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) 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 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. Working knowledge of structural design, mechanical and electrical systems, methods and materials, soil mechanics and construction equipment is also essential.

ABET Curriculum Requirement

Graduates of the construction management program will have the knowledge and technical, administrative and communication skills, necessary to succeed in the construction industry. To successfully complete the program, students must be able to demonstrate the knowledge and skills to deliver construction projects with respect to scope, schedule, budget, quality, safety, and sustainability. Topics covered through the course of study include:

1. Construction project management from pre-design through commissioning;
2. Risk management including identification, analysis, and mitigation;
3. Cost estimating including types, levels, and accuracy;
4. Financial management including budgeting, cost control, and forecasting;
5. Schedule management including development, forecasting, and planning;
6. Contract administration, legal requirements and delivery methods;
7. Project sustainability including materials, methods of construction;
8. Construction systems and constructability analysis;
9. Leadership including business, communication skills, and behavioral awareness;
10. Labor and workforce planning and management;
11. Construction health and safety, accident prevention, and regulatory compliance;
12. Advancements in construction technology.

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

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 106, PHYS 151 (or PHYS 142 or PHYS 212), ENGR 10 and at least one of ENGL 150, ENGL 151 or JGEN 200, STAT 218 or CNST 112. Additionally, a minimum cumulative GPA of 2.5 is required.

Articulation Agreement with Metropolitan Community College

Metropolitan Community College students enrolled in the Associate in Applied Science (AAS) Construction Management (CBCMO) degree program are eligible to transfer up to 60 hours of qualified course credit to the Bachelor of Science in Construction Management at UNL program. AAS can complete the BSCM degree in as little as two years. See an

advisor for more information regarding transfer eligibility and course requirements.

College Requirements

College Admission

College Entrance Requirements

Students must meet both the University and College of Engineering entrance requirements. The following includes both the University and College of Engineering 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 or computer science)
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 without test scores who are missing a full unit of trigonometry/pre-calculus/calculus or chemistry or physics will be evaluated through College Review.
7. Students having an ACT score of 19 or less in English (or equivalent SAT score) or a grade lower than B in high school English, must take ENGL 150 Writing and Inquiry or ENGL 151 Writing for Change.

A total of 16 units is required for admission.

Engineering requires that student performance meet one of the following standards: composite ACT of 24, SAT of 1180, ACT Math subscore of 24, SAT Math subscore of 580, or a 3.5 cumulative GPA.

Any domestic first-year student who does not gain admission to Engineering but does gain admission to the University of Nebraska-Lincoln (UNL) will be reviewed through College Review. College Review is conducted through the College Review Committee which considers factors beyond standardized testing. Any first-year student who is not admitted through college review is placed in Pre-Engineering (PENG) with the Exploratory and Pre-Professional Advising Center (Explore Center). Students in the Explore Center can transfer to the College of Engineering once college admission requirements are met.

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 Explore Center or other colleges at UNL.

Students should consult their advisor, their department chair, or Engineering Student Services (ESS) 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 first-year student entrance requirements, 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 Kearney and the University of Nebraska 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.

Students who were previously admitted to COE and are returning to the College of Engineering must demonstrate a cumulative GPA of 2.5 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 their instructor, and appropriate department chair or school director (in that order). If a satisfactory solution is not achieved, the student may appeal their case through the College Academic Appeals Subcommittee.

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.

Students who have transferred from a community college may be eligible to fulfill the requirements as stated in the catalog for an academic year in which they were enrolled at the community college prior to attending the University of Nebraska-Lincoln.#This decision should be made in consultation with the student's College of Engineering academic advising team (e.g., ESS professional advisor and the chief faculty advisor for the student's declared degree program).#The chief faculty advisor has the final authority for this decision. Eligibility is based on a) enrollment in a community college during the catalog year the student wishes to utilize, b) maintaining continuous enrollment of at least 12 credit hours per semester at the previous institution for at least 2 semesters, and c) continuous enrollment at the University of Nebraska-Lincoln within 1 calendar year from the student's last term at the previous institution. #Students must complete all degree requirements from a single catalog year and within the timeframe allowable for that catalog year.

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 Construction Management (Bachelor of Science in Construction Management) program is accredited by the Applied and Natural Science Accreditation Commission of ABET, https://www.abet.org, under the commission's General Criteria and Program Criteria for Construction Management and Similarly Named Programs.

Major Requirements

Requirements for the Degree (Lincoln Campus)

First Semester		
CNST 131	Introduction to the Construction Industry	2
ENGL 151	Writing for Change (ACE 1)	3
or ENGL 150	Writing and Inquiry	
ENGR 100	Interpersonal Skills for Engineering Leaders (ACE 2)	3
MATH 106	Calculus I (ACE 3)	5
ACE Elective		3
Choose one course from not yet satisfied ACE outcomes 5, 7, or 9		
ENGR 10	Freshman Engineering Seminar	0
or ENGR 30	Transfer Student Engineering Seminar	
Credit Hours Subtotal:		16
Second Semester		
CNST 112	Construction Communications	3
PHYS 151	Elements of Physics (ACE 4)	4
PHYS 153	Elements of Physics Laboratory	1
JGEN 200	Technical Communication I	3
ECON 200	Economic Essentials and Issues	3
ACE Elective		3
Choose one course from not yet satisfied ACE outcomes 5, 7, or 9		
Credit Hours Subtotal:		17
Third Semester		
CONE 221	Geometric Control Systems	3
CNST 241	Horizontal Construction	3
CNST 251	Construction Materials and Specifications	3
CNST 252	Construction Materials and Testing	3
ACCT 200	Accounting for Business Decisions	3
ENGR 20	Sophomore Engineering Seminar	0
Credit Hours Subtotal:		15
Fourth Semester		
CNST 225	Introduction to Building Information Modeling (BIM)	3
CNST 242	Vertical Construction	3
FINA 300	Financial Decision Making	3
or CONE 206	Engineering Economics	
STAT 218	Introduction to Statistics	3
ACE Elective		3
Choose one course from not yet satisfied ACE outcomes 5, 7, or 9		
Credit Hours Subtotal:		15
Fifth Semester		
ARCH 331	Structural Mechanics	3
CNST 305 / ARCH 333	Building Environmental Technical Systems I	3
CNST 378 / CONE 378	Construction Estimating I	3
CNST 411	Project Administration	3
CNST 444	Construction Site Safety Management	3
Credit Hours Subtotal:		15
Sixth Semester		
ARCH 332	Structural Optimization	3
CNST 306	Electrical Systems	3
CNST 379	Construction Estimating II	3
Construction Electives or MNGT 300		6
Credit Hours Subtotal:		15
Seventh Semester		
CNST 420	Professional Practice and Ethics (ACE 8)	3
CNST 476 / CONE 476	Project Budgets and Controls	3
CNST 485	Construction Planning, Scheduling, and Controls	3
Construction Elective or MRKT 300		3
Technical Elective or BLAW 300		3
Credit Hours Subtotal:		15
Eighth Semester		
CNST 480	Productivity and Human Factors in Construction	3
CNST 489	Senior Construction Project (ACE 10)	3
Construction Electives		6
Credit Hours Subtotal:		12
Total Credit Hours		**120**

Construction Electives

*Any CNST 300 or 400 Level Course	
*Any CONE 300 or 400 Level Course	
BLAW 300	Business, Government & Society
FINA 300	Financial Decision Making
MNGT 300	Management Essentials For Contemporary Organizations
MRKT 300	Contemporary Marketing

Technical Electives

*Any CNST 300 or 400 Level Course	
*Any CONE 300 or 400 Level Course	

BLAW 300	Business, Government & Society	
CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	
CSCE 101	Fundamentals of Computer Science	3
CSCE 155A	Computer Science I	
CSCE 155E	Computer Science I: Systems Engineering Focus	
ECEN 211	Elements of Electrical Engineering I	
ECEN 231	Electrical Engineering Laboratory	
FINA 300	Financial Decision Making	
MATH 107	Calculus II	
MATH 208	Calculus III	
MECH 325	Mechanics of Elastic Bodies	
MECH 373	Engineering Dynamics	
MNGT 300	Management Essentials For Contemporary Organizations	
MRKT 300	Contemporary Marketing	
PHYS 141	Physics for Life Sciences I	
PHYS 211	General Physics I	

Students may complete the requirements for a Business minor by selecting appropriate courses in the major. Please see your academic advisor or Engineering Student Services.

Additional Major Requirements

Grade Rules

C- and D Grades

All required and elective courses (including ACE 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 Construction Management program follows the University of Nebraska–Lincoln ACE general education requirements (https://ace.unl.edu/). Because of the specific needs of the program, most of these courses are specified in the curriculum. Please contact DurhamSchool@unl.edu if you are interested in more information about this program.

Requirements for Minor Offered by Department

This minor is for engineering, architecture and business 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. The 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. Minors on the Lincoln or Omaha campuses may be added by approval of the College of Engineering Curriculum Committee and faculty.
5. The minor requires taking one 3-credit course from each of the six required topics listed below for a total of 18 credit hours.

Course Requirements

All courses must be taken for a letter grade.

Choose One Course for Each Requirement		
1) Communications		*3*
CNST 112	Construction Communications	
2) Methods & Materials		*3*
CNST 241	Horizontal Construction	
CNST 242	Vertical Construction	
CNST 252	Construction Materials and Testing	
CONE 319	Construction Methods and Equipment	
3) Building Systems		*3*
CNST 251	Construction Materials and Specifications	
CNST 305	Building Environmental Technical Systems I	
CNST 306	Electrical Systems	
4) Estimating		*3*
CNST 378	Construction Estimating I	
5) Safety/Human Factors		*3*
CNST 444	Construction Site Safety Management	
CNST 480	Productivity and Human Factors in Construction	
6) Budgeting/Scheduling		*3*
CNST 476	Project Budgets and Controls	
CNST 485	Construction Planning, Scheduling, and Controls	
Credit Hours Subtotal:		18
Total Credit Hours		**18**

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, safety, construction documents, project administration, scheduling, and budgets.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Offered: FALL
Prerequisite for: CONE 211
Experiential Learning: Fieldwork

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 106
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 106
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 106
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 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 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 106, PHYS 151
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 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: Junior or senior standing
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 378
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 378
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
Experiential Learning: Research

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 442 Healthcare Design and Construction
Crosslisted with: AREN 442, AREN 842, CNST 842
Prerequisites: Senior or graduate standing
Description: Introduction to the design and construction of healthcare facilities. Healthcare regulations and standards, infection control, interim life safety measures, code requirements, medical equipment selection and coordination, healthcare design and construction techniques, and best practices will be addressed. Provides guidance in preparation for the Certified Healthcare Constructor credential offered by the American Healthcare Association.
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
Experiential Learning: Case/Project-Based Learning

CNST 476 Project Budgets and Controls
Crosslisted with: CONE 476, CONE 876
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
Prerequisite for: CONE 489

CNST 480 Productivity and Human Factors in Construction
Crosslisted with: CNST 880
Prerequisites: Corequisite CNST 489, senior standing
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
Experiential Learning: Case/Project-Based Learning

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; CONE 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
Experiential Learning: Case/Project-Based Learning

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
Experiential Learning: Fieldwork

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

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 - 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 - Colorado Springs, CO
- Project Engineer, Union Pacific - Tehachapi, CA
- Field Engineer, J.E. Dunn Construction - 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 - Omaha, NE
- Project Engineer, Swinerton Builders - Portland, OR
- Superintendent, Hawkins Construction - Omaha, NE
- Field Engineer, Constuctors Inc. - Lincoln, NE
- Project Engineer, McCarthy Construction - 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 - 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. - 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

- Ph.D., Construction Management & Engineering, University of Nebraska-Lincoln - Lincoln, NE
- Master's in Construction Management & Engineering, University of Nebraska-Lincoln - Lincoln, NE
- Master's in Community and Regional Planning, University of Nebraska-Lincoln - Lincoln, NE
- Master's in Project Management, Norwegian University of Science and Technology - Trondheim, Norway
- Master's in Construction Management, University of Florida - Gainesville, FL
- Master's in Business Administration, Kaplan University