

# CONSTRUCTION MANAGEMENT, BACHELOR OF SCIENCE

## Construction Management Durham School of Architectural Engineering and Construction

Construction management (CNST) is a complete undergraduate degree program available to students within the Charles W. Durham School of Architectural Engineering and Construction located at Nebraska Hall on the Lincoln City Campus and at the Peter Kiewit Institute (PKI) on the Scott Campus in Omaha. Construction is one of the largest and most diversified industries in the country, accounting for approximately four percent of the U.S. gross domestic product (GDP). The key professional in this vast enterprise is the “constructor,” a term given to leaders and managers in the construction industry who are responsible for planning, scheduling, and building the projects designed by architects and engineers. These highly-specialized efforts are indispensable in meeting the country’s growing need for new structures, infrastructure and environmental controls that are of high quality and are cost effective, efficient and sustainable.

Construction firms vary in size from large corporations to small proprietorships and partnerships. These are often classified according to the kind of construction work they do—general contractors, heavy and highway contractors, specialty contractors—including mechanical and electrical—and residential builders and developers. Many firms engage in more than one category of work. Some larger companies incorporate the architectural and engineering design functions as part of their role as a design/build firm. Collectively, constructors manufacture our entire built environment—buildings for housing, commerce and industry, highways, railroads, waterways, airports, power plants, energy distribution systems, military bases and space center complexes. Thus, the construction management field is broad, requiring a unique educational background for its professional practitioners.

Although the range of construction activities appears wide and diverse, the general education requirements for construction management are universal regardless of a particular firm’s area of specialization. Since construction is primarily a business enterprise, the graduate must have a sound background in business management and administration as well as an understanding of the fundamentals of architecture and engineering as they relate to project design and the actual construction process in the field. Professional expertise lies in the fields of construction science, methods and management. A working knowledge of structural design, mechanical and electrical systems, methods and materials, soil mechanics and construction equipment is also essential.

The construction management curriculum embraces a course of study in:

1. Construction project management from pre-design through commissioning.
2. Project life-cycle and sustainability.
3. Health and safety, accident prevention and regulatory compliance.
4. Law, contract documents administration and dispute prevention and resolution.
5. Materials, labor and methods of construction.
6. Finance and accounting principles.
7. Planning and scheduling.
8. Cost management including plan reading, quantity take offs and estimating.
9. Project delivery methods.

10. Leadership and managing people.
11. Business and communication skills.

## Program Educational Objectives

The following is a list of the Construction Management Program Educational Objectives (PEO) that graduates are expected to attain within a few years of graduation:

1. Develop construction project objectives and plans including delineation of scope, budget and schedule.
2. Select project participants and set performance requirements.
3. Maximize resource efficiency through judicious procurement and management of labor, materials and equipment.
4. Implement and complete construction activities through coordination and control of scheduling, contracting, estimating and cost control.
5. Develop effective communication protocols and mechanisms for resolving conflicts associated with the construction process.
6. Ensure quality and safety through design, measurement, analysis and control.

Educational standards and criteria were established by the construction faculty of The Charles W. Durham School of Architectural Engineering and Construction and approved by the Construction Industry Advisory Committee (CIAC) and ABET, the accrediting agency for the construction management program at the University of Nebraska–Lincoln.

## Professional Admission Requirements

Requirements for professional admission to the construction management degree program include: students must complete 28 semester hours, including the following courses with a C or better: MATH 1950, PHYS 1050 (or PHYS 1120 or PHYS 2120), ENGR 100 and at least one of ENGL 1160, ENGL 3980, ENGR 220, STAT 1530, or CNST 112. Additionally, a minimum cumulative GPA of 2.5 is required.

## Learning Outcomes

Graduates of the construction management program will have:

1. An ability to identify, formulate and solve broadly defined technical or scientific problems by applying knowledge of mathematics and science and/or technical topics to areas relevant to the discipline.
2. An ability to formulate or design a system, process, procedure or program to meet desired needs.
3. An ability to develop and conduct experiments or test hypotheses, analyze and interpret data and use scientific judgment to draw conclusions.
4. An ability to communicate effectively with a range of audiences.
5. An ability to understand ethical and professional responsibilities and the impact of technical and/or scientific solutions in global, economic, environmental and societal contexts.
6. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines and analyze risk and uncertainty.

The above student outcomes have been approved by the ABET Applied and Natural Science Accreditation Commission 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.

## Grade Rules

C- and D Grades

All required and elective courses must be passed with a grade of C or better to be included in the 120 credit hours needed for degree completion.

## ACE Requirements

The CNST program follows the UNL ACE general education requirements. Because of the specific needs of the program, most of these courses are specified in the curriculum. Please contact [DurhamSchool@unl.edu](mailto:DurhamSchool@unl.edu) ([durhamschool@unl.edu](mailto:durhamschool@unl.edu)), if you are interested in more information about this program.

## Requirements

Course	Title	Credits
<b>First Semester</b>		
CNST 131	INTRODUCTION TO THE CONSTRUCTION INDUSTRY	2
ENGL 1160/1164	ENGLISH COMPOSITION II	3
ENGR 10	FRESHMAN ENGINEERING SEMINAR	0
ENGR 100 or CMST 1110	INTERPERSONAL SKILLS FOR ENGINEERING LEADERS or PUBLIC SPEAKING FUNDS	3
MATH 1950	CALCULUS I	5
ACE Elective <sup>1</sup>		3
<b>Credits</b>		<b>16</b>
<b>Second Semester</b>		
CNST 112	CONSTRUCTION COMMUNICATIONS	3
PHYS 1050 or PHYS 2120	INTRODUCTION TO PHYSICS <sup>2</sup> or GENERAL PHYSICS-CALCULUS LEVEL	4
Technical Writing (ENGR 220, ENGL 3980, or CIST 1600)		3
PHYS 1054 or PHYS 1164	INTRODUCTION TO PHYSICS LABORATORY or GENERAL PHYSICS LABORATORY II	1
STAT 1530	ELEMENTARY STATISTICS <sup>2</sup>	3
ACE Elective <sup>1</sup>		3
<b>Credits</b>		<b>17</b>
<b>Third Semester</b>		
CONE 221	GEOMETRIC CONTROL SYSTEMS	3
CONE 206	ENGINEERING ECONOMICS	3
CNST 241	HORIZONTAL CONSTRUCTION	3
CNST 251	CONSTRUCTION MATERIALS AND SPECIFICATIONS	3
CNST 252	CONSTRUCTION MATERIALS AND TESTING	3
ENGR 20	SOPHOMORE ENGINEERING SEMINAR	0
<b>Credits</b>		<b>15</b>
<b>Fourth Semester</b>		
ACCT 2000	ACCOUNTING BASICS FOR NON-BUSINESS MAJORS <sup>2</sup>	3
CNST 225	INTRODUCTION TO BUILDING INFORMATION MODELING	3
CNST 242	VERTICAL CONSTRUCTION	3
ECON 2200	PRINCIPLES OF ECONOMICS (MICRO) <sup>2</sup>	3
ACE Elective <sup>1</sup>		3
<b>Credits</b>		<b>15</b>
<b>Fifth Semester</b>		
CNST 331	STRUCTURAL MECHANICS	3
CNST 305	BUILDING ENVIRONMENTAL TECHNICAL SYSTEMS I	3
CNST/CONE 378	CONSTRUCTION ESTIMATING I	3
CNST 411	PROJECT ADMINISTRATION	3

CNST 444	CONSTRUCTION SITE SAFETY MANAGEMENT	3
<b>Credits</b>		<b>15</b>
<b>Sixth Semester</b>		
CNST 332	STRUCTURAL OPTIMIZATION	3
CNST 306	ELECTRICAL SYSTEMS	3
CNST 379	CONSTRUCTION ESTIMATING II	3
CONSTRUCTION TECHNICAL ELECTIVES or MKT 3310, MGMT 3490, ENTR 3710, or any RELU 3xxx-4xxx courses		6
<b>Credits</b>		<b>15</b>
<b>Seventh Semester</b>		
CNST 420	PROFESSIONAL PRACTICE AND ETHICS	3
CNST/CONE 476	PROJECT BUDGETS AND CONTROLS	3
CNST/CONE 485	CONSTRUCTION PLANNING, SCHEDULING, AND CONTROLS	3
CONSTRUCTION TECHNICAL ELECTIVE or MKT 3310, MGMT 3490, ENTR 3710, or any RELU 3xxx-4xxx course		3
TECHNICAL ELECTIVE or MKT 3310, MGMT 3490, ENTR 3710, or any RELU 3xxx-4xxx course		3
<b>Credits</b>		<b>15</b>
<b>Eighth Semester</b>		
CNST 480	PRODUCTIVITY AND HUMAN FACTORS IN CONSTRUCTION	3
CNST 489	SENIOR CONSTRUCTION PROJECT	3
CONSTRUCTION TECHNICAL ELECTIVES or MKT 3310, MGMT 3490, ENTR 3710, or any RELU 3xxx-4xxx courses		6
<b>Credits</b>		<b>12</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> ACE elective: Choose one course from not yet satisfied ACE outcomes 5, 7, or 9

<sup>2</sup> PHYS 1120 or 2120 can be substituted for PHYS 1050. Credit for PHYS 1110 or 2110 can be applied as elective credit.