BASc in 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 2015-2016 calendars (http://www.uottawa.ca/academic/info/regist/1516/calendars) for the previous requirements.

Compulsory First-Year Courses:

- CHM 1311 Principles of Chemistry 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
- 3 course units from: 3 Units
  - ECO 1192 Engineering Economics
  - GNG 2101 Introduction to Product Development and Management for Engineers and Computer Scientists

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
- ENG 1112 Technical Report Writing 3 Units
- 3 course units from: 3 Units
  - HIS 2129 Technology, Society and Environment Since 1800
  - PHI 2394 Scientific Thought and Social Values 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 a complementary studies elective 3 Units

Compulsory Third-Year Courses:

- CEG 3136 Computer Architecture II 3 Units
- ELG 3106 Electromagnetic Engineering 3 Units
- ELG 3125 Signal and System Analysis 3 Units
- ELG 3126 Random Signals and Systems 3 Units
- ELG 3136 Electronics II 3 Units
- ELG 3137 Fundamentals of Semiconductor Devices 3 Units
- ELG 3155 Introduction to Control Systems 3 Units
- ELG 3175 Introduction to Communication Systems 3 Units
- ELG 3316 Electric Machines and Power Systems 3 Units
- 3 course units from a complementary studies elective 3 Units

Compulsory Fourth-Year Courses:

One option from the following: 30 Units

**Option 1: Communications**
- ELG 4118 Wave Propagation and Antennas
- ELG 4137 Principles and Applications of VLSI Design
- ELG 4156 Linear Systems
- 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
List of Optional Courses

List of Technical Electives: ¹

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>CEG 3185</td>
<td>Introduction to Data Communications and Networking</td>
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<tr>
<td>CEG 4158</td>
<td>Computer Control in Robotics</td>
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<td>CEG 4186</td>
<td>Wireless Networks</td>
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<td>CEG 4187</td>
<td>Optical Networks</td>
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<td>CEG 4188</td>
<td>Higher Layer Network Protocols</td>
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<td>CEG 4190</td>
<td>Computer Network Design</td>
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<td>CEG 4316</td>
<td>Digital Image Processing</td>
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<td>CEG 4396</td>
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<td>ELG 4115</td>
<td>Microwave Circuits</td>
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<td>ELG 4117</td>
<td>Optoelectronics and Optical Components</td>
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<tr>
<td>ELG 4118</td>
<td>Wave Propagation and Antennas</td>
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<td>ELG 4121</td>
<td>Topics in Electrical Engineering II</td>
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<td>ELG 4122</td>
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<td>Electric Power Transmission, Distribution and Utilization</td>
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<td>ELG 4126</td>
<td>Sustainable Electrical Power Systems</td>
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<td>ELG 4137</td>
<td>Principles and Applications of VLSI Design</td>
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<td>ELG 4139</td>
<td>Electronics III</td>
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<td>ELG 4156</td>
<td>Linear Systems</td>
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<td>ELG 4157</td>
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<tr>
<td>ELG 4179</td>
<td>Wireless Communication Fundamentals</td>
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</table>

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.