COSC - CONSTRUCTION SCIENCE

COSC 601 Construction Practices
Credits 3. 3 Lecture Hours.
Materials and methods of construction with emphasis on the design and construction process; includes structural steel and other metals, foundation materials, precast and tilt wall concrete, concrete reinforcement including pre-stressing, wood dimension lumber framing, and heavy timber framing.

COSC 602 Construction Cost Estimating
Credits 3. 3 Lecture Hours.
Determination of quantities for various types of construction materials and works including earthwork, foundations, structural systems, mechanical and electrical systems, and building finishes; methods used for pricing of construction works including labor, materials, equipment, sub-contractors, overhead and profit; use of various types of cost data catalogs available in the industry.

COSC 603 Construction Scheduling
Credits 3. 3 Lecture Hours.
Introduction to commonly used techniques and computer applications for the planning, scheduling, monitoring, and controlling of construction projects; includes key scheduling techniques such as Gantt Chart, CPM, PERT, LSM, and EVM; practical scheduling practices such as tracking, controlling, and forecasting trends of schedules, cost control, and reporting.
Prerequisite: COSC 602 or equivalent.

COSC 606 Mechanical and Electrical Construction
Credits 3. 3 Lecture Hours.
Building environmental systems with a major emphasis on the design and control of the heating, ventilation and cooling systems, plumbing and drainage systems, electrical, fire and lighting protection, and lighting; design opportunities, calculations, equipment selection and economics as they relate to design and construction.

COSC 608 Structural Principles and Practices
Credits 3. 3 Lecture Hours.
Investigations into practical applications of structural design including the analysis and design of structural members in steel and concrete; surveys and studies of various structural systems.

COSC 620 Construction Company Operations
Credits 3. 3 Lecture Hours.
Running a construction company; strategic planning; business planning; organizational theory; competitor analysis; risk management; financial analysis; human resources; management information systems; leadership; codes of ethics; best practices.

COSC 621 Advanced Project Management
Credits 3. 3 Lecture Hours.
Theoretical, practical, and strategic development in the management of contemporary construction projects; advanced techniques used in scheduling and evaluating progress in construction project control; exploration of state-of-the-art management principles and practices, and development of additional insights.
Prerequisite: COSC 603 or COSC 475.

COSC 622 Construction Economics
Credits 3. 3 Lecture Hours.
Foundation in Life Cycle Cost Analysis computation within the context of current issues in environmental sustainability and evidence-based thinking; lean construction as a strategy to overcome the hurdle of first cost.

COSC 624 Construction Business Development
Credits 3. 3 Lecture Hours.
Acquisition of new work in the construction industry; understanding available project delivery systems; competitor analyses; acquisition procedures including response techniques for complex requests for proposals; understanding concepts of sales and marketing, branding, backlog, and business development budgeting in construction.

COSC 628 Construction Contracts and Risk Management
Credits 3. 3 Lecture Hours.
Advanced construction law, contracts, and risk management applicable to construction management; identification of common disputes and construction risks among the owner, design professionals, and contractor; analysis of construction contracts with an emphasis on troublesome provisions and solutions; demonstration of tools of negotiation and dispute resolution; ethics in construction.

COSC 631 Advanced Productivity and Lean
Credits 3. 3 Lecture Hours.
Introduction to lean history, concepts and methods; deduction of basic training modules in lean project delivery; application of lean management in construction projects.

COSC 642 Construction Information Technology
Credits 3. 3 Lecture Hours.
Exploration of emerging technologies for the construction industry including hardware and software systems such as BIM, RFID, Wireless/Mobile, information systems, construction specific programs, and information strategy planning; using information strategy planning by owners and contractors to effectively enhance the management of business entities and projects in construction.

COSC 644 Advanced Construction Systems
Credits 3. 3 Lecture Hours.
Theoretical, practical, and strategic development in contemporary construction systems; exploration of state-of-the-art innovations in environmental control systems, structural principles and practices; integration of innovations with information technologies, and development of additional insights.

COSC 650 Advanced Construction Visualization
Credits 3. 3 Lecture Hours.
Introduction to the theory and application of 3-D computer models in the design/build construction process; creation, positioning in 3-D space, and linking of building components to a database record; creation of a wide range of construction related information useful in controlling project quality.

COSC 663 Sustainable Construction
Credits 3. 3 Lecture Hours.
Contribution of materials and methods to meeting the needs of the present without compromising the ability of future generations to meet their own needs; overview of international, national and local programs promoting sustainable construction; characteristics of the components of successful sustainable construction projects; theories and practices through case studies.
COSC 670 Facilities Asset Management  
**Credits 3. 3 Lecture Hours.**  
Fundamentals of facility asset management and property management including concepts, theories, and principles of design, construction, accounting, finance, and management of the built environment; an overview of a project throughout its entire life cycle from various perspectives including the owner, users, designers, constructors and facility management personnel.

**COSC 681 Seminar**  
**Credit 1. 1 Lecture Hour.**  
Discussion and review of degree requirements, career opportunities, and current research activities in construction management.  
**Prerequisite:** Graduate classification.

**COSC 684 Professional Internship**  
**Credits 3 to 6. 3 to 6 Other Hours.**  
Approximately 400-600 hours with a construction or construction-related company that exposes the student to construction-related activities; an initial report, monthly progress reports, a final report, and a final completion letter are required.  
**Prerequisites:** Graduate classification; approval of graduate coordinator; approval of internship coordinator.

**COSC 685 Directed Studies**  
**Credits 1 to 6. 1 to 6 Other Hours.**  
Individual problems in the area of building construction involving the application of theory and practice.  
**Prerequisite:** Approval of instructor.

**COSC 689 Special Topics in...**  
**Credits 1 to 4. 1 to 4 Lecture Hours.**  
Selected topics in an identified field of construction management. May be repeated for credit.  
**Prerequisite:** Approval of instructor.

**COSC 690 Theory of Research in Construction Management**  
**Credits 3. 3 Lecture Hours.**  
Introduction to research, research tools, proposal writing and research reports; emphasis on research planning and design, conducting a comprehensive review of literature, quantitative and qualitative research methodologies, defining research problems in construction science, and the development of research proposals.  
**Prerequisite:** STAT 651 or concurrent enrollment.

**COSC 691 Research**  
**Credits 1 to 23. 1 to 23 Other Hours.**  
Research for thesis.  
**Prerequisites:** COSC 690 or concurrent enrollment; approval of graduate coordinator.

**COSC 693 Professional Study**  
**Credits 1 to 6. 1 to 6 Other Hours.**  
Approved professional study of project undertaken as terminal requirement for Master of Science, non-thesis option. Preparation of a record of study summarizing the rationale, procedure and results of the completed study. May be repeated for credit.  
**Prerequisite:** COSC 690 or concurrent enrollment; approval of graduate coordinator.