



Computer Engineering

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. These systems may vary from high performance parallel supercomputers to special servers that operate computer networks, to micro devices that will operate the next generation of home appliances. Indeed, functions performed a few years ago by complex, multi-element systems, can now be performed by a single computer chip.

Program

First year courses are common to all Engineering programs. Upon completion of first year, students must be admitted into the Computer Engineering program. For admission to the Computer Engineering program, students must have completed the common first year curriculum of Engineering with at least 60% Year Weighted Average (YWA), a minimum of 60% in both Engineering Science 1036a/b and Applied Mathematics 1413 and a minimum of 50% in Applied Mathematics 1411a/b and Physics 1026. In order to remain in the Computer Engineering program, students must also obtain at least 60% in Computer Science 1037a/b taken in second year. The remaining three years of this program are devoted to courses in Digital Logic, Very Large Scale Integrated Circuits (VLSI), Microelectronics, Control Systems, Signal Processing, etc. Students are also required to take a number of courses devoted to software tools required for control and operation of computer hardware.

The opportunity exists for students to enroll in a concurrent degree program, with the most popular being a concurrent 3-year degree in Computer Science. With concurrent degrees, some courses will be counted toward both degrees allowing you to graduate with two degrees in less time. In this case, students can graduate with a B.E.Sc. in Electrical Engineering and a B.Sc. in Computer Science in 5 years rather than six years.

Employment Opportunities

Computer Engineering graduates are actively pursued as candidates for employment in a number of sectors such as microelectronics, communications engineering, industrial controls, and in Software Engineering related fields. In addition, the skills possessed by Computer Engineers have wide applicability in the manufacturing of a wide range of devices - biomedical instruments, home entertainment products, multimedia systems, and new device development. A number of computer engineers are self-employed in entrepreneurial activities or as private consultants.



Computer Engineering cont'd

First year 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 program (2011-2012):

Term 3:	Course Title	Term 4:	Course Title
AM 2415	Applied Mathematical and Numerical Methods for Electrical Engineering	AM 2415	Applied Mathematical and Numerical Methods for Electrical Engineering
CS 1037a	Computer Science Fundamentals II	ECE 2233b	Electric Circuits II
ECE 2205a	Electric Circuits I	ECE 2231b	Introduction to Electronics
ECE 2277a	Digital Logic Systems	ECE 2236b	Magnetic Circuits and Transmission Lines
ECE 2240a	Electrical Laboratory	ECE 2241b	Electrical Laboratory II
ES 2211F	Engineering Communications	MME 2234b	Heat Transfer and Dynamics

Third year program (2012-2013):

Term 5:	Course Title	Term 6:	Course Title
AM 3415a	Applied Math for Electrical Engineers	ECE 3331b	Introduction to Signal Processing
ECE 3330a	Control Systems	ECE 3349b	Introduction of VLSI
ECE 3337a	Electronics Circuits	ECE 3375b	Microprocessors and Microcomputers
SS 2141a	Applied Probability and Statistics	CS 2210b	Data Structures and Algorithms
CS 2211a	Software Tools & Systems Programming	SE 3314b	Design and Implementation of Computer Networks
ECE 4436a	Networking: Principles, Protocols, and Architecture		Non-technical elective taken from the approved list.

Fourth year program (2013-2014):

Term 7:	Course Title	Term 8:	Course Title
Bus 2299	Business Organization	Bus 2299	Business Organization
ECE 4416	Electrical/Computer Engineering Project	ECE 4416	Electrical/Computer Engineering Project
ECE 4434a	Advanced Digital Systems	ECE 4460b	Real-Time Systems
ECE 4470a	Microcomputer Engineering	ECE 4489b	Computer Architectures
ECE 4480a	VLSI and Microelectronics	ES 4498G	Engineering Ethics, Sustainable Development and the Law
	One technical elective		One technical elective

Technical Electives:

ECE 3370a/b	Communication Electronics I	MME 4482a/b	Fundamentals of MEMS
ECE 4429a/b	Advanced Digital Signal Processing	MME 4487a/b	Mechatronic System Design
ECE 4430a/b	Selected Topics in Electrical Eng. I	CS 3305a/b	Operating Systems
ECE 4431a/b	Selected Topics in Electrical Eng. II	CS 3307a/b/y	Object-Oriented Design and Analysis
ECE 4433a/b	Communications Systems	CS 3319a/b	Databases I
ECE 4437a/b	Communications Theory	CS 3340a/b	Analysis of Algorithms I
ECE 4445a/b	Intro to Digital Image Processing	CS 3342a/b	Organization of Programming Languages
ECE 4455a/b	Engineering Analysis of Physiological Systems	CS 3346a/b	Artificial Intelligence I
ECE 4468a/b	Systems Optimization	SE 3353a/b	Human-Computer Interaction
ECE 4469a/b	Applied Control Systems	SE 4410a/b	Wireless LANs and WANs
MME 4452a/b	Robotics & Manufacturing Automation	SE 4472a/b	Information Security
MME 4473a/b	Computer Integrated Manufacturing (CIM)		

Electives must be chosen from the approved list. Some technical electives may not be offered in a given academic year.

Note: A maximum of one 0.5 Computer Science course at the 3000 level or higher from the list can be used as a technical elective.