

CONSTRUCTION MANAGEMENT (CONM)

CONM1000 INTRODUCTION TO CONSTRUCTION MANAGEMENT, FACILITIES MANAGEMENT & REAL ESTATE DEVELOPMENT

This course provides an introduction to construction management and facilities management. The course will also explore the process of real estate development as it pertains to the built environment. The course will analyze the cultural context of construction, emphasizing its centrality in the evolution and expansion of the built environment. Industry trends, ethical considerations, delivery systems, technologies and recent "mega" projects including green construction and sustainability will be discussed. (3 credits) fall

CONM1050 INTRODUCTION TO THE BUILT ENVIRONMENT

This course introduces the professions of construction management, facility management, and real estate development and analyzes the cultural context of construction, emphasizing its centrality in the evolution and expansion of the built environment. Industry trends, ethical considerations, delivery systems, technologies, and recent "mega" projects, including green construction and sustainability, are discussed. (3 credits)

CONM1200 BUILDING CONSTRUCTION

Survey of current materials and methods used in building construction, including building foundations; timber, concrete and steel framing systems; masonry construction; interior and exterior finishes. (4 credits) fall

CONM1500 CONSTRUCTION GRAPHICS

The development and interpretation of civil, architectural, structural, and electrical drawings; freehand sketching of construction details and sections; computer aided construction drafting. (3 credits) spring

CONM1525 INTRODUCTION TO BUILDING INFORMATION MODELING (BIM)

This introductory course focuses on basic building information modeling (BIM) concepts and discusses the impact of BIM in the construction industry. The course utilizes industry-standard authoring tools as the BIM platform for learning key aspects of designing and documentation of building elements. The fundamentals of BIM training are provided to the students through labs and lectures to advance students' skills in the virtual, design, and construction aspects of construction. The course also introduces rendering software so that students can learn high-quality rendering processes. **Prerequisites:** CONM1200 (2 credits)

CONM1550 INTRODUCTION TO PLAN READING & SPECIFICATIONS

Since blueprints represent such a large portion of the construction documents necessary to build any structure, it is essential that all people involved in the building process know how to interpret them. This course teaches students how to read and interpret civil, architectural, and structural prints, as well as construction specifications. In addition, the course emphasizes the development of plan reading skills to understand common and new construction techniques in building, residential, and commercial projects. **Prerequisites:** CONM1200 (2 credits)

CONM1600 HEAVY CONSTRUCTION EQUIPMENT

Study of current methods and equipment used in heavy construction projects, including highways, tunnels, bridges, dams, storm drains, and sanitary sewers. (3 credits) spring

CONM2000 CONSTRUCTION SURVEYING

Instruction is given in the theory and techniques of horizontal and vertical measurements. Laboratory exercises will focus on the application of these techniques as they relate to the building industry including construction layout and grades. **Prerequisites:** MATH1000 (4 credits) fall

CONM2100 STATICS & STRENGTH OF MATERIALS

This course covers the fundamental concepts of structural static; forces, moments, equilibrium, support conditions, and free body diagrams; and the fundamentals of strength of materials: properties, stress, strain, shear, bending, and torsion. **Prerequisite:** PHYS1000 (4 credits) fall

CONM2150 MANAGEMENT OF ROADS, HIGHWAYS, AND BRIDGES

This course covers elements of design, construction, inspection, and maintenance for bridges and roadways, with emphasis on identifying and understanding construction management life-cycle responsibilities and design decision-making for public works roadway projects. (3 credits)

CONM2200 ESTIMATING

Topics include the basic manual and computer-aided skills for estimating a variety of projects and developing takeoffs for all trades. **Prerequisites:** CONM1525 and CONM1550 or CONM1500 (4 credits) fall

CONM2500 BUILDING SYSTEMS

Building Systems is an introduction to the design, construction and start-up of building systems including mechanical, electrical and life safety systems. In particular, it covers the elements of these systems as they relate to the realm of the construction manager. The course provides basic design concepts and code requirements for a variety of systems, including: plumbing, heating, ventilation and air conditioning, fire protection, electrical distribution, lighting, low voltage, and building management control (BMS). It also provides information on systems testing and start-up. (4 credits) spring

CONM2525 AIR, RAIL, AND INTERMODAL TRANSPORTATION FACILITY PLANNING

This course covers planning for airports, railways, and intermodal transportation terminals with an emphasis on applying guidelines and best practices for the improvement of passenger and freight transportation facilities. Topics include but are not limited to multimodal and intermodal transportation concepts, passenger and freight planning, airport classification, layout and design standards, railroad and transit guideway, and rail transit station planning and design. (3 credits)

CONM2600 WOOD & STEEL ANALYSIS & DESIGN

This course covers the properties of wood and steel products used in construction. The basic design principles for timber and steel structures are covered including connections, beams, columns, trusses, and frames. **Prerequisite:** CONM2100 (3 credits) fall

CONM3000 MATERIALS TESTING & QUALITY CONTROLS

Aggregate, concrete, asphalt, wood, and masonry are tested using ASTM procedures to establish design criteria, inspection and quality control programs. (4 credits) fall

CONM3100 CONSTRUCTION PROJECT MANAGEMENT

Topics include Construction Project Delivery Types, and Construction Project Management in the Pre-Construction, Construction and Post Construction Phases. **Prerequisite:** CONM2200 (4 credits) fall

CONM3125 CONSTRUCTION AND MAINTENANCE OF WATER AND WASTEWATER INFRASTRUCTURE SYSTEMS

This course provides an overview of the construction and maintenance of water and wastewater infrastructure systems. Topics include an introduction to water and wastewater systems and their characteristics, different components and units, cost estimate and scheduling, asset management, life-cycle analysis, resiliency, sustainability, public implementation and implementation issues, new technologies, and future challenges. (3 credits) spring

CONM3150 QUALITY CONTROL AND ASSURANCE

This course provides students with an opportunity to become familiar with the properties of aggregates, cement, concrete, asphalt, steel, masonry, and timber. Aggregate, concrete, wood, and masonry are tested using American Society for Testing and Materials (ASTM) procedures to establish design criteria and quality control programs. Understanding these properties allows for the design and construction of safe products and structures. Students also get an in-depth look at Portland cement concrete mixture designs. They learn how to follow standard procedures in determining the properties of materials and how to interpret the results of tests conducted in the laboratory. (3 credits) fall

CONM3201 CONSTRUCTION PROJECT SCHEDULING

This course will cover topics such as project scheduling methods, types of schedules, CPM mechanics, and schedule resource loading and reports. Students will explore computer applications using current scheduling software. **Prerequisite:** CONM1525 and CONM1550 or CONM1500 (4 credits) fall

CONM3500 ADVANCED ESTIMATING & BID ANALYSIS

Detailed cost estimates including quantity takeoffs, labor/material pricing, overhead/profit. Also, included are the preparation of preliminary budgets; factors affecting construction cost, bid strategies and computer applications are explored. **Prerequisite:** CONM2200 (4 credits) summer

CONM3600 CONCRETE ANALYSIS & DESIGN

This course covers topics related to the analysis and design of reinforced concrete structures including beams, columns, slabs, footings and retaining walls. **Prerequisite:** CONM2100 (4 credits) summer

CONM3700 MARINE INFRASTRUCTURE CONSTRUCTION

This course offers a unique and comprehensive treatment of construction and maintenance aspects of offshore and nearshore infrastructures rather than the more commonly addressed design considerations. The course details all the particulars of building in a marine environment, including construction equipment, marine operations, installing piles, pipelines, and cables, steel and concrete offshore platforms, and underwater repairs. (3 credits) spring

CONM3800 SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT

Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (1 - 4 credits) summer

CONM4000 CONSTRUCTION PROJECT CONTROL

Examines the activities involved in the effective management of single and multiple construction projects including basic control theory, the preparation of control models, the collection of actual production data, and the corresponding computation of project performance.

Prerequisites: CONM2200 and CONM3201 (3 credits) spring

CONM4100 CONSTRUCTION BUSINESS & FINANCE

Topics include construction financing during all phases of project development involving permanent loans, construction loans, sources of mortgage funds and venture capital, and tax and interest considerations.

Prerequisites: MGMT2700 (4 credits) spring

CONM4200 CONSTRUCTION SAFETY & RISK MANAGEMENT

Topics include the knowledge and skills required to effectively manage safety compliance and risks associated with construction. This course satisfies the OSHA 30-hour training requirement for graduation.

Prerequisites: COOP3000 or COOP3500 or COOP4500 (3 credits) spring

CONM4650 BUSINESS, CONSTRUCTION LAW & GOVERNMENT REGULATIONS

This course introduces business law and relationships, construction contracts, and the contractual relationships commonly established between owner/real estate developer, designer, builder and construction manager. (3 credits) summer

CONM5500 SENIOR PROJECT CONSTRUCTION MANAGEMENT

Students have the opportunity to explore a subject in construction management of their own choice and to present it. A final oral presentation is required. **Prerequisite:** Completion of preceding 7 semesters of BSCM program (4 credits) summer

CONM7000 EXECUTIVE MANAGEMENT FOR CONSTRUCTION MANAGEMENT

This course covers the management of a design and construction office and dealing with challenges of change, culture, diversity, portfolio management, project management, strategic management and other elements that influence the management process. This course also covers leadership, authority and decision making, and ethics concepts as systems-thinking ways of winning desired cooperation from associates, customers and the construction project participants. The use of case studies and analysis to develop a deeper understanding of executive management in a construction organization is emphasized. (3 credits) fall

CONM7050 RESEARCH METHODOLOGY FOR CONSTRUCTION MANAGEMENT

This course will guide each student in the understanding and development of research, research tools, proposal writing, and research reports. Emphasis is placed on research planning and design. Topics to be covered range from the Review of Literature through qualitative and quantitative research methodologies. Special attention will be devoted to defining research problems in construction science or construction management and the development of research papers. Upon completion of this course, students will be able to: Demonstrate an understanding of the scientific approach to a research project; Demonstrate knowledge of the variety research tools used in scientific research; Examine "real world" construction science or management problems and develop research methodologies to define and understand them; Demonstrate knowledge of the available quantitative research methodologies; Demonstrate an understanding of how to write a research proposal; Specify the assumptions and limitations implicit in using these techniques, and explain the effect they have on the validity of the results obtained. (3 credits) spring

CONM7100 MODERN CONSTRUCTION DELIVERY METHODS

This course will expose students to current Architecture-Engineering-Construction (AEC) industry practices that are used to finance and manage the design and construction of capital facilities. It will investigate as well as differentiate recent trends in project contracting, organization, and production management. (3 credits) summer

CONM7150 CONSTRUCTION ESTIMATING

This course serves as a leveling course for students without a construction background and as an open elective to students with a construction-related background. The course provides students with the knowledge to perform construction estimating using digital tools and software, construction bidding, and cost control. Course lectures cover quantity takeoffs from construction plans; specifications on materials, labor, equipment, profit, contracts, bonds, and insurance; and overhead of a construction project. The course also highlights the importance of cost control and monitoring project cash flow. Students are introduced to construction estimating software utilized in the construction industry. (3 credits) fall

CONM7175 CONSTRUCTION PROJECT SCHEDULING AND CONTROLS

This course serves as a leveling course for students without a construction background and as an open elective for students with a construction-related background. The course provides an understanding of scheduling principles, construction cost control methodologies, and the use of schedules for monitoring the health of construction projects. The course also introduces the technology behind planning, sequencing, and visualizing the schedule of a project. The course focuses on industry standard software for project planning and scheduling. (3 credits) fall

CONM7200 CONSTRUCTION LAW

This course will provide a focused study of the key legal concepts and considerations encountered in the construction industry. The course shall include the student and analysis of: industry standard construction contract forms and documents, contractual relationships on a construction project, risk allocation among the parties to a construction project, the procurement and contract formation issues arising on construction projects (public v. private considerations), claims and changes (for time and compensation), and alternative dispute resolution. (3 credits) fall

CONM7250 CONFLICT RESOLUTION & NEGOTIATION FOR CONSTRUCTION MANAGEMENT

The course reviews the theoretical basis and practical application of traditional and evolving methods of dispute avoidance, mitigation and resolution within the construction industry. The class will cover key strategies, styles, and tactics involved in negotiating typical construction industry transactions, as well as alternative project delivery methods and partnering. The class will also address the negotiation of construction disputes and the resolution of disputes using third parties. Traditional litigation and all forms of alternative dispute resolution will be examined. (3 credits) Spring

CONM7300 REAL ESTATE DEVELOPMENT

Introduce elements, players and processes associated with real estate development. Emphasis placed on understanding the real estate development process from the perspective of each of the major players. Topics to be covered include the developer's role, the relationship between owner/developer, architect and contractor, legal issues, and the perspective of lenders and investor partners. (3 credits) fall

CONM7400 ADVANCED PROJECT CONTROLS

This course covers the construction project controls necessary to be an effective project manager. Several key aspects of construction projects, such as construction contracts, cost estimation, planning and scheduling, equipment costs and productivity, construction control and monitoring, and risk management are discussed. (3 credits) spring

CONM7500 INTERNATIONAL CONSTRUCTION

A detailed introduction to the key elements of the international construction markets is covered, with emphasis on strategic elements having the most effect on project scopes, schedules and budgets. (3 credits) spring

CONM7800 GRADUATE SPECIAL TOPICS IN CONSTRUCTION MANAGEMENT

Presents topics that are not covered by existing courses and are likely to change from semester to semester. Refer to the Class Schedule for a specific semester for details of offerings for the semester. (4 credits)

CONM8000 CAPSTONE PROJECT IN CONSTRUCTION MANAGEMENT

This course will guide each student in the development of an individual research topic. It integrates applied classroom and current industry practice and knowledge through observation and interpretation of realistic construction management issues. (3 credits) spring

CONM8900 CONSTRUCTION MANAGEMENT THESIS

The MS in Construction Management program offers an optional thesis for students who are considering doctoral-level study in the field.

Prerequisite: CONM7050 (3 credits)