COURSE AND OPTIONS SELECTION HANDBOOK

MECHANICAL ENGINEERING

3RD YEAR
WHAT IS COURSE & OPTIONS SELECTION?

Each year the Office of the Registrar asks you to provide them with indicators as to which program option and technical elective courses you plan to take in the coming academic year. The information that you provide to us through Course and Options Selection (COS) helps us identify the demand for program options and courses. This information is used for the course scheduling process and for uploading your course selections to ROSI. When selecting your technical electives be sure that your selections meet the program requirements for your program of study.

Please be advised that students who do not participate in COS will not be guaranteed a space in technical elective courses, so it is in your interest to submit your selections.

We greatly appreciate your cooperation with this exercise. It can be completed on Degree Explorer at the link: degreeexplorer.utoronto.ca
# IMPORTANT DATES

<table>
<thead>
<tr>
<th>DATE</th>
<th>IMPORTANT EVENT</th>
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<tbody>
<tr>
<td>Early February</td>
<td>CURRICULUM TALK: 3RD YEAR MECH CURRICULUM</td>
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</table>
| Mid February to Early March | COURSE & OPTION SELECTION OPENS  
degreeexplorer.utoronto.ca  
Students may now login and make their curriculum selections for the upcoming academic year |
| Early March | LAST DAY FOR STUDENTS TO APPLY TO RE-ENROL OR SWITCH TO FULL-TIME FOR FALL SESSION* |
| Late July | COURSE SELECTION (ROUND 1) OPENS *ACORN*  
Students may now make changes to their timetable. Electives offered by the Faculty of Engineering and Enhanced Enrolment Arts & Science electives are now open for enrolment |
| Mid August | COURSE SELECTION (ROUND 2) OPENS *ACORN*  
For electives offered by the Faculty of Arts & Science |
| Late August | LAST DAY TO PAY OR DEFER TUITION FEES |
| Early September | ENGINEERING FALL (F) LECTURES BEGIN |
| Late September | FALL (F) & FULL-YEAR (Y) COURSE ADD DEADLINE  
Last day to add or substitute Fall (F) or Full-Year (Y) Session |
| Early November | FALL (F) COURSE DROP DEADLINE  
Last day to drop Fall (F) Session courses without academic penalty, withdraw from the Fall (F) session without academic penalty, or transfer to part-time |
| Early January | ENGINEERING WINTER (S) LECTURES BEGIN |
| Mid January | WINTER (S) COURSE ADD DEADLINE  
Last day to add or substitute Winter (S) Session courses |
| Early March | WINTER (S) & FULL YEAR (Y) COURSE DROP DEADLINE  
Last day to drop Winter (S) Session and Full-Year (Y) courses without academic penalty |

*For fee and refund schedule information, follow the link below:  
http://www.fees.utoronto.ca/sessions.htm
# CURRICULUM

## FALL SESSION - YEAR 3

### CORE REQUIRED COURSES

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### NATURAL SCIENCE ELECTIVE (CHOOSE ONE):

- Engineering Biology: CHE353H1 3 / - / 2 / 0.5
- Urban Engineering Ecology: CIV220H1 3 / - / 1 / 0.5
- Terrestrial Energy Systems: CIV300H1 3 / - / 2 / 0.5

### CAN I TAKE A NATURAL SCIENCE ELECTIVE OTHER THAN THOSE ON THIS LIST?

### CAN I TAKE MY NATURAL SCIENCE ELECTIVE IN THE WINTER OR SUMMER TERM?
If the natural science elective you are interested in taking is only offered in the winter semester, you must first obtain formal approval from the MIE Undergraduate Office to overload. Many natural science electives on the extended list are also available in the summer.

### CAN I CHANGE MY STREAMS IN FOURTH YEAR?
No. In order to graduate, you must take a course following each of your stream selections in 3W. If you find another 4F stream course interesting, you may take it in place of a technical elective in addition to your two continued stream courses.
## Core Required Courses

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## Stream Options (Choose Two):

### MANUFACTURING
- Introduction to Quality Control
  - MIE304H1
  - 3 / 1 / 2 / 0.5

### MECHATRONICS
- Analog and Digital Electronics for Mechatronics
  - MIE346H1
  - 3 / 1.5 / 1 / 0.5

### SOLID MECHANICS & DESIGN
- Mechanics of Solids II
  - MIE320H1
  - 3 / 1.5 / 1 / 0.5

### ENERGY & ENVIRONMENT
- Thermal Energy Conversion
  - MIE311H1
  - 3 / 3 / - / 0.5

### BIOENGINEERING (CHOOSE ONE):
- Cellular and Molecular Biology
  - CHE354H1
  - 3 / 1 / 2 / 0.5
- Physiological Control Systems
  - MIE331H1
  - 3 / 1 / 1 / 0.5

### CAN I TAKE THREE STREAMS?
It is strongly advised that mechanical engineering students do not overload in third year. Only under exceptional circumstances are overloads granted in third year. If you are interested in taking three streams, you must first obtain formal approval from the MIE Undergraduate Office to overload.

### WHAT IF I WANT TO CHANGE MY STREAM CHOICES FROM WHAT I SELECTED ON COS?
Please see the Important Dates for more details on opportunities to change your stream selections. Please try to make an informed decision for your COS selections to ensure you have a spot.
Manufacturing, the transformation of materials and information (technology) into useful products for human beings, is the cornerstone to many economic activities. It is a versatile skill, with employment opportunities existing over a wide range of Canadian industry, including automotive, microelectronics, aeronautics, pharmaceutical, etc.

It is an exciting, creative field, where engineers get to design from cradle-to-grave. You must understand how an idea can be produced, and at what cost. This design may also include the manner the product should be disposed of or recycled. It is a truly international field, with demand around the world. Within Canada, average earnings of all employees in manufacturing are 22% higher than average earnings across all economic occupations in Canada.

STREAM COURSES

3W - MIE304H1S - INTRODUCTION TO QUALITY CONTROL
In manufacturing and service industries alike, quality is viewed as an important strategic tool for increasing competitiveness. Continuous quality improvement is a key factor leading to a company’s success. With more emphasis on quality, the cost and the product cycle time are reduced and the communication between producer and customer is improved.

MANUFACTURING

4F - MIE422H1S - AUTOMATED MANUFACTURING

TOPICS: Introduction to Computer Integrated Manufacturing, Introduction to robotics and kinematics, CNC Basics, CNC Programming, Programmable Logic Controllers (PLCs) FMS, Table-top manufacturing, Group technology

SUGGESTED TECHNICAL ELECTIVES (4TH YEAR)

- MIE440H1 - Design of Innovative Products
- MSE401H1 - Materials Selection in Design II
- FOR424H1 - Innovation and Manufacturing of Sustainable materials
- MIE469H1 - Reliability and Maintainability Engineering
- MIE506H1 - MEMS Design and Microfabrication
- MIE519H1 - Advanced Manufacturing Technologies
- MSE432H1 - Polymers and Composite Engineering

FIELDS OF APPLICATION


LINKS

Canadian Society of Manufacturing Engineers
www.sme.org/smecanada
# MANUFACTURING MINOR

## SAMPLE COURSE SELECTION FOR MINOR (3RD YEAR)

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*Note: If you are pursuing any minor please refer to the Academic Calendar for more information on taking the required courses to achieve that minor. This may require overloading. Taking a stream does not mean you will get a minor in that area.*
# MANUFACTURING MINOR

## SAMPLE COURSE SELECTION FOR MINOR (4TH YEAR)

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**STREAM COURSES (TWO OF):**

**MANUFACTURING**

| Automated Manufacturing | MIE422H1 | 2 / 3 / - / 0.5 |

**SOLID MECHANICS & DESIGN**

| Machine Design | MIE442H1 | 3 / 1.5 / 3 / 0.5 |

**TECHNICAL ELECTIVES (ONE OF):**

| Materials Selection in Design | MSE401H1 | 2 / 2 / 1 / 0.5 |

**COMPLEMENTARY STUDIES ELECTIVE**

| CS Elective | - | - / - / - / 0.5 |

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**TECHNICAL ELECTIVES (THREE OF):**

* Advanced Manufacturing Technologies | MIE519H1 | 3 / - / - / 0.5 |

| Human Factors Integration | MIE542H1 | 3 / - / 2 / 0.5 |

| Innovation and Manufacturing of Sustainable Materials | FOR424H1 | 2 / - / 1 / 0.5 |

**COMPLEMENTARY STUDIES ELECTIVE**

| CS Elective | - | - / - / - / 0.5 |

*HIGHLIGHTED COURSES WILL COUNT TOWARDS YOUR MINOR*

This is assuming you allocate the second year Manufacturing (MIE221) course to the minor.
MECHATRONICS

Ten years ago it was comparably easy to explain the functions of a camera to a young engineer, even though the mechanisms were complex. Today, it is nearly impossible since the design of a camera not only involves mechanics and optics, but also electronics and software. The design of such products and processes requires a synergetic combination of mechanical and electrical engineering and computer science.

As with our mechanical engineering program, mechatronics at U of T emphasizes design. You will learn the skills needed to design and build mechatronic systems and that includes mechanical design (mechanical, hydraulic, pneumatic, thermal), electronic design, programming skills and their integration into functional systems.

As Canada’s largest and oldest mechatronics program, you will have access to well-established labs where you put theory into action as well as cutting edge technology provided by our outstanding professors, support engineers and graduate students. Remember, U of T is Canada’s best research university! You benefit from our established mechatronics graduate studies. As part of the 4th year Mechatronics Principles course (MIE 444F), students are divided into small groups and asked to develop an autonomous vehicle that will navigate through a maze. The class is concluded with a competition.

STREAM COURSES

3W - MIE346H1S - ANALOG AND DIGITAL ELECTRONICS FOR MECHATRONICS
A study of the fundamental behaviour of the major semiconductor devices (diodes, bipolar junction transistors and field effect transistors). Development of analysis and design methods for basic analog and digital electronic circuits and devices using analytical, computer and laboratory tools.

TOPICS: Laplace Transform for Circuit Analysis, Operational Amplifiers, Filters and Tuned Amplifiers, Diodes, Signal Generators and Waveform-Shaping Circuits, MOSFETs, BJTs, OpAmps and Data Converters, Digital Logic Circuits. Lab topics include Voltage Controlled Oscillator, Diode Circuits, Transistors and Relays, Analog Pulse
MECHATRONICS

Width Modulations Motor Driver, Digital Logic and Stepper Motor Driver.

4F - MIE404H1F - CONTROL SYSTEMS I

TOPICS: MATLAB & Simulink, Feedback control and PID, Root Locus Design, Frequency Response Analysis, Magnetic Levitation

SUGGESTED TECHNICAL ELECTIVES (4TH YEAR)

- AER307H1 - Aerodynamics
- AER525H1 - Robotics
- MIE444H1 - Mechatronics Principles
- MIE438H1 - Microprocessors and Embedded Microcontrollers
- MIE443H1 - Mechatronics Systems: Design and Integration
- MIE505H1 - Micro/Nano Robotics

FIELDS OF APPLICATION

Robotics, Sensing and Control Systems, Medical imaging, Computer aided and integrated manufacturing systems, Microcontrollers/PLCs, Mobile Apps

LINKS

Institute for Robotics and Mechatronics
irm.utoronto.ca
**ROBOTICS AND MECHATRONICS MINOR**

SAMPLE COURSE SELECTION FOR MINOR (3RD YEAR)

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Taking a stream does not mean you will get a minor in that area.
**ROBOTICS AND MECHATRONICS MINOR**

**SAMPLE COURSE SELECTION FOR MINOR (4TH YEAR)**

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**STREAM COURSES (TWO OF):**

**MANUFACTURING**

- Automated Manufacturing | MIE422H1 | 2 / 3 / - / 0.5 |

**MECHATRONICS**

- Control Systems I | MIE404H1 | 3 / 3 / 2 / 0.5 |

**TECHNICAL ELECTIVES (ONE OF):**

- Mechatronics Principles | MSE401H1 | 2 / 2 / 1 / 0.5 |

**COMPLEMENTARY STUDIES ELECTIVE**

- CS Elective | - | - / - / - / 0.5 |

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**TECHNICAL ELECTIVES (THREE OF):**

- Mechatronics Systems: Design and Integration | MIE443H1 | 2 / 5 / - / 0.5 |
- Microprocessors and Embedded Microcontrollers | MIE438H1 | 2 / 3 / - / 0.5 |

**COMPLEMENTARY STUDIES ELECTIVE**

- CS Elective | - | - / - / - / 0.5 |

*HIGHLIGHTED COURSES WILL COUNT TOWARDS YOUR MINOR*

This is assuming you allocate the second year Mechanical Engineering Design (MIE243) course to the minor.
Solid mechanics is the analysis of stress, strain and deflection. It is one of the core technical areas of mechanical engineering. Applications of solid mechanics are common in: the design of virtually every product; creating manufacturing processes and equipment; biomechanics as related to medicine and dentistry; many fields of graduate research.

STREAM COURSES

*Evaluations & Textbook information accurate as of 2017/2018. Please note that this information is subject to change and should be used as a general guide ONLY*

**3W - MIE320H1S - MECHANICS OF SOLIDS II**
Three-dimensional stress transformation, strain energy, energy methods, finite element method, asymmetric and curved beams, superposition of beam solutions, beams on elastic foundations, buckling, fracture mechanics, yield criteria, stress concentration, plane stress and strain. Finite Element Method.

**4F - MIE442H1F - MACHINE DESIGN**
Introduction to the fundamental elements of mechanical design including the selection of engineering materials, load determination and failure analysis under static, impact, vibration and cyclic loads. Surface failure and fatigue under contact loads, lubrication and wear. Consideration is given to the characteristics and selection of machine elements such as bearings, shafts, power screws and couplings. In place of your project, you may choose to take two machine shop courses at George Brown College. The courses are Basic Machine Operation plus one of the two advanced courses: Advanced Machining or Basic Welding Operations.
SOLID MECHANICS & DESIGN

SUGGESTED TECHNICAL ELECTIVES (4TH YEAR)

- MIE440H1 - Design of Innovative Products
- MSE401H1 - Materials Selection in Design II
- MIE402H1 - Vibrations
- MIE408H1 - Thermal and Machine Design of Nuclear Power Reactors
- MIE550H1 - Advanced Momentum, Heat and Mass Transfer
- CHE475H1 - Biocomposites: Mechanics and Bioinspiration
- MIE439H1 - Biomechanics I
- MIE441H1 - Design Optimization
- MIE469H1 - Reliability and Maintainability Engineering
- MIE506H1 - MEMS Design and Microfabrication
- MIE540H1 - Product Design
- MSE442H1 - Surgical and Dental Implant Design

FIELDS OF APPLICATION

Geomechanics (Modeling the shape of planets, tectonics, and earthquake prediction), Infrastructure (Designing foundations or structures), Mechanical Design (Designing load bearing components for vehicles, powertrain design), Manufacturing (Metal and polymer forming processes, machining), Biomedical (Implant design, bone mechanics, modeling stress phenomena controlling cellular and molecular processes), Materials Science (Composite design, allow microstructructions, material processing design), Microelectronics (Failure resistant packaging)

LINKS

The Canadian Society for Mechanical Engineering
www.csme-scgm.ca

The Society of Automotive Engineers
www.sae.org
The energy industry is one of the biggest in Canada, dominated by oil and gas, nuclear power and electricity. Environmental engineers play a pivotal role in improving polluted environments, designing facilities that directly affect our modern economy, public health and safety, and designing environmentally-responsible products and processes. Their knowledge of physics, chemistry, and biological processes allows them to address problems such as protecting air, water and land quality; providing safe drinking water; treating and disposing of industrial wastes; preventing environmental problems by designing “cleaner” manufacturing processes; and developing alternative energy sources. Mechanical engineers in this field have a strong foundation in thermal dynamics and fluid mechanics. Engineers with a firm knowledge of environmental processes and solutions are widely sought after by employers in both industry and government.

STREAM COURSES

3W - MIE411H1F - THERMAL ENERGY CONVERSION
Engineering applications of thermodynamics in the analysis and design of heat engines and other thermal energy conversion processes within an environmental framework. Steam power plants, gas cycles in internal combustion engines, gas turbines and jet engines. Refrigeration, psychrometry and air conditioning. Fossil fuel combustion and advanced systems includes fuel cells.

TOPICS: Vapor Power Cycles, Gas Power Cycles, Refrigeration and Heat pumps, Psychrometry and ideal Gas Mixture, Efficient Energy Utilization

4F - MIE515 - ALTERNATIVE ENERGY SYSTEMS
This course covers the basic principles, current technologies and applications of selected alternative energy systems. Specific topics include solar thermal systems, solar photovoltaic systems, wind, wave, and tidal energy, energy storage, and grid connections issues.
ENERGY & ENVIRONMENT

SUGGESTED TECHNICAL ELECTIVES (FOURTH YEAR)

MIE407H1 - Nuclear Reactor Theory and Design
MIE516H1 - Combustion and Fuels
CIV440H1 - Environmental Impact and Risk Assessment
FOR424H1 - Innovation and Manufacturing of Sustainable Materials
MIE408H1 - Thermal and Machine Design of Nuclear Power Reactors
MIE507H1 - Heating, Ventilating, Air Conditioning (HVAC) Fundamentals
MIE517H1 - Fuel Cell Systems

FIELDS OF APPLICATION

Power generation, Automotive (engine design, intake, exhaust, and cooling system design), Aerodynamics (Wind power systems, car body design), Fluid pumping systems (Oil and gas pipelines), Manufacturing (Die-casting, metal processing), Electronics (electronics cooling, ink-jet printing), MEMS systems (microfluidics), Environmental assessment (pollution control).

LINKS

Association of Energy Engineers
www.aeecenter.org

Institute for Sustainable Energy
energy.utoronto.ca
Biomedical engineers design and develop products for the most complex system on earth – the human body. Artificial organs, medical imaging devices, drug delivery systems are innovative and lifesaving solutions that arise from applying engineering principles to medical problems. Biomedical engineering jobs are expected to increase by 31.4% over the next seven years, more than double the average predicted rate in other fields.

STREAM COURSES

Students may choose to take either MIE331 OR CHE354 for their 3W stream Course.

3W - MIE331H1S - PHYSIOLOGICAL CONTROL SYSTEMS
Prerequisite: CHE353H1F
The purpose of this course is to provide undergraduate engineering students with an introduction to physiological concepts and selected physiological control systems present in the human body. Due to the scope and complexity of this field, this course will not cover all physiological control systems but rather a selected few. This course will combine linear control theory, physiology, and neuroscience with the objective of explaining how these complex systems operate in a healthy human body.

TOPICS: Homeostasis, modeling physical systems (Laplace transform), transfer functions & block diagrams, endocrine system, cardiovascular system, system response in time and frequency domains, stability analysis, nervous system, design of PID controllers, controllability and observability, system identification

3W - CHE354H1S- CELL & MOLECULAR BIOLOGY
Prerequisite: CHE353H1F
To introduce students to concepts and techniques relevant to bioengineering research, including cell cultivation, molecular biology, protein biochemistry, and genetic engineering. In addition to opportunities for hands-on learning and application of bioengineering techniques and
BIOENGINEERING

instrumentation, this course will explain fundamental aspects of biomolecular chemistry that govern bioengineering practice.

4F - MIE520H1F - BIOTRANSPORT PHENOMENA
Application of conservation relations and momentum balances, dimensional analysis and scaling, mass transfer, heat transfer, and fluid flow to biological systems, including: transport in the circulation, transport in porous media and tissues, transvascular transport, transport of gases between blood and tissues, and transport in organs and organisms.

TOPICS: Control Volume Approach (Reynold’s Transport Theorem - mass and momentum), Differential Approach (Fluid Statics, Rheology, Navier-Stokes, Euler, Bernoulli), Dimensional Analysis, Real Flows, Mass Transfer, Heat Transfer

SUGGESTED TECHNICAL ELECTIVES (FOURTH YEAR)

MIE414H1 - Applied Fluid Mechanics
MIE508H1 - Fluids of Biological Systems
BME520H1 - Imaging Case Studies in Clinical Engineering
BME595H1 - Medical Imaging
CHE475H1 - Biocomposites: Mechanics and Bioinspiration
MIE433H1 - Waves and Their Applications in Non-Destructive Testing and Imaging
MIE439H1 - Biomechanics I
MIE504H1 - Applied Computational Fluid Dynamics
MSE440H1 - Biomaterials Processing and Properties
MIE448H1 - Engineering Psychology and Human Performance

FIELDS OF APPLICATION
Bioinformatics (software for bio modelling), Biotechnology (products related to agriculture & environment), Instrumentation and Diagnostics (tools for research, hospital diagnostic equipment), Medical Devices (prosthetics, pace makers), Therapeutics (Pharmaceuticals), Biomedical Suppliers (development of lab and medical equipment)

LINKS
Institute of Biomaterials and Biomedical Engineering (IBBME)
ibbme.utoronto.ca

Club for Undergraduate Biomedical Engineering (CUBE)
cube.skule.ca
## BIOENGINEERING MINOR

### SAMPLE COURSE SELECTION FOR MINOR (3RD YEAR)

#### FALL SESSION

<table>
<thead>
<tr>
<th>COURSE REQUIRED COURSES</th>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinematics and Dynamics of Machines</td>
<td>MIE301H1</td>
<td>3 / 3 / 2 / 0.5</td>
</tr>
<tr>
<td>Fluid Mechanics</td>
<td>MIE312H1</td>
<td>3 / 1 / 1 / 0.5</td>
</tr>
<tr>
<td>Circuits with Applications to Mechanical Systems</td>
<td>MIE342H1</td>
<td>3 / 1.5 / 1 / 0.5</td>
</tr>
<tr>
<td>Engineering Economics and Accounting</td>
<td>MIE258H1</td>
<td>3 / - / 2 / 0.5</td>
</tr>
<tr>
<td>Natural Science Elective (Choose One):</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering Biology</td>
<td>CHE353H1</td>
<td>3 / - / 2 / 0.5</td>
</tr>
<tr>
<td>Urban Engineering Ecology</td>
<td>CIV220H1</td>
<td>3 / - / 1 / 0.5</td>
</tr>
<tr>
<td>Terrestrial Energy Systems</td>
<td>CIV300H1</td>
<td>3 / - / 2 / 0.5</td>
</tr>
</tbody>
</table>

#### WINTER SESSION

<table>
<thead>
<tr>
<th>COURSE REQUIRED COURSES</th>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design for the Environment</td>
<td>MIE315H1</td>
<td>3 / - / 1 / 0.5</td>
</tr>
<tr>
<td>Heat and Mass Transfer</td>
<td>MIE313H1</td>
<td>3 / 1.5 / 2 / 0.5</td>
</tr>
<tr>
<td>Numerical Methods I</td>
<td>MIE334H1</td>
<td>3 / - / 1.5 / 0.5</td>
</tr>
<tr>
<td>Stream Options (Choose Two):</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BIOENGINEERING</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cellular and Molecular Biology</td>
<td>CHE354H1</td>
<td>3 / 1 / 2 / 0.5</td>
</tr>
<tr>
<td><strong>SOLID MECHANICS &amp; DESIGN</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mechanics of Solids II</td>
<td>MIE320H1</td>
<td>3 / 1.5 / 2 / 0.5</td>
</tr>
</tbody>
</table>

*Note: If you are pursuing any minor please refer to the Academic Calendar for more information on taking the required courses to achieve that minor. This may require overloading.

Taking a stream does not mean you will get a minor in that area.
# BIOENGINEERING MINOR

## SAMPLE COURSE SELECTION FOR MINOR (4TH YEAR)

### FALL SESSION

<table>
<thead>
<tr>
<th>CORE REQUIRED COURSES</th>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capstone Design</td>
<td>MIE490Y1</td>
<td>- / - / 4 / 1.0</td>
</tr>
</tbody>
</table>

**STREAM COURSES (TWO OF):**

**BIOENGINEERING**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIE520H1</td>
<td>3 / - / 1 / 0.5</td>
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</table>

**SOLID MECHANICS & DESIGN**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIE442H1</td>
<td>3 / 1.5 / 3 / 0.5</td>
</tr>
</tbody>
</table>

**TECHNICAL ELECTIVES (ONE OF):**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIE343H1</td>
<td>3 / 3 / - / 0.5</td>
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</table>

**COMPLEMENTARY STUDIES ELECTIVE**

<table>
<thead>
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</table>

### WINTER SESSION

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<tr>
<th>CORE REQUIRED COURSES</th>
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<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capstone Design</td>
<td>MIE491Y1</td>
<td>- / - / 4 / 1.0</td>
</tr>
</tbody>
</table>

**TECHNICAL ELECTIVES (THREE OF):**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>LEC/LAB/TUT/WGT.</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIE439H1</td>
<td>3 / 2 / - / 0.5</td>
</tr>
<tr>
<td>FOR424H1</td>
<td>2 / - / 1 / 0.5</td>
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</thead>
<tbody>
<tr>
<td>MIE441H1</td>
<td>3 / 2 / - / 0.5</td>
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**COMPLEMENTARY STUDIES ELECTIVE**

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<td></td>
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</tr>
</tbody>
</table>

*HIGHLIGHTED COURSES WILL COUNT TOWARDS YOUR MINOR*
DEGREE REQUIREMENTS

Degree Explorer is a planning tool designed to help students and advisors evaluate academic progress towards completion of requirements for graduation. It is not a transcript. It allows you to map out your degree and can help you determine if you are on track. Just because you are able to enrol in a course on ACORN does not mean it will fulfill your degree requirements.

TO GRADUATE, YOU NEED

- All Core and Stream Courses
- 2.0 CS Credits (1.0 or more must be HSS)
- 0.5 Natural Science Credits
- 2.0 Technical Elective Credits
- 600 hours of professional experience, or PEY credit
- At least one design course

COMPLEMENTARY STUDIES (CS) AND HUMANITIES & SOCIAL STUDIES (HSS)

To graduate, you must take 2.0 credits in complementary studies, of which at least 1.0 credits are HSS courses. 0.5 credits = 1 half year course. These are typically taken in second and fourth year, or in the summer (have to pay extra tuition). For a list of faculty approved elective lists, please consult the following links. You can also request other A&S courses to act as a substitute:

HSS Courses [https://undergrad.engineering.utoronto.ca/academics-registration/electives/humanities-social-science-hss-electives/](https://undergrad.engineering.utoronto.ca/academics-registration/electives/humanities-social-science-hss-electives/)

CS Courses [https://undergrad.engineering.utoronto.ca/academics-registration/electives/complementary-studies-cs-electives/](https://undergrad.engineering.utoronto.ca/academics-registration/electives/complementary-studies-cs-electives/)

TECHNICAL ELECTIVES

- One in first semester in 4th year, three in second semester in 4th year
- Select from list of approved electives
- Can apply for another course to substitute for a Technical Elective
- Can substitute at most two technical electives

PRACTICAL EXPERIENCE REQUIREMENT (PER)

- Minimum of 600 hours to graduate
- Work should support professional career of student
- Form must be filled out and submitted to MIE Undergrad Office
- If you do PEY, you do not need to submit PER form
NATURAL SCIENCE ELECTIVES
The curriculum has 3 pre-approved Natural Science electives which are: CHE353, CIV220, and CIV300. There is also an extended list of approved natural science electives. [https://undergrad.engineering.utoronto.ca/academics-registration/electives/natural-science-ns-electives/](https://undergrad.engineering.utoronto.ca/academics-registration/electives/natural-science-ns-electives/)

ENGINEERING MINORS & CERTIFICATES
In addition to academic programs in Core 8 subjects/TrackOne and Engineering Science, undergraduate Engineering students may pursue a number of minors and certificates that add breadth and depth to their academic careers.

To obtain a minor, students must take six (6) courses in a particular field. A certificate requires three (3) courses. There are many minors and certificates, which are listed and detailed at [uoft.me/engminors](http://uoft.me/engminors). Enrolling for a minor puts it on your Degree Explorer, which can help you plan. You can de-enrol at any point.

HOW DO I ENROL IN A MINOR?
Each minor has a specific enrolment form for you to complete and submit to the Cross-Disciplinary Programs Office. Please visit [uoft.me/engminors](http://uoft.me/engminors) Please note that enrolling in a minor does not guarantee you a spot in any of the engineering minor electives, as they are open to everyone. To avoid disappointment, plan ahead and select courses at 6 AM on course selection days. You are responsible for making sure you fulfill the requirements.

I DIDN'T GET INTO THE COURSES I WANTED TO, AND I'M WORRIED I WONT FINISH MY MINOR BEFORE GRADUATION. WHAT DO I DO?
Due to popularity, many engineering minor courses are offered in the summer. You are also welcome to complete those courses following graduation, it just may not appear on your degree until later. You can also visit the Cross-Displinary Programs Office to de-enrol you in a minor.

WILL MY HSS/CS ELECTIVES BE ADDED TO MY TIMETABLE AUTOMATICALLY? WHAT IF I AM ENROLED IN A MINOR THAT REQUIRES THAT COURSE?
No, you must add them yourself on course selection days. Enrolling in a minor does not guarantee you a spot in its required courses.

I'M NOT SURE WHICH ELECTIVES TO TAKE.
The Arts & Science Student’s Union puts together a publication called the Anti-Calendar, which provides honest student feedback about many arts & science elective courses offered. [http://assu.ca/anti-calendar](http://assu.ca/anti-calendar)
ENROLMENT AND REGISTRATION

OVERLOADS
• To take more than 5 courses in a semester, must get approval from undergrad office
• Need to have 75%+ average in previous semester or extenuating circumstances

“EXT” OR EXTRA COURSES
• If taking a course not needed for your degree, you can apply to designate it as EXT
• Mark will not count towards your GPA, but still shows on transcript
• Credit can be used for minors/certificates
• Deadline to designate EXT is the same as drop deadline

FAILED COURSES
If you have failed a core curriculum course, you must re-take it at the next available opportunity. Many first year engineering courses are offered during the summer. If you were unsuccessful in a second or third year course that is a prequisite for an upper level course, you must retake the prequisite course first. To add a core curriculum course, submit the Course Request Form (https://www.mie.utoronto.ca/programs/undergraduate/undergraduate-office/) to the Undergraduate Office by one week before the add course deadline. To add a failed stream course, HSS/CS elective, or natural science elective, you may do so yourself on the course selection dates.

ENROLMENT & REGISTRATION QUICKLINKS

COURSE FINDER
coursefinder.utoronto.ca
- Timetable, enrolment, waitlists

DEGREE EXPLORER
degreeexplorer.utoronto.ca
- Plan and check on track to graduate

ENGSOC TIMETABLE BUILDER
schedule.skule.ca
- Visual timetable builder

ARTS & SCIENCE ANTI-CALENDAR
assu.ca/anti-calendar
- Course descriptions and reviews

MIE UNDERGRADUATE FORMS
https://www.mie.utoronto.ca/programs/undergraduate/undergraduate-office/
- PER, Course request, TES, etc.
MIE UNDERGRADUATE OFFICE

Room 109, Mechanical Building, 5 King’s College Rd.

EMAIL undergrad@mie.utoronto.ca

PHONE (416) 978 6420

HOURS Monday - Friday, 9 AM to 4 PM

WWW.MIE.UTORONTO.CA