BASIC IN COMPUTER ENGINEERING

Building on a solid foundation of traditional engineering skills, this program covers many different aspects of computer software and hardware design, and allows for more specialized studies in microprocessor-based systems, computer architecture, programming concepts, real-time operating systems, software engineering and robotics. This program provides multiple paths to a variety of careers.

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 2019-2020 calendars (https://catalogue.uottawa.ca/en/archives/) for the previous requirements.

Compulsory First-Year Courses:
- CHM 1311 Principles of Chemistry 3 Units
- GNG 1105 Engineering Mechanics 3 Units
- ITI 1100 Digital Systems I 3 Units
- ITI 1120 Introduction to Computing I 3 Units
- ITI 1121 Introduction to Computing II 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
- CSI 2110 Data Structures and Algorithms 3 Units
- ELG 2136 Electronics I 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
- MAT 2322 Calculus III for Engineers 3 Units
- MAT 2377 Probability and Statistics for Engineers 3 Units
- MAT 2384 Ordinary Differential Equations and Numerical Methods 3 Units
- PHY 2323 Electricity and Magnetism 3 Units
- SEG 2105 Introduction to Software Engineering 3 Units
- 3 complementary electives course units at the undergraduate level 1

Compulsory Third-Year Courses:
- CEG 3136 Computer Architecture II 3 Units
- CEG 3155 Digital Systems II 3 Units
- CEG 3156 Computer Systems Design 3 Units
- CEG 3185 Introduction to Data Communications and Networking 3 Units
- CSI 3131 Operating Systems 3 Units
- ELG 3125 Signal and System Analysis 3 Units
- ELG 3155 Introduction to Control Systems 3 Units
- 3 course units from:
  - ECO 1192 Engineering Economics 3 Units
  - GNG 2101 Introduction to Product Development and Management for Engineers and Computer Scientists 3 Units

Compulsory Fourth-Year Courses:
- CEG 4136 Computer Architecture III 3 Units
- CEG 4166 Real-Time Systems Design 3 Units
- CEG 4912 Computer Engineering Design Project I 3 Units
- CEG 4913 Computer Engineering Design Project II 3 Units
- 3 course units from the list of technical electives 12 Units
- 12 course units of technical electives from the list of technical electives 12 Units
- Total: 129 Units

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://engineering.uottawa.ca/undergraduate-programs/courses/complementary-electives/) on the Faculty of Engineering website.

List of Optional Courses

List of Technical Electives:
- CEG 4112 Topics in Computer Engineering II 3 Units
- CEG 4140 Digital Control Systems 3 Units
- CEG 4158 Computer Control in Robotics 3 Units
- CEG 4186 Wireless Networks 3 Units
- CEG 4187 Optical Networks 3 Units
- CEG 4188 Higher Layer Network Protocols 3 Units
- CEG 4190 Computer Network Design 3 Units
- CEG 4198 Distributed Systems Design 3 Units
- CEG 4316 Digital Image Processing 3 Units
- CEG 4396 Computer Network Management 3 Units
- CEG 4399 Design of Secure Computer Systems 3 Units
- CSI 2120 Programming Paradigms 3 Units
- CSI 2132 Databases I 3 Units
- CSI 2372 Advanced Programming Concepts With C++ 3 Units
- CSI 3120 Programming Language Concepts 3 Units

12 Units

Total: 129 Units
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<th>Course</th>
<th>Title</th>
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<tr>
<td>CSI 3140</td>
<td>WWW Structures, Techniques and Standards</td>
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<tr>
<td>CSI 4106</td>
<td>Introduction to Artificial Intelligence</td>
<td>3</td>
</tr>
<tr>
<td>ELG 2137</td>
<td>Circuit Theory II</td>
<td>3</td>
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<tr>
<td>ELG 3136</td>
<td>Electronics II</td>
<td>3</td>
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<tr>
<td>ELG 4137</td>
<td>Principles and Applications of VLSI Design</td>
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<tr>
<td>ELG 4177</td>
<td>Digital Signal Processing</td>
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<td>SEG 3102</td>
<td>Software Design and Architecture</td>
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<tr>
<td>SEG 3125</td>
<td>Analysis and Design of User Interfaces</td>
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