# Mechatronic Systems 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
- CS 1037A  Computer Science Fundamentals II
- ECE 2205A  Electric Circuits I
- MSE 2200Q  Engineering Shop Safety Training
- MSE 2201A  Introduction to Electrical Instrumentation
- MSE 2212A  Mechanics of Materials
- MSE 2214A  Thermodynamics

### Term B
- AM 2276B  Applied Mathematics for Electrical & Mechanical Eng. III
- MSE 2202B  Introduction to Mechatronic Design
- MSE 2213B  Engineering Dynamics
- MSE 2233B  Circuits and Systems
- MSE 2273B  Introduction to Fluid Mechanics and Heat Transfer
- Writ 2130G  Building Better (Communication) Bridges

## Year 3

### Term A
- AM 3415A  Applied Mathematics for Electrical Engineering
- Biol 1201A  General Biology I
- ECE 2277A  Digital Logic Systems
- ECE 3330A  Control Systems
- MSE 3301A  Materials Selection and Manufacturing Processes
- MSE 3310A  Electric Motors and Drives
- MSE 3381A  Kinematics and Dynamics of Machines

### Term B
- Biol 1202B  General Biology II
- ECE 3331B  Signal Processing
- ECE 3375B  Microprocessors and Microcomputers
- MSE 3302B  Sensors and Actuators
- MSE 3360B  Finite Element Methods for Mechatronic Systems
- MSE 3380B  Machine Component Design for Mechatronic Systems

## Year 4

### Term A
- Biochem 2280A  Biochemistry and Molecular Biology
- BME 3301A  Neural Systems Engineering
- ECE 4455A  Biomedical Systems Analysis
- Physiol 2130  Human Physiology
- SS 2141A  Applied Probability and Statistics for Engineers
- One 0.5-credit Biomedical Science 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
- Two 0.5-credit Healthcare non-technical electives

## 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 ([https://www.eng.uwo.ca/undergraduate/upper-year/electives.html](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

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

## 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

<table>
<thead>
<tr>
<th>Biochemistry 3385A/B</th>
<th>Human Biochemistry</th>
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</thead>
<tbody>
<tr>
<td>Biochemistry 3386A/B</td>
<td>Clinical Biochemistry</td>
</tr>
<tr>
<td>Biology 2382A/B</td>
<td>Cell Biology</td>
</tr>
<tr>
<td>Biology 2581A/B</td>
<td>Genetics</td>
</tr>
<tr>
<td>Chemistry 2213A/B</td>
<td>Organic Chemistry</td>
</tr>
<tr>
<td>Chemistry 2283F/G</td>
<td>Organic Chemistry II</td>
</tr>
<tr>
<td>Communication Sciences and Disorders 4417A/B</td>
<td>Hearing Science</td>
</tr>
<tr>
<td>Health Science 2300A/B</td>
<td>Systemic Approach to Functional Anatomy</td>
</tr>
<tr>
<td>Health Science 3300A/B</td>
<td>Anatomy of the Human Body</td>
</tr>
<tr>
<td>Medical Science 4931F/G</td>
<td>Selected Topics in Medical Science</td>
</tr>
<tr>
<td>Physiology 3140A/B</td>
<td>Cellular Physiology</td>
</tr>
</tbody>
</table>

The official version of the academic calendar can be found at: [www.westerncalendar.uwo.ca](http://www.westerncalendar.uwo.ca)
**Year 5**

**Term A**
- BME 4400 Biomedical Engineering Research Thesis (1.5-credit course)
- ECE 4445A Introduction to Digital Image Processing
- ES 3330A Engineering Innovation I: New Venture Creation
- MSE 4401A Robotic Manipulators
- MSE 4499 Mechatronic Design Project
- One 0.5-credit non-technical elective

**Term B**
- BME 4400 Biomedical Engineering Research Thesis (1.5-credit course)
- ES 4498G Engineering Ethics, Sustainable Development and the Law
- MSE 4499 Mechatronic Design Project
- Two 0.5-credit BME technical electives
- One 0.5-credit MSE technical elective

(https://www.eng.uwo.ca/undergraduate/upper-year/next.html)

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**Psychology 2220A/B**
- Intro. to Behavioural & Cognitive Neuroscience

**Biomedical Engineering (BME) Electives**
- CBE 4421A/B Intro. to Biomaterials Engineering
- ECE 4438A/B Advanced Image Processing and Analysis
- Medical Biophysics 3507F/G Analysis of Oxygen Transport
- Medical Biophysics 3645A/B Intro. to Biomedical Optics
- Medical Biophysics 4475A/B Medical Imaging
- Medical Biophysics 4535A/B Hemodynamics