CONSTRUCTION MANAGEMENT, BACHELOR OF SCIENCE

Construction Management

Construction management (CNST) is a complete undergraduate degree program available to students within the Charles W. Durham School of Architectural Engineering and Construction located on the Lincoln City Campus and at the Peter Kiewit Institute (PKI) 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 educational 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.

Learning Outcomes

Graduates of the construction management 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.

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 Charles W. Durham School of Architectural Engineering and Construction and approved by ABET, the accrediting agency for the construction management program at the University of Nebraska–Lincoln.

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 Melissa Hoffman at melissa.hoffman@unl.edu or 402.554.4482, if you are interested in more information about this program.

### Requirements

#### Course Title Credits

**First Semester**
- **ENGR 1000** INTERPERSONAL SKILLS FOR ENGINEERING LEADERS 3
- **CNST 1310** INTRODUCTION TO THE CONSTRUCTION INDUSTRY 1
- **ENGL 1160/1164** ENGLISH COMPOSITION II 2
- **MATH 1950** CALCULUS I 2
- **ENGR 100** FRESHMAN ENGINEERING SEMINAR 0
- **ACE Elective** 1

**Credits** 15

**Second Semester**
- **CNST 1120** CONSTRUCTION COMMUNICATIONS 3
- **PHYS 1050** INTRODUCTION TO PHYSICS 4
- **PHYS 1054** INTRODUCTION TO PHYSICS LABORATORY 1
- **ENGL 3980** TECHNICAL WRITING ACROSS THE DISCIPLINES 2
- **STAT 1530** ELEMENTARY STATISTICS 2
- **ACE Elective** 1

**Credits** 15

**Third Semester**
- **CNST 2410** HORIZONTAL CONSTRUCTION 3
- **CNST 2510** CONSTRUCTION MATERIALS AND SPECIFICATIONS 3
- **CNST 2520** CONSTRUCTION MATERIALS AND TESTING 3
- **CONE 2210** GEOMETRIC CONTROL SYSTEMS 3
- **CONE 2060** ENGINEERING ECONOMICS 2
- **ENGR 200** SOPHOMORE ENGINEERING SEMINAR 0

**Credits** 17

**Fourth Semester**
- **CNST 2420** VERTICAL CONSTRUCTION 3
- **CNST 2250** INTRODUCTION TO BUILDING INFORMATION MODELING 3
- **ACCT 2000** ACCOUNTING BASICS FOR NON-BUSINESS MAJORS 2
- **ECON 2200** PRINCIPLES OF ECONOMICS (MICRO) 2
- **ACE Elective** 1

**Credits** 15

**Fifth Semester**
- **CNST/CONE 3780** CONSTRUCTION ESTIMATING I 2
- **CNST 3060** ELECTRICAL SYSTEMS 3
- **CNST 3310** STRUCTURAL MECHANICS 2
- **CNST 4440** CONSTRUCTION SITE SAFETY MANAGEMENT 3
- **CONSTRUCTION TECHNICAL ELECTIVE** 3

**Credits** 15

**Sixth Semester**
- **CNST 3790** CONSTRUCTION ESTIMATING II 3
- **CNST 3050** BUILDING ENVIRONMENTAL TECHNICAL SYSTEMS I 3
- **CNST 3320** STRUCTURAL OPTIMIZATION 3
- **CNST 4110** PROJECT ADMINISTRATION 3
- **CONSTRUCTION TECHNICAL ELECTIVE** 3

**Credits** 15

**Seventh Semester**
- **CNST/CONE 4850** CONSTRUCTION PLANNING, SCHEDULING, AND CONTROLS 3
- **CNST/CONE 4760** PROJECT BUDGETS AND CONTROLS 3
- **CNST 4200** PROFESSIONAL PRACTICE AND ETHICS IN CONSTRUCTION 3
- **CONSTRUCTION TECHNICAL ELECTIVE** 3
- **TECHNICAL ELECTIVE** 3

**Credits** 15

**Eighth Semester**
- **CNST 4890** SENIOR CONSTRUCTION PROJECT 3
- **CNST 4800** PRODUCTIVITY AND HUMAN FACTORS IN CONSTRUCTION 3
- **SENIOR SEMINAR** 1
- **CONSTRUCTION TECHNICAL ELECTIVE** 3
- **CONSTRUCTION TECHNICAL ELECTIVE** 3

**Credits** 13

**Total Credits** 120

1. ACE elective: Choose one course from not yet satisfied ACE outcomes 5, 7, or 9
2. Additional placement and/or prerequisites may apply