WHAT IS CHEMICAL ENGINEERING?
Chemical engineering is that part of the engineering profession that deals with materials that undergo a change in chemical composition, energy content, or physical state. The job of the chemical engineer is to make practical application of the laboratory chemist's discoveries. To accomplish this, the chemical engineer must use specialized knowledge of chemistry, mass transfer operations, chemical thermodynamics, and chemical reaction kinetics. These topics distinguish chemical engineering from other branches of engineering.

WHAT CHEMICAL ENGINEERS DO
The men and women in chemical engineering perform in a number of professional areas. Some of the more common of these are:

- **Research and development**
  Designing and performing experiments followed by interpretation of the results. These experiments are performed either in the laboratory or the pilot plant (a miniature version of a commercial facility).

- **Design and construction**
  Translating pilot plant information and equipment specifications into a finished chemical manufacturing facility that is capable of producing a product profitably.

- **Operations**
  Running a commercial facility on a day-to-day basis. This work includes quality control, equipment maintenance, labor relations, and process improvement studies.

- **Production**
  Recovering natural resources from their base state. This includes production of both materials (oil, gas, coal, synfuels, metals) and energy (geothermal, solar).

- **Technical sales and service**
  Using technical knowledge to aid customers in applying your products to their own particular problems and providing those products at a reasonable price.

- **Academics**
  Teaching and carrying out fundamental studies which are the basis for the future. The professor's research projects have a major impact on the training of graduate students and on the quality of the undergraduate program.
CHEMICAL ENGINEERING
AT UNM

The Department of Chemical and Nuclear Engineering at UNM offers the bachelor of science, master of science and doctor of philosophy degrees in chemical engineering. The B.S.Ch.E. degree is fully accredited by the Accreditation Board for Engineering and Technology (ABET). The program began in 1947. Chemical and nuclear engineering programs, though differing in content, have been offered within the same department since 1972.

The undergraduate program provides a strong, fundamental education that prepares you to function in a broad spectrum of professions. Electives are offered to provide more detailed information about specific topics. Most of the graduates during the last few years have accepted first jobs in petroleum production, petroleum refining, and petrochemical processing. Other positions have included medical school, electronics, copper, nuclear materials, and geothermal development. Our students have been admitted for graduate studies at other universities throughout the nation.

The B.S.Ch.E. degree requires 130 hours of credit. You as an incoming student begin with basics: freshman English, general chemistry, general physics, calculus, and computer programming. Beginning in the sophomore year, most courses are taken in the department; the exceptions are humanities and social science electives, economics, differential equations, general engineering sciences, and the advanced chemistry courses (organic and physical). The remaining chemical engineering courses are grouped into the science and design sequences. The science sequence begins with chemical engineering calculations and includes thermodynamics, chemical reaction kinetics, chemical engineering analysis, and the technical electives. The design sequence includes heat, mass, and momentum transfer; the unit operations laboratories; and integrated senior design.

LABORATORY FACILITIES

The department has several mini-computers for your use, as well as terminals linked to the University Computing Center’s IBM 3032, which provides graphics capability. Several large design programs have been placed on the IBM 3032 computer and are used interactively by the students.

The teaching laboratories contain twenty-five different experiments in the following groups: fluid dynamics, heat transfer, mass transfer, process control, and reaction kinetics. In addition, students frequently perform special experiments for individual faculty members on a short-term basis.

The research laboratories provide you with exposure to highly specialized pieces of equipment. For example, we have air pollution monitoring devices, vacuum freezing separators, optical spectrophotometers, mass spectographs, differential thermal and thermogravimetric analyzers, gas chromatographs, and many other pieces of equipment.

RESEARCH INTERESTS

The faculty is actively committed to maintaining their skills by directing research programs that advance the profession. As an undergrad-

uate student, you frequently work with faculty and graduate students in these programs and attend the research seminars. These seminars acquaint you with the work done by chemical engineering professionals at national laboratories, industrial laboratories, and other universities. Examples of current research topics in the department are:

- **Synfuels**
  Production of liquid fuels from oil shale and tar sands, coal gasification, methane drainage from coal seams, and modeling of in situ combustion processes.

- **Freeze separations**
  Production of high purity organic chemicals with vacuum freeze crystallization and water desalination from both brackish and sea water.

- **Biochemical applications**
  Development of a glucose sensing electrode for diabetics, magnetic separation of biological products, and production of fuel alcohol from wood wastes.

- **Metal ion processing**
  Separation of impurities from metallurgical leach solutions, fractionation of radioactive
waste, and recovery of aluminum from oil shale wastes and fly ash.

- Catalysis
  Surface properties of catalytically active materials and substrates, activity of shock-treated catalysts, and co-adsorption of gases on carbon surfaces.

- Nuclear fuel cycle
  Migration of radioactive wastes in geological media, gas centrifuge and laser enrichment, and disposal methods for uranium mill tailings.

- Advanced design studies
  The effect of design on the safety and reliability of chemical plants, refineries, and synfuels operations.

- Vacuum science
- Solar gel pond
- Geothermal energy utilization
- Environmental analysis
- Stability of synthetic crudes
- Classification of international oil shales
- Carbon reactions in plasmas

PREPARING FOR CHEMICAL ENGINEERING

If you are a high school student who is considering an engineering education, you should plan your courses carefully. Good preparation in mathematics is extremely valuable, since the first required college course is calculus. Science courses are good preparation for the college-level chemistry and physics required in engineering. If you enter the University with an inadequate background there are remedial courses which may be taken, but more time will be required to finish the bachelor's degree.

An engineer must communicate and deal with human as well as technical problems. This requires good preparation in English. Writing and speaking skills acquired early in your high school career will be advantageous when you get to the University.

STUDENT ACTIVITIES

The student chapter of the American Institute of Chemical Engineers plays an important part in your life as a student at UNM. The chapter sponsors picnics, field trips, T-shirt sales, and the student lounge. The chapter also coordinates student participation in Engineering Open House.

If you excel scholastically and contribute to the department and college, you are invited to join Tau Beta Pi, the national engineering honor society.

ACADEMIC ADVISEMENT

Every student in chemical engineering is assigned an academic advisor. The department encourages close contact between you and your advisors, thus assuring you the best academic program and the best progress toward your professional degree.
FINANCIAL ASSISTANCE

Upperclassmen who demonstrate high scholastic achievement are eligible for departmental scholarships ranging from $50 to $500. Scholarships and grants for entering students with outstanding high school records are available. Information regarding these programs may be obtained by contacting:

Student Financial Aid Office
Mesa Vista Hall
The University of New Mexico
Albuquerque, NM 87131

Student Services—Scholarships
College of Engineering
Farris Engineering Center 107
The University of New Mexico
Albuquerque, NM 87131

If you wish to supplement your education with practical work experience, you may apply for the Cooperative Education Program. You spend part of the year in school and part working for an industrial employer.

THE FACULTY


ADDITIONAL INFORMATION

Are you interested? Do you still have unanswered questions? If so, please contact:

Chairman
Department of Chemical and Nuclear Engineering
The University of New Mexico
Albuquerque, NM 87131
Telephone (505) 277-5431

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