished history dating back to 1884 when the first classes in engineering were offered. Graduates of the School helped build the infrastructure of New Orleans and of the South. Its graduates have also been pioneers in developing communications satellites, in designing medical devices, and in mining the resources of the internet. The faculty members of the School of Engineering are working at the cutting edge of their disciplines and bringing that knowledge into the classroom. While the School is research intensive, it maintains the strong commitment to teaching that has characterized it through the decades.

The School of Engineering offers four-year undergraduate programs leading to the Bachelor of Science in Engineering. These include the programs in biomedical engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, and environmental engineering, which are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology. Programs also exist in computer engineering and an individually designed major. In addition, the School offers a program leading to the Bachelor of Science in Computer Science. The program in computer science is accredited by the Computer Science Accreditation Commission (CSAC) of the Computing Sciences Accreditation Board (CSAB), a specialized accrediting body recognized by the Council on Postsecondary Accreditation (COPA) and the U. S. Department of Education.

Special options allow study in the liberal arts, participation in the Junior Year Abroad program, participation in a senior honors program, or the adaptation of an engineering program to meet medical school or law school entrance requirements. These options are described under Programs of Study.

The Master of Business Administration program at Tulane is ordinarily a two-year program, but qualified engineering students can earn a Bachelor of Science in Engineering Science degree and a MBA in five years. Engineering students are particularly well-suited to the MBA program because of their strong quantitative background, and there are many responsible management positions in business and in government open to those with this combination. This option is also described under Programs of Study.

Programs leading to the Master of Science in Engineering, the Master of Science in Computer Science, and the Doctor of Science degree are administered by the Graduate Division of the School of Engineering. The Master of Science in Engineering and Doctor of Science are offered in biomedical engineering, chemical engineering, civil engineering, electrical engineering, environmental engineering, and mechanical engineering. The Doctor of Science is also available in computer science. Programs leading to the Master of Science and Doctor of Philosophy degrees are available through the Graduate School.

While it is an important and thoroughly integrated part of the university as a whole, the School of Engineering maintains its own unique identity and takes pride in the close relationship between faculty and students and in the strong unity and esprit de corps among the students themselves. The engineering student body and the student council sponsor a number of social and professional activities, including an Engineering Week each spring. The School also supports very active chapters of Tau Beta Pi, the national engineering honor society, and Upsilon Pi Epsilon, the national computing sciences honor society. There are student chapters of professional societies in all departments.

FACILITIES

The School of Engineering is housed in a building complex consisting of the Lindy Boggs Center for Energy and Biotechnology, the Chemical Engineering Building, the Civil Engineering Building, the Mechanical Engineering Building, and Stanley Thomas Hall.

The Department of Biomedical Engineering is primarily located on the fifth floor of the Boggs Center, with additional space on the second, fourth, and sixth floors. The department has more than 15,000 square feet of offices and laboratories. The facilities include laboratories for biomaterials, mechanical testing, computers, imaging and computer graphics, respiratory function, neuromonitoring and neurosignal analyses, biomedical electronics, senior projects, specimen preparation, and cell and tissue engineering. The computational facilities include PC's and Mac's networked with departmental "front-end" workstations (IBM RS6000, and SGI). The mechanical testing laboratory houses an MTS 809 high-capacity combined tension-torsion machine. The biomaterials laboratory houses EG&G PAR computerized electrochemical testing equipment. These instruments are capable of DC measurement and AC impedance testing of corrosion behavior. They are also capable of polarographic analysis for measurement of solution concentrations. Tissue culture facilities are also available. The specimen preparation laboratory houses equipment for preparation of samples for metallographic and histologic examination. The respiratory functions laboratory contains spirometers, flowmeters, and data acquisition and analysis equipment.

The Department of Chemical Engineering has outstanding facilities for research and instruction in biochemical engineering, electrochemical engineering, control, optimization, process design, reaction kinetics, catalysis, microemulsions, colloids and surface phenomena, separations processes and environmental engineering. There are 13 laboratories in the Lindy Claiborne Boggs Center. One of these laboratories has been designed and equipped for genetic engineering. Tulane has established the centralized Coordinated Instrumentation Facility (CIF) with the intent to operate and manage sophisticated instrumentation for academic and industrial research; the core facility is located in the Boggs Center. Instruments operated by the CIF include high-field NMR=s, high resolution GC/MS, X-ray diffractometers, electron microscopes (SEM and TEM), and induced coupled plasma (ICP). The F. M. Taylor Laboratory is a three-story building which houses pilot-plant-sized equipment for both instruction and research. The Practice School in the senior year offers an opportunity to work with commercial scale equipment at local industrial sites.

The Department of Civil and Environmental Engineering, with associated laboratories, is predominantly located in the Walter E. Blessey Hall, Civil Engineering Building. Superb laboratory facilities are offered to support undergraduate and graduate studies in the traditional areas related to civil and environmental engineering. The John K. Mayer Geoenvironmental Laboratory is equipped with all equipment necessary for both research and instruction. The McDermott Materials Testing Laboratory includes a 200-ton capacity MTS testing machine for static and vibratory testing of large specimens. The William Benjamin Gregory Hydraulics Laboratory has four large self-contained bench systems capable of conducting experiments in Bernoulli flow, pump and weir analysis, hydrostatic pressure and stability of floating objects. A biotreatment research laboratory is housed in Blessey Hall and an additional graduate research laboratory is located in the Israel Environmental Sciences Building. The environmental engineering laboratories are equipped with the most modern equipment available for the study of water quality and waste treatment problems. Finally, state-of-the-art computer facilities provide an ability to conduct instruction and/or research in areas related to design and analysis of structures, water quality modeling, and spatial analysis (geographic information systems, remote sensing technology). Available peripherals include digitizing tablets, plotters, assorted printers and multimedia equipment.

The Department of Electrical Engineering and Computer Science (EECS) offers undergraduate and graduate programs in Computer Science, Computer Engineering, and Electrical Engineering and features several interdisciplinary programs with other departments in the university. The department is located in Stanley Thomas Hall, a four story building that was completely renovated in the academic year 1998. The renovated building exhibits two state-of-the-art electronic classrooms, a Robotics Laboratory, a 1,200 square-foot facility for Electrodynamics Systems Research, and instructional laboratories including the Pendleton Lehde Laboratory, the Electronics and Communications laboratory, and the Computer Engineering laboratories. In addition to the instructional laboratories, the faculty, the graduate, and the undergraduate students of the department are accommodated by several research laboratories in the research areas of Intelligent & Knowledge-Based Systems, Electronic Instrumentation, Microprocessor Applications and Microcomputer Interfacing, Computer Vision, Signal & Image Processing, Robotics, Electric Power Engineering, and Control Systems.

The EECS department operates a local area network (LAN) with a number of Sun workstations running UNIX and X windows, as well as two multiple CPU Sun SPARC servers. This LAN is accessible from X-Terminals and personal computers in the department's laboratories, and from workstations, all personal computers, and dial-up lines on the University's campus network and the Internet. Other computing facilities available to EECS students include a cluster of IBM RS/6000 systems operated by the University computing center and a personal computer laboratory operated by the School of Engineering, all of which are on the campus network.

The physical facilities of the Department of Mechanical Engineering are located in the engineering complex. The Senior Room, the Computer Lab/Classroom, the Design Fabrication Laboratory, the Mechanics Laboratory, the Materials Laboratory, the Mechanical Engineering Student Lounge, and some graduate student offices are located in the Mechanical Engineering Building. The Robotics and Control Laboratory and several graduate student offices are located in the Mechanical Engineering Graduate Laboratory Building. The Thermodynamics Laboratory, the Basic Measurements Laboratory, the Materials Testing Laboratory, and Metallurgy Laboratory are situated in annexes surrounding the Mechanical Engineering Building. The Laboratory for Mechatronics and Intelligent Sensors is located on the sixth floor of the Boggs Center. Faculty offices and additional graduate student offices are located on the fourth floor of the Boggs Center.

Programs of Study

DEGREES

The School of Engineering offers degrees in the following undergraduate programs, each designed to prepare the student for a particular professional goal:

Biomedical Engineering

Chemical Engineering

Civil Engineering

Computer Engineering

Computer Science

Electrical Engineering

Environmental Engineering

Individually Designed Major

Mechanical Engineering

Engineering-Master of Business Administration

BSE/MSE 5-Year Degree in Engineering

Six-year combined Engineering and Architecture Degree

All undergraduate curricula in the School of Engineering are four years in length. The computer science program leads to the Bachelor of Science in Computer Science. All other programs lead to the Bachelor of Science in Engineering (biomedical engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, environmental engineering, individually designed major, and mechanical engineering). The School of Engineering reserves the right to limit the enrollment in each program to insure that the educational process is not compromised. The five-year combined BSE/MSE Degree is completed in conjunction with the departmental honors program.

Curriculum

Freshman Year

The freshman curriculum is common to all programs except computer engineering and computer science.

Fall Semester		**Credits**
CHEM 107, 117	Chemistry I and Lab	(3/1)
PHYS 131	General Physics I (*with lab*)	(4)
MATH 121	Calculus I	(4)
ENGR 100	Introduction to Engineering and Computer Science	(1)
	and	
CPSC 101	Software Design and Programming	
	or	
ENGL 101	Writing	
	or	
****119	Writing Seminar	(4)
	Fall Semester Total:	**17**

Spring Semester		**Credits**
CHEM 108, 118	General Chemistry II and Lab	(3/1)
PHYS 132	General Physic II (with lab)	(4)
MATH 122	Calculus II	(4)
ENGR 101	Introduction to Engineering and Computer Science	
	or	
BMEN 102	Elements of BME Design	(1,2)
	or	
MCEN 102	Contemporary Issues in Mechancial Engineering Design	
	and	
CPSC 101	Software Design and Programming	
	or	
ENGL 101	Writing	
	or	
****119	Writing Seminar	(4)
	Spring Semester Total:	**17-18**

Modifications to the freshman program may be made by:

- Achievement of advanced standing through Advanced Placement Tests offered by the CEEB or International Baccalaureate.
- Submission of transcripts from other universities for equivalent courses taken prior to entering Tulane.

ROTC courses, if elected, are taken in addition to the listed freshman courses.

Each freshman is assigned a faculty adviser prior to their first semester and each is expected to consult with him or her regularly. Faculty members keep posted office hours for that purpose and are readily available for conferences.

HUMANITIES AND SOCIAL SCIENCES COMPONENT

In order to truly complete an undergraduate experience in engineering, students must be able to place their technical education in the context of societal and cultural needs. Accordingly, course work in the humanities and social sciences is considered integral to all engineering curricula. Each curriculum requires a minimum of six courses (18 credits) of acceptable humanities and social science electives in addition to English 101 or one of the 119 writing seminars. (ENGL 101, ****119 is usually taken as a freshman). The humanities and social science electives are to be chosen to provide both a broad and in depth exposure to societal and cultural issues. They are not meant to be a collection of introductory courses, nor are they intended to focus on the development of technical skills. A list of acceptable courses is available in the Dean's Office.

While the School of Engineering does not require a foreign language, it is highly recommended that students with a talent and background in languages consider using a language for some of the course work to meet the humanities and social science requirement. Engineering has become increasingly global and a background in a foreign language and culture can add significantly to a graduate's credentials.

Students must satisfy the following requirements:

Humanities: At least one approved course (3 credits) must be selected from the humanities, which include art history, American studies, classics, communications, dance, English, foreign languages, history of architecture, Jewish studies, music, philosophy, and theater.

Social Sciences: At least one approved course (3 credits) must be taken in the social sciences, which include anthropology, economics, education, geography, history, Latin American studies, political economy, political science, psychology, sociology, and women's studies.

World Culture: Of the six courses selected to satisfy the humanities and social science requirement, one (3 credits) must be chosen from a list of courses in World Culture.

Breadth: Courses must be selected in a minimum of three different departments.

Depth: Two courses must be selected in each of two departments.

Humanities and Social Sciences electives may be taken satisfactory/unsatisfactory.