College of Engineering and Mines

Hesham El-Rewini, Dean

History and Organization

The University charter, in compliance with the Federal Enabling Act of February 22, 1889, which provided a land grant of 40,000 acres for the School of Mines in harmony with the Constitution of North Dakota, located the School of Mines at Grand Forks and made the School of Mines the Engineering College of the University of North Dakota.

The College of Engineering and Mines (CEM) offers programs in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Environmental Geosciences, Geological Engineering, Geology, Mechanical Engineering and Petroleum Engineering. All programs are housed in a central campus location with lecture rooms and laboratories in the Collaborative Energy Complex, Harrington Hall, Leonard Hall and Upson I and II.

Mission

The primary mission of CEM is to provide students a broad general education coupled with strong fundamentals that prepare graduates to successfully fill important positions in professional practice in industry and government. Program graduates will have a solid background in technical subjects, i.e., mathematics, science, engineering science and design, the ability to think and work accurately, breadth and clearness of vision, and high ideals and purposes. CEM's further mission is to engage in research and scholarly activity that contributes basic and applied discovery to enhance knowledge and student learning while being of benefit to the state, region and nation.

The College of Engineering and Mines further provides engineering programs of equal quality, via distance education, to industry and individuals through the Distance Engineering Degree Program (DEDP). Continuous and on-going assessment of student learning in accordance with specific program outcomes, including input from program constituents such as students, alumni, employers and industry advisory groups, provides opportunity to measure success and effect program improvement in meeting the mission of the College of Engineering and Mines. The mission of the College includes engineering programs being accredited by the Engineering Accreditation Commission of ABET (http://www.abet.org/).

Accreditation of Engineering Programs

The Engineering Accreditation Commission of ABET has accredited the following University of North Dakota programs: Chemical Engineering, Civil Engineering, Electrical Engineering, Geological Engineering, Mechanical Engineering, and Petroleum Engineering. Accreditation identifies professional engineering curricula that provide a solid education upon which to base engineering practice. ABET serves the public through the promotion and advancement of engineering, technology and applied science education.

State Boards of Registration governing the practice of professional engineering allow a student who is completing an accredited engineering curriculum to take the Fundamentals of Engineering (FE) examination. Engineer-In-Training certification is granted only after graduation from an accredited curriculum and passing the FE examination. Graduates who have earned Engineer-In-Training certification may typically complete the professional practice examination after four years of engineering experience acceptable to the state board of registration in the state in which they seek registration as professional engineers.

Degrees

The following baccalaureate degrees are conferred upon engineering students who have successfully completed the prescribed courses of study and who have complied with all the other requirements established by the University, including the Essential Studies Requirements for engineering students as listed later in this section: Bachelor of Science in Chemical Engineering, Bachelor of Science in Civil Engineering, Bachelor of Science in Electrical Engineering, Bachelor of Science in Environmental Geosciences, Bachelor of Science in Geology, Bachelor of Science in Geological Engineering, Bachelor of Science in Mechanical Engineering and Bachelor of Science in Petroleum Engineering.

An aerospace option/emphasis is offered through both the Electrical Engineering and the Mechanical Engineering programs. The objective of these programs is to prepare graduates for professional engineering practice while simultaneously preparing licensed pilots with an aerospace background.

Additional options and emphases are available for various degrees (e.g. Petroleum, Energetics or Sustainable Energy Engineering concentrations in Chemical Engineering, Biomedical or Computer Science concentrations in Electrical Engineering). For more information on available options and emphases, please see your advisor, your departmental office, or the Solberg Student Success Center (SSSC) in room 103 of the Collaborative Energy Complex.

Graduate Study

Graduate work, offered by departments in the College of Engineering and Mines, leads to the degrees of Master of Engineering with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Mechanical Engineering, Petroleum Engineering and Sustainable Energy Engineering; Master of Science with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Environmental Engineering, Geological Engineering, Geology, Mechanical Engineering, Petroleum Engineering and Sustainable Energy Engineering; and Doctor of Philosophy with majors in Chemical Engineering, Civil Engineering, Electrical Engineering, Energy Engineering, Environmental Engineering, Geological Engineering and Geology, Mechanical Engineering, and Petroleum Engineering. Admission to graduate work in the various departments may be granted to a student upon the recommendation of the Dean of the School of Graduate Studies and the chair of the department in which the study will be undertaken. Prospective graduate students should familiarize themselves with the material listed in the School of Graduate Studies section.

Minor in Engineering Sciences

A minor in engineering sciences is available to non-engineering students, and has a requirement of 20 credit hours as detailed below:

Required Courses		
ENGR 201	Statics	3
EE 206	Circuit Analysis	3
ENGR 202	Dynamics	3
or ENGR 203	Mechanics of Materials	
Select one of the following:		3
CE 306	Fluid Mechanics	
ME 306	Fluid Mechanics	
ME 341	Thermodynamics	
Electives		8

Any regularly offered course at the 200 or higher level with the prefix Engr, ChE, CE, EE, GE, ME or PtrE may be used as an elective. Further information is available in the Engineering Dean's Office.

Admission Policy

Admission to the University and the College of Engineering and Mines

Students planning to receive a baccalaureate degree in engineering must be enrolled in the College of Engineering and Mines. They will be admitted to the University and to the College of Engineering and Mines through the Office of Admissions. Application forms and information regarding enrollment and transferring may be obtained from that office. Students transferring to the College of Engineering and Mines from another college within the University or from another institution must have a Grade Point Average (GPA) of at least 2.0. Students planning to seek a baccalaureate degree in a non-engineering topic simply follow campus admission policies.

In some CEM programs, a student is formally admitted to the professional degree program (PDP) when the student is completing the second year of

study in the major. In these programs, admittance to the PDP is required prior to being allowed to take upper division engineering courses. Student should check with their respective CEM department for more information.

Engineering Degree Program Requirements

Most CEM degree programs require that the following requirements be met in addition to any degree-specific requirements:

1. A minimum grade of C must be earned in each of the following foundation courses:

General Chemistry		
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	4
or CHEM 221 & 221L	Fundamentals of Chemistry - Concepts and Fundamentals of Chemistry Laboratory	
English Composition		
ENGL 110	College Composition I	3
or ENGL 130	Composition II: Writing for Public Audiences	
Calculus		
MATH 165 & MATH 166 & MATH 265	Calculus I and Calculus II and Calculus III	12
General Physics (calculus-based)		
PHYS 251 & PHYS 252	University Physics I and University Physics II	8

   Additional science and engineering courses which may be prescribed by each admitting department.
2. A GPA of at least 2.0 must be maintained in all engineering courses taken to date.

Engineering Degree Program Application Procedures and Deadlines

Some degree programs require admission to the Professional Degree Program (PDP) prior to enrolling in upper-level (junior- and senior-level) coursework. Please speak with your academic advisor and/or departmental office for more information on the PDP and any relevant deadlines in your program.

If the number of applications for admission to the PDP exceeds the number of spaces available in a degree program, admission will be on the basis of program criteria that include:

1. the GPA earned in the foundation courses and all other engineering courses completed at the time of application for admission
2. additional admission criteria as specified by each program

Additional students may be admitted to an engineering degree program at other times if positions become available and interim admissions are allowed.

Reapplication Procedure

Non-admission to any degree program may be appealed through the College of Engineering and Mines Program Appeals Committee. Reapplication may be made during the next application session.

Academic and Enrollment Policy

General

A minimum 2.0 overall GPA and 2.0 UND GPA in each degree program is required of all students in engineering. If either of these GPAs drop below 2.0, the student is placed on probation for one semester. Upon completion of the probation semester the minimum GPA requirements must be satisfied.

Dismissal

Dismissal from the College of Engineering and Mines will result if the conditions of probation are not met. For a student wishing to return to the College of Engineering and Mines following dismissal, an Application for Reinstatement must be submitted to the appropriate department. A denial of reinstatement may be appealed to the College of Engineering and Mines Program Appeals Committee.

Appeals

Appeals of the Dean's decisions, and all appeals regarding admission and reinstatement, are heard by the College's Program Appeals Committee.

Graduation Requirement

A student in Engineering must obtain a 2.0 overall Grade Point Average and a 2.0 GPA for engineering courses required in the College of Engineering and Mines to satisfy graduation requirements for a degree from the College of Engineering and Mines. A student who transfers to the University of North Dakota from another college or university must also attain a 2.0 GPA for at least 30 credit hours of approved coursework taken at the University of North Dakota. Some programs have additional course requirements for transfer students.

Cooperative Education

The undergraduate programs offered by the College of Engineering and Mines prepare students for entry-level professional practice. Since career-related work experience is a valuable adjunct to the academic programs, students are encouraged to participate in the cooperative education program offered through Career Services. Students who participate in the cooperative education program are usually placed in para-professional positions in industry or government, gaining valuable working experience while seeing practical applications of the subjects in their academic studies. In addition, students can increase their understanding of career choices available in their professional fields while gaining valuable experience. Students may be able to earn academic credit for their co-op experience.

General Curriculum in Engineering

First and Second Years

The first year of the general curriculum permits a student to continue in any engineering degree program with little modification to his/her departmental program. Students who complete the third or the fourth semester of the general curriculum are required to modify their programs from those listed by their department but can, by proper scheduling, complete their degree requirements at the end of eight full semesters. Students who have not decided upon an engineering department should take the course of studies outlined in the general curriculum until they have made a departmental choice, at which time they should obtain departmental counseling on their academic program.

Course	Title	Credits
Freshman Year		
First Semester		
CHEM 121 & 121L	General Chemistry I and General Chemistry I Laboratory	4
ENGL 110	College Composition I	3
ENGR 101	Graphical Communication	3
MATH 165	Calculus I	4
	Credits	14
Second Semester		
CHEM 122 & 122L or CHEM 221 ***and*** CHEM 221L	General Chemistry II or Fundamentals of Chemistry - Concepts ***and*** Fundamentals of Chemistry Laboratory	4
MATH 166	Calculus II	4
PHYS 251	University Physics I	4
	Credits	12
Sophomore Year		
First Semester		
ENGR 201	Statics	3
ENGR 200	Computer Applications in Engineering	2
ENGL 130	Composition II: Writing for Public Audiences	3
MATH 265	Calculus III	4

PHYS 252	University Physics II	4
	Credits	16
Second Semester		
ENGR 202	Dynamics	3
ENGR 203	Mechanics of Materials	3
EE 206 or ENGR 206	Circuit Analysis or Fundamentals of Electrical Engineering	3
MATH 266	Elementary Differential Equations	3
	Credits	12
	Total Credits	54

Outlines for all four-year curricula are found in the Courses of Instruction section of the catalog. Students interested in ROTC programs should consult with their department chair and the Department of Military Science on curriculum options.

Essential Studies Requirements

The University requires completion of 39 credits of Essential Studies Requirements (see Essential Studies Requirements listing). Students enrolled in all Engineering programs must complete PHIL 250 Ethics in Engineering and Science, or an approved alternative. Most engineering programs require ENGR 460 Engineering Economy. All Engineering students should plan carefully the fulfillment of their university Essential Studies requirements so they are inclusive of these Engineering Program Requirements.

Combined Degree Program

To encourage undergraduate engineering students to extend their studies to include a graduate degree, the College of Engineering and Mines has combined programs in Chemical, Civil, Electrical, Geological, Mechanical, and Petroleum Engineering as well as Geology which permit students to earn both B.S. and M.S./M.Engr. degrees concurrently. This program allows students to designate two three-credit hour courses to count for both degrees and additional courses for graduate-only credit while completing the B.S.

- Students may be admitted to the Combined Degree Program after the completion of 95 credit hours towards the B.S. degree with a GPA of at least 3.0, and before completion of the B.S. degree.
- Completed applications must be received at the School of Graduate Studies by the application deadline.
  A complete application includes:
  - School of Graduate Studies application and application fee
  - 3 letters of reference
  - Statement of Purpose
  - Program of Study - Combined Degree

  The two three-credit hour courses designated for both degrees must not have been completed at the time of application and they must have graduate course standing.
- The student is admitted to the School of Graduate Studies on completion of 125 credit hours towards the B.S. degree with a GPA of 3.0 or higher.
- Students in the program may opt to be awarded their B.S. and M.S. degrees sequentially or at the same time.

Student Organizations

Student Societies

There are student chapters of each of the following professional and technical societies: American Association of Petroleum Geology (AAPG), American Institute of Chemical Engineers (AIChE), American Society of Civil Engineers (ASCE), American Society of Mechanical Engineers (ASME), American Water Works Association/Water Environment Federation (AWWA/WEF), Association of Engineering Geologists (AEG), Association of Undergraduate Geologists, International Society of Rock Mechanics (ISRM), Institute of Electrical and Electronics Engineers (IEEE), IEEE Computer Society, Society of Exploration Geologists (SEG), Society of Manufacturing Engineers (SME), Society of Women Engineers (SWE) and Society of Petroleum Engineers (SPE).

For information on meeting times and activities, please see your departmental office or the Solberg Student Success Center (SSSC).

Honor Societies

Eta Kappa Nu, Sigma Gamma Epsilon, and Tau Beta Pi are engineering or geology honor societies whose purpose is to recognize excellence in the scholarship.

Engineers' Student Council (E-Council)

The Engineers' Council (E-Council) of the University of North Dakota is a student organization representing all departments of the College of Engineering and Mines. E-Council, as a student chapter of the National Society of Professional Engineers (NSPE), is open to students from all engineering disciplines. Its Council Body membership comprises the Executive Members of Engineers' Council, the Vice Presidents of all active Engineering Student Organizations and Honor Societies, and the Engineering Student Senator. The purpose of E-Council is to foster student professional development and help create a sense of community between the engineering disciplines.

Distance Engineering Degree Program

The Distance Engineering Degree Program (DEDP) offers online access to accredited degree programs in Chemical, Civil, Electrical, Geological, Mechanical and Petroleum Engineering. The DEDP program includes summer on-campus laboratories and other laboratories via the internet.

On-campus courses are recorded and the files are available shortly thereafter through the internet to each student enrolled in DEDP. Through this program, students are able to complete their degree programs while taking the majority of their courses at their "home site." Students are required to travel sometime during the summer months to the UND campus to complete the laboratory portions of their programs. Students have opportunities to interact with faculty through phone, email and internet. For further information please contact UND at 1-800-225-5863.