CONSTRUCTION MANAGEMENT (CNST)

CNST 8116 PROJECT ADMINISTRATION (3 credits)
An introduction to construction project administration. Ownership and organization of construction companies, construction documentation specifications, type of contracts, takeoffs, 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 4110.)
Prerequisite(s)/Corequisite(s): CIVE 378 or CNST 3790. Not open to non-degree graduate students.

CNST 8156 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 4150.)
Prerequisite(s)/Corequisite(s): CNST 3050, CNST 3060 and CNST 3790. CNST 4050 and CNST 4060 are recommended.

CNST 8206 PROFESSIONAL PRACTICE AND ETHICS (3 credits)
Orientation to professional practice through a study of the designers' and the contractors' relationship 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. (Cross-listed with CNST 4200.)
Prerequisite(s)/Corequisite(s): CNST 3790; and LAWS 3930

CNST 8260 OCCUPNTL HLTH/SAFETY FOR CNST (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)/Corequisite(s): Permission; open only to students in engineering, construction management, architecture, or other closely related fields

CNST 8346 PROFESSIONAL TRENDS IN DESIGN/BUILD (3 credits)
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. (Cross-listed with CNST 4340)
Prerequisite(s)/Corequisite(s): CNST 3790.

CNST 8350 DESIGN/BUILD MTHDS & APPLCTNS (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)/Corequisite(s): Permission; open only to students in engineering, construction management, architecture, or other closely related field

CNST 8366 INTENT AND APPLICATION OF INTERNATIONAL BUILDING CODE (3 credits)
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 new and renovated structures. (Cross-listed with CNST 4360)
Prerequisite(s)/Corequisite(s): CNST 1120 and 2510.

CNST 8406 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 4400)
Prerequisite(s)/Corequisite(s): CNST 2250 and CNST 3780.

CNST 8446 CONSTRUCTION SITE SAFETY MANAGEMENT (3 credits)
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. 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. (Cross-listed with CNST 4440)
Prerequisite(s)/Corequisite(s): CNST 2420.

CNST 8500 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)/Corequisite(s): ARCH major or CIVE major or CNST major. Not open to non-degree graduate students.

CNST 8790 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 3D, BIM applications relevant to construction estimating and risk analysis.

CNST 8806 PRODUCTIVITY AND HUMAN FACTORS IN CONSTRUCTION (3 credits)
Motivation and productivity improvement methods in the management of construction workers in their typical job environments. Methods to improve working environment in the field and in the office. Procedures and mechanisms to implement human behavior concepts and ergonomic concepts for enhanced productivity and safety. (Cross-listed with CNST 4800)
Prerequisite(s)/Corequisite(s): Senior standing; CNST 3780; MGMT 3490

CNST 8825 HEAVY AND/OR CIVIL CONSTRUCTION (3 credits)
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. (Cross-listed with CNST 8420, CONE 8200, CONE 8826)
Prerequisite(s)/Corequisite(s): ARCH major or AE major or CIVE major or CNST major or CONE major), not open to non-degree graduate students

CNST 8830 MGMT 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)/Corequisite(s): ARCH major or CIVE major or CNST major). Not open to non-degree graduate students.
**CNST 8856  CONSTRUCTION PLANNING, SCHEDULING, AND CONTROLS (3 credits)**
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. (Cross-listed with CNST 4850, CONE 4850, CONE 8856)
Prerequisite(s)/Corequisite(s): CNST 3780 and CNST 2250.

**CNST 8866  CONSTRUCTION MANAGEMENT SYSTEMS (3 credits)**
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. (Cross-listed with CNST 4860).
Prerequisite(s)/Corequisite(s): CNST 3790.

**CNST 8870  CNSTRCTN LDRSHP & STRATGC PLNG (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)/Corequisite(s): Permission; open only to students in engineering, construction management, architecture, or other closely related fields

**CNST 8886  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 4880)
Prerequisite(s)/Corequisite(s): CNST 3970.

**CNST 8900  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)/Corequisite(s): Permission; admission to the master of engineering degree program with an emphasis in construction. Not open to non-degree graduate students.

**CNST 8910  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)/Corequisite(s): CNST 8900 and permission.

**CNST 8950  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 Prerequisite(s)/Corequisite(s): Permission. Not open to non-degree graduate students.

**CNST 8986  SPEC TOPS IN CONSTRUCTION MGMT (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 4980, CONE 4980)
Prerequisite(s)/Corequisite(s): Master of engineering in construction management or related discipline and permission.

**CNST 8990  MASTER’S THESIS (1-10 credits)**
Master's Thesis.
Prerequisite(s)/Corequisite(s): Admission to Masters of Science in Construction degree program and permission of major advisor. Not open to nondegree students

**CNST 9930  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)/Corequisite(s): Graduate student in Construction. Not open to non-degree graduate students.

**CNST 9990  DOCTORAL DISSERTATION (1-24 credits)**
None provided
Prerequisite(s)/Corequisite(s): Admission to doctoral degree program and permission of supervisory committee chair. Not open to nondegree students.