



Computer Engineering with Computer Science

Department of Electrical and Computer Engineering

Computer Engineering is the most rapidly evolving discipline in engineering, partially due to the application of computers themselves. Computer Engineering deals with the design of hardware elements and building of computer systems of various levels of complexity. Recently, a larger and larger fraction of the time allocated to a Computer Engineering task involves some form of interaction with software tools. To prepare students for work with hardware as well as software problems, a program is offered which allows students in the Computer Engineering program to study for a concurrent degree in Computer Science.

The B.E.Sc. in Computer Engineering 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.

The curriculum for the Computer Engineering program is unchanged. The subject matter covered in computer engineering includes Digital Logic, VLSI, Microelectronics, Control Systems, Signal Processing and Telecommunications, etc. The content of the Computer Science degree is related to the fundamentals of the discipline and includes courses in computer organization, algorithms and data structures, operating systems and computer networks.

The combination of qualifications in both Computer Engineering and Computer Science provides an excellent opportunity for students interested in this particular aspect of the profession. Such qualified graduates are in demand from many organizations covering a wide range of industrial, manufacturing and general business activity.

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 3305a/b will be counted as one 0.5 fourth year technical elective in the B.E.Sc. degree program. The final course selection must be approved in consultation with both the Faculty of Engineering and the Faculty of Science.



Computer Engineering with Computer Science cont'd

First year Engineering program (2010-2011): 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 Engineering program (2011-2012): Applied Math 2415, Comp Sci 1037a, ECE 2205a, ECE 2277a, ECE 2240a, Eng Sci 2211F, ECE 2231b, ECE 2233b, ECE 2236b, ECE 2241b, MME 2234b.

Third year Engineering program: Applied Math 3415a, Comp Sci 2211a, ECE 3330a, ECE 3337a, ECE 4436a, Stat Sci 2141a,a ECE 3331b, ECE 3349b, ECE 3375b, Comp Sci 2210b, SE 3314b, 0.5 non-technical elective taken from the approved list.

Fourth year Engineering program: Business 2299, ECE 4416, ECE 4434a, ECE 4470a, ECE 4480a, ECE 4460b, ECE 4489b, Eng Sci 4498G, two 0.5 ECE technical electives. (Note: Comp Sci 3305a/b is used as one 0.5 fourth year technical elective in the Engineering program so only one additional 0.5 technical elective is required for the B.E.Sc. degree.)

See current Academic Calendar for technical electives in the Computer Engineering program. Electives must be chosen from the approved list. Some technical electives may not be offered in a given academic year. A maximum of one Computer Science half-course at the 3000-level or higher from the list can be used as a technical elective. CS 3305a/b will be used in this program.

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.