CONSTRUCTION MANAGEMENT

Description

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) 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; and
11. business and communication skills.

Educational Objectives

The long-term program educational objectives are to produce graduates who, as leaders in the field who can:

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

Educational standards and criteria for construction education are established by the American Council for Construction Education (ACCE) which is the accrediting agency for construction education programs at all levels. The program at the University of Nebraska—Lincoln, having met these standards and criteria, is currently fully accredited by ACCE.

Major Department Admission

Criteria for Professional Admission to the Construction Management Degree Program

Students must complete 28 semester hours or be classified as a sophomore before applying for admission to the construction management degree program.

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, 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 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 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 degree requirements may not be more than 10 years old at the time of graduation.

**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.

**Major Requirements**

**Requirements for the Degree (Lincoln Campus)**

**First Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST 131</td>
<td>Introduction to the Construction Industry</td>
<td>1</td>
</tr>
<tr>
<td>ENGR 10</td>
<td>Freshman Engineering Seminar</td>
<td>0</td>
</tr>
<tr>
<td>ENGL 151</td>
<td>Writing and Argument</td>
<td>3</td>
</tr>
<tr>
<td>GEOL 101</td>
<td>Dynamic Earth</td>
<td>4</td>
</tr>
<tr>
<td>MATH 106</td>
<td>Calculus I</td>
<td>5</td>
</tr>
<tr>
<td>ACE Elective</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Choose one course from not yet satisfied ACE outcomes 5, 7, or 9. 

Credit Hours Subtotal: 16

**Second Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST 112</td>
<td>Construction Communications</td>
<td>3</td>
</tr>
<tr>
<td>JGEN 200</td>
<td>Technical Communication I</td>
<td>3</td>
</tr>
<tr>
<td>STAT 218</td>
<td>Introduction to Statistics</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>Elements of Physics</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 153</td>
<td>Elements of Physics Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 14

**Third Semester**

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIVE 221</td>
<td>Geometric Control Systems</td>
<td>3</td>
</tr>
<tr>
<td>CONE 221</td>
<td></td>
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</tr>
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</table>
### Construction Management

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST 241</td>
<td>Construction Methods and Equipment I</td>
<td>3</td>
</tr>
<tr>
<td>CNST 252</td>
<td>Construction Materials and Testing</td>
<td>3</td>
</tr>
<tr>
<td>CNST 251</td>
<td>Construction Materials and Specifications</td>
<td>3</td>
</tr>
<tr>
<td>ENGR 20</td>
<td>Sophomore Engineering Seminar</td>
<td>0</td>
</tr>
<tr>
<td>CNST 225</td>
<td>Introduction to Building Information Modeling (BIM)</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 15

### Fourth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCT 200</td>
<td>Accounting for Business Decisions</td>
<td>3</td>
</tr>
<tr>
<td>CNST 242</td>
<td>Construction Equipment and Methods II</td>
<td>3</td>
</tr>
<tr>
<td>ECON 200</td>
<td>Economic Essentials and Issues</td>
<td>3</td>
</tr>
<tr>
<td>COMM 286</td>
<td>Business and Professional Communication</td>
<td>3</td>
</tr>
<tr>
<td><strong>ACE Elective</strong></td>
<td>Choose one course from not yet satisfied ACE outcomes 5, 7, or 9</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 15

### Fifth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 331</td>
<td>Structural Mechanics</td>
<td>3</td>
</tr>
<tr>
<td>CNST 305 / ARCH 333</td>
<td>Building Environmental Technical Systems I</td>
<td>3</td>
</tr>
<tr>
<td>CNST 444</td>
<td>Construction Site Safety Management</td>
<td>3</td>
</tr>
<tr>
<td>CNST 378 / CONE 378</td>
<td>Construction Estimating</td>
<td>3</td>
</tr>
<tr>
<td>MNGT 300</td>
<td>Management Essentials For Contemporary Organizations</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 15

### Sixth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCH 332</td>
<td>Structural Optimization</td>
<td>3</td>
</tr>
<tr>
<td>CNST 306</td>
<td>Building Environmental Technical Systems II</td>
<td>3</td>
</tr>
<tr>
<td>CNST 379</td>
<td>Construction Estimating II</td>
<td>3</td>
</tr>
<tr>
<td>BLAW 300</td>
<td>Business, Government &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>FINA 300</td>
<td>Financial Decision Making</td>
<td>3</td>
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</tbody>
</table>

**Credit Hours Subtotal:** 15

### Seventh Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
<td>CNST 476 / CONE 476</td>
<td>Project Budgets and Controls</td>
<td>3</td>
</tr>
<tr>
<td>CNST 420</td>
<td>Professional Practice and Ethics</td>
<td>3</td>
</tr>
<tr>
<td>CNST 485</td>
<td>Construction Planning, Scheduling, and Controls</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 300</td>
<td>Contemporary Marketing</td>
<td>3</td>
</tr>
<tr>
<td>Technical/Design Elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 15

### Eighth Semester

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CNST 480</td>
<td>Productivity and Human Factors in Construction</td>
<td>3</td>
</tr>
<tr>
<td>CNST 489</td>
<td>Senior Construction Project</td>
<td>3</td>
</tr>
<tr>
<td>Construction Management Elective</td>
<td></td>
<td>3</td>
</tr>
<tr>
<td><strong>ACE Elective</strong></td>
<td>Choose one course from not yet satisfied ACE outcomes 5, 7, or 9</td>
<td>3</td>
</tr>
<tr>
<td>Technical/Design Elective</td>
<td></td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 15

### Additional Major Requirements

#### Grade Rules

**C- and D Grades**

Construction management students must pass all courses offered within the College of Engineering and all architecture, math and science courses with a grade of C or higher.

#### ACE Requirements

The CNST program follows the University of Nebraska–Lincoln 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.

### Exit Examination

Senior students enrolled in the Capstone are required to participate in the American Institute of Constructors’ Level I examination during their last semester. Students who pass the exam will be reimbursed a majority portion of their exam registration fee.

### Requirements for Minor Offered by Department

This minor is for engineering and architecture majors ONLY.

The College of Engineering enables its students to participate in this approved minor subject to the following conditions:

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 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 must be approved by the advisor, the department chair or head, the Dean and the cognizant program offering the minor.
4. The College of Engineering will follow the “Plan A/B” format of the College of Arts and Sciences in which a student pursuing a single minor must complete the “Plan A” requirements. A student pursuing a double (or greater) minor must fulfill either the “Plan A” or “Plan 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 by approval of the College of Engineering Curriculum Committee and faculty.

### Course Requirements

#### Plan A only

All courses must be taken for a letter grade.

#### Required Courses

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLAW 300</td>
<td>Business, Government &amp; Society</td>
<td>3</td>
</tr>
<tr>
<td>CNST 112</td>
<td>Construction Communications</td>
<td>3</td>
</tr>
<tr>
<td>CNST 241</td>
<td>Construction Methods and Equipment I</td>
<td>3</td>
</tr>
<tr>
<td>CNST 305 / ARCH 333</td>
<td>Building Environmental Technical Systems I</td>
<td>3</td>
</tr>
<tr>
<td>CNST 378 / CONE 378</td>
<td>Construction Estimating</td>
<td>3</td>
</tr>
</tbody>
</table>

### ACE Elective

Choose one course from not yet satisfied ACE outcomes 5, 7, or 9

**Total Credit Hours:** 120

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**Technical/Design Elective:**

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**Grade Rules:**

**C- and D Grades**

Construction management students must pass all courses offered within the College of Engineering and all architecture, math and science courses with a grade of C or higher.

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5. Minors on the Lincoln or Omaha campuses may be added by approval of the College of Engineering Curriculum Committee and faculty.

**Course Requirements**

#### Plan A only

All courses must be taken for a letter grade.

#### Required Courses

<table>
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<tr>
<th>Course Code</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BLAW 300</td>
<td>Business, Government &amp; Society</td>
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<tr>
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<td>Construction Communications</td>
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<tr>
<td>CNST 378 / CONE 378</td>
<td>Construction Estimating</td>
<td>3</td>
</tr>
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</table>

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**Technical/Design Elective:**

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Grade Rules

C- and D Grades
Construction management students must pass all courses offered within the College of Engineering and all math and science courses with a grade of C or higher.

Pass/No Pass
All courses must be taken for a letter grade.

CNST 112 Construction Communications
Description: Development of construction industry communication skills including the ability to read contract documents. Complete comprehension of working drawings, technical terminology including graphic symbols and abbreviations. Fundamentals of drafting principles, sketching, and dimensioning techniques.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 225; CNST 241; CNST 251; CNST 252

CNST 131 Introduction to the Construction Industry
Description: Introduction to basic management principles and practices used in the control of manpower, materials, machinery and money in the construction of the built environment.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC
Prerequisite for: CNST 251

CNST 225 Introduction to Building Information Modeling (BIM)
Prerequisites: CNST 112, CNST 251
Description: An introduction to the fundamentals of Building Information Modeling (BIM), establishing a solid foundation for further study in this area. BIM concepts and Modeling Techniques, and the use of the Revit Architecture platform to create detailed 3D models of construction projects will be explored.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 440

CNST 241 Construction Methods and Equipment I
Prerequisites: CNST 112, GEOL 101 and MATH 106.
Notes: Parallel registration in CNST 251 and CNST 252 is recommended.
Description: Introduction to earthmoving equipment and methods used in the U.S. construction industry. Labor, productivity, and economic aspects of site, excavation, and foundation work utilizing various mixes of manpower and machinery.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL
Prerequisite for: CNST 242

CNST 242 Construction Equipment and Methods II
Prerequisites: CNST 241
Notes: A continuation of CNST 241.
Description: The structure from grade to topping out. Functions and applications of material handling equipment from simple pulleys to large cranes. Methods of constructing concrete formwork in a variety of applications. Assembly and erection of steel, wood, precast concrete, and masonry structural elements. Material finishing methods and equipment.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3

CNST 251 Construction Materials and Specifications
Prerequisites: CNST 112 and CNST 131
Description: Introduction to construction materials. Physical, mechanical, and aesthetic properties of soils, concrete, masonry, metals, plastics, and other materials as they relate to in-service conditions and acceptability either individually or in combination with other materials. Proper methods of specifying to achieve design and construction goals, construction safety and inspection, and to meet zoning codes and environmental requirements.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 378, CONE 378

CNST 252 Construction Materials and Testing
Prerequisites: CNST 112 and MATH 106
Notes: Parallel registration in CNST 241 is recommended. Laboratory testing procedures emphasizing testing of aggregates, soil, and concrete.
Description: Introduction to basic materials used in construction. Laboratory testing and evaluation of material properties. Inspection and quality control of construction materials. Material variation, testing procedures and characteristics of material types including aggregates.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
CNST 305 Building Environmental Technical Systems I
Crosslisted with: ARCH 333
Prerequisites: PHYS 151.
Description: Characteristics and performance of buildings with respect to thermal and psychrometric environment in buildings related to human comfort, heat gain/heat loss, ventilation, natural energy systems and sustainable design principles, and Plumbing and life safety systems in the Built environment.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: ARCH 430, ARCH 430H, CNST 405

CNST 306 Building Environmental Technical Systems II
Prerequisites: MATH 106 or MATH 108H and PHYS 151 and PHYS 153
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 405; CNST 406

CNST 331 Structural Mechanics
Crosslisted with: ARCH 331
Prerequisites: ARCH 232 or admission into the Construction Management degree program
Description: Introduction to various external force systems, and their resulting internal forces and deformations, which act on structural elements.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: ARCH 332, CNST 332

CNST 332 Structural Optimization
Crosslisted with: ARCH 332
Prerequisites: ARCH 331
Description: Optimization of key properties of elemental components and systems of building structures: force, geometric, and material.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: ARCH 430, ARCH 430H

CNST 378 Construction Estimating
Crosslisted with: CONE 378
Prerequisites: CNST 242 or (UNO) CONE 2420.
Description: Preparation of detailed cost estimates based on contract documents. Identify and analyze cost components to perform a reliable quantity take-off. Recap components in their common trade areas for labor, material, and equipment pricing. Introduction to subcontractor bids and assembly of bid proposal.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 379; CNST 440; CNST 476, CONE 476

CNST 379 Construction Estimating II
Prerequisites: CNST 378.
Description: Continuation of CNST 378 with emphasis on implementing basic elements of estimating, including: quantity survey, price extension, and bidding. Advanced computer applications of estimating to various construction projects.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 405; CNST 406; CNST 489

CNST 405 Mechanical Estimating
Prerequisites: CNST 305, 306 and 379.
Description: Application of estimating principles, quantity take-off, bidding strategies, and computerization to the specialty field of mechanical construction.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 406 Electrical Estimating
Prerequisites: CNST 305, CNST 306 and CNST 379.
Description: Application of estimating principles, quantity take-off, bidding strategies, and computerization to the specialty field of electrical construction.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 411 Project Administration
Crosslisted with: CNST 811
Prerequisites: CIVE 378 or CNST 379
Description: An introduction to construction project administration. Ownership and organization of construction companies, construction documentation and specifications, type of contracts, take-offs, estimating, bidding, bonds, insurance, project management and administration, scheduling, time and cost management, labor law and labor relations, and project safety.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 415 Mechanical/Electrical Project Management
Crosslisted with: CNST 815
Prerequisites: CNST 305, CNST 306, CNST 379
Notes: CNST 405 and CNST 406 are recommended.
Description: Fundamentals of project management within the mechanical and electrical contracting industry. Codes, contract documents, productivity, coordination, project control and administration, scheduling, safety, and project closeout, from a specialty contracting perspective.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
CNST 420 Professional Practice and Ethics
Crosslisted with: CNST 820
Prerequisites: CNST 379 and BLAW 300 or BLAW 372
Notes: This course is a prerequisite for or must be taken parallel with CNST 489.
Description: Orientation to professional practice through the designers' and the contractors’ relationships to society, specific clients, their professions, and other collaborators in environmental design and construction fields. Ethics, professional communication and responsibility, professional organization, office management, construction management, professional registration, and owner-designer-contractor relationships.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 8 Civic/Ethics/Stewardship

CNST 425 Alternative Project Delivery Methods
Crosslisted with: CNST 825
Prerequisites: Senior or graduate standing
Description: Historical and current project delivery methods (PDM) are explored. Procurement strategies, contractual arrangements, and compensation methods are also discussed in conjunction with risks, costs, and legal and ethical issues that need to be considered when determining which system is best for a particular project.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: SPRING

CNST 434 The Design/Build Project Delivery System
Crosslisted with: CNST 834
Prerequisites: CNST 379.
Description: The organizational, managerial, ethical and legal principles involved in design/build as a construction project delivery system. Advantages and disadvantages, growth, merits, and criticism of the design-build system.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 436 Intent and Application of International Building Code
Crosslisted with: CNST 836
Prerequisites: CNST 112 and CNST 251
Description: This course is designed to provide a fundamental understanding of how to research, interpret and apply building code requirements to the design and construction of both new and renovated structures.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 440 Building Information Modeling (BIM) II
Prerequisites: CNST 225, CNST 378
Description: Advanced topics in building information modeling, including structural and MEP modeling, 4/5 dimensional construction animations and visualization. Good knowledge of Revit Architectural Modeling and knowledge of construction estimating and scheduling is required before registering in this class.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 444 Construction Site Safety Management
Crosslisted with: CNST 844
Prerequisites: CNST 242
Notes: Satisfactory completion will partially qualify the individual to be designated by their employer as a construction site "competent person" by successfully completing the OSHA 30-hour Construction Safety Card as well as additional certifications in basic first aid, CPR, and AED.
Description: Provides introductory construction site safety management for project engineers, project managers, safety teams, and company safety officers. Addresses basic accident and injury models, human accident costs, safety behavior, ethical issues in safety, workers' compensation and EMR, job safety analysis (JSA), project site safety audits, safety promotion and training, emergency planning and response, safety management programs and training, and OSHA record-keeping and reporting.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL

CNST 476 Project Budgets and Controls
Crosslisted with: CONE 476
Prerequisites: CONE/CNST 378; ISMG 2060 (UNO).
Description: The basic systems related to revenues and expenses associated with record keeping of construction contracts. Managerial accounting related to planning and control of construction projects.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

CNST 480 Productivity and Human Factors in Construction
Crosslisted with: CNST 880
Prerequisites: CNST 378, and MNGT 300.
Notes: This course is a prerequisite for or must be taken parallel with CNST 489.
Description: Motivation and productivity improvement methods in the management of construction workers in their typical job environments. Methods to improve working environments in the field and in the office. Procedures and mechanisms to implement human behavior and ergonomics concepts for enhanced productivity and safety.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: CNST 489
CNST 482 Heavy and/or Civil Construction  
**Crosslisted with:** CNST 882, CONE 482, CONE 882  
**Prerequisites:** Senior or Graduate standing in ARCH, AREN, CIVE, CNST, or CONE.  
**Description:** Application of management principles to the construction of heavy and/or civil projects. History, theory, and methods of planning and constructing heavy and/or civil projects. Emerging equipment and new equipment capabilities. Economical use of equipment and managing costs associated with production.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

CNST 485 Construction Planning, Scheduling, and Controls  
**Crosslisted with:** CONE 485, CNST 885, CONE 885  
**Prerequisites:** CNST 378; CNST 2250 (UNO)  
**Description:** Planning and scheduling a construction project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, network construction, time estimates, critical path, float time, crash programs, scheduling, and monitoring project activities.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**Prerequisite for:** CNST 489  

CNST 486 Construction Management Systems  
**Crosslisted with:** CNST 886  
**Prerequisites:** CNST 379  
**Description:** Application of selected topics in systems analysis (operations research) to construction management. Simulation, mathematical optimization, queuing theory, Markov decision processes, econometric modeling, neural networks, data envelopment analysis, decision analysis and analytic hierarchy processes as used in the construction industry.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

CNST 488 Residential Construction and Real Estate  
**Crosslisted with:** CNST 888  
**Prerequisites:** CNST 379  
**Description:** Application of various strategies to real estate development including community and residential design, planning, site selection, land development, marketing and customer service. Methods used by construction companies to analyze, bid, and market their developments to customers through the pre-construction and bidding process.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

CNST 489 Senior Construction Project  
**Prerequisites:** CNST 379, CNST 420, CNST 476, CNST 485. CNST 480 must be completed as a prerequisite or taken parallel.  
**Notes:** Capstone course.  
**Description:** Execution of a construction project involving conceptual design and location, estimating, bidding, site layout, construction organization, planning and scheduling, cost control, records management, and project completion and documentation.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**ACE:** ACE 10 Integrated Product  

CNST 493 Internship Workshop  
**Crosslisted with:** CNST 893, CONE 493  
**Prerequisites:** Permission of instructor, Letter of application, Letter of agreement from industry mentor  
**Description:** Participation in a full-time summer internship associated with a Construction related entity. Includes weekly assignments and a final presentation designed to foster interactions associated with the business side of the entity between the Construction entity and the intern. General topics include Time Management and Scheduling Work, Business Plans and Structures, Finance and Budgets, Marketing Plans, Contracts, Risk Analysis and Management, Personnel Management, Communication and Leadership.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LAB  
**Offered:** SUMMER  

CNST 498 Special Topics in Construction Management  
**Crosslisted with:** CNST 898  
**Prerequisites:** Permission.  
**Notes:** A signed student-instructor learning contract is required.  
**Description:** Individual or small group investigation of topics in construction management.  
**Credit Hours:** 1-6  
**Min credits per semester:** 1  
**Max credits per semester:** 6  
**Max credits per degree:** 6  
**Format:** LEC  

PLEASE NOTE  
This document represents a sample 4-year plan for degree completion with this major. Actual course selection and sequence may vary and should be discussed individually with your college or department academic advisor. Advisors also can help you plan other experiences to enrich your undergraduate education such as internships, education abroad, undergraduate research, learning communities, and service learning and community-based learning.  

### Career Information  
*The following represents a sample of the internships, jobs and graduate school programs that current students and recent graduates have reported.*  

### Jobs of Recent Graduates  
- Project Engineer, McCarthy Building Co. - Phoenix AZ  
- Project Superintendent, Chief Construction - Grand Island NE  
- Engineer I, Kiewit - Omaha NE
• Project Manager/Designer, Continental Fire Sprinkler Company - Omaha NE
• Field Engineer, Hensel Phelps - Austin TX
• Project Engineer, McCarthy Building Co. - Colorado Springs CO
• Project Engineer, Union Pacific - Tehachapi CA
• Field Engineer, J.E. Dunn Construction Company - Kansas City MO
• Project Controls Associate, Black & Veatch - Overland Park KS
• Field Engineer - LEED Buildings, Hensel Phelps - Dallas TX
• Sales Engineer, Johnson Controls, Inc. - Oklahoma City OK
• Field Engineer, Skanska - Phoenix AZ
• Project Engineer, JE Dunn Construction Company - Omaha NE
• Project Manager, Ayars & Ayars, Inc. - Omaha NE
• Project Engineer, Swinerton Builders - Portland OR
• Superintendent, Hawkins Construction Company - Omaha NE
• Field Engineer, Constuctors Inc. - Lincoln NE
• Project Engineer, McCarthy Construction Co. - Kansas City KS
• Office Engineer, Archer Western - Dallas TX
• Field Engineer, Mortenson Construction - Minneapolis MN
• Highway Construction Technician II, Nebraska Department of Roads - Grand Island NE
• Project Manager, Sampson Construction - Lincoln NE
• Project Manager, Balfour Beatty - San Francisco CA
• Field Engineer, Hensel Phelps Construction Company - Greeley CO
• Project Engineer, The Waldinger Corp - La Vista NE

Internships
• Estimating Intern, Walt Disney World - Lake Buena Vista FL
• Field Engineer Intern, Hensel Phelps - Houston TX
• Engineer Intern, Kiewit Building Group - Omaha NE
• Project Management Intern, Simply Better Homes - Omaha NE
• Superintendent Intern, Haselden Construction - Denver CO
• Field Coordinator, Holder Construction - Atlanta GA
• Project Management Intern, Brinkman Constructors - Denver CO
• Design Engineer, Continental Fire Sprinklers - Omaha NE
• Estimating Intern, Sampson Construction - Lincoln NE
• Assistant Project Manager, Ayars & Ayars, Inc. - Lincon NE
• Facilities Management Intern, Union Pacific - Omaha NE
• Construction Management Intern, Alfred Benesch and Company - Omaha NE
• Office Intern, J.E. Dunn Construction Company - Kansas City MO
• Field Engineer, Hensel Phelps Construction Co. - Denver CO
• Assistant Project Manager, City Glass Company - Omaha NE
• Construction Intern, Black & Veatch - Overland Park KS
• Project Engineer, E&K Industries - Omaha NE
• Construction Administrator Intern, Alley Poyner Macchietto Architecture - Omaha NE
• Project Engineer Intern, Swinerton Builders - Portland OR
• Surveying Intern, Ehrhart Griffin & Associates - Omaha NE
• Field Engineer Intern, Hensel Phelps - Austin TX
• Office Engineer Intern, Mortenson Construction - Minneapolis MN
• Intern, Turner Construction - Kansas City MO
• Intern, Archer Western - Dallas TX

Graduate & Professional Schools
• Construction Management & Engineering, Ph.D., University of Nebraska-Lincoln - Lincoln NE
• Construction Management & Engineering, M.S., University of Nebraska-Lincoln - Lincoln NE
• Community and Regional Planning, M.S., University of Nebraska-Lincoln - Lincoln NE
• Project Management, M.S., Norwegian University of Science and Technology - Trondheim, Norway
• Construction Management, M.S., University of Florida - Gainesville FL
• Master of Business Administration, Kaplan University - Online