# Chemical Engineering and Biomedical Engineering

**For students entering Year 2 in September 2019**

## Year 2

### Term A
- AM 2270A Applied Mathematics for Engineering II
- BME 3201A Fundamentals of Biomedical Engineering Design
- CBE 2206A Industrial Organic Chemistry I
- CBE 2214A Engineering Thermodynamics
- CBE 2220A Chemical Process Calculations
- CBE 2290A Fundamentals of Biochemical and Environmental Eng.

### Term B
- AM 2277B Applied Mathematics for Chemical & Civil Engineering III
- CBE 2207B Industrial Organic Chemistry II
- CBE 2221B Fluid Flow
- CBE 2224B Chemical Engineering Thermodynamics
- CBE 2291B Computational Methods for Engineering
- SS 2143B Applied Statistics and Data Analysis for Engineers
- Writ 2130G Building Better (Communication) Bridges

## Year 3

### Term A
- Biol 1201A General Biology I
- CBE 3315A Reaction Engineering
- CBE 3318A Introduction to Chemical Process Simulation
- CBE 3322A Heat Transfer Operations
- CBE 3325A Particulate Operations
- CBE 3395Y Chemical Engineering Lab
- One 0.5-credit non-technical elective *

### Term B
- Biol 1202B General Biology II
- CBE 3310B Process Dynamics and Control
- CBE 3319B Introduction to Plant Design and Safety
- CBE 3323B Staged Operations
- CBE 3324B Mass Transfer Operations
- CBE 3395Y Chemical Engineering Lab
- ECE 2208B Electrical Measurements

## Year 4

### Term A
- Biochem 2280A Biochemistry and Molecular Biology
- BME 3301A Neural Systems Engineering
- ECE 4455A Biomedical Systems Analysis
- Physiol 2130 Human Physiology
- One 0.5-credit Biomedical Science elective
- One 0.5-credit Healthcare non-technical elective

### Term B
- BME 3303B Cellular Systems Engineering
- MME 4469B Biomechanics of the Musculoskeletal System
- Physiol 2130 Human Physiology
- Two 0.5-credit Biomedical Science electives
- One 0.5-credit Healthcare non-technical elective
- One 0.5-credit Open elective (taken in either term)**

## Non-technical Electives

Students are required to complete 1.5 credits of non-technical electives as part of the program.

a) The first 0.5 credit can come from the approved non-technical elective list [here](https://www.eng.uwo.ca/undergraduate/upper-year/electives.html).

b) The remaining 1.0 credits must come from the following Healthcare Non-technical Elective list.

Students must pay attention when selecting the first 0.5 credit to ensure appropriate prerequisite courses are completed for the non-technical electives below.

### Healthcare Non-technical Electives
- Anthropology 2290F/G Cultures of Health and Healing
- Economics 2169F/G Economics of Health Care
- History 2195A/B Epidemics in North America
- Law 3101A/B Healthcare Law
- Philosophy 2071E Biomedical Ethics
- Philosophy 2072F/G Bioethics and Disability
- Philosophy 2715F/G Health Care Ethics
- Political Science 2276F/G The Politics of Health Care
- Religious Studies 2239F/G Christian Bioethics
- Sociology 2179A/B Promotion of Community Health
- Sociology 2180A/B Development of Health Inequalities
- Women’s Studies 2244 Women and Health
- Writing 3222F/G Advanced Healthcare Communication

### Technical Elective List:

Some technical electives may not be offered in a given academic year. Consult the Department for accurate listing. Courses that do not appear on the list below require special permission from the Department.

### Biomedical Sciences Electives
- Biochemistry 3385A/B Human Biochemistry
- Biochemistry 3386A/B Clinical Biochemistry
- Biology 2382A/B Cell Biology
- Biology 2581A/B Genetics
- Chemistry 2213A/B Organic Chemistry
- Chemistry 2283F/G Organic Chemistry II
- Communication Sciences and Disorders 4417A/B Hearing Science
- Health Science 2300A/B Systemic Approach to Functional Anatomy
- Health Science 3300A/B Anatomy of the Human Body
- Medical Science 4931F/G Selected Topics in Medical Science
- Physiology 3140A/B Cellular Physiology
<table>
<thead>
<tr>
<th>Term</th>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term A</td>
<td>BME 4400</td>
<td>Biomedical Engineering Research Thesis</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>CBE 4421A</td>
<td>Introduction to Biomaterials Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBE 4497</td>
<td>Chemical Process and Plant Design</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ES 3330A</td>
<td>Engineering Innovation I: New Venture Creation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>One 0.5-credit CBE technical elective</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(<a href="https://www.eng.uwo.ca/undergraduate/upper-year/next.html">https://www.eng.uwo.ca/undergraduate/upper-year/next.html</a>)</td>
<td></td>
</tr>
<tr>
<td>Term B</td>
<td>BME 4400</td>
<td>Biomedical Engineering Research Thesis</td>
<td>1.5</td>
</tr>
<tr>
<td></td>
<td>CBE 4497</td>
<td>Chemical Process and Plant</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ES 4498G</td>
<td>Engineering Ethics, Sustainable Development and the Law</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Two 0.5-credit BME technical electives</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>One 0.5-credit CBE technical elective</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(<a href="https://www.eng.uwo.ca/undergraduate/upper-year/next.html">https://www.eng.uwo.ca/undergraduate/upper-year/next.html</a>)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Psychology 2220A/B</td>
<td>Intro. to Behavioural &amp; Cognitive Neuroscience</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CBE 4423A/B</td>
<td>Tissue Engineering</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical Biophysics 3507F/G</td>
<td>Analysis of Oxygen Transport</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical Biophysics 3645A/B</td>
<td>Intro. to Biomedical Optics</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical Biophysics 4475A/B</td>
<td>Medical Imaging</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medical Biophysics 4535A/B</td>
<td>Hemodynamics</td>
<td></td>
</tr>
</tbody>
</table>

**Open Electives**
For the course credit designated as an “open elective”, students may select any course from the lists of: Biomedical Science electives; BME technical electives; CBE technical electives; Healthcare non-technical electives; or Faculty of Engineering approved non-technical electives.