



Electrical Engineering Options

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 in the Electrical Option or they may choose to specialize in the Wireless Communication Option, the Power Systems Option or the Biomedical signals and Systems Option (chosen in third year).

Electrical Engineering Power Systems Option

Fourth year program:

Term 7:	Course Title	Term 8:	Course Title
Bus 2299	Business Organization	Bus 2299	Business Organization
ECE 4416	Electrical/Computer Eng. Project	ECE 4416	Electrical/Computer Eng. Project
ECE 4437a	Communications Theory	ES 4498G	Engineering Ethics, Sustainable Development and the Law
ECE 4429a	Advanced Digital Signal Processing	ECE 4456b	Power System Protection
ECE 4464a	Electric Power Systems II	ECE 4439b	Conventional, Renewable and Nuclear Energy
ECE 4457a	Power Electronics		One technical elective

Technical Electives:

ECE 4432a/b	Radiation and Propagation	ECE 3349a/b	Introduction of VLSI
ECE 4434a/b	Advanced Digital Systems	ECE 4433a/b	Communications Systems
ECE 4436a/b	Networking: Principles, Protocols and Architecture	ECE 4455a/b	Engineering Analysis of Physiological Systems
ECE 4445a/b	Introduction to Digital Image Processing	ECE 4460a/b	Real-Time and Embedded Systems
ECE 4470a/b	Microcomputer Engineering	ECE 4469a/b	Applied Control Systems
MME 4487a/b	Mechatronic System Design	ECE 4489a/b	Computer Architectures
		MME 4452a/b	Robotics and Manufacturing Automation
		MME 4473a/b	Computer Integrated Manufacturing



Electrical Engineering Wireless Option



Fourth year program:

Term 7:	Course Title	Term 8:	Course Title
Bus 2299	Business Organization	Bus 2299	Business Organization
ECE 4416	Electrical/Computer Eng. Project	ECE 4416	Electrical/Computer Eng. Project
ECE 4429a	Advanced Digital Signal Processing	ES 4498G	Engineering Ethics, Sustainable Development and the Law
ECE 4432a	Radiation and Propagation	ECE 4433b	Communications Systems
ECE 4437a	Communications Theory		Two technical electives
ECE 4436a	Networking: Principles, Protocols and Architecture		

Technical Electives:

ECE 4434a/b	Advanced Digital Systems	ECE 3349a/b	Introduction of VLSI
ECE 4439a/b	Conventional, Renewable and Nuclear Energy	ECE 4445a/b	Introduction to Digital Image Processing
ECE 4457a/b	Power Electronics	ECE 4455a/b	Engineering Analysis of Physiological Systems
ECE 4464a/b	Electric Power Systems II	ECE 4456a/b	Power System Protection
ECE 4470a/b	Microcomputer Engineering	ECE 4460a/b	Real-Time and Embedded Systems
MME 4487a/b	Mechatronic System Design	ECE 4469a/b	Applied Control Systems
		ECE 4489a/b	Computer Architectures
		MME 4452a/b	Robotics and Manu. Automation
		MME 4473a/b	Computer Integrated Manufacturing

Electrical Engineering Biomedical Signals and Systems Option

Third year program:

Term 5:	Course Title	Term 6:	Course Title
AM 3415a	Applied Mathematics	ECE 3331b	Introduction to Signal Processing
ECE 3330a	Control Systems	ECE 3336b	Electromagnetic Theory
ECE 3337a	Electronic Circuits	ECE 3374b	Electromechanics
MedBio 3501F	Biophysics of Transport Systems	ECE 3375b	Microprocessors and Microcomputers
MedBio 3330F	Human & Animal Biomechanics		Non-technical elective taken from the approved list
SS 2141a	Applied Probability and Statistics		One technical elective

Fourth year program:

Term 7:	Course Title	Term 8:	Course Title
Bus 2299	Business Organization	Bus 2299	Business Organization
ECE 4416	Electrical/Computer Eng. Project	ECE 4416	Electrical/Computer Eng. Project
ECE 4429a	Advanced Digital Signal Processing	ES 4498G	Engineering Ethics, Sustainable Development and the Law
ECE 4437a	Communications Theory	ECE 4438b	Advanced Image Processing and Analysis
ECE 4445a	Introduction to Digital Image Processing	ECE 4455b	Engineering Analysis of Physiological Systems
Physiol 2130	Human Physiology	Physiol 2130	Human Physiology

Technical Electives:

Biochemistry 2280a/b	Biochemistry and Molecular Biology
Medical Biophysics 3503G	Fundamentals of Digital Imaging
CBE 4421b	Introduction to Biomaterials Engineering

With permission of the department, students may opt to take ECE 3332a in place of ECE 3374b.