<table>
<thead>
<tr>
<th>Term</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1st Term (Fall)</strong></td>
<td>14</td>
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<tr>
<td>BIEN 200</td>
<td>Introduction to Bioengineering</td>
<td>2</td>
</tr>
<tr>
<td>CHEM 212</td>
<td>Introductory Organic Chemistry 1</td>
<td>4 ( P - \text{CHEM 110} / \text{CHEM 120} )</td>
</tr>
<tr>
<td>MATH 262</td>
<td>Intermediate Calculus</td>
<td>3 ( P - \text{MATH 133, MATH 141} )</td>
</tr>
<tr>
<td>MATH 263</td>
<td>Ordinary Differential Equations for Engineers</td>
<td>3 ( C - \text{MATH 262} )</td>
</tr>
<tr>
<td>MEC 210</td>
<td>Mechanics 1</td>
<td>2 ( P - \text{PHYS 101 or PHYS 131 or equivalent} )</td>
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<tr>
<td><strong>2nd Term (Winter)</strong></td>
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<tr>
<td>BIEN 210</td>
<td>Electrical and Optical Properties of Biological Systems</td>
<td>3 ( P - \text{BIEN 200} / \text{BIOL 112} )</td>
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<tr>
<td>BIEN 300</td>
<td>Thermodynamics in Bioengineering</td>
<td>3 ( P - \text{CHEM 120, MATH 262} )</td>
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<tr>
<td>BIOL 112</td>
<td>Cell and Molecular Biology</td>
<td>3 -</td>
</tr>
<tr>
<td>COMP 208</td>
<td>Computers in Engineering</td>
<td>3 ( P - \text{MATH 141} / \text{MATH 133} )</td>
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<tr>
<td>FACC 100</td>
<td>Introduction to the Engineering Profession</td>
<td>1 -</td>
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<tr>
<td>MATH 203</td>
<td>Principles of Statistics 1</td>
<td>3 -</td>
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<tr>
<td><strong>3rd Term (Fall)</strong></td>
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<tr>
<td>BIEN 219</td>
<td>Introduction to Physical Biology of the Cell</td>
<td>4 ( P - \text{BIOL 112} / \text{CHEM 212} )</td>
</tr>
<tr>
<td>BIEN 290</td>
<td>Bioengineering Measurement Laboratory</td>
<td>3 ( P - \text{BIEN 200} )</td>
</tr>
<tr>
<td>BIEN 310</td>
<td>Introduction to Biomolecular Engineering (TC Stream 2)</td>
<td>3 ( P - \text{BIEN 200 or permission of instructor} )</td>
</tr>
<tr>
<td>BIEN 350</td>
<td>Biosignals, Systems and Control</td>
<td>4 ( P - \text{MATH 263 or permission of instructor} )</td>
</tr>
<tr>
<td>MATH 264</td>
<td>Advanced Calculus for Engineers</td>
<td>3 ( P - \text{MATH 262 or MATH 151 or MATH 152} / \text{MATH 263} )</td>
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<td><strong>4th Term (Winter)</strong></td>
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<tr>
<td>BIEN 320</td>
<td>Molecular, Cellular and Tissue Biomechanics (TC Stream 2)</td>
<td>3 ( P - \text{BIOL 112, MECH 210} )</td>
</tr>
<tr>
<td>BIEN 360</td>
<td>Physical Chemistry in Bioengineering</td>
<td>3 ( P - \text{BIEN 300} )</td>
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<tr>
<td>CS</td>
<td>Complimentary Studies - Group B (HSSML)</td>
<td>3 -</td>
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<tr>
<td>CCOM 206</td>
<td>Communication in Engineering</td>
<td>3 -</td>
</tr>
<tr>
<td>FACC 250</td>
<td>Responsibilities of the Professional Engineer</td>
<td>0 ( P - \text{FACC 100 or BREE 250} )</td>
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<tr>
<td>FACC 300</td>
<td>Engineering Economy</td>
<td>3 -</td>
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<tr>
<td><strong>5th Term (Fall)</strong></td>
<td>18</td>
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<tr>
<td>BIEN 314</td>
<td>Transport Processes in Biological Systems 1</td>
<td>3 ( P - \text{BIEN 200, MATH 263, BIEN 300 or permission of instructor} )</td>
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<tr>
<td>BIEN 390</td>
<td>Bioengineering Laboratory</td>
<td>3 ( P - \text{BIEN 290} )</td>
</tr>
<tr>
<td>BIEN 410</td>
<td>Computational Methods in Biomolecular Engineering (TC Stream 2)</td>
<td>3 ( P - \text{BIEN 310 and COMP 208, or permission of instructor} )</td>
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<tr>
<td>GIVE 281</td>
<td>Analytical Mechanics</td>
<td>3 ( C - \text{MATH 262, MATH 263} )</td>
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<tr>
<td>EC</td>
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<tr>
<td>CS</td>
<td>Complimentary Studies Group A (Impact)</td>
<td>3 -</td>
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<tr>
<td><strong>6th Term (Winter)</strong></td>
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<tr>
<td>BIEN 330</td>
<td>Tissue Engineering and Regenerative Medicine (TC Stream 2)</td>
<td>3 ( P - \text{BIEN 200, BIOL 112, BIOL 200, and CHEM 212, or instructor permission} )</td>
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<tr>
<td>BIEN 340</td>
<td>Transport Phenomena in Biological Systems 2</td>
<td>3 ( P - \text{BIEN 314, BIEN 360 or permission of instructor} )</td>
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<tr>
<td>BIEN 590</td>
<td>Cell Culture Engineering (TC Stream 2)</td>
<td>3 ( P - \text{Permission of instructor} )</td>
</tr>
<tr>
<td>PHYS 319</td>
<td>Introduction to Biophysics</td>
<td>3 ( P - \text{BIOL 200, MATH 222 / MATH 262, PHYS 230 and (PHYS 232 or PHYS 253), or permission of instructor} )</td>
</tr>
<tr>
<td>EC</td>
<td>Elective - 2</td>
<td>3 -</td>
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<tr>
<td><strong>7th Term (Fall)</strong></td>
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<tr>
<td>BIEN 470D1</td>
<td>Bioengineering Design Project</td>
<td>3 ( P - \text{BIEN 390} )</td>
</tr>
<tr>
<td>BIEN 510</td>
<td>Engineered Nanomaterials for Biomedical Applications (TC Stream 2)</td>
<td>3 ( P - \text{BIEN 200, CHEM 212, and BIOL 112, or permission of instructor} )</td>
</tr>
<tr>
<td>BIEN 550</td>
<td>Biomolecular Devices (TC Stream 2)</td>
<td>3 ( P - \text{Permission of instructor} )</td>
</tr>
<tr>
<td>BIEN 570</td>
<td>Active Mechanics in Biology (TC Stream 2)</td>
<td>3 ( P - \text{Permission of instructor} )</td>
</tr>
<tr>
<td>BIEN 590</td>
<td>High Throughput Bioanalytical Devices (TC Stream 2)</td>
<td>3 ( P - \text{Permission of instructor} )</td>
</tr>
<tr>
<td><strong>8th Term (Winter)</strong></td>
<td>12</td>
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<tr>
<td>BIEN 470D2</td>
<td>Bioengineering Design Project</td>
<td>3 ( P - \text{BIEN 390} )</td>
</tr>
<tr>
<td>BIEN 471</td>
<td>Bioengineering Research Project</td>
<td>2 ( P - \text{Permission of instructor} )</td>
</tr>
<tr>
<td>BIEN 540</td>
<td>Information Storage and Processing in Biological Systems (TC Stream 2)</td>
<td>3 ( \text{Restricted to U3 Students, or permission of instructor} )</td>
</tr>
<tr>
<td>FACC 400</td>
<td>Engineering Professional Practice</td>
<td>1 ( P - \text{FACC 100, FACC 250, and 60 program credits} )</td>
</tr>
<tr>
<td>EC</td>
<td>Elective - 3</td>
<td>3 -</td>
</tr>
</tbody>
</table>

*The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A and one course (3 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication (www.mcgill.ca/study) (see your program listing in the "Browse Academic Units & Programs" section).

**FACC 250 is not yet indicated as a prerequisite in the eCalendar course information (www.mcgill.ca/study) but it will be before FACC 400 is taken. Elective courses (EC) can be chosen from any course at the 200-level or higher offered by the University, subject to permission of the offering department.

Students are responsible for satisfying pre/co-requisites and verifying with their department that they are meeting the requirements of their program.
Engineering Science and Design Technical Complementaries

Starting in the third year (second year for CEGEP students) (Year 2), students will need to take 36 credits of courses to upgrade their general knowledge of Bioengineering. While it is not mandatory, it is highly recommended that the students choose all courses in one of the three streams of bioengineering knowledge and practice: 1) Biological Materials and Mechanics (37 credits); 2) Biomolecular and Cellular Engineering (36 credits) [as indicated above]; or 3) Biomedical, Diagnostics and High Throughput Screening Engineering (36 credits). However, students may satisfy the Bioengineering Complementary Courses requirement by taking a minimum of 30 credits from the Engineering Science and Design Complementaries course list and 6 credits of any other courses in the Stream course lists.

30-37 credits from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Prerequisites/Co-requisites</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIEN 310</td>
<td>Introduction to Biomolecular Bioengineering</td>
<td>3</td>
<td>P - BIEN 200 or permission of instructor</td>
</tr>
<tr>
<td>BIEN 320</td>
<td>Molecular, Cellular, and Tissue Biomechanics</td>
<td>3</td>
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</tr>
<tr>
<td>BIEN 330</td>
<td>Tissue Engineering and Regenerative Medicine</td>
<td>3</td>
<td>P - BIEN 200, BIOL 112, BIOL 200, and CHEM 212, or instructor permission</td>
</tr>
<tr>
<td>BIEN 350</td>
<td>Biosystems and Control</td>
<td>3</td>
<td>P - MATH 263 or instructor permission</td>
</tr>
<tr>
<td>BIEN 410</td>
<td>Computational Methods in Biomolecular Engineering</td>
<td>3</td>
<td>P - BIEN 310 and COMP 208, or instructor permission</td>
</tr>
<tr>
<td>BIEN 510</td>
<td>Engineered Nanomaterials for Biomedical Applications</td>
<td>3</td>
<td>P - BIEN 200, CHEM 212, and BIOL 112, or instructor permission</td>
</tr>
<tr>
<td>BIEN 520</td>
<td>High Throughput Bioanalytical Devices</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>BIEN 530</td>
<td>Imaging and Bioanalytical Instrumentation</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>BIEN 550</td>
<td>Biomolecular Devices</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>BIEN 550</td>
<td>Biosensors</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>BIEN 570</td>
<td>Active Mechanics in Biology</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>BIEN 590</td>
<td>Cell Culture Engineering</td>
<td>3</td>
<td>P - Permission of instructor</td>
</tr>
<tr>
<td>CHEE 314</td>
<td>Fluid Mechanics</td>
<td>3</td>
<td>P - CHEE 204 or BIEN 200 / C - MATH 264</td>
</tr>
<tr>
<td>CHEE 370</td>
<td>Elements of Biotechnology</td>
<td>3</td>
<td>-</td>
</tr>
<tr>
<td>CHEE 563</td>
<td>Biofluids and Cardiovascular Mechanics</td>
<td>3</td>
<td>P - CHEE 314 or MECH 331 or instructor permission</td>
</tr>
<tr>
<td>MECH 563</td>
<td>Biofluids and Cardiovascular Mechanics</td>
<td>3</td>
<td>-</td>
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<td>CIVE 207</td>
<td>Solid Mechanics</td>
<td>4</td>
<td>P - CIVE 205 or MECH 210</td>
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<td>ECSE 415</td>
<td>Introduction to Computer Vision</td>
<td>3</td>
<td>P - ECSE 304 or ECSE 306 or ECSE 206</td>
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<tr>
<td>MECH 547</td>
<td>Mechanics of Biological Materials</td>
<td>3</td>
<td>P - MECH 210 and MIME 260 / 261, or instructor permission</td>
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</table>

Last update: April 30, 2019
For the official program listing, see the Programs, Courses and University Regulations publication (www.mcgill.ca/study).