# Mechatronic Systems Engineering and Biomedical Engineering

## September 2020 (for students who entered Year 1 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 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).
- **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

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The official version of the academic calendar can be found at: 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)

Biomedical Engineering (BME) Electives

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
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<tbody>
<tr>
<td>Psychology 2220A/B</td>
<td>Intro. to Behavioural &amp; Cognitive Neuroscience</td>
</tr>
<tr>
<td>CBE 4421A/B</td>
<td>Intro. to Biomaterials Engineering</td>
</tr>
<tr>
<td>ECE 4438A/B</td>
<td>Advanced Image Processing and Analysis</td>
</tr>
<tr>
<td>Medical Biophysics 3507F/G</td>
<td>Analysis of Oxygen Transport</td>
</tr>
<tr>
<td>Medical Biophysics 3645A/B</td>
<td>Intro. to Biomedical Optics</td>
</tr>
<tr>
<td>Medical Biophysics 4475A/B</td>
<td>Medical Imaging</td>
</tr>
<tr>
<td>Medical Biophysics 4535A/B</td>
<td>Hemodynamics</td>
</tr>
</tbody>
</table>

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