Civil & Environmental Engineering
with Computer Science

Department of Civil and Environmental Engineering

Civil Engineers were among the first professional groups to make extensive use of computers. Today Civil Engineers develop computer software for the design of engineering systems, for data base management, for assessing environmental impacts and for monitoring performance. They apply computation tools, ranging from PC’s to supercomputers, to design civil engineering structures, to assess the safety of existing structures, and to design environmental systems. Computers are revolutionizing various aspects of Civil Engineering including computer aided design and structural fabrication and Geographical Information Systems used in all forms of infrastructure management (e.g. roads and pipelines, sewers, etc.). The computational skills developed by Civil Engineering students also find application in areas outside of Civil Engineering and graduates follow career paths that they may not have anticipated. Positions attained by Western Civil Engineering graduates include: President of IBM Canada, President of a telecommunication company, the head of IBM’s world wide software division and heads of divisions of major multinational corporations.

The B.E.Sc. in Civil Engineering (Environmental Option) is a four year program while the B.Sc. with a Major in Computer Science is of three years duration. However, some courses can be counted towards both degrees and the end result is that a program has been established which allows the student to graduate with both degrees in five years. Students take the common first year of Engineering courses. After second year, for the next three years, a combination of courses from the third and fourth years of the B.E.Sc. degree and the second and third years of the B.Sc. degree are taken depending on timetabling and prerequisites.

As part of the Civil Engineering program all students take courses in structural theory and design, fluid mechanics, geology, design of concrete structures, soil mechanics and geotechnical engineering, materials, finite elements, ethics, law and sustainable development. Students in the Civil Environmental Option also take courses in water pollution, air pollution, hydrology, hydrogeology, municipal engineering design, environmental hydraulics and environmental design for waste disposal. As part of the Computer Science degree students take courses such as algorithms and data structures, fundamentals of computer organization and elective courses such as operating systems, databases, numerical computing, artificial intelligence, computer networks, computer graphics.

Admission and Program Structure

In order to be eligible to enter the Major in Computer Science a minimum mark of 60% in each of: Applied Math 1413 and Engineering Science 1036a/b or Computer Science 1026a/b and 65% in Computer Science 1037a/b or 1027a/b, is required. Students may enter Year 2 of the Computer Science module only after completion of Year 2 of the concurrent program. In order to be considered for the concurrent program, students must apply and be admitted to the Computer Science module by the Office of the Dean of the Faculty of Science after completion of the required prerequisite courses. At least 8 of the courses counted towards the B.Sc. degree must be taken from the offerings of the Faculty of Science. In addition students must take 1.0 course from each of Category A and Category B (see calendar for listing of course categories). As well, 2.0 designated essay courses must be taken (Eng Sci 2211F/G and Eng Sci 4498F/G will count as 1.0 of the essay requirement). A maximum of 10.0 courses may be double tied to both degrees. Computer Science 2210a/b and 2211a/b will be counted as two 0.5 fourth year technical electives in the B.E.Sc. degree program. Computer Science 2208a/b replaces CEE 2219b assuming that the student also takes Math 2155a. The final course selection must be approved in consultation with both the Faculty of Engineering and the Faculty of Science.
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Second year Engineering program (2011-2012): Applied Math 2411, CEE 2224, CEE 2202a, CEE 2217a, CEE 2220a, CEE 2211b, Earth Sciences 2281b, Eng Sci 2211G, Stat Sci 2143b, Computer Science 1027a or 1037a (required for admission to the Computer Science program).

Note: CEE 3324a (Surveying) is available each summer (15 days) and must be completed before a student may graduate from the Civil Engineering program.

Third year Engineering program: CEE 3326, CEE 3347a, CEE 3348a, CEE 3362a, CEE 3386a, Earth Sciences 3340a, CEE 3355b, CEE 3361b, CEE 3369b, CBE 4409b, 0.5 non-technical elective taken from the approved list.

Fourth year Engineering program: CEE 4441, Business 2299, CEE 4426a, CEE 4465a, CEE 4476b, CEE 4478b, Eng Sci 4498G, one of: CEE 4440 (counts as two), CEE 4405a/b, CEE 4418a/b, CEE 4428a/b, CEE 4429a/b, CEE 4458a/b, CEE 4461a/b, CEE 4477a/b, CBE 4463a/b, Earth Sciences 4440a/b. (Note: Computer Science 2210a/b and 2211a/b are used as two 0.5 fourth year technical electives in the Engineering program making the total number of 0.5 technical electives equal three).

Students taking CEE 4440 will earn a half credit more than the minimum requirements.

Major in Computer Science Module:

(This module cannot be completed in a single year because of prerequisites. The 3000-level Computer Science courses require the 2000-level Computer Science courses as prerequisites, so this must be taken into consideration. This module, therefore, will take at least two years to complete after having taken Computer Science 1027a or 1037a.)

- Computer Science 2208a/b
- Computer Science 2209a/b
- Computer Science 2210a/b
- Computer Science 2211a/b
- Computer Science 2212a/b/y
- Math 2155a
- Computer Science 3305a/b
- Computer Science 3307a/b/y
- 2.0 additional courses from: Math 2156b, 3000-level Computer Science half courses

Note: This document is for guideline purposes only. Once a student is admitted to the concurrent program, they will receive an outline from the Faculty of Science detailing the courses which will be used for the B.Sc. degree.