## ROBOTICS ENGINEERING MINOR

### Description
This minor is available to all majors. Consult with your advisor before declaring this minor.

The robotics engineering minor is jointly administered by the Departments of:

- Electrical and Computer Engineering (ECE)
- Computer Science and Engineering (CSE)
- Mechanical and Materials Engineering (MME)

### College Requirements

#### College Admission

#### College Entrance Requirements

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

1. Mathematics – 4 units: 2 of algebra, 1 of geometry, and 1 of precalculus and trigonometry
2. English – 4 units
3. Natural sciences – 3 units that must include 1 unit of physics and 1 unit of chemistry (chemistry requirement waived for students in construction management)
4. Foreign language – 2 units of a single foreign language
5. Social studies – 3 units
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 Exploratory and Pre-Professional Advising Center.

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 University of Nebraska–Lincoln 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 Nebraska.

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 and have a minimum cumulative GPA of 2.5 and be calculus-ready. Students not meeting either of these requirements must enroll in the Explore Center or another University college until they meet COE admission requirements. Students transferring from UNO, UNL, or UNK to the College of Engineering must be in good academic standing with their institution.

The COE accepts courses for transfer for which a C or better grade was received. Although the University of Nebraska–Lincoln 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 the University of Nebraska–Lincoln. Upon admission to Nebraska, students wishing to pursue degree programs in the COE will be classified and subject to the policies defined in the subsequent section.

Students who were previously admitted to COE and are returning to the College of Engineering must demonstrate a cumulative GPA of 2.5 in order to be readmitted to COE.

### 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.

#### Catalog Rule

Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted at the University of Nebraska–Lincoln. 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 Nebraska in the College of Engineering. Students must complete all degree requirements from a single catalog year. The catalog which a student follows for graduation must demonstrate a cumulative GPA of 2.5 in order to be readmitted to COE.

### Requirements for Minor Offered by Department

This minor is available to all majors. Consult with your advisor before declaring this minor.

The robotics engineering minor consists of three core courses and three elective courses. When selecting electives, the student must take two courses outside of their major area of study. For example, a student in mechanical engineering might take an elective from the Department of Computer Science and Engineering and one from the Department of Electrical Engineering.
### Core Requirements
Select one course from each of the three following topic areas:

**Topic Area: Core Programming**
- CSCE 155A  Computer Science I
- CSCE 156  Computer Science II
- CIST 1400  UNO course

**Topic Area: Controls**
- MECH 350  Introduction to Dynamics and Control of Engineering Systems
- ECEN 444  Linear Control Systems
- ECEN 220  Introduction to Embedded Systems
- ECEN 491  Special Topics in Electrical and Computer Engineering IV

**Topic Area: Embedded Systems**
- ECEN 106  Microprocessor Applications
- CSCE 236  Embedded Systems
- MECH 457  Mechatronic Systems Design

Credit Hours Subtotal:  9-10

### Elective Requirements
Three courses from the following list of electives are required; two must be outside your department.

- ECEN 400  Electronic Instrumentation
- ECEN 428  Power Electronics
- ECEN 444  Linear Control Systems
- ECEN 460  Labview Programming
- ECEN 462  Communication Systems
- ECEN 498  Special Topics in Electrical Engineering IV
- CSCE 436  Advanced Embedded Systems
- CSCE 439  Robotics: Algorithms and Applications
- CSCE 473  Computer Vision
- CSCE 476  Introduction to Artificial Intelligence
- CSCE 4XX  special topics courses on Robotics
- ECEN 345  Mobile Robotics I
- ECEN 433  Microprocessor System Design
- ECEN 435  Embedded Microcontroller Design
- MECH 342  Kinematics and Dynamics of Machinery
- MECH 450  Mechanical Engineering Control Systems Design
- MECH 442  Intermediate Kinematics
- MECH 444  Intermediate Dynamics of Machinery
- MECH 449  Advanced Dynamics
- MECH 453  Robotics: Kinematics and Design
- MECH 458  Digital Control of Mechanical Systems
- MECH 488  Kinematics and Machine Design Laboratory

Credit Hours Subtotal:  7-10

Total Credit Hours  16-20

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1. *On the Omaha Campus—similar courses being offered by CIST could be substitutions.*

### Grade Rules
**Pass/No Pass**
No course taken Pass/No Pass will be counted toward the minor.