COLLEGE of ENGINEERING

Dean • *Steven P. Castillo*

Associate Dean (Academic Programs) • *Krist Petersen*

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

Assistant Dean (Development) • *Patricia Sullivan*

Scholarship and Career Development Coordinator • *Diane Calhoun*

Communications and special Events coordinator • *Linda Fresques*

Enrollment Specialist • *Stacey Sloan*

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.

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

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 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).

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 are placed into an appropriate math course based upon the results of the Math Placement Exam administered regularly by the NMSU mathematics department. Students with Advanced Placement or transfer credit for mathematics will be placed accordingly. Math placement may be altered at the discretion of the associate dean.

Minors

The College of Engineering offers minors in agricultural engineering, computer engineering, environmental engineering, surveying, electrical engineering, manufacturing, security technology and intelligence studies, and environmental management. The surveying minor is administered by the Department of Surveying Engineering, the security technology and intelligence studies minor is jointly administered by the Departments of Criminal Justice and Engineering Technology. The agricultural engineering and environmental engineering minors are administered by the Department of Civil Engineering. The 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 Engineering Complex III.

Requirements: (all courses must be completed with a grade of C or higher. No courses may be taken S/U.)

1. 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 of the following (3 credits): WERC 330, Environmental Management Seminar I (or equivalent); WERC 430, Environmental Management Seminar II (or equivalent); WERC/ES/ET 312, Emergency Response to Hazardous Material Incidents.....3
3. Any four approved environmental management courses (12 credits).....12

Also see http://www.werc.net/education/Environmental%20course%20requirements.pdf

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 years generally make some extension necessary if ROTC is to be included. Taking summer classes between the sophomore and junior year will usually 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 engineering students are in the cooperative education program. Students may, with the approval of their department head, earn credit while participating in a co-op work phase. Co-op credits do not normally count toward the degree requirements but do show on the transcript.

General Requirements

Students in the College of Engineering are expected to:

1) Earn a minimum cumulative grade-point average of 2.0 before enrolling in engineering courses number 200 or above
2) Have completed (with a grade of C, or better) the prerequisites for each engineering, technology, math, and science course taken .
3) Earn at least a grade of C in all engineering, technology, math and science courses numbered below 200 which are specifically required for the degree.
4) Repeat all courses which have not been satisfactorily completed, each semester they are offered.

Requirements for Graduation

The minimum requirements for undergraduate degrees are

1) Satisfaction of the university requirements as previously outlined in the "Regulations" section of this catalog.
2) Satisfaction of the college requirements as outlined under "General Requirements", above.
3) Satisfaction of the departmental rules and course requirements as outlined in the program descriptions later in this catalog.

NOTE: In order to maintain quality, remain current , and satisfy changes in accreditation criteria, requirements which have been published may be changed. Any such changes will be announced and will not be retroactive . Always consult an academic advisor before registering for classes.

General Education requirements were under revision at the time of publication. Students must check with their academic adviser for current requirements and lists of specific courses that meet these requirements.

CHEMICAL ENGINEERING

Associate Professor Martha C. Mitchell*, department head
Professor Richard L. Long*#, associate department head

Professors Long*#, Johnson, Ghassemi, Munson-McGee, Patton (emeritus), Roubicek (emeritus); ***Associate Professors*** Andersen, Mitchell*, Rockstraw*; ***Assistant Professors*** Deng; ***College Professor*** Del Valle

(505) 646-1214

**Registered Professional Engineer (NM)*
#Registered Professional Engineer (State other than NM)

DEGREE: Bachelor of Science in Chemical Engineering

Chemical engineers combine their knowledge of science, mathematics, and physics with their expertise in engineering analysis to solve industry-level problems in both the private and public sectors. An undergraduate degree leads to an exciting career in fields such as computer chip manufacturing; environmental restoration and pollution prevention; biotechnology and bioengineering; pharmaceutical manufacturing; food production; transportation (including automotive and aerospace); advanced materials; petrochemical and refining; chemical synthesis and production; power and energy production (including the nuclear industry); law, medicine or advanced studies at the graduate level.

In support of the mission of New Mexico State University, the Department of Chemical Engineering strives to prepare Chemical Engineering Bachelor of Science graduates to successfully and safely practice the chemical engineering profession, to engage in life-long personal and professional development, and to contribute to the betterment of their community and society.

To accomplish this mission, the department supports the objectives of the college and the university and expands the objectives to satisfy the needs of the Chemical Engineering constituent groups. The department strives to achieve the objectives of providing all graduating B.S. students with: