CEE Graduate Course Descriptions – Summer 2025

GENG-8020: Engineering Project Management
This course will expose students to principles, concepts, and tools utilized in project management activities. This course will include topics such as defining project scope, and time, cost, risk, procurement and stakeholder management. The students will be engaged in working on a major project to develop proficiency in project management activities and tools. (Open to Masters of Engineering and Masters of Engineering Management students, excluding students in the MEng Auto Program. Open to engineering MASc/PhD students on permission of the department/faculty as a qualifying course only. Will not count for credit towards MASc/PhD degree.
Instructor: TBD

CIVL/ENVE/MECH 8006: Life Cycle Thinking for Engineering Projects
Practical and theoretical applications of life cycle thinking in engineering projects, products, and processes. Understand international standards and methods in Life Cycle Assessment (LCA), Life Cycle Costing (LCC), and Social Life Cycle Assessment (S-LCA). Analyze, interpret, provide critical feedback, and report on claims on sustainability. (Antirequisite: CIVL-8900-49.) (Cross-listed with ENVE-8006 and MECH-8006.)
Instructor: Dr. M. Lee

CIVL 8900-2: Special Topics: Project Planning and Control
Practical and theoretical applications to aid project planning and control in engineering projects. Understand advanced project management practices (e.g., earned value analysis, financial risk management), decision-making methods (e.g., multi-attribute decision-making methods, decision trees, optimization), and modeling techniques (e.g., Monte Carlo simulation, machine learning). Interpret and provide critical feedback on the intended project planning and control techniques.
Instructor: Dr. R. Ruparathna

CIVL 8900-21: Special Topics: GIS Data Modeling
This course examines a range of advanced topics that are utilized to analyze and model spatial datasets with emphasis on transportation related problems. Key topics covered include: spatial data management, data representation and integration; data automation & model building; multi-criteria evaluation; site suitability; least-cost path analysis; network analysis; location-allocation problems; spatial statistics methods to explore and model spatial datasets (namely point events, continuous and area data); machine learning and big data analysis. The course follows a problem-solving based approach to study real world data in a GIS environment using contemporary GIS software (e.g., ArcGIS10.x).
(Cross-listed with ENVE 8900-21).
Instructor: Dr. H. Maoh

CIVL 8900-45: Special Topics: Durability Advanced Modern Materials
This course studies the durability, performance, and long-term sustainability of advanced and modern building materials used in construction and infrastructure. It examines the mechanisms of material degradation, innovative approaches to enhancing durability, and the role of advanced materials in improving the resilience of built environments. Special emphasis is placed on sustainable, smart, and nanomaterial-based solutions, as well as their real-world applications under different environmental and stress conditions. This course focuses on subjects particularly useful to thesis research students, and those with a strong background and comprehensive knowledge of civil engineering materials.
Instructor: Dr. A. Adesina

CIVL 8900-47: Special Topics: Design, Deterioration & Repair of Concrete
Design of concrete; normal concrete, high and ultra-high-performance concrete, self-compacting concrete, fibre reinforced cementitious composites, sprayable, and overlay cement based cementitious composites, textile fibre reinforced composites. Curing methods, long term performance, quality assurance (QA) and quality control (QC) of concrete materials. Relevant concrete materials specifications. Types and causes of concrete deterioration; errors during construction, scaling and disintegration, freeze-thaw, corrosion of embedded steel, cracking, shrinkage, chemical attack, alkali-silica reaction, spalling, erosion, effloresces, exposure to fire. Experimental and non-destructive testing. Repair of concrete; repair materials, repair techniques, challenges with conventional repair techniques, patch repair and materials compatibility with existing concrete, horizontal, vertical, and overhead repair methods.
Instructor: TBD

CIVL 8900-59: Special Topics: Modular Construction, Design, and Technology
Introduction to modular construction; Types of modular building, Steel, timber, concrete; Planning of modular buildings; Hybrid modular construction systems; Structural design of steel and light steel modules; Structural design of concrete modules; Structural design of timber-framed modules; Cladding, roofing, and balconies in modular construction; Constructional issues in modular systems; Factory production of modules; Service interfaces in modular construction.
Instructor: TBD

ENVE 8900-31: Special Topics: Water Treatment & Reuse
Conventional water treatment systems. Disinfection requirements, technologies, and by-products. Membrane processes, advanced oxidation processes. Chemicals of emerging concern. Water reuse criteria and applications.
Instructor: TBD

ENVE 8900-21: Special Topics: GIS Data Modeling (see CIVL 8900-21)