BASC ELECTRICAL ENGINEERING

Electrical engineering is at the heart of today’s exciting advances in technology. With five technical specializations—communications, systems, electronics, microwave and photonic, and power and sustainable energy—our curriculum will enable you to influence how the world communicates, generate sustainable energy and heal diseases. As an electrical engineer, you will work with other engineers or scientists on emerging technologies.

The option of Engineering Management will prepare you with necessary skills to pursue entrepreneurial activities and start your own technology-related business. The double degree program—BASc in Electrical Engineering and BSc in Computing Technology—will put you at the intersection of the two areas that propel the waves of technological development.

This program is offered in English and in French.

All courses are available in English and French. Advanced courses are sometimes offered only in English.

Program Requirements

Co-operative education is available with this program.

Requirements for this program have been modified. Please consult the 2018-2019 calendars (https://catalogue.uottawa.ca/en/archives/) for the previous requirements.

Compulsory First-Year Courses:

- CHM 1311 Principles of Chemistry 3 Units
- ENG 1112 Technical Report Writing 3 Units
- GNG 1103 Engineering Design 3 Units
- GNG 1105 Engineering Mechanics 3 Units
- GNG 1106 Fundamentals of Engineering Computation 3 Units
- ITI 1100 Digital Systems I 3 Units
- MAT 1320 Calculus I 3 Units
- MAT 1322 Calculus II 3 Units
- MAT 1341 Introduction to Linear Algebra 3 Units
- PHY 1124 Fundamentals of Physics for Engineers 3 Units

Compulsory Second-Year Courses:

- CEG 2136 Computer Architecture I 3 Units
- ELG 2136 Electronics I 3 Units
- ELG 2137 Circuit Theory II 3 Units
- ELG 2138 Circuit Theory I 3 Units
- ELG 2911 Professional Practice in Information Technology and Engineering 3 Units
- GNG 2101 Introduction to Product Development and Management for Engineers and Computer Scientists 3 Units
- MAT 2322 Calculus III for Engineers 3 Units
- MAT 2384 Ordinary Differential Equations and Numerical Methods 3 Units
- PHY 2323 Electricity and Magnetism 3 Units
- 3 course units from: 3 Units

Compulsory Third-Year Courses:

- 3 complementary electives course units at the undergraduate level 3 Units

Compulsory Fourth-Year Courses:

One option from the following: 30 Units

Option 1: Communications

- ELG 4118 Wave Propagation and Antennas
- ELG 4156 Linear Systems
- ELG 4157 Modern Control Engineering
- ELG 4176 Communication Systems
- ELG 4177 Digital Signal Processing
- ELG 4179 Wireless Communication Fundamentals
- ELG 4912 Electrical Engineering Design Project: Part I
- ELG 4913 Electrical Engineering Design Project: Part II
- 6 course units of technical electives

Option 2: Systems Engineering

- CEG 4158 Computer Control in Robotics
- ELG 4137 Principles and Applications of VLSI Design
- ELG 4156 Linear Systems
- ELG 4157 Modern Control Engineering
- ELG 4159 Integrated Control Systems
- ELG 4177 Digital Signal Processing
- ELG 4912 Electrical Engineering Design Project: Part I
- ELG 4913 Electrical Engineering Design Project: Part II
- 6 course units of technical electives

Option 3: Electronics

- ELG 4115 Microwave Circuits
- ELG 4117 Optoelectronics and Optical Components
- ELG 4137 Principles and Applications of VLSI Design
- ELG 4139 Electronics III
- ELG 4176 Communication Systems
- ELG 4177 Digital Signal Processing
- ELG 4912 Electrical Engineering Design Project: Part I
- ELG 4913 Electrical Engineering Design Project: Part II
- 6 course units of technical electives

Option 4: Microwave and Photonic Engineering

- ELG 4115 Microwave Circuits
- ELG 4117 Optoelectronics and Optical Components
- ELG 2394 Scientific Thought and Social Values
- 3 Units

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ELG 4139 Electronics III
ELG 4178 Optical Communications and Networking
ELG 4179 Wireless Communication Fundamentals
ELG 4912 Electrical Engineering Design Project: Part I
ELG 4913 Electrical Engineering Design Project: Part II

6 course units of technical electives

Option 5: Power and Sustainable Energy

ELG 4125 Electric Power Transmission, Distribution and Utilization
ELG 4126 Sustainable Electrical Power Systems
ELG 4139 Electronics III
ELG 4157 Modern Control Engineering
ELG 4159 Integrated Control Systems
ELG 4179 Wireless Communication Fundamentals
ELG 4912 Electrical Engineering Design Project: Part I
ELG 4913 Electrical Engineering Design Project: Part II

6 course units of technical electives

Total: 123 Units

List of Optional Courses

List of Technical Electives: ¹

CEG 3185 Introduction to Data Communications and Networking 3 Units
CEG 4158 Computer Control in Robotics 3 Units
CEG 4186 Wireless Networks ² 3 Units
CEG 4187 Optical Networks 3 Units
CEG 4188 Higher Layer Network Protocols 3 Units
CEG 4190 Computer Network Design ³ 3 Units
CEG 4316 Digital Image Processing 3 Units
CEG 4396 Computer Network Management 3 Units
ELG 4115 Microwave Circuits 3 Units
ELG 4117 Optoelectronics and Optical Components 3 Units
ELG 4118 Wave Propagation and Antennas 3 Units
ELG 4121 Topics in Electrical Engineering II 3 Units
ELG 4122 Topics in Electrical Engineering I 3 Units
ELG 4125 Electric Power Transmission, Distribution and Utilization 3 Units
ELG 4126 Sustainable Electrical Power Systems 3 Units
ELG 4137 Principles and Applications of VLSI Design 3 Units
ELG 4139 Electronics III 3 Units
ELG 4156 Linear Systems 3 Units
ELG 4157 Modern Control Engineering 3 Units
ELG 4159 Integrated Control Systems 3 Units
ELG 4176 Communication Systems 3 Units
ELG 4177 Digital Signal Processing 3 Units
ELG 4178 Optical Communications and Networking 3 Units
ELG 4179 Wireless Communication Fundamentals 3 Units

Note(s)

¹ One graduate course may be substituted for a 4000 level course for those students with a DGPA of at least 7.0. Faculty approval required.
² CEG 4186 cannot be chosen as a technical elective in the Communications option.
³ CEG 4190 cannot be chosen as a technical elective in the Computing Technology program.

Complementary elective courses at the undergraduate level includes GNG 2101, GNG 4170, and GNG 4120, but excludes all courses offered by the Faculty of Science and the Faculty of Engineering as well as all courses that have a science, mathematics or engineering content.

For a complete list of courses please refer to the list of complementary elective courses (https://www2.uottawa.ca/faculty-engineering/undergraduate-studies/courses-and-course-sequences/complementary-electives/) on the Faculty of Engineering website.