

COLLEGE of ENGINEERING

Dean *Steven P. Castillo*

Associate Dean/Academic Programs *William C. McCarthy**

Associate Dean/Director of Engineering Research Center *Rudi Schoenmackers*

Assistant Dean *Patricia Sullivan*

Assistant to the Dean/Engineering Student Services *Rosemarie Melon-Sanchez*

**Registered Professional Engineer (NM)*

Bachelor of Science Chemical Engineering, Civil Engineering, Electrical Engineering, Engineering Physics, Engineering Technology, Industrial Engineering, Mechanical Engineering, Surveying Engineering

Bachelor of Information and Communication Technology

The College of Engineering comprises seven departments: Chemical Engineering; Civil Engineering; Electrical and Computer Engineering; Engineering Technology; Industrial Engineering; Mechanical Engineering; and Surveying Engineering.

Mission of the College of Engineering

The mission of the College of Engineering is to provide our various constituencies with high-quality engineering and engineering technology programs and services. Recognizing our charge as New Mexico's land-grant institution, we strive to build these programs and services on a strong foundation of academic rigor, nationally recognized applied and basic research, and effective outreach efforts.

With respect to our undergraduate programs, we will accomplish our mission by focusing on the following goals:

1. Maintaining and further developing a world-class engineering college offering high-quality and accredited education programs that prepare students for successful engineering careers in industry and government, or for further study at the graduate level.
2. Recruiting, maintaining and further developing a diverse faculty and staff skilled at teaching, research, and providing support services.
3. Maintaining and enhancing an environment that fosters creative and critical thinking, student involvement, professional and ethical awareness, life-long learning, societal awareness and a continuous improvement philosophy.
4. Building and supporting an infrastructure of appropriate laboratories, facilities, technology, and resources that enhance the College's education, research and outreach services.
5. Initiating, developing and delivering outreach programs that positively impact New Mexico's educational systems and industrial enterprises.

Furthermore, as proposed by the Accreditation Board for Engineering and Technology* (ABET) Engineering Criteria 2000, graduates receiving baccalaureate degrees in Chemical Engineering; Civil Engineering; Electrical Engineering; Industrial Engineering; Mechanical Engineering; and Surveying Engineering will demonstrate:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs;
- an ability to function on multi-disciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;

- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global and societal context;
- a recognition of the need for, and an ability to engage in life-long learning;
- a knowledge of contemporary issues; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

The Engineering Technology programs are accredited by the Technology Accreditation Commission* of ABET. Specific skills demonstrated by graduates of this program are covered in the Engineering Technology section.

Graduate Degrees

Graduate study is available in the College of Engineering. For a listing of advanced degrees, see "Graduate Programs" in the General Information chapter of this catalog, and for additional details, see the Graduate Catalog.

Student Advisement

Students coming into the College of Engineering are encouraged to declare a major and be advised by that department. At their discretion, students may change majors any time in the course of their study by notifying the associate dean for academics. However, a change in major may result in a delay in graduation.

Students uncertain about choosing a major may list themselves as undeclared in the College of Engineering and be advised by the associate dean for academics. Undeclared students will be asked to choose a major after two semesters in the college. Students must have a declared major in order to graduate.

At the discretion of the associate dean for academics, students that do not demonstrate satisfactory progress may be required to leave the College of Engineering.

Accreditation

The Accreditation Board for Engineering and Technology (ABET), established in 1933 and composed of representatives from technical societies, assures professional standards by periodic evaluations of the programs in the College of Engineering. (ABET may be contacted at 111 Market Place, Suite 1050, Baltimore, MD 21202-4012 or by phone at (410) 347-7700.)

Continuous accreditation of the various programs by the Engineering Accreditation Commission (EAC) of ABET has been in force since 1938 for civil, electrical, and mechanical engineering, 1967 for chemical engineering, 1971 for industrial engineering, 2001 for surveying engineering, and 1994 for the M.S. in environmental engineering. The electronics and computer, civil, and mechanical engineering technology associate and baccalaureate degree programs are accredited by the Technology Accreditation Commission (TAC) of ABET.

The college is a member of the American Society for Engineering Education (ASEE).

Students who desire a broader liberal education than is provided in the four-year program are encouraged to arrange with their advisers for special programs of longer duration. Students wanting to obtain strengths in other areas of academic specialization and yet remain in engineering are encouraged to do so. Specific department heads offer advisement for such dual programs.

Basic Programs

The first year of all seven Bachelor of Science degree programs in engineering are quite similar. Listing of specific courses can be found under each of the degree requirements or curricula.

Humanities and Social Sciences

As the role of the engineering graduate requires, to an ever increasing extent, a knowledge and awareness of the interaction of engineering policy and design decisions with the whole of society, an integrated group of courses in the humanities and social sciences is required of each graduate. A listing of specific courses which may be used to satisfy the humanities and social sciences requirements is available in each department. At least 18 credits of humanities and social sciences are required for the bachelors degrees. It is expected that the courses will be selected in such a manner as to provide a coherent body of study in one or more areas and to satisfy the general education requirements of the university.

S/U Coursework

The College does not allow engineering, science, mathematics, communications and technical writing coursework graded S/U to count toward the degree requirements except for those courses specifically designated in the undergraduate catalog as S/U by the departments. Qualified students may take humanities and social science courses under the S/U option.

Math Placement

Entering freshmen with an ACTM greater than 16 or transfer students without math prerequisite transfer credits are placed into the appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students that have Advanced Placement credit for mathematics will be placed according to their AP scores but are encouraged to take the Math Placement Exam anyway to reveal areas that may require additional preparatory work. Students with an ACTM of 16 or less are placed according to the basic skills requirements of the university. At the discretion of the academic dean, math placement requirements may be altered on a case-by-case basis.

Minors

The College of Engineering offers minors in agricultural engineering, computer engineering, environmental engineering, surveying, electrical engineering, ET/manufacturing, security technology and intelligence studies, and WERC/environmental management. The surveying minor is administered by the Department of Surveying Engineering, the security technology and intelligence studies minor is administered through the Departments of Criminal Justice and Engineering Technology. The agricultural engineering and environmental engineering minors are administered by the Department of Civil Engineering. The ET/manufacturing minor is administered by the Department of Engineering Technology. The computer engineering and electrical engineering minors are administered by the Klipsch School of Electrical and Computer Engineering. Students majoring in engineering may also earn minors in other colleges.

Minor: Environmental Management (18 credits)

The environmental management minor is an interdisciplinary program administered by WERC: A Consortium for Environmental Education and Technology Development located in the Engineering Complex III building.

Requirements: A student must pass 18 credits with a grade of C or higher as outlined below. No courses may be taken S/U.

1. All students must complete the one of following (3 credits): WERC WebCT courses (classes are offered every semester and topics may vary); WERC 300, Introduction to Pollution Prevention and Its Applications; WERC 301, Introduction to Nuclear Energy Technology; WERC 350, Introduction to Energy, Environmental and Risk Assessment; WERC 425, Chemical Hygiene Awareness for New Mexico Schools; WERC 490, Special Topics.....3

2. Any two courses from the following (3 credits): WERC 330, Environmental Management Seminar I (or COE equivalent); WERC 430, Environmental Management Seminar II (or COE equivalent); WERC/ES/ET 312, Emergency Response to Hazardous Material Incidents.....3
3. Any four environmental management courses that are approved for this program (12 credits)12

Also see www.werc.net (Degree Programs - courses that are approved for this program).

ROTC

ROTC students planning to take the advanced military courses leading to a commission as second lieutenant in the Army or the Air Force should discuss their programs with their advisers before the end of the sophomore year. The large number of required engineering courses in the junior and senior engineering programs generally make some extension necessary if ROTC is to be included. Usually taking classes during the summer between the sophomore and junior year will allow sufficient additional time.

Co-op Education

After two semesters of satisfactory academic work (2.5 GPA), an engineering student may go on a work phase with one of the many companies or governmental agencies with which the university has co-op agreements. The experience obtained through alternating periods of academic and fieldwork greatly contributes to the preparation of a student for professional life. Work phases are considered to be a vital part of the educational process, and students are counseled in the selection of co-op positions that will lead to progressive learning experiences. Earnings while on work phase provide a source of financial assistance to meet educational expenses.

A significant number of undergraduate students in engineering are in the cooperative education program. Students may enroll for 1 credit while participating in a work phase having a duration of at least 15 weeks. A total of 4 credits may be earned in this manner with the approval of the cognizant department head. Internship courses ENGR 291 and 391, designed for co-op students, are listed in the "Course Descriptions" chapter of this catalog. Internship courses do not normally count toward the degree requirements but do show on the transcript to indicate Co-op experience.

General Requirements

- 1) Students in the College of Engineering majors are expected to have a 2.0 or better cumulative grade-point average before enrolling in sophomore-level engineering courses. Additionally, the Basic Skill requirement in English and math must be satisfied before enrolling in courses numbered 300 or above.
- 2) I

n order to assure continuing competency, students in the College of Engineering must have completed, with a C or better grade including transfer credit, the published prerequisites for any required engineering, technology, math, or science course before being allowed to enroll in that course.

- 3) Students in the College of Engineering must earn a C or better grade in all lower-division engineering, technology, math or science courses used to satisfy degree requirements and are encouraged to repeat any course not meeting this requirement the next time the course is offered, until the student passes the course with a C or better.

NOTE: The curricula in this catalog are subject to change if the requirements of the Accreditation Board for Engineering and Technology should change.

Requirements for Graduation

The minimum requirements for undergraduate degrees are

- 1) Satisfaction of the course requirements for the various degrees as shown by the department in which the degree is offered.
- 2) Satisfaction of all other requirements for graduation as discussed in the "Regulations" section of this catalog.

In order to maintain currency and quality in the curriculum and satisfy changes in accreditation criteria, specific requirements for a given degree may be changed after publication of the Undergraduate Catalog. Any such changes will be announced and publicized.