

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.

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 lightning 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 Accounting and Financial Management

Credits 3. 3 Lecture Hours.

Fundamental theories and applied methods of construction accounting and construction financial management including cash flow analysis, financial planning, risk analysis, and project financing.

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.