

# CONSTRUCTION MANAGEMENT (CNST)

## Construction Management Graduate Courses

### **CNST 811 PROJECT ADMINISTRATION (3 credits)**

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. (Cross-listed with CNST 411).

**Prerequisite(s):** CNST 3790. Not open to non-degree graduate students.

### **CNST 815 MECHANICAL/ELECTRICAL PROJECT MANAGEMENT (3 credits)**

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. (Cross-listed with CNST 415).

**Prerequisite(s):** CNST 305, CNST 306 and CNST 379. CNST 405 and CNST 406 are recommended.

### **CNST 820 PROFESSIONAL PRACTICE AND ETHICS (3 credits)**

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. (Cross-listed with CNST 420).

**Prerequisite(s):** CNST 379, LAWS 3930. Not open to non-degree graduate students.

### **CNST 825 ALTERNATIVE PROJECT DELIVERY METHODS (3 credits)**

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. (Cross-listed with CNST 425)

**Prerequisite(s):** Not open to non-degree graduate students.

### **CNST 826 OCCUPATIONAL HEALTH AND SAFETY FOR CONSTRUCTION (3 credits)**

Investigation of occupational health and safety hazards in the construction environment. Accident causation and illness exposure models, construction and safety programs and contract requirements, project safety and health management, special problems in construction safety, OSHA/EPD/ADA regulation and compliance issues, health assessment and monitoring, safe building methods design, toxic substance exposures, abatement methods, and worker training and protection.

**Prerequisite(s):** Permission; open only to students in engineering, construction management, architecture, or other closely related fields

### **CNST 834 THE DESIGN-BUILD PROJECT DELIVERY SYSTEM (3 credits)**

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. (Cross-listed with CNST 434)

**Prerequisite(s):** CNST 379. Not open to non-degree graduate students.

### **CNST 835 DESIGN/BUILD: METHODS AND APPLICATION (3 credits)**

Investigation, documentation, and application of current Design/Build processes and methodology used in commercial construction. Principles and practices of Design/Build as a project delivery system.

**Prerequisite(s):** Permission; open only to students in engineering, construction management, architecture, or other closely related field

### **CNST 836 INTENT AND APPLICATION OF INTERNATIONAL BUILDING CODE (3 credits)**

Fundamentals of how to research, interpret, and apply building code requirements to the design and construction of both new and renovated structures. (Cross-listed with CNST 436)

**Prerequisite(s):** CNST 379. Not open to non-degree graduate students.

### **CNST 840 BUILDING INFORMATION MODELING (BIM) II (3 credits)**

Advance 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. (Cross-listed with CNST 440)

**Prerequisite(s):** CNST 225 and CNST 378.

### **CNST 842 HEALTHCARE DESIGN AND CONSTRUCTION (3 credits)**

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. (Cross-listed with AREN 8426, AREN 4420, CNST 442).

**Prerequisite(s):** Senior or graduate standing

### **CNST 844 CONSTRUCTION SITE SAFETY MANAGEMENT (3 credits)**

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. (Cross-listed with CNST 444)

**Prerequisite(s):** CNST 241 or CONE 319. Not open to non-degree graduate students.

### **CNST 850 SUSTAINABLE CONSTRUCTION (3 credits)**

Application of Leadership in Energy and Environmental Design (LEED) best practices in building procurement and delivery systems. History, theory, and state-of-the-art practices in designing and constructing green buildings. Basic principles required to make the multitude of decisions when designing or constructing a green building. LEED construction practices (emerging practices that are economical, produce esthetically pleasing structures, and are environmentally sound).

**Prerequisite(s):** ARCH major or CIVE major or CNST major. Not open to non-degree graduate students.

### **CNST 860 CONSTRUCTION VISUALIZATION AND SIMULATION (3 credits)**

Fundamental knowledge of visualization platforms of buildings and construction. Topics include construction visualization software, basic data structure and programming, interoperability, and building performance simulation.

**Prerequisite(s):** Graduate standing in construction management or related discipline with instructor approval. Not open to non-degree graduate students.

### **CNST 879 CONSTRUCTION MANAGEMENT & CONSTRUCTION SYSTEMS (3 credits)**

Quantity survey methods, production rate and cost analysis, bidding, contingency and risk analysis. Computer applications of estimating and research topics. Monte Carlo simulation, Virtual #D, BIM applications relevant to construction estimating and risk analysis.

**CNST 880 PRODUCTIVITY AND HUMAN FACTORS IN CONSTRUCTION (3 credits)**

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. (Cross-listed with CNST 480).

**Prerequisite(s):** CNST 379 and senior standing. Not open to non-degree graduate students.

**CNST 882 HEAVY AND/OR CIVIL CONSTRUCTION (3 credits)**

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. (Cross-listed with CNST 482, CONE 482, CONE 882)

**Prerequisite(s):** CNST 379. Not open to non-degree graduate students.

**CNST 883 MANAGEMENT OF LIMITED SCOPE PERMITTING (3 credits)**

Building code permitting process associated with all projects. Phased projects that require one or more limited scope permits prior to receiving the final full construction permit. How to improve coordination and reduce the confusion and risk associated with managing the permitting process. The permitting process that is applicable to both large and small projects and that can be easily adapted and used in all jurisdictions throughout the United States.

**Prerequisite(s):** (ARCH major or CIVE major or CNST major). Not open to non-degree graduate students.

**CNST 885 CONSTRUCTION PLANNING, SCHEDULING, AND CONTROLS (3 credits)**

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. (Cross-listed with CNST 485, CONE 485, CONE 885)

**Prerequisite(s):** CNST 378. Not open to non-degree graduate students.

**CNST 886 CONSTRUCTION MANAGEMENT SYSTEMS (3 credits)**

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. (Cross-listed with CNST 486).

**Prerequisite(s):** CNST 379. Not open to non-degree graduate students.

**CNST 887 CONSTRUCTION LEADERSHIP AND STRATEGIC PLANNING (3 credits)**

New models of construction leadership for the 21st Century. Application of transformational leadership to strategic planning and marketing in construction contracting. Leadership and strategic problem solving constructs and methods.

**Prerequisite(s):** Permission; open only to students in engineering, construction management, architecture, or other closely related fields

**CNST 888 RESIDENTIAL CONSTRUCTION AND REAL ESTATE DEVELOPMENT (3 credits)**

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 preconstruction and bidding process. (Cross-listed with CNST 488)

**Prerequisite(s):** CNST 397.

**CNST 890 MASTERS PROJECT (3 credits)**

First course in a two-course sequence required for the masters degree. Technical report, technical paper, or portfolio project, culminating in a final document or oral presentation.

**Prerequisite(s):** Permission; admission to the master of engineering degree program with an emphasis in construction. Not open to non-degree graduate students.

**CNST 891 MASTERS PROJECT II (3 credits)**

Second course in a two-course sequence required for the masters degree. Technical report, technical paper, or portfolio project, culminating in a final document or oral presentation.

**Prerequisite(s):** CNST 890 and permission.

**CNST 895 GRADUATE INTERNSHIP (3 credits)**

Open only to Construction Management graduate students. Participation in a full-time summer internship with an approved Construction Engineering or Construction Management related entity. Includes weekly assignments and a final presentation that are designed to create interaction between the Construction entity and the intern, and associated with the business aspects of the entity. General topics include Business Plans, Marketing, Finance and Budgets, Contracts, Legal Issues and Professionalism. (Cross-listed with CONE 895).

**Prerequisite(s):** Permission. Not open to non-degree graduate students.

**CNST 898 SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT (1-6 credits)**

Individual or small group study of special topics in construction management. Topic varies. A signed student-instructor learning contract is required. (Cross-listed with CNST 498, CONE 498).

**Prerequisite(s):** Master of engineering in construction management or related discipline and permission.

**CNST 899 MASTER'S THESIS (1-10 credits)**

Master's Thesis.

**Prerequisite(s):** Admission to Masters of Science in Construction degree program and permission of major advisor. Not open to nondegree students

**CNST 993 GRADUATE SEMINAR (1 credit)**

Seminar participation to broaden knowledge of construction engineering and management topics, improve presentation and professional skills, and learn about professional development resources available on campus.

**Prerequisite(s):** Graduate student in Construction. Not open to non-degree graduate students.

**CNST 999 DOCTORAL DISSERTATION (1-24 credits)**

None provided

**Prerequisite(s):** Admission to doctoral degree program and permission of supervisory committee chair. Not open to nondegree students.