CONSTRUCTION ENGINEERING, BACHELOR OF SCIENCE

Description
Construction engineering (CONE) is a program of the Charles W. Durham School of Architectural Engineering and Construction. The construction engineering major integrates engineering, construction and management courses. This program is designed for persons fulfilling the construction industry’s need for licensed professional engineers. It resembles the construction management program but provides a greater emphasis on engineering, scientific, and technical courses to meet requirements for licensure as a professional engineer. The courses focus on the application of engineering principles to solve real-world construction problems. They include instruction in civil engineering, structural principles, material testing and evaluation, project management, computer-assisted design, 3D animation, sustainability, and graphic communication.

The Durham School Construction Engineering program is accredited by the Engineering Accreditation Commission (EAC) of ABET, Inc.

Program Educational Objectives (PEOs)
1. Professional Achievement: The Construction Engineering program prepares graduates to become Licensed Professional Engineers and Certified Professional Constructors.
2. Career Achievement: The Construction Engineering program prepares graduates to contribute to society by working in an occupation related to the architecture-engineering-construction industry.

Under the stimulus of increasing demand for global services, many Nebraska companies have expanded their reach well beyond U.S. borders. This demand gives the construction engineering graduate an unprecedented number of opportunities for employment—locally, nationally and internationally—and for pursuing an advanced degree at the University of Nebraska–Lincoln or elsewhere.

Construction engineers participate in the preparation of engineering and architectural documents, including specifications, which they translate into finished projects such as buildings for housing, commerce and industry, highways, railroads, waterways, airports, power plants, energy distribution systems, military bases and space center complexes. These projects involve thousands of details shared by a team of owners, architects, engineers, general constructors, specialty constructors, manufacturers, material suppliers, equipment distributors, regulatory bodies and agencies, labor resources and others. The constructor assumes responsibility for delivery of the completed project at a specified time and cost and also accepts associated legal, financial and management obligations. Because of the broad scope of the construction engineer’s project responsibility, they must assure the project’s constructability as well as its capability to be operated and maintained.

Construction engineering students are required to enroll in a set of courses specifically designed for a general construction education. Each student selects, with the guidance of an advisor, a set of approved electives.

Professional Admission Requirements
In order to be professionally admitted into the construction engineering program, students must complete at least 43 credit hours of courses listed in the first two years of the required curriculum with a minimum GPA of 2.5 for those major courses (not necessarily the cumulative GPA).

Learning Outcomes
Graduates of the construction engineering program will have:
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

The above student outcomes have been approved by the ABET Engineering Area Delegation for use beginning with the 2019-20 academic year, and have been adopted by the faculty of the Charles W. Durham School of Architectural Engineering and Construction.

Requirements
Students are required to enroll in a predetermined set of courses specifically designed for general construction education. Each student selects, with the approval of their advisor, a set of approved electives.

Course Title Credits
First Semester
CHEM 1180 GENERAL CHEMISTRY I 3
CHEM 1184 GENERAL CHEMISTRY I LABORATORY 1
CMST 1110 PUBLIC SPEAKING FUNDS 3
CONE 103 INTRODUCTION TO CONSTRUCTION ENGINEERING 1
CIST 1400 INTRODUCTION TO COMPUTER SCIENCE I 3
MATH 1950 CALCULUS I 5
ENGR 10 FRESHMAN ENGINEERING SEMINAR 0

Second Semester
CNST 112 CONSTRUCTION COMMUNICATIONS 3
MATH 1960 CALCULUS II 4
PHYS 2110 GENERAL PHYSICS I - CALCULUS LEVEL 4
PHYS 1154 GENERAL PHYSICS LABORATORY I 1
ACE Elective 2

Third Semester
CNST 221 GEOMETRIC CONTROL SYSTEMS 3
ENGR 20 SOPHOMORE ENGINEERING SEMINAR 0
ENGL 3980 TECHNICAL WRITING ACROSS THE DISCIPLINES 3
MATH 1970 CALCULUS III 4
MECH 223 ENGINEERING STATICS 3
PHYS 2120 GENERAL PHYSICS-CALCULUS LEVEL 4

Credits 16
Credits 15
Credits 17
Electives

Students are required to enroll in a predetermined set of courses specifically designed for general construction education. Each student selects, with the approval of their advisor, a set of approved electives.

Technical electives are selected from the following list. One (3 credit hour) of the required two electives needs to be considered a design technical elective.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CONE 416</td>
<td>WOOD/CONTEMPORARY MATERIALS DESIGN</td>
<td>3</td>
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<tr>
<td>CONE 417</td>
<td>FORMWORK SYSTEMS</td>
<td>3</td>
</tr>
<tr>
<td>CONE 481</td>
<td>HIGHWAY &amp; BRIDGE CONSTRUCTION</td>
<td>3</td>
</tr>
<tr>
<td>CONE 483</td>
<td>SUPPORT OF EXCAVATION</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 443</td>
<td>ADVANCED STRUCTURAL ANALYSIS</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 444</td>
<td>STRUCTURAL DESIGN AND PLANNING</td>
<td>3</td>
</tr>
<tr>
<td>CIVE 446</td>
<td>STEEL DESIGN II</td>
<td>3</td>
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<tr>
<td>CIVE 447</td>
<td>REINFORCED CONCRETE II</td>
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Technical Electives

All previously listed Design Electives

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<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>CIVE 379</td>
<td>CONSTRUCTION ESTIMATING II</td>
<td>3</td>
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<tr>
<td>CIVS 434</td>
<td>THE DESIGN-BUILD PROJECT DELIVERY SYSTEM</td>
<td>3</td>
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<td>CONE 450</td>
<td>SUSTAINABLE CONSTRUCTION</td>
<td>3</td>
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<tr>
<td>CONE 466</td>
<td>HEAVY AND/OR CIVIL ESTIMATING</td>
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ACE Requirements

The CONE program follows the University of Nebraska-Lincoln ACE general education requirements. Because of the specific needs of the program, several of these courses are specified in the curriculum. Please contact DurhamSchool@unl.edu (durhamschool@unl.edu), if you are interested in more information about this program.

Additional Major Requirements

Grade Rules

C- and D Grades

All coursework must be of C grade level or higher to be credited toward graduation requirements or to be valid as a prerequisite for another course.