

# Co-op Program CIVIL ENGINEERING



The program in Civil Engineering provides students with a comprehensive and proven set of professional skills to prepare for a career in the conception, design, implementation, management and operation of complex public systems. This practical training integrates mathematics, applied computing and extensive use of software. It is further reinforced with complimentary studies in other fields, such as communications, project management, human resource management, environmental management, economic analysis, and professional liability of engineers.

As early as the first year, the curriculum is built with a particular focus on the development of various skills and knowledge needed for successful first work terms (surveying, AutoCAD design, health and safety, information technology and materials science).

## WHAT OUR STUDENTS CAN DO FOR YOU

### Research and Development

- Information retrieval
- Identify and analyze problems, and interpret results
- Develop prototypes
- Assembly and test
- Modeling and simulation
- Feasibility and profitability study
- Presentation of results and reports

### Design

- Studies and reports
- Topographic surveys (total station and GPS)
- Cartography (MapInfo, Argos, AutoCAD, Map3D)
- Drawing (AutoCAD, CATIA, AutoCAD Civil 3D)
- Estimation (ProjEst)
- Design of structures (SAP2000, SAFI, ETABS, Visual Design, ADINA, ADA)
- Design and hydraulic analysis (EPANET, SWMM, HEC-HMS, HEC-RAS, Flow Pro 2.0, Ponceau)
- Geotechnical investigation (GEO-SLOPE)
- Programming (Visual Basic.net, Excel (VBA), MATLAB, Mathcad)
- Assessment of options
- Tender documents

### Construction

- Inspection: quantity and quality control
- Surveying (total station and GPS)
- Monitor and supervise work
- Construction management
- Progress and cost tracking reports

### Management

- Plan, organize, supervise, control and monitor projects (MS Project)
- Project management
- Write reports



## KNOWLEDGE AND SKILLS

Term	Description	Professional Development
S-1	<b>Introduction to civil engineering</b> Topometry; AutoCAD; teamwork; basic statics and mathematics.	<ul style="list-style-type: none"> <li>Intended career path statement</li> <li>Five seminars given by engineers from various fields</li> </ul>
S-2	<b>Basic sciences</b> Computer science; materials science; strength of materials and mathematics.	<ul style="list-style-type: none"> <li>Writing and technical communication</li> <li>Health and safety at work</li> <li>Introduction to construction management</li> </ul>
S-3	<b>Experimental methods and other engineering sciences</b> Experiments; measurement and data acquisition; geology; fluid mechanics and thermodynamics; electrical engineering.	<ul style="list-style-type: none"> <li>T-1 work term report</li> </ul>
S-4	<b>Design process and civil engineering science</b> Structural analysis I (National Building Code); basic soil properties; hydraulics; probabilities and statistics; project development process.	<ul style="list-style-type: none"> <li>Filing first project sheets in the portfolio</li> <li>T-2 work term report</li> </ul>
S-5	<b>Design</b> Structural analysis II; structural steelwork; road design; environmental engineering and civil engineering materials.	<ul style="list-style-type: none"> <li>T-3 work term presentation to the S-2 and S-5 students and mentors (Faculty members)</li> <li>First individual meeting with the mentor</li> </ul>
S-6	<b>Advanced design and management tools</b> Reinforced concrete I; project management (including MS Project) and environmental management; foundations and retaining structures; economic analysis and sustainable development.	<ul style="list-style-type: none"> <li>Presentation of the graduate studies possibilities</li> <li>Expanding the portfolio</li> </ul>
S-7	<b>Specialization</b> One compulsory course in assessment. Specialization options: structure, hydraulics, geotechnics, materials, environmental and road.	<ul style="list-style-type: none"> <li>T-5 work term report</li> </ul>
S-8	<b>Specialization and final design project</b> A six-credit integration project; law and engineering; two electives.	<ul style="list-style-type: none"> <li>OIQ conference</li> <li>Individual meeting with the mentor and portfolio presentation to the board of examiners</li> </ul>

## 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	W-1	S-3	W-2	S-4	W-3	S-5	S-6	W-4	S-7	W-5	S-8