

# COLLEGE OF ENGINEERING

## Description

Lance C. Pérez, Ph.D., Interim Dean

David Jones, Ph.D., Associate Dean for Undergraduate Programs

## Role and Mission

The College of Engineering enthusiastically embraces its unique role as the singular intellectual and cultural resource for engineering instruction, research, and outreach within the state. It provides the people of Nebraska with comprehensive engineering academic programs to fulfill their highest aspirations and ambitions.

The missions of the College of Engineering at the University of Nebraska–Lincoln are:

- to deliver relevant and challenging educational programs to attract an outstanding diverse student body, prepare graduates for rewarding careers in their chosen professions, and encourage graduates to extend their level of knowledge through lifelong learning;
- to conduct leading edge research advances in engineering science, and stimulate the intellectual development and creativity of both students and faculty; and,
- to extend exemplary engineering service and transfer knowledge that contributes to the well-being and betterment of society.

## Administrative Structure

The College of Engineering is located on three campuses (Lincoln City Campus, Lincoln East Campus, and Scott Campus), and has two Dean's Offices, 114 Othmer Hall in Lincoln and 100 Peter Kiewit Institute in Omaha. The College is subdivided into units, each under the leadership of a chairperson, department head, or director.

## Admission

### College Admission

#### College Entrance Requirements

Students must have high school credit for (one unit is equal to one high school year):

1. 4 units of mathematics: 2 of algebra, 1 of geometry, 1 of precalculus and trigonometry.
2. 4 units of English.
3. 3 units of natural science that must include 1 unit of physics and 1 unit of chemistry (chemistry requirement waived for students in construction management).
4. 2 units of a single foreign language.
5. 3 units of social studies.
6. Students having a composite ACT score of 28 or greater (or equivalent SAT score) will be admitted to the College of Engineering even if they lack any one of the following: trigonometry, chemistry, or physics.
7. Students having an ACT score of 19 or less in English (or equivalent SAT score) must take ENGL 150 Writing and Inquiry or ENGL 151 Writing and Argument.

A total of 16 units is required for admission.

Students must have an ACT (enhanced) score of 24 or greater (or equivalent SAT). Students who lack entrance requirements may be

admitted based on ACT scores, high school rank and credits, or may be admitted to pre-engineering status in the Exploratory and Pre-Professional Advising Center. Pre-engineering students are advised within the College of Engineering.

Students for whom English is not their language of nurture must meet the minimum English proficiency requirements of the University.

Students who lack entrance units may complete precollege training by Independent Study through the UNL Office of On-line and Distance Education, in summer courses, or as a part of their first or second semester course loads while in the Exploratory and Pre-Professional Advising Center or other Colleges at UNL.

Students should consult their advisor, their department chair, or Engineering Student Services if they have questions on current policies.

## Other Admission Requirements

Students who transfer to the University of Nebraska-Lincoln from other accredited colleges or universities and wish to be admitted to the College of Engineering (COE) must meet COE freshman entrance requirements, have a minimum cumulative GPA of 2.5, and be calculus-ready. Students not meeting all of these requirements must enroll in the Explore Center or another UNL college until they meet COE admission requirements.

The COE accepts courses for transfer for which a C or better grade was received. Although UNL accepts D grades from the University of Nebraska at Kearney and at Omaha, not all majors in the COE accept such low grades. Students must conform to the requirements of their intended major and, in any case, are strongly encouraged to repeat courses with a grade of C- or less.

All transfer students must adopt the curricular requirements of the undergraduate catalog current at the time of transfer to the COE—not that in use when they entered UNL. Upon admission to UNL, students wishing to pursue degree programs in the COE will be classified and subject to the policies defined in the subsequent section.

## Advising

### Academic Advising

Advisors assigned to students are either part of the Engineering Student Services located in the Engineering Library, or are in the student's major department.

## Student Responsibility

### Application for the Diploma

Students are expected to develop a clear understanding of degree requirements and to plan their course of study with a College advisor. Students requiring clarification of outstanding degree requirements should visit with a College advisor promptly.

Students should access their Degree Audit via MyRed at least once each term to review degree requirements and progress toward graduation. It is the student's responsibility to make sure their Degree Audit accurately reflects their current College and program of study.

Students who believe their Degree Audit has errors or omissions should visit with a College advisor promptly. It is important that these matters be resolved as soon as practicable to avoid a delay in graduation.

Each student with MyRED access must submit an online Application for Graduation via MyRED for each degree to be received by:

- The last Friday in January for May graduation
- The last Friday in June for August graduation
- The last Friday in September for December graduation

Students submitting an electronic Application for Graduation via MyRed will be billed a \$25.00 per degree fee on their student account. Those students without MyRED access may apply for graduation in person at the Office of the University Registrar, 107 Canfield Administration Building or by mail. Applications for Graduation submitted in person or by mail must be accompanied by a check or money order in the amount of \$25.00 payable to the University of Nebraska–Lincoln. Failure to submit a timely Application for Graduation may preclude the awarding of a degree in the intended term.

Your Application for Graduation and required \$25.00 fee are good only for the term marked on your application. Neither your application nor your fee, are transferrable to another term. If you submit an Application for Graduation and pay the \$25.00 fee for a specified term but do not complete your degree requirements in that term, you will need to reapply to graduate in a future term and incur another \$25.00 fee.

Commencement ceremony information will be emailed to all degree applicants approximately one month before graduation. Each student who has applied for graduation must submit an online Commencement Attendance Form via MyRED, which will be available when the informational email is distributed.

Only those students who have applied for graduation, had the application accepted, and fulfilled all degree requirements as of the last day of the academic term may participate in the commencement ceremony for that term. Because the University of Nebraska–Lincoln has a commencement for each term, ceremony participation is allowed only in the term during which the student has properly and timely applied for graduation and fulfilled degree requirements.

## Academic Programs & Policies

### Honors Program

#### Honor Societies

These recognize students who excel in scholarship and give promise of being leaders in professional areas. They are branches of national societies and are generally open upon invitation to juniors and seniors: Alpha Epsilon (agricultural engineering), Chi Epsilon (civil engineering, both campuses), Eta Kappa Nu (electrical engineering), Pi Tau Sigma (mechanical engineering), Sigma Lambda Chi (construction management), Sigma Xi (scientific, all colleges), Tau Alpha Pi (engineering technology, Omaha campus), and Tau Beta Pi (all engineering).

### Student Recognition

#### Graduation with Distinction

Students with outstanding scholastic records may obtain the special honor of graduation With Distinction, With High Distinction, or With Highest Distinction upon the recommendation of the faculty of the College. Check with your major department for specific requirements of each degree.

### Student Standing/Classification/Professional Admission

**Professional Admission to a student's degree program is a requirement for graduation from that program.**

**Explore Center Pre-Engineering Students.** These are students who aspire to enter the College of Engineering but who are not immediately admitted due to not meeting one or more admission criteria such as

required high school mathematics, chemistry or physics course(s), ACT, or other qualifications. These students are admitted to the Explore Center and receive advising services from the Explore Center. These students may enroll in ENGR 10 Freshman Engineering Seminar and 100-level engineering courses provided they meet the prerequisites on a space-available basis. Once the student has earned a 2.5 cumulative GPA in at least 12 credit hours and has removed all entrance deficiencies they will be admitted to the College of Engineering (COE).

After being admitted to the COE, students wishing to pursue degree programs in the College of Engineering will be classified as described below.

**Pre-Professionally Admitted COE Students.** These are students who have been admitted to the College of Engineering and are in the process of establishing their academic credentials and confirming their choice of major. Transfer students from other colleges or universities, or from the Explore Center, will be classified as pre-professionally admitted for at least one semester (12 credits) while they confirm their career path and establish their academic credentials (see Professional Admission). Most students are in pre-professionally admitted status for one to four semesters. Pre-professionally admitted students may enroll in upper level engineering courses provided they meet the prerequisites, space is available, and no departmental restrictions exist.

**Professionally Admitted COE Students.** These students may register in engineering courses where they meet all prerequisites or have permission. A professionally admitted student who wishes to transfer from one COE major to another must re-apply for Professional Admission to gain professionally admitted status in the new major, subject to the admission criteria of the new major.

Students who are enrolled in the Explore Center or in other colleges may enroll only in ENGR 10 and 100-level engineering courses. Those with greater than a 2.5 cumulative GPA may register in upper-level engineering courses, but only on a space-available basis in courses where they meet all prerequisites and have permission from the department. These students may retake an engineering course for C-, D, and F removal no more than once, on a space-available basis and with permission. They may repeat courses with a previous withdrawal (W) only once.

Professional Admission must be earned by a student in order to move from pre-professionally admitted status to professionally admitted status within the College of Engineering. Review of the student's academic history is completed by the department of the student's intended major after the student has completed at least 43 credit hours within his or her intended degree program. Additional review criteria are based on the individual degree program and can be found under that major's information in the undergraduate catalog.

A student may be reviewed up to two times for Professional Admission in a single major. If the student is rejected for Professional Admission on the second review, the student will not be allowed to continue in that major. The student may choose to pursue a new College of Engineering major, but will be subject to the review criteria of the new major. If the student is rejected for Professional Admission by the new major, the student will be dismissed from the College of Engineering. Further reviews for Professional Admission will not be allowed and the student will no longer be eligible to enroll in College of Engineering courses.

**College Probation.** A student who receives a cumulative grade point average (GPA) of less than a 2.4 will be placed on college probation. The student will remain on probation until a semester is completed with a cumulative GPA at or above 2.4. Any student with two sequential

semesters on college probation will be dismissed from the College of Engineering.

The first semester of probation is defined as the semester in which failure to meet a cumulative or semester GPA threshold, a course failure or withdrawal, or a code of conduct violation occurs.

Completion of the following semester (12 credits) with a semester GPA above 2.4 is required for a student to be removed from the college probation. Students may be placed on college probation (or dismissed) for violation of the UNL Student Code of Conduct at any time. A student cannot graduate from the College of Engineering while on college probation.

**College Dismissal.** A student will be dismissed from the College of Engineering at the end of any semester in which:

- The student has been on college probation for two sequential semesters
- The student is dismissed by UNL

Students may also be dismissed for violating the UNL Student Code of Conduct at any time. College dismissal will cause an administrative change in the student's matriculation to the Explore Center or to a college indicated by the student. Students who have been dismissed from the College of Engineering may be readmitted (one time only) provided they have removed all academic deficiencies that led to dismissal.

### General College Policies

These policies are applicable to all students in the College of Engineering:

1. Student priority for entrance into classes for which demand exceeds available class space will be based on accumulative GPA. This priority will be applied at the end of early registration (when applicable).
2. Students may repeat a maximum of three engineering courses. Students may take any one engineering course a maximum of two times.
3. At least 30 of the last 36 credit hours needed for a degree must be registered for and completed at UNL or UNO while identified with the College of Engineering. This means that, practically speaking, the last year of a student's work must be spent in residence. Credit earned during education abroad may be used toward degree requirements if students participate in prior approved programs and register through UNL (see <http://educationabroad.unl.edu>).
4. Pass/No Pass courses: Students in the College of Engineering must take ENGR 10 Freshman Engineering Seminar, ENGR 20 Sophomore Engineering Seminar, ENGR 30 Transfer Student Engineering Seminar, and ENGR 400 Professional Ethics and Social Responsibilities with the grading option Pass/No Pass. In addition, students may take up to 12 credit hours of courses in the humanities and social sciences on a Pass/No Pass basis. Students in the College of Engineering may not take any other required courses or technical elective courses with the grading option of Pass/No Pass.
5. Credits for "international students who are non-native speakers of English" at UNL and "English as a Second Language" at UNO are not applicable to degree programs in the College of Engineering.
6. Six hours of English composition may be substituted for the written communications requirement in all engineering degree programs.
7. Students who enroll at UNL, UNO, or UNK under the academic year (Fall, Spring, Summer) of this catalog must fulfill the requirements stated in this UNL catalog or in any other UNL catalog which is published while they are enrolled in the College, provided that the

catalog is no more than 10 years old at the time of graduation. A student must, however, meet the graduation requirements from one catalog only. A student may not choose a portion from one catalog and the remainder from another catalog.

**Undergraduate Seminars.** Freshmen engineering students are required to attend ENGR 10, a 0 credit course. The Freshman Engineering Seminar provides information on engineering disciplines, resources and tools available to students at UNL, and opportunities to meet engineering faculty members. Transfer engineering students are required to attend ENGR 30, a 0 credit course, which exposes newly arrived transfer students to the tools and resources available to them as UNL College of Engineering students. Sophomore engineering students are required to attend ENGR 20, a 0 credit course. The Sophomore Engineering Seminar provides information on career planning, interviewing, resumé preparation and coop/internship opportunities.

**Design Requirement.** All engineering majors require a minimum of 48 credit hours of engineering topics (engineering topics include subjects in the engineering sciences or engineering design). Engineering design is the process of devising a system, component or process to meet desired needs. Engineering design work may be done by individuals; however, team efforts are encouraged where appropriate. Engineering majors are provided an integrated engineering design experience throughout the curriculum. In addition, all engineering programs include a meaningful major design experience that builds upon the fundamental concepts of mathematics, basic sciences, humanities, social sciences, engineering topics, and communication skills.

## Catalog to Use

Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted at UNL. In consultation with advisors, a student may choose to follow a subsequent catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at UNL in the College of Engineering. Students must complete all degree requirements from a single catalog year. The catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

## College Degree Requirements

### Grade Rules

#### Grade Appeals

In the event of a dispute involving any college policies or grades, the student should appeal to his/her instructor, and appropriate department chair or school director (in that order). If a satisfactory solution is not achieved, the student may appeal his/her case through the College Academic Appeals Committee on his/her campus.

## Degrees & Majors Engineering

To meet the need for innovative engineers, the College's programs offer broad education in the physical sciences, social sciences, mathematics, information sciences, and humanities. This education is complemented by study of engineering methods of modeling, analysis, synthesis, and design in students' areas of specialization. In addition to preparing students for careers in engineering, the College's bachelors degree programs provide excellent preparation for graduate study in those fields.

## Construction Management

This profession is allied with architecture, engineering, and business. Construction managers coordinate people, machines, and materials to produce (within the constraints of budget and time) buildings, highways, bridges, dams, and other structures essential to modern society. The College's construction management program provides a solid technical background, develops business knowledge, and considers ethical issues of the profession.

## Undergraduate Programs

**Engineering.** The College offers bachelor of science degree programs in each of the following engineering fields: agricultural engineering, architectural engineering (Omaha campus only), biological systems engineering, chemical engineering, civil engineering, computer engineering, construction engineering, electrical engineering, electronics engineering (Omaha campus only), and mechanical engineering. Over 85 percent of all the engineering degrees granted in the United States during the last five years were granted in these fields. Students with interests in specialty fields such as aerospace, environmental, or biomedical engineering should seek advice in the Engineering Student Services Center on how to incorporate such emphases into the above degree programs.

**Construction Management.** The College offers the bachelor of science degree program in construction management, a program accredited by The American Council for Construction Education.

**Dual Degrees.** Students can major in two departments in the college by consulting their advisors (one from each department) and completing all the requirements for the departmental majors.

## Minors & Areas of Specializations Offered

### Approved Minors for College of Engineering Students

#### Policies

1. A minor will not reduce or alter the existing course or degree requirements for students electing to pursue a minor.
2. A student's minor program(s) must be organized and approved by an advisor prior to the submission of the senior check to the department chair or head.
3. The minor(s) must be approved by the Engineering Dean and the cognizant program offering the minor(s).
4. The College of Engineering will follow the "A/B" format of the Arts and Sciences College in which a student pursuing a single minor must complete the "A" requirements. A student pursuing a double (or greater) minor must fulfill either the "A" or "B" requirements for both minors depending on which plan is offered by the cognizant department.
5. Minors on the Lincoln or Omaha campuses may be added to the following list on approval of the College of Engineering Curriculum Committee and faculty.

### Approved Minors

If not otherwise listed here, refer to the individual college sections for requirements on the following minors.

#### Aerospace Studies

#### Agricultural Economics

#### Agricultural Leadership, Education and Communication

#### Agriculture and Natural Resources

#### Agronomy

#### Animal Science

#### Art

#### Art History

#### Biochemistry

#### Biological Sciences

#### Biomedical Engineering Minor

#### Business Minor for Jeffrey S. Raikes School of Computer Science and Management (Plan A only)

- This minor is applicable only to students participating in the Jeffrey S. Raikes School of Computer Science and Management. All courses must be taken for a letter grade.

#### Chemistry

- Chemical Engineering students cannot earn this minor.

#### Classical Languages

#### Communication Studies

- Engineering students may not use internship credit to satisfy this minor.

#### Computational Biology and Bioinformatics

#### Computer Science

- Refer to the College of Arts and Sciences for the computer science minor.

#### Construction Management (Plan A only)

- All courses must be taken for a letter grade.

#### Economics

#### Energy Science

- For information about the energy science minor, please contact Professor Adam Liska, 402-472-8744, [aliska2@unl.edu](mailto:aliska2@unl.edu).

#### Engineering Leadership

#### Engineering Mechanics (Plan A only)

#### English

#### Ethnic Studies

#### Food Science & Technology

#### General Business (Plan A only)

- All courses must be taken for a letter grade.

#### Required Courses

|                        |  |    |
|------------------------|--|----|
| ACCT 200               | Accounting for Business Decisions                    | 3  |
| ECON 200               | Economic Essentials and Issues                       | 3  |
| FINA 300               | Financial Decision Making                            | 3  |
| MRKT 300               | Contemporary Marketing                               | 3  |
| MNGT 300               | Management Essentials For Contemporary Organizations | 3  |
| BLAW 300               | Business, Government & Society                       | 3  |
| Credit Hours Subtotal: |  | 18 |
| Total Credit Hours     |  | 18 |

- **Note:** No more than one course may be transferred from another institution into the General Business minor.

#### Geography

#### Geology

#### Global Studies

#### History

#### Informatics

#### International Agriculture and Natural Resources

#### International Engineering

#### Landscape Architecture

#### Leadership & Entrepreneurship

#### Mathematics for Engineers (Engineering students only)

#### Meteorology-Climatology

#### Modern Languages (Engineering students only)

- Czech
- French, German and Russian
- Japanese



- Spanish

**Music**

**Music Technology**

**National Security Studies**

**Philosophy**

**Physics**

**Political Science**

**Psychology**

**Robotics Engineering**

**Society and the Environment**

**Sociology**

**Software Development (not allowed for computer engineering or electrical engineering majors)**

**Water Science**

**Women's and Gender Studies**

## Graduate Student Information

Courses supporting several engineering graduate programs are offered both on and off campus. For details, see the University of Nebraska–Lincoln Graduate Studies Catalog and contact the appropriate department or the Office of the Dean of the College of Engineering.

Seniors in this University who have obtained prior approval of the Dean of Graduate Studies may receive up to 12 hours credit for graduate courses taken in addition to their required undergraduate work. However, these credits must be earned within the calendar year prior to receipt of the bachelors degree. For procedures, inquire at the UNL Graduate Studies Office. Graduate credits earned prior to receipt of the bachelors degree may not always be accepted for transfer to other institutions as graduate work.

## Other

### Professional Licensure

The College encourages professional licensure. The majority of the College's engineering seniors take the Fundamentals of Engineering (FE) examination prior to graduation. This examination is administered by the Nebraska Board of Engineers and Architects, a state agency, and the first step in the process of becoming a licensed professional engineer. To become a licensed professional engineer, one must pass the FE exam, have four years of experience, and pass a professional practice examination. Students may take the FE exam in the last semester of their baccalaureate program.

### Accreditation

The agricultural engineering, biological systems engineering, chemical engineering, civil engineering (Lincoln and Omaha campuses), computer engineering (Lincoln and Omaha campus), electrical engineering, electronics engineering, and mechanical engineering programs are accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), <http://www.abet.org>.

The master of architectural engineering is also accredited by the Engineering Accreditation Commission of the Accreditation Board for Engineering and Technology (ABET), <http://www.abet.org>.

The construction management program is accredited by the American Council for Construction Education.

## Practical Training

For a student who anticipates pursuing a career as a practicing engineer, it is strongly recommended that the student engage in an internship or equivalent practical training experience.

## Scholarships and Financial Aid

Each year the College awards scholarships to freshmen and upperclassmen worth more than \$750,000. Scholarship awards are made possible through generous gifts of alumni and friends, local and national organizations, and through funding by the Nebraska Legislature. Contact the Office of the Dean or the Office of Scholarships and Financial Aid for information regarding these awards and for other financial assistance.

Application for UNL freshmen scholarships automatically makes you eligible for College of Engineering scholarships as well as other university awards such as the Regents and David scholarships. You must submit the UNL Application form (due January 15, prior to the beginning of the next academic year) to be eligible.

A significant number of entering students have academic records that qualify them for university-wide scholarship awards. Each year about 25 percent of the freshman Regent Scholarship recipients are engineering students.

A large number of students are able to find part-time employment in fields related to their interests.

## Student Organizations in the College

### Technical Societies

The technical student societies help develop a greater personal and professional interest and understanding in engineering, computer science and construction management. Student branches of the major national technical and scientific societies are sponsored by the academic programs and departments.

**Lincoln Campus.** American Institute of Chemical Engineers; The Society for Engineering in Agricultural, Food, and Biological Systems; American Society of Civil Engineers; American Society of Mechanical Engineers; Associated General Contractors; Association for Computer Machinery; Institute of Electrical and Electronic Engineers; American Society for Metals; Student Advisory Board; Institute of Transportation Engineers; National Society of Black Engineers; Society of American Military Engineers; Society of Women Engineers; and Society of Automotive Engineers.

### Lifelong Learning

The education of professionals in construction management and engineering is a continuing process. The groundwork in both technical and nontechnical studies is laid while in college, but education continues after graduation. For a professional, education will continue not only in the technical areas but in areas that relate to human and social concerns. A professional may expect to take a leadership role in the community and must have a broad awareness of human and social accomplishments, needs, values, and a willingness to take the responsibility for meeting these needs. For these reasons, an integrated program of course work in the humanities and social sciences is a part of the educational requirements.