BASC ELECTRICAL ENGINEERING, ENGINEERING MANAGEMENT AND ENTREPRENEURSHIP OPTION

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 communities communicate, 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

Requirements for this program have been modified. Please consult the 2023-2024 calendars (https://catalogue.uottawa.ca/en/archives/) for the previous requirements.

Co-operative education is available with this program.

Compulsory First-Year Courses:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHM 1311</td>
<td>Principles of Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>GNG 1103</td>
<td>Introduction to Engineering Design</td>
<td>3</td>
</tr>
<tr>
<td>GNG 1105</td>
<td>Engineering Mechanics</td>
<td>3</td>
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<tr>
<td>GNG 1106</td>
<td>Fundamentals of Engineering Computation</td>
<td>3</td>
</tr>
<tr>
<td>ITI 1100</td>
<td>Digital Systems I</td>
<td>3</td>
</tr>
<tr>
<td>MAT 1320</td>
<td>Calculus I</td>
<td>3</td>
</tr>
<tr>
<td>MAT 1322</td>
<td>Calculus II</td>
<td>3</td>
</tr>
<tr>
<td>MAT 1341</td>
<td>Introduction to Linear Algebra</td>
<td>3</td>
</tr>
<tr>
<td>PHY 1124</td>
<td>Fundamentals of Physics for Engineers</td>
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Compulsory Second-Year Courses:

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<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ADM 1100</td>
<td>Introduction to Business</td>
<td>3</td>
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<tr>
<td>ADM 1340</td>
<td>Financial Accounting</td>
<td>3</td>
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<tr>
<td>CEG 2136</td>
<td>Computer Architecture I</td>
<td>3</td>
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<tr>
<td>ELG 2136</td>
<td>Electronics I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 2137</td>
<td>Circuit Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 2138</td>
<td>Circuit Theory I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 2911</td>
<td>Professional Practice in Information Technology and Engineering</td>
<td>3</td>
</tr>
<tr>
<td>ENG 1112</td>
<td>Technical Report Writing</td>
<td>3</td>
</tr>
<tr>
<td>GNG 2101</td>
<td>Introduction to Product Development for Engineers and Computer Scientists</td>
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</tr>
<tr>
<td>MAT 2322</td>
<td>Calculus III for Engineers</td>
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<tr>
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<th>Course Title</th>
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<tbody>
<tr>
<td>MAT 2384</td>
<td>Ordinary Differential Equations and Numerical Methods</td>
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</tr>
<tr>
<td>PHY 2323</td>
<td>Electricity and Magnetism</td>
<td>3</td>
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<tr>
<td>HIS 2129</td>
<td>Technology, Society and Environment Since 1850</td>
<td>3</td>
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<tr>
<td>PHI 2394</td>
<td>Scientific Thought and Social Values</td>
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Compulsory Third-Year Courses:

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<tr>
<td>ADM 2320</td>
<td>Marketing</td>
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<tr>
<td>ADM 3313</td>
<td>New Venture Creation</td>
<td>3</td>
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<tr>
<td>CEG 3136</td>
<td>Computer Architecture II</td>
<td>3</td>
</tr>
<tr>
<td>ELG 3106</td>
<td>Electromagnetic Engineering</td>
<td>3</td>
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<tr>
<td>ELG 3125</td>
<td>Signal and System Analysis</td>
<td>3</td>
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<tr>
<td>ELG 3126</td>
<td>Random Signals and Systems</td>
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<tr>
<td>ELG 3136</td>
<td>Electronics II</td>
<td>3</td>
</tr>
<tr>
<td>ELG 3137</td>
<td>Fundamentals of Semiconductor Devices</td>
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</tr>
<tr>
<td>ELG 3155</td>
<td>Introduction to Control Systems</td>
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</tr>
<tr>
<td>ELG 3175</td>
<td>Introduction to Communication Systems</td>
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<tr>
<td>ELG 3316</td>
<td>Electric Machines and Power Systems</td>
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<tr>
<td>GNG 4170</td>
<td>Engineering Law</td>
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<tr>
<td>3 optional course units from the list of optional courses for the Engineering Management and Entrepreneurship Option</td>
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Compulsory Fourth-Year Courses:

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<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ELG 4118</td>
<td>Wave Propagation and Antennas</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4139</td>
<td>Electronics III</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4156</td>
<td>Linear Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4176</td>
<td>Communication Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4177</td>
<td>Digital Signal Processing</td>
<td>3</td>
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<tr>
<td>ELG 4179</td>
<td>Wireless Communication Fundamentals</td>
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<tr>
<td>ELG 4912</td>
<td>Electrical Engineering Design Project: Part I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4913</td>
<td>Electrical Engineering Design Project: Part II</td>
<td>3</td>
</tr>
<tr>
<td>6 course units of technical electives</td>
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Option 1: Communications

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>ELG 4137</td>
<td>Principles and Applications of VLSI Design</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4156</td>
<td>Linear Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4912</td>
<td>Electrical Engineering Design Project: Part I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4913</td>
<td>Electrical Engineering Design Project: Part II</td>
<td>3</td>
</tr>
<tr>
<td>6 course units of technical electives</td>
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Option 2: Systems Engineering

<table>
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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<tbody>
<tr>
<td>CEG 4158</td>
<td>Computer Control in Robotics</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4137</td>
<td>Principles and Applications of VLSI Design</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4156</td>
<td>Linear Systems</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4912</td>
<td>Electrical Engineering Design Project: Part I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4913</td>
<td>Electrical Engineering Design Project: Part II</td>
<td>3</td>
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<td>6 course units of technical electives</td>
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Option 3: Electronics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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<tbody>
<tr>
<td>ELG 4115</td>
<td>Microwave Circuits</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4117</td>
<td>Optoelectronics and Optical Components</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4137</td>
<td>Principles and Applications of VLSI Design</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4139</td>
<td>Electronics III</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4912</td>
<td>Electrical Engineering Design Project: Part I</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4913</td>
<td>Electrical Engineering Design Project: Part II</td>
<td>3</td>
</tr>
<tr>
<td>6 course units of technical electives</td>
<td>3</td>
<td></td>
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</tbody>
</table>
6 course units of technical electives

**Option 4: Microwave and Photonic Engineering**
- ELG 4115 Microwave Circuits
- ELG 4117 Optoelectronics and Optical Components
- ELG 4118 Wave Propagation and Antennas
- 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:** 135 Units

Note(s)

1 Students who complete the Engineering Management and Entrepreneurship option are exempted from two complementary studies electives required for the Electrical Engineering degree.

**List of Optional Courses**

List of courses in Engineering Management and Entrepreneurship

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADM 1101</td>
<td>Business and Society</td>
<td>3</td>
</tr>
<tr>
<td>ADM 2336</td>
<td>Organizational Behaviour</td>
<td>3</td>
</tr>
<tr>
<td>ADM 3118</td>
<td>International Business</td>
<td>3</td>
</tr>
<tr>
<td>ADM 3319</td>
<td>Cross-Cultural Management</td>
<td>3</td>
</tr>
<tr>
<td>ADM 3326</td>
<td>Advertising and Sales Promotion Management</td>
<td>3</td>
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<tr>
<td>GNG 4120</td>
<td>Technology Entrepreneurship for Engineers and Computer Scientists</td>
<td>3</td>
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<tr>
<td>PHI 2397</td>
<td>Business Ethics</td>
<td>3</td>
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List of technical electives:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Units</th>
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</thead>
<tbody>
<tr>
<td>CEG 3185</td>
<td>Introduction to Data Communications and Networking</td>
<td>3</td>
</tr>
<tr>
<td>CEG 4158</td>
<td>Computer Control in Robotics</td>
<td>3</td>
</tr>
<tr>
<td>CEG 4186</td>
<td>Wireless Networks</td>
<td>3</td>
</tr>
<tr>
<td>CEG 4187</td>
<td>Optical Networks</td>
<td>3</td>
</tr>
<tr>
<td>CEG 4188</td>
<td>Higher Layer Network Protocols</td>
<td>3</td>
</tr>
<tr>
<td>CEG 4190</td>
<td>Computer Network Design</td>
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</tr>
<tr>
<td>CEG 4396</td>
<td>Computer Network Management</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4115</td>
<td>Microwave Circuits</td>
<td>3</td>
</tr>
<tr>
<td>ELG 4117</td>
<td>Optoelectronics and Optical Components</td>
<td>3</td>
</tr>
</tbody>
</table>

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 Communication option.

3 CEG 4190 cannot be chosen as a technical elective in the Computing Technology program.