Civil Engineering & International Development

Department of Civil and Environmental Engineering

The traditional role of the civil engineer is to design, plan, and construct the built environment for the well-being and progress of society. However, there is an increasing need for the civil engineer to play a further role in poverty reduction and sustainable development, both in Canada and abroad. This change in emphasis requires engineers with different skill-sets and knowledge beyond the familiar civil engineering sub-disciplines. This program has been designed to fulfill this demand by introducing the learner to the complex societal, environmental, political and economic issues impacting engineering activities in less developed communities in Canada and abroad. On completion of the degree, graduates will have the ability to cope with broad ranging international challenges from poverty to climate change to human security.

Admission and Program Structure

First year courses are common to all of the Engineering programs. Upon completion of the first year, students must apply to the Civil Engineering and International Development Option within the Department of Civil and Environmental Engineering. To be eligible for this option, students must have completed the first year Engineering program with a minimum average of 75%.

The degree program will be based on the current framework of Civil Engineering courses and will enhance and broaden the students' abilities with further technical and non-technical courses. Emphasis will be placed on appropriate technologies, techniques and analyses for developing communities. There will be exposure to important issues in water resources, business organization and economics, international development and aid, and mitigation of the effects of natural disasters. Students will be encouraged to complete a summer placement in an 'at-need' community in Canada or in a developing country in the summer between third and fourth year, and will complete a final year design project that addresses a social need from an appropriate engineering perspective. This will allow students to gain further hands-on experience by interacting with policy makers, professional engineers and aid workers practicing in this area.

Employment Opportunities

In addition to the wide range of employment options in the engineering industry that graduates from the civil engineering program are typically able to choose from, individuals from the international development option will also be attractive to government departments, aid agencies, NGOs and international organisations (such as WHO, UNESCO, the World Bank, etc.). The international flavour of the degree will provide individuals with outstanding problem-solving, business and language skills, and an excellent grasp of global issues, making them highly sought after by multi-national companies.

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First year program (2009-2010): Applied Math 1413, Eng Sci 1050, Physics 1026, Applied Math 1411a/b, Chemistry 1024a/b, Eng Sci 1021a/b, Eng Sci 1022a/b/y, Eng Sci 1036a/b, 1.0 non-technical elective.

Second year program (2010-2011):

Term 3:	**Course Title**	**Term 4:**	**Course Title**
AM 2411	Applied Math for Engineering II	AM 2411	Applied Math for Engineering II
CEE 2224	Engineering Fluid Mechanics	CEE 2224	Engineering Fluid Mechanics
CEE 2202a	Mechanics of Materials	CEE 2218b	Civil Engineering Systems
CEE 2217a	Intro to Environmental Engineering	CEE 2221b	Structural Theory and Design II
CEE 2220a	Structural Theory and Design I	EarthSci 2281b	Geology for Engineers
ES 2211F	Engineering Communications	Stat Sci 2141b	Applied Probability and Statistics

Note: CEE 3324a (Surveying). This course is available each summer (15 days) and must be completed between second and third year if a student plans on registering for ES 3390, Summer Community Development Placement**.** The course has a limited enrolment and preference will be given to students who have completed the work term 4 of the Civil Engineering program. (39 lecture hours, 59 field work/laboratory hours, half course).

Third year program (2011-2012):

Term 5:	**Course Title**	**Term 6:**	**Course Title**
CEE 3326	Soil Mechanics & Hydrogeologic Engineering	CEE 3326	Soil Mechanics & Hydrogeologic Engineering
CEE 3327a	International Development for Engineers	CEE 3328b	Appropriate Technologies for International Development
CEE 3340a	Structural Theory III	CEE 3355b	Municipal Engineering Design
CEE 3347a	Concrete Design	CEE 3362b	Drinking Water Quality and Treatment
CEE 3348a	Project Management and Eng. Cases	CEE 3369b	Materials for Civil Engineering
EarthSc 340a	Watershed Hydrology	CBE 3363b	Wastewater Treatment Process Design

Fourth year program (2012-2013):

Term 7:	**Course Title**	**Term 8:**	**Course Title**
CEE 4441	Civil Engineering Design Project (International Community Development)	CEE 4441	Civil Engineering Design Project (International Community Development)
CEE 4426a	Geotechnical Engineering Design	CEE 4404b	Advanced Topics in International Development
CEE 4465a	Environmental Design for Waste Disposal	CEE 4478b	Case Studies in Civil Engineering
Bus 2299	Business Organization	ES 4498G	Engineering Ethics, Sustainable Development and the Law
Two technical electives		Bus 2299	Business Organization
		Technical elective	

Three of:

CEE 4440	Civil Engineering Thesis *(full year course – counts for two)*
CEE 4405a/b	Air Pollution
CEE 4427a/b	Special Topics in International Development
CEE 4458a/b	Risk Analysis and Decision Making in Engineering
CEE 4461a/b	Natural Disasters: Mitigation, Modeling and Assessment
EarthSc 4440a/b	Fundamentals of Groundwater Flow and Contaminant Transport
CBE 4467a/b	Green energy and chemical processes
Geog 2230a/b	Remote Sensing
Geog 2280b	Geographic Information Science I

Recommended Additional Optional Courses:

(a) Eng Sci 3390 Summer Community Development Placement – taken between third and fourth year.

Some technical electives may not be offered in a given academic year.