

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.
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 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.

Admission

Criteria for Professional Admission to the Construction Management Degree Program

Before applying for admission to the construction management degree program, students must complete 28 semester hours, including the following courses with a C or better: MATH 104 (or MATH 106), PHYS 141 (or PHYS 211), ENGR 10, and at least one of ENGL 151, JGEN 200, STAT 218, or CNST 112. Additionally, a minimum cumulative GPA of 2.5 is required.

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.

- 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—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:

- An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 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.
- An ability to communicate effectively with a range of audiences.
- 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.
- 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.
- An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- 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

| | | |
|----------|---|---|
| PHYS 141 | Elementary General Physics I | 5 |
| CNST 131 | Introduction to the Construction Industry | 1 |
| ENGL 151 | Writing and Argument | 3 |
| MATH 104 | Applied Calculus | 3 |
| ENGR 10 | Freshman Engineering Seminar | 0 |

ACE Elective

| | | |
|--|--|----|
| Choose one course from not yet satisfied ACE outcomes 5, 7, or 9 | | 3 |
| Credit Hours Subtotal: | | 15 |

Second Semester

| | | |
|----------|-----------------------------|---|
| CNST 112 | Construction Communications | 3 |
|----------|-----------------------------|---|

| | | |
|--|-------------------------------|----|
| PHYS 142 | Elementary General Physics II | 5 |
| JGEN 200 | Technical Communication I | 3 |
| STAT 218 | Introduction to Statistics | 3 |
| <i>ACE Elective</i> | | |
| Choose one course from not yet satisfied ACE outcomes 5, 7, or 9 | | 3 |
| Credit Hours Subtotal: | | 17 |

Third Semester

| | | |
|------------------------|---|----|
| CNST 241 | Horizontal Construction | 3 |
| CNST 251 | Construction Materials and Specifications | 3 |
| CNST 252 | Construction Materials and Testing | 3 |
| CIVE 221 / CONE 221 | Geometric Control Systems | 3 |
| CNST 225 | Introduction to Building Information Modeling (BIM) | 3 |
| ENGR 20 | Sophomore Engineering Seminar | 0 |
| Credit Hours Subtotal: | | 15 |

Fourth Semester

| | | |
|--|---|----|
| CNST 242 | Vertical Construction | 3 |
| COMM 286 | Business and Professional Communication | 3 |
| ACCT 200 | Accounting for Business Decisions | 3 |
| ECON 200 | Economic Essentials and Issues | 3 |
| <i>ACE Elective</i> | | |
| Choose one course from not yet satisfied ACE outcomes 5, 7, or 9 | | 3 |
| Credit Hours Subtotal: | | 15 |

Fifth Semester

| | | |
|------------------------|--|----|
| CNST 378 / CONE 378 | Construction Estimating I | 3 |
| CNST 305 / ARCH 333 | Building Environmental Technical Systems I | 3 |
| ARCH 331 | Structural Mechanics | 3 |
| CNST 444 | Construction Site Safety Management | 3 |
| MNGT 300 | Management Essentials For Contemporary Organizations | 3 |
| Credit Hours Subtotal: | | 15 |

Sixth Semester

| | | |
|------------------------|--------------------------------|----|
| CNST 379 | Construction Estimating II | 3 |
| CNST 306 | Electrical Systems | 3 |
| ARCH 332 | Structural Optimization | 3 |
| BLAW 300 | Business, Government & Society | 3 |
| FINA 300 | Financial Decision Making | 3 |
| Credit Hours Subtotal: | | 15 |

Seventh Semester

| | | |
|----------------------------------|---|----|
| CNST 485 | Construction Planning, Scheduling, and Controls | 3 |
| CNST 476 / CONE 476 | Project Budgets and Controls | 3 |
| CNST 420 | Professional Practice and Ethics | 3 |
| MRKT 300 | Contemporary Marketing | 3 |
| Construction Management Elective | | 3 |
| Credit Hours Subtotal: | | 15 |

Eighth Semester

| | | |
|----------|-----------------------------|---|
| CNST 489 | Senior Construction Project | 3 |
|----------|-----------------------------|---|

| | | |
|----------|--|---|
| CNST 480 | Productivity and Human Factors in Construction | 3 |
|----------|--|---|

| | |
|----------------------------------|----|
| Senior Seminar | 1 |
| Construction Management Elective | 3 |
| Technical/Design Elective | 3 |
| Credit Hours Subtotal: | 13 |

| | |
|--------------------|-----|
| Total Credit Hours | 120 |
|--------------------|-----|

Additional Major Requirements

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 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.

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

| | | |
|------------------------|--|---|
| BLAW 300 | Business, Government & Society | 3 |
| CNST 112 | Construction Communications | 3 |
| CNST 241 | Horizontal Construction | 3 |
| CNST 305 / ARCH 333 | Building Environmental Technical Systems I | 3 |

| | | |
|------------------------|--|----|
| CNST 378 / CONE 378 | Construction Estimating I | 3 |
| CNST 379 | Construction Estimating II | 3 |
| CNST 480 | Productivity and Human Factors in Construction | 3 |
| CNST 485 / CONE 485 | Construction Planning, Scheduling, and Controls | 3 |
| MNGT 300 | Management Essentials For Contemporary Organizations | 3 |
| Credit Hours Subtotal: | | 27 |
| Total Credit Hours | | 27 |

Grade Rules

C- and D Grades

A grade of C or better is required for all courses in the minor.

Pass/No Pass

All courses must be taken for a letter grade.

CNST 112 Construction Communications

Description: Development of communication skills including understanding of contract documents, working drawings, technical terminology, 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

Grading Option: Graded

Prerequisite for: CNST 225; CNST 378, CONE 378

CNST 131 Introduction to the Construction Industry

Description: Introduction to basic management principles and practices for labor, materials, machinery, and budgets.

Credit Hours: 1

Max credits per semester: 1

Max credits per degree: 1

Grading Option: Graded

Prerequisite for: CONE 211

CNST 225 Introduction to Building Information Modeling (BIM)

Prerequisites: CNST 112

Description: Introduction to Building Information Modeling (BIM) concepts and techniques. Explore the use of the Revit Architecture platform to create detailed 3D models of construction projects and other BIM-related topics such as clash detection and point-cloud models.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

Prerequisite for: CNST 440

CNST 241 Horizontal Construction

Prerequisites: MATH 104

Description: Introduction to earthmoving equipment and methods, labor, productivity, and economic aspects of excavation, material transportation, and fill work. Introduction to the financial principles of equipment ownership and operation.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

Offered: FALL

CNST 242 Vertical Construction

Prerequisites: MATH 104

Description: Focus on vertical structures, from grade to topping out, with an emphasis on materials and material handling equipment. Includes the assembly process for a variety of applications including cast-in-place concrete, steel erection, wood framing, precast concrete, masonry structural elements, and material finishing.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

CNST 251 Construction Materials and Specifications

Prerequisites: MATH 104

Description: Introduction to construction materials and proper methods of specifying to achieve design and construction goals, safety and inspection, and to meet zoning code and environmental requirements. Physical, mechanical and aesthetic properties of soils, concrete, masonry, metals, plastics and other materials will be studied as they relate to in-service conditions, acceptability, and performance.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

CNST 252 Construction Materials and Testing

Prerequisites: MATH 104

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 of soil, aggregate, and concrete.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded

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

Grading Option: Graded

Prerequisite for: ARCH 430, ARCH 430H; CNST 405

CNST 306 Electrical Systems

Prerequisites: MATH 104, PHYS 142

Description: Fundamentals of electric power generation and distribution, service, and circuits in buildings with an emphasis on electrical equipment and systems, lighting principles and applications, and fire protection systems. Review of National Electric Code.

Credit Hours: 3

Max credits per semester: 3

Max credits per degree: 3

Grading Option: Graded with Option

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**Grading Option:** Graded**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**Grading Option:** Graded**Prerequisite for:** ARCH 430, ARCH 430H**CNST 378 Construction Estimating I****Crosslisted with:** CONE 378**Prerequisites:** CNST 112**Description:** Preparation of detailed cost estimates based on contract documents. Identify and analyze cost components of building and site scopes of work to perform detailed quantity take-offs. Apply labor, material, and equipment pricing from RS Means. Use production rates and quantity takeoffs to prepare a preliminary construction schedule. Complete quantity takeoffs from 2D plans and from 3D BIM software models.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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 the determination of total project cost and preparation of complete bid proposals for self-performed and subcontracted commercial projects. Evaluation and analysis of subcontractor bids to determine overall project costs by completing a hard bid simulation scenario. Exploration of contract delivery methods and their effect on overall project cost.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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**Grading Option:** Graded**CNST 411 Project Administration****Crosslisted with:** CNST 811**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** Ownership and administration of companies focusing on documentation and specifications, 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**Grading Option:** Graded**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**Grading Option:** Graded**CNST 420 Professional Practice and Ethics****Crosslisted with:** CNST 820**Prerequisites:** CNST 379 and BLAW 300**Notes:** Not open to non-degree graduate students**Description:** Examination of professional practice considering the perspectives of designers and the contractors and their respective relationships to society, specific client types, and other collaborators in the design and construction fields. Focus on ethics, professional communication and responsibility, professional organization, office management, environmental stewardship, professional registration, and owner-designer-contractor relationships.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**ACE:** ACE 8 Civic/Ethics/Stewardship

CNST 425 Alternative Project Delivery Methods**Crosslisted with:** CNST 825**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**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**Grading Option:** Graded**Offered:** SPRING**CNST 434 The Design-Build Project Delivery System****Crosslisted with:** CNST 834**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** The organizational, managerial, ethical and legal principles involved in design-build as a 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**Grading Option:** Graded**CNST 436 Intent and Application of International Building Code****Crosslisted with:** CNST 836**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** Fundamentals 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**Grading Option:** Graded with Option**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**Grading Option:** Graded**CNST 444 Construction Site Safety Management****Crosslisted with:** CNST 844**Prerequisites:** CNST 241 or CONE 319**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. Not open to non-degree graduate students**Description:** Introduction to 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**Grading Option:** Graded with Option**Offered:** FALL**CNST 476 Project Budgets and Controls****Crosslisted with:** CONE 476**Prerequisites:** CNST 378, and BSEN 206 or FINA 300**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**Grading Option:** Graded**CNST 480 Productivity and Human Factors in Construction****Crosslisted with:** CNST 880**Prerequisites:** CNST 379, MNGT 300**Notes:** Not open to non-degree graduate students**Description:** Motivation and productivity improvement methods for management in typical job environments. Methods to improve working environments in the field and 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**Grading Option:** Graded with Option**Prerequisite for:** CNST 489**CNST 482 Heavy and/or Civil Construction****Crosslisted with:** CNST 882, CONE 482, CONE 882**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students**Description:** History, theory, methods, and management principles of planning and executing heavy and/or civil projects. Emerging and new equipment capabilities. Economical use of equipment and management of costs associated with production.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded

CNST 485 Construction Planning, Scheduling, and Controls**Crosslisted with:** CONE 485, CNST 885, CONE 885**Prerequisites:** CNST 378**Notes:** Not open to non-degree graduate students**Description:** Planning and scheduling a project using the critical path methods (CPM) with computer applications. Project pre-planning, logic networks, precedence diagrams, time estimates, critical path, float time, crash programs, scheduling, short interval schedules, pull planning, and monitoring project activities.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Prerequisite for:** CNST 489**CNST 486 Construction Management Systems****Crosslisted with:** CNST 886**Prerequisites:** CNST 379**Notes:** Not open to non-degree graduate students.**Description:** Application of selected topics in systems analysis (operations research). 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 industry.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded with Option**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**Grading Option:** Graded**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 project from conceptual design and location through estimating, bidding, site layout, 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**Grading Option:** Graded with Option**ACE:** ACE 10 Integrated Product**CNST 495 Internship****Crosslisted with:** CONE 495**Prerequisites:** Permission of instructor, Letter of application, Letter of agreement from industry mentor**Notes:** Not open to non-degree graduate students**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 between the intern and the business side of the entity. General topics include personnel and time management, structuring business plans, scheduling work, finance and budgets, marketing plans, contracts, risk analysis, and communication and leadership.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**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**Grading Option:** Graded**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. - Pheonix 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
- Construction Management, M.S., University of Florida - Gainesville FL
- Master of Business Administration, Kaplan University - Online

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. - Lincoln 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
- Field Engineer Intern, The Whiting-Turner Contracting Company - Boston MA

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