

## Mechatronic Systems Engineering and Biomedical Engineering

September 2024 (for students who entered Year 1 in September 2020 or later)

### Year 2

#### Term A

NMM 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

NMM 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

### Year 3

#### Term A

Biol 1001A	Biology for Sciences 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

MSE 2221b	Computational Methods in Mechatronic Systems Engineering
Biol 1002B	Biology for Sciences 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.

- \*The first 0.5 credit can come from the approved non-technical elective list (<https://www.eng.uwo.ca/undergraduate/upper-year/electives.html>).
- 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
Anthropology 2240A/B	Evolution, Ecology & Human Health
Economics 2169F/G	Economics of Health Care
History 2195A/B	Epidemics in North America
Law 3101A/B	Healthcare Law
Philosophy 2071E	Biomedical Ethics
Philosophy 2272F/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

#### 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 2223A/B	Organic Chemistry of Biological Molecules
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

## Year 5

### Term A

BME 4400	Biomedical Engineering Research Thesis (1.5-credit course)
ECE 4445A	Introduction to Digital Image Processing
ELI 4110F	Engineering Ethics, Sustainable Development and the Law
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)
ELI 3200B	Engineering Innovation I: New Venture Creation
MSE 4499	Mechatronic Design Project
Two 0.5-credit BME technical electives	
One 0.5-credit MSE technical elective	
<a href="https://www.eng.uwo.ca/undergraduate/upper-year/next.html">https://www.eng.uwo.ca/undergraduate/upper-year/next.html</a>	

Psychology 2220A/B	Intro. to Behavioural & Cognitive Neuroscience
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### Biomedical Engineering (BME) Electives

CBE 4421A/B	Intro. to Biomaterials Engineering
CBE 4422A/B	Nanobiotechnology
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

### Mechatronic Systems Engineering (MSE) Electives

ECE 4460A/B	Real Time and Embedded Systems
ECE 4469A/B	Applied Control Systems