

# ELECTRICAL ENGINEERING, B.Sc.

## Degree Requirements

### Electrical Engineering Departmental Program

Course	Title	Hours
Students must complete the Preliminary Engineering Program requirements for graduation.		37.5
ANTH 2430	Ecology, Technology and Society <sup>1</sup>	3
ENG 2030	Engineering Communication: Strategies for the Profession	3
or ENG 2040	Engineering Communication: Strategies, Practice and Design	
ENG 3000	Engineering Economics	3
MATH 2130	Engineering Mathematical Analysis 1	3
MATH 2132	Engineering Mathematical Analysis 2	3
MATH 3132	Engineering Mathematical Analysis 3	3
PHYS 2152	Modern Physics for Engineers	3
STAT 2220	Contemporary Statistics for Engineers	3
ECE 2160	Electronics 2E	5
ECE 2220	Digital Logic Systems	5
ECE 2240	Numerical Methods for Electrical Engineers	4
ECE 2262	Electric Circuits	4
ECE 3540	Advanced Circuit Analysis and Design	4
ECE 3580	Foundations of Electromagnetics	4
ECE 3590	Electromagnetic Theory	4
ECE 3600	Physical Electronics	4
ECE 3610	Microprocessing Systems	4
ECE 3670	Electronics 3E	4
ECE 3720	Electric Power and Machines	4
ECE 3730	Principles of Embedded System Design	4
ECE 3780	Signal Processing 1	4
ECE 4150	Control Systems	4
ECE 4260	Communications Systems	4
ECE 4600	Group Design Project <sup>2</sup>	6
One Complementary Studies Elective <sup>3</sup>		3
One Natural Science Elective from the approved list		3
Seven Technical Electives from the approved list		24-29
<b>Total Hours</b>	<b>159.5-164.5</b>	

<sup>1</sup> ANTH 2430 is an Indigenous Knowledge course.

<sup>2</sup> Course continues through both terms with credit given upon completion.

<sup>3</sup> The complimentary studies electives can be any course at the 1000 level or above from either the faculties of Arts or Management. However, ARTS 1110 may not be used for credit in the Price Faculty of Engineering.

### Electrical Engineering Technical Electives <sup>1,2</sup>

#### Group A Qualified Engineering Design Elective Courses

Course	Title	Hours
ECE 4160	Control Engineering	4
ECE 4250	Digital Communications	4
ECE 4290	Microwave Engineering	4
ECE 4370	Power Electronics	4
ECE 4830	Signal Processing 2	4

#### Group B Technical Elective Courses

Course	Title	Hours
ECE 3650	Electric Machines	5
ECE 3700	Telecommunication Network Engineering	4
ECE 3770	Digital Systems Design 2	4
ECE 4100	Introduction to Microelectronic Fabrication	4
ECE 4180	Introduction to Robotics	4
ECE 4240	Microprocessor Interfacing	4
ECE 4270	Antennas	4
ECE 4280	Engineering Electromagnetics	4
ECE 4300	Electrical Energy Systems 1	4
ECE 4310	Electrical Energy Systems 2	4
ECE 4360	High Voltage Engineering	4
ECE 4390	Engineering Computations 4E	4
ECE 4420	Digital Control	4
ECE 4430	Design of RF Devices and Wireless Systems	4
ECE 4440	Computer Vision	4
ECE 4450	Applied Computational Intelligence	4
ECE 4520	Simulation and Modelling	4
ECE 4530	Parallel Processing	4
ECE 4540	Wireless Networks	4
ECE 4560	Modern Computing Systems	4
ECE 4580	Optoelectronics	4
ECE 4610	Biomedical Instrumentation and Signal Processing	4
ECE 4740	Digital Systems Implementation	4
ECE 4850	Topics in Electrical and Computer Engineering 1	4
ECE 4860	Topics in Electrical and Computer Engineering 2	4
ECE 4870	Topics in Electrical and Computer Engineering 3	3
ECE 4880	Topics in Electrical and Computer Engineering 4	3
COMP 1020	Introductory Computer Science 2	3
COMP 2140	Data Structures: Analysis and Implementation	3
MATH 3460	Partial Differential Equations	3
PHYS 2260	Optics	3
PHYS 3220	Medical Physics and Physiological Measurement	3
PHYS 4590	Advanced Optics	3
PHYS 4646	Electro - and Magnetodynamics and Special Relativity	3

<sup>1</sup> A minimum of 3 electives are required from Group A; the other 4 electives may be taken from either Group A or B unless the student completes a Focus Area.

<sup>2</sup> The Department of Electrical and Computer Engineering does not guarantee that all elective courses will be offered every session or that it will be possible to fit courses into all of the many possible timetable combinations of students taking the programs. The term in which an elective course is offered is specified each year in Aurora and the online

timetables on the Department website. There may be a maximum limit set on the number of students allowed to take a particular elective in a session. Similarly, there may be a minimum limit and if registration is below the minimum, the elective will be cancelled and those registered will be required to transfer to another elective before the registration revision deadline.

### **Natural Science Electives for Electrical Engineering**

The Electrical Engineering program requires students to complete an elective course in natural science selected from the following Department approved list.

<b>Course</b>	<b>Title</b>	<b>Hours</b>
ASTR 1810	Introduction to Astronomy: The Magnificent Universe	3
ASTR 3180	Stars	3
BIOL 1020	Biology 1: Principles and Themes	3
BIOL 1300	Economic Plants	3
BIOL 1410	Anatomy of the Human Body	3
CHEM 1110	Introductory Chemistry 2: Interaction, Reactivity, and Chemical Properties	3
CHEM 1130	Introduction to Organic Chemistry	3
ENTM 2050	Introductory Entomology	3
GEOL 1340	The Dynamic Earth	3
MBIO 1220	Essentials of Microbiology	3
PHYS 2260	Optics	3
PHYS 2386	Introduction to Quantum Mechanics and Special Relativity	3
PHYS 2650	Classical Mechanics 1	3
PHYS 3220	Medical Physics and Physiological Measurement	3

**Note:**

- Students are urged to discuss their program of courses with members of the instructional staff before the end of their third year to obtain advice concerning the best choice of electives for their needs.