

# CONSTRUCTION MANAGEMENT (CNST)

---

## 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

**Format:** LEC

**Prerequisite for:** CNST 378, CONE 378

## 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 225

## 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  
**Description:** Fundamentals of electric power generation and distribution. Service and circuits in buildings, electrical equipment and systems in buildings, 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  
**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:** Senior standing, 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