



Electrical Engineering

Department of Electrical and Computer Engineering

Electrical Engineering concerns the harnessing of electrical energy for human benefit. Use of electrical energy is very versatile, and thus electrical engineering covers a broad range of applications. Examples of such applications include telecommunications, digital electronics, computers, robots, electric motors, all sizes of generators, electric power distribution systems, and electric cars.

Program

First year courses are common to all Engineering programs. Upon completion of first year, students must be admitted into the Electrical Engineering program. For admission to the Electrical Engineering program, students must have completed the common first year curriculum of Engineering with at least 60% Year Weighted Average (YWA) and a minimum 50% in Applied Mathematics 1411a/b, Applied Mathematics 1413, Physics 1026 and Engineering Science 1036a/b. In the remaining three years, students take courses in Electrical Circuits and Electronics, Digital Logic, Microprocessors, Electric Machines, etc. Students in the fourth year may choose from a range of technical electives, which allows a certain amount of specialization in the areas of Communications, Digital Electronics or Power Systems. In third year students have the option to specialize in the Biomedical Systems and Signals Option. Students in fourth year may choose to specialize in the Wireless Communication Option or the Power Systems Option.

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

Career opportunities for electrical engineers are very diverse. Examples include work with power systems, communication and information systems, controls and instrumentation, computers and digital signal processing as well as a range of electronic devices. Research and Development opportunities in these areas are often available.



Electrical 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 Methods	AM 2415	Applied Mathematical Methods
CS 1037a	Computer Science Fundamentals II	ECE 2231b	Introduction to Electronics
ECE 2205a	Electric Circuits I	ECE 2233b	Circuits and Systems
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 (2013-2014):

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 3333b	Electric Power Systems I
ECE 3332a	Electric Machines	ECE 3336b	Electromagnetic Theory
ECE 3337a	Electronic Circuits	ECE 3370b	Communication Electronics I
SS 2141a	Applied Probability and Statistics	ECE 3375b	Microprocessors and Microcomputers
Non-technical elective taken from the approved list.			

Fourth year program (2014-2015):

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 4437a	Communications Theory	ES 4498G	Engineering Ethics, Sustainable Development and the Law
ECE 4429a	Advanced Digital Signal Processing		
Two technical electives		Three technical electives	

Technical Electives:

ECE 3349a/b	Introduction of VLSI	ECE 4456a/b	Power System Protection
ECE 4430a/b	Selected Topics in Electrical Eng. I	ECE 4457a/b	Power Electronics
ECE 4431a/b	Selected Topics in Electrical Eng. II	ECE 4460a/b	Real-Time and Embedded Systems
ECE 4432a/b	Radiation and Propagation	ECE 4464a/b	Electric Power Systems II
ECE 4433a/b	Communications Systems	ECE 4468a/b	Systems Optimization
ECE 4434a/b	Advanced Digital Systems	ECE 4469a/b	Applied Control Systems
ECE 4436a/b	Networking: Principles, Protocols and Architecture	ECE 4470a/b	Microcomputer Engineering
ECE 4439a/b	Conventional, Renewable and Nuclear Energy	ECE 4489a/b	Computer Architectures
ECE 4445a/b	Intro to Digital Image Processing	MME 4452a/b	Robotics and Manufacturing Automation
ECE 4451a/b	Advanced Topics in Wireless Communications	MME 4473a/b	Computer Integrated Manufacturing (CIM)
ECE 4455a/b	Engineering Analysis of Physiological Systems	MME 4482a/b	Fundamentals of MEMS
		MME 4487a/b	Mechatronic System Design

Electives must be chosen from the approved list. Some technical electives may not be offered in a given academic year. Up to two MME half courses from the approved list may be used as technical electives.

For students registered in a concurrent degree program in Computer Science up to two Computer Science half courses at the 3000 level or higher from the list can be used as technical electives.