**Construction Management (CMGT)**

**Course Descriptions**

**CMGT 11000 - Introduction to Construction Management (3 cr.)**

An introduction to the construction management profession. Topics include: construction as a career; drafting standards; ethics; construction document reading and management; and Building Information Modeling (BIM) software. P: None

**CMGT 12000 - Materials and Methods (3 cr.)**

Introduction to common construction terminology, materials, methodologies, building codes, structural fundamentals, and contract documents related to buildings, industrial facilities, and infrastructure. Field trips to production / fabrication facilities for each type of material (wood, steel, concrete, and masonry).

P: CMGT 11000 - Introduction to Construction Management

**CMGT 15000 - Surveying (3 cr.)**

Fundamental concepts and practical applications related to measurement of vertical and horizontal distances and angles using the tape, level, and total station. Computations of grades, traverses, areas, and curves. Basic concepts and applied use of topography, contours, and topographical maps. P: Math 15300 - College Algebra C: Math 15400 - Trigonometry

**CMGT 21000 - Quantity Take-Off (3 cr.)**

Study of methods to estimate material quantities for construction projects. Topics include, interpreting construction drawings, fundamental construction technology, quantity take-offs. Excel and take-off software are used. P: Math 15400 - Trigonometry and P: CMGT 12000 - Materials and Methods

**CMGT 25000 - Mechanical and Electrical Systems (3 cr.)**

Methods for design, construction and inspection of mechanical and electrical systems for buildings. Emphasis on heating and cooling loads, equipment selection, duct and pipe sizing, codes, safety installation, inspection, commissioning, and estimating. Responsibilities of the general contractor for HVAC (heating, ventilating, and air-conditioning), electrical and plumbing work.

P: Math 15400 - Trigonometry P: CMGT 12000 - Materials and Methods

**CMGT 26000 - Statics (3 cr.)**

Forces acting on bodies at rest, including coplanar, concurrent, and non-concurring systems; equivalent force systems and distributed forces. Use of free body diagrams and equations of equilibrium in solving problems for array of determinate structural systems: trusses, pin frames, arches, cables, retaining walls, and beams. Load tracing to examine the overall structural conditions with regards to lateral and gravity loads.

P: Math 15400 - Trigonometry P: CMGT 12000 - Materials and Methods

**CMGT 31000 - Cost Estimating (3 cr.)**

Study of methods to estimate quantities and costs for material, labor and equipment; establishing direct overhead and markups including indirect overhead and profit for a construction project; software applications for estimating; conceptual estimating procedures; and subcontractor qualifications and scope of work.

P: CMGT 21000 - Quantity Take-Off

**CMGT 32000 - Scheduling and Project Control (3 cr.)**

A study of the planning and control of construction schedules. Topics include Gantt charts, critical path method (CPM) network scheduling, and monitoring and controlling the schedule. Lab work includes the application of MS Project for creating, presenting, revising, updating and controlling construction schedules.

P: CMGT 31000 - Cost Estimating

**CMGT 33000 - Contract Administration and Specifications (3 cr.)**

Study of the contractual organization and administration of a construction project. Topics include, analysis of delivery systems, working with contracts, general and special conditions of the contract, specifications, project communication, payment applications, change orders and close out. Project management software is used.

P: CMGT 31000 - Cost Estimating

**CMGT 35000 - Materials Testing (2 cr.)**

Laboratory and field testing of structural materials to determine their mechanical properties and behavior under load. Materials included are steel, aluminum, concrete, wood, and asphalt.

P: CMGT 26000 - Statics C: CMGT 36000 - Strength of Materials

**CMGT 36000 - Strength of Materials (3 cr.)**

Stress-strain relationships of construction materials. Consideration of strength issues related to major classes of engineering materials including steel, concrete, and wood. Composite analysis; shear forces and bending moments in beams. Introduction to analysis and design of steel and wood beams and columns, beam deflections.

P: CMGT 26000 - Statics C: CMGT 36000 - Materials Testing

**CMGT 37000 - Temporary Structures in Construction (3 cr.)**

Study of temporary structures used to support construction operations, such as: concrete formwork, scaffolding systems, shoring systems, cofferdams, underpinning, slurry walls, construction dewatering systems, and other temporary structures and systems that are either dismantled and removed when the permanent works become self-supporting or completed, or they are incorporated into the finished work.

P: CMGT 35000 - Materials Testing P: CMGT 36000 - Strength of Materials

**CMGT 38000 - Infrastructure Planning, Engineering, and Economics (3 cr.)**

Introduction to the planning and analysis of infrastructure projects. The focus will be on the prioritization, stewardship, management and decision-making roles within the division of a large public works agency. This course will cover municipal infrastructure system, infrastructure alternatives, financial and economic analyses, environmental and social impact assessment, uncertainty and risk-benefit analysis, sustainability, and public-private partnerships including numerous case studies. P: CMGT 35000 - Materials Testing P: CMGT 36000 - Strength of Materials

**CMGT 39000 - Construction Experience III (1 cr.)**

Supervised pre-professional learning experience that allows students to apply their skills and knowledge in a professional setting. This experience is designed to enhance the student's preparedness for an intended career in the construction profession. A minimum of 400 work-hours is required.

P: CMGT 21000 - Quantity Take-Off P: TCM 22000 - Technical Report Writing P: TCM 34000 - Correspondence in Business & Industry

**CMGT 41000 - Equipment and Field Operations (3 cr.)**

Study of heavy equipment used in construction operations with an emphasis on equipment selection, application, cost, productivity, safety, and economics. P: CMGT 31000 - Cost Estimating

**CMGT 42000 - Safety and Inspection (3 cr.)**

Study of safety regulations, practices, policies, and procedures required for construction projects. Topics include, accident investigation, record keeping, OSHA reporting requirements, inspections, and hazards. Included is an OSHA safety card.

P: CMGT 33000 - Contract Administration and Specifications

**CMGT 43000 - Jobsite Management (3 cr.)**

Examination of construction project management on the jobsite. Topics include, submittals, record keeping, jobsite layout, meetings, negotiations, dispute resolution, labor relations, safety, subcontracting, quality, cost control, waste management, changes, claims, progress payments, and project closeout.

P: CMGT 31000 - Cost Estimating P: CMGT 32000 - Scheduling and Project Control

C: CMGT 44000 - Project Management Capstone

 **CMGT 44000 - Project Management Capstone (3 cr.)**

Students apply the knowledge and skills, acquired during their construction management program of study, to simulate the construction management process on an actual construction project. Includes role playing and a formal oral presentation. P: CMGT 31000 - Cost Estimating, P: CMGT 32000 - Scheduling and Project Control, P: CMGT 41000 - Equipment and Field Operations, P: CMGT 42000 - Safety and Inspection.

C: CMGT 43000 - Jobsite Management

**CMGT 45000 - Structural Systems and Analysis (3 cr.)**

Analysis of the structural characteristics of common construction materials, including: wood, steel, concrete, masonry, and light gauge metal in order to integrate structural elements into complete structural systems in the construction of modern buildings and structures to withstand gravity, wind, earthquake, and other environmental forces.

P: CMGT 35000 - Materials Testing P: CMGT 36000 - Strength of Materials

**CMGT 46000 - Soils and Foundations (3 cr.)**

Study of soils and foundations in the construction projects. Topics include, fundamental soil engineering theories, properties of soils, soil classification, compaction, permeability, stress, shear strength, consolidation, and bearing capacity.

P: CMGT 35000 - Materials Testing P: CMGT 36000 - Strength of Materials