

Co-op Program

BUILDING ENGINEERING



This program prepares engineers with particular expertise in the conception, design, planning, construction and rehabilitation of buildings, as well as installation and operation of various systems of a building, including mechanical, hydraulic, energy and electrical systems. The program also covers such fields of study as sustainable development and environmental impacts associated with energy consumption, water and air quality, and the lifecycle stages of buildings. Moreover, to prepare well-rounded, capable building engineers, the core curriculum is enhanced with additional studies to provide students with essential skills in communication, project management and economic analysis, and with a keen understanding of their professional responsibilities and obligations as future engineers.

Furthermore, the program pays particular attention to such areas as developing integrated skills for successful work in multidisciplinary construction project teams, gaining practical experience with analysis and design tools, and acquiring good knowledge and understanding of building codes and standards, which form the very foundation of this professional study course.

WHAT OUR STUDENTS CAN DO FOR YOU

Conception & Design

- Studies, reports, cost estimates (RSMMeans), bidding for projects
- Programming (Visual Basic, VBA Excel, MATLAB, MatCAD)
- Topographic analysis and drawing (AutoCAD, CATIA, Revit) and 3D modeling (BIM)
- Analysis and design of structural systems (SAP2000, SAFI, Visual Design, ADINA)
- Sustainable building (LEED certification)

- Implementation of operation and maintenance programs for systems in buildings
- Application of laws, regulations, procedures and standards related to environmental, health, safety and fire protection
- Application of standards and codes (CNBC, CSA, NECB, NFC, NPC, Electrical Code, etc.)

Construction

- Inspection and quality control
- Land surveying
- Monitoring and supervision
- Job reports, progress reports and cost tracking
- Rehabilitation of buildings

Management

- Project planning, organization, supervision, control and monitoring
- Project management
- Reporting

Research & Development

- Information search and processing
- Identification and analysis of issues, data interpretation
- Development of methods, processes and prototypes
- Test station setup
- Feasibility and profitability analysis



KNOWLEDGE AND SKILLS

| Term | Description | Professional Development |
|------|---|--|
| S-1 | Introduction to Building Engineering Surveying; technical drawing (AutoCAD, Revit); teamwork; basic sciences and mathematics | <ul style="list-style-type: none"> • Statement of career intent • Five seminars given by engineers from various fields of expertise |
| S-2 | Basic Sciences and Communications Mathematics; computer science; material sciences; strength of materials, technical communication | <ul style="list-style-type: none"> • Technical writing and communication • Workplace health and safety • Introduction to construction management |
| S-3 | Basic Sciences in Building Engineering Reliability; energy; fluid mechanics; building materials; testing | |
| S-4 | Sizing, Standards and Codes Structure; building envelope; heat transfer; electrical and hydraulic systems; standards and codes (CNBC, NECB, Plumbing and Electrical Codes) | <ul style="list-style-type: none"> • T-1 work term retrospective report |
| S-5 | Design of Building Systems Framing, acoustics, mechanical systems (HVAC), modeling (BIM), NFPA codes and ASHRAE standards; project development process | <ul style="list-style-type: none"> • First project sheets to build the portfolio • T-2 work term retrospective report |
| S-6 | Project Design and Management Reinforced concrete, foundations, eco design and sustainable building (LCA, LEED), project management (including MS project) and financial analysis | <ul style="list-style-type: none"> • Presentation of T-1 to T-3 work terms to S-2, S-5 students and mentors (Faculty) • First one-on-one meeting with the mentor • Building the portfolio |
| S-7 | Further Studies and Specialization | <ul style="list-style-type: none"> • T-4 work term retrospective report |
| S-8 | Further Studies and Final Design Project | <ul style="list-style-type: none"> • T-5 work term report (full review of all five work terms) |

ORGANIZATION OF STUDY (S) AND WORK TERM (W)

| 1st year | | | 2nd year | | | 3rd year | | | 4th year | | | 5th year |
|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|-----|-----|----------|
| FALL | WIN | SUM | FALL | WIN | SUM | FALL | WIN | SUM | FALL | WIN | SUM | FALL |
| S-1 | S-2 | S-3 | W-1 | S-4 | W-2 | S-5 | W-3 | S-6 | W-4 | S-7 | W-5 | S-8 |