Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Electrical and Computer Engineering

Subject Code
ECE

Number
457B

Course Level
400

Proposed
Title Machine Learning
Existing
Title Fundamentals of Computational Intelligence

Proposed
Abbreviated Title Machine Learning
Existing
Abbreviated Title Computational Intelligence

Undergraduate Communication Requirement Identifier

No,

Description

Fundamentals and recent advances in computational intelligence. Building accurate models with collected data or rules bases. Model-based prediction and classification. Concepts in machine learning, supervised and unsupervised learning, artificial neural networks, deep learning, feature extraction, feature selection, dimensionality reduction, classification and clustering, support vector machines. Approximate reasoning based on fuzzy set theory. Performance metrics to assess the validity of produced models. Multiple examples and case studies such as autonomous driving, intelligent manufacturing, natural language understanding, speech recognition, computer vision, stock market prediction, disease early detection and diagnosis.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

LectureTutorial

Primary Component

Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Complete 1 of the following
   - Must have completed at least 1 of the following:
   - BME122 - Data Structures and Algorithms (0.50)
   - **CS240 - Data Structures and Data Management (0.50)**
   - ECE250 - Algorithms and Data Structures (0.50)
   - MSE240 - Algorithms and Data Structures (0.50)
   - MTE140 - Algorithms and Data Structures (0.50)
   - SYDE223 - Data Structures and Algorithms (0.50)
   -
   - Must have completed the following: MSCI240
   -
   - Students must be in level 4A or higher
   - Complete 1 of the following
   - Enrolled in H-Software Engineering
   - Enrolled in a BASc program

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **Course Not Found**
   - **Course Not Found**
   - CS486 - Introduction to Artificial Intelligence (0.50)
   - **MSE446 - Introduction to Machine Learning (0.50)**
   - SYDE522 - Foundations of Artificial Intelligence (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- SYDE 522 - Foundations of Artificial Intelligence — View Program
- MSE 446 - Introduction to Machine Learning — View Program

Prerequisites

- MSE 546 - Advanced Machine Learning — View Program

Course Requirements (no units)

- Medical Artificial Intelligence Specialization - Medical Artificial Intelligence Specialization — View Program
- Management Science Option - Management Science Option — View Program

Course Lists

- Computing Option - Computing Option — View Program
- Computer Engineering Option - Computer Engineering Option — View Program
- Software Engineering Option - Software Engineering Option — View Program

Course Requirements (no units)

- Artificial Intelligence Option - Artificial Intelligence Option — View Program
- Mechatronics Option - Mechatronics Option — View Program

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
- H-Biomedical Engineering - Biomedical Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)
- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Systems Design Engineering - Systems Design Engineering (Bachelor of Applied Science - Honours)
- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours)   [View Program](#)

ECE 457C - Reinforcement Learning

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-23

Rationale for Change

Adding MSE 253 to pre-requisites to ease admin burden for MSE students wishing to take ECE 457C. ECE 457C requires ECE 203 or equivalent/higher as a pre-req. MSE 253 is the 2nd probability and stats course in MSE

Consultations

Change requested by MSE.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Electrical and Computer Engineering

Subject Code
ECE

Number
457C

Course Level
400

Title
Reinforcement Learning

Abbreviated Title
Reinforcement Learning

Undergraduate Communication Requirement Identifier
No,

Description
Introduction to reinforcement learning (RL) theory and algorithms for learning decision-making policies in situations with uncertainty and limited information. Topics include Markov decision processes, classic exact/approximate RL algorithms such as value/policy iteration, Q-learning, State-action-reward-state-action (SARSA), Temporal Difference (TD) methods, policy gradients, actor-critic, and Deep RL such as Deep Q-Learning (DQN), Asynchronous Advantage Actor Critic (A3C), and Deep Deterministic Policy Gradient (DDPG).

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureProjectTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add   **Consent to Drop**
No consent required,   No consent required,

Prerequisites

1. Must have completed at least 1 of the following:
   - BME213 - Statistics and Experimental Design (0.50)
   - ECE203 - Probability Theory and Statistics 1 (0.50)
   - **MSE253 - Probability and Statistics 2 (0.50)**
   - MTE201 - Experimental Measurement and Statistical Analysis (0.50)
   - STAT206 - Statistics for Software Engineering (0.50)
   - STAT230 - Probability (0.50)
   - STAT240 - Probability (Advanced Level) (0.50)
   - SYDE212 - Probability and Statistics (0.50)

Corequisites

No Rules

Antirequisites

Complete all of the following

- Not completed nor concurrently enrolled in:
  - ECE493 - Special Topics in Electrical and Computer Engineering (0.50)
- Not completed nor concurrently enrolled in: ECE493 (Topic 25: Prob. Reason & Reinforce Learn)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Medical Artificial Intelligence Specialization - Medical Artificial Intelligence Specialization — View Program

Course Lists

- Computing Option - Computing Option — View Program
- Computer Engineering Option - Computer Engineering Option — View Program
- Software Engineering Option - Software Engineering Option — View Program

Course Requirements (no units)

- Artificial Intelligence Option - Artificial Intelligence Option — View Program
- SE-Artificial Intelligence Specialization - Artificial Intelligence Specialization — View Program
- CS-Artificial Intelligence Specialization - Artificial Intelligence Specialization — View Program

Course Lists

- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours) — View Program
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours) — View Program
- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours) — View Program

GENE 119 - First-Year Engineering Seminar — Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-24

Rationale for Change

Moving Co-op Fundamentals for Engineering to this course, to highlight the importance of this activity. Changing to a CR/NCR 0.0 weight course so we can see that CFE was completed. The First Year Office and the Centre for Career Development will work with all students to gain credit for this course before the end of 1B. This is an important activity to ensure success in seeking Co-op employment.

Consultations

Consultations with Co-operative & Experiential Education, Centre for Career Development who are supportive of this change.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Subject Code
GENE

Number
119

Course Level
100

Title
First-Year Engineering Seminar

Abbreviated Title
First-Year Engineering Seminar

Undergraduate Communication Requirement Identifier
No,

Proposed

Description

Existing

Description
Seminar series focusing on topics relating to success in Waterloo Engineering.

Units
0.00

Exceptions to Fees or Academic Progress Units
No,

Components
Seminar

Primary Component
Seminar

Grading Information

Standard Course Grading
No,

Proposed

Special Course Grading
Credit/No Credit

Existing

Special Course Grading
No Grade Required

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add

No consent required,

Consent to Drop

Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1A
- Complete 1 of the following
    - Enrolled in H-Software Engineering
    - Enrolled in a BASc program

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path

Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

There are no dependencies

ME 123 - Electrical Engineering for Mechanical Engineers

Effective Date & Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2024	

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Other engineering programs were consulted:

Mohamad Araji, AE Director

Rania Al-Hammoud, ACUG CEE

Derek Wright, MTE Director

Ting Tsui, NE Director

Mahesh Tripunitara, ACUG ECE

Presented at FOPS - October 3rd, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics
Engineering

Subject Code
ME

Number
123

Course Level
100

Title
Electrical Engineering for Mechanical Engineers

Abbreviated Title
Electrical Engineering

**Undergraduate Communication Requirement
Identifier**
No,

Description
Definitions of electric and magnetic fields. Introduction to circuit theory (direct current) DC circuits, amplifiers,
operational amplifiers, single- and three-phase (alternating current) AC circuits. Introduction to basic electronic
devices.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTest Slot Tutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 1B or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE123 - Electrical Circuits and Instrumentation (0.50)**
   - **CIVE123 - Electrical Circuits and Instrumentation (0.50)**
   - **ECE140 - Linear Circuits (0.50)**
   - **ENVE123 - Electrical Circuits and Instrumentation (0.50)**
   - GENE123 - Electrical Circuits and Instrumentation (0.50)
   - **GEOE123 - Electrical Circuits and Instrumentation (0.50)**
   - **MTE120 - Circuits (0.75)**
   - **NE140 - Linear Circuits (0.50)**

Course Notes

Workflow Information

Dependencies

Antirequisites

• AE 123 - Electrical Circuits and Instrumentation	View Program
• CIVE 123 - Electrical Circuits and Instrumentation	View Program
• ENVE 123 - Electrical Circuits and Instrumentation	View Program
• GEOE 123 - Electrical Circuits and Instrumentation	View Program
• ECE 140 - Linear Circuits	View Program
• NE 140 - Linear Circuits	View Program

Required Courses (Term by Term)

• H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)	View Program

Course Requirements (no units)

• Quantum Engineering Option - Quantum Engineering Option	View Program

ME 201 - Advanced Calculus Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The anti-requisites are being updated to add MTE 203 (noting that ME 201 is already an anti-requisite for MTE 203), so we're taking the opportunity to update the calendar description to match what is taught in the course. This includes dropping the lab, which is not used.

Consultations

Consulted with Derek Wright, Director MTE.

Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
201

Course Level
200

Title
Advanced Calculus

Abbreviated Title
Advanced Calculus

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
A continuation of first-year calculus, focusing on scalar and vector functions of multiple variables. Three-dimensional analytic geometry and space curves; multivariable calculus including partial differentiation, total differentiation, chain rule, directional derivative, gradient operator, maxima and minima; multiple integrals - surface area and volume; line, surface, and triple integrals; vector calculus, divergence, curl, and vector theorems. Applications include moment of inertia, scalar flux transport, work and energy, conservative force fields.

Existing

Description

A continuation of first-year calculus, focusing on calculus of scalar and vector functions of several variables. Both classical calculus techniques and the computer implementation of numerical methods are discussed. Partial differentiation, total derivatives, chain rule, transformation of variables, Taylor series. Applications include geometrical problems, error estimation, maxima and minima, least squares curve fits. Multiple integration in standard coordinate systems, Jacobians. Vector calculus, divergence, curl, Laplacian, and Stokes', Green's and Divergence theorems. Scalar flux transport, work and energy, conservative force fields.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Primary Component
Lecture

Proposed

Components

Lecture

Existing

Components

Laboratory   Tutorial

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - MATH118 - Calculus 2 for Engineering (0.50)
- Students must be in level 2A or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites
1. Not completed nor concurrently enrolled in:
   - **MTE203 - Advanced Calculus (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- ME 203 - Ordinary Differential Equations | View Program
- ME 303 - Advanced Engineering Mathematics | View Program

Antirequisites

- MTE 203 - Advanced Calculus | View Program

Prerequisites

- ME 321 - Dynamics of Machines and Mechanical Vibrations

<div align="right">

View Program

</div>

Antirequisites

- MATH 217 - Calculus 3 for Chemical Engineering

<div align="right">

View Program

</div>

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

<div align="right">

View Program

</div>

ME 202 - Statistics for Engineers

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Consulted with Derek Wright, Director MTE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
202

Course Level
200

Title
Statistics for Engineers

Abbreviated Title
Statistics for Engineers

Undergraduate Communication Requirement Identifier
No,

Description
Frequency distributions; measures of central tendency; standard deviation and other measures of dispersion. Probability. Binomial, Poisson, normal distributions. Techniques of sampling and statistical estimation. Tests of hypotheses; significance. The t-test and chi-squared test. Curve fitting by least squares. Statistical process control. Correlation and regression. Experimental design.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?

No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - MATH116 - Calculus 1 for Engineering (0.50)
- Students must be in level 2A or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
    - **MTE201 - Experimental Measurement and Statistical Analysis (0.50)**

Course Notes

Workflow Information

Workflow Path	**Faculty/AFIW Path(s) for Workflow**
Committee approvals,	Faculty of Engineering

Dependencies

Antirequisites

- BME 213 - Statistics and Experimental Design [View Program](#)
- MTE 201 - Experimental Measurement and Statistical Analysis [View Program](#)

Prerequisites

- MSE 446 - Introduction to Machine Learning [View Program](#)
- MSE 431 - Stochastic Models and Methods [View Program](#)

Antirequisites

- NE 215 - Probability and Statistics [View Program](#)
- MSE 251 - Probability and Statistics 1 [View Program](#)

Prerequisites

- MSE 543 - Analytics and User Experience [View Program](#)
- MSE 334 - Operations Planning and Inventory Control [View Program](#)
- MSE 452 - Decision Making Under Uncertainty [View Program](#)
- MSE 551 - Quality Management and Control [View Program](#)
- MSE 422 - Economic Impact of Technological Change and Entrepreneurship [View Program](#)
- MSE 432 - Production and Service Operations Management [View Program](#)
- MSE 541 - Search Engines [View Program](#)

Course Requirements (no units)

- Statistics Option - Statistics Option [View Program](#)

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours) [View Program](#)

ME 203 - Ordinary Differential Equations [Top](#)

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Offering Number
1

Existing

Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Consulted with Derek Wright, Director MTE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
203

Course Level
200

Title
Ordinary Differential Equations

Abbreviated Title
Ordinary Differential Equation

Undergraduate Communication Requirement Identifier
No,

Description
Solution of ordinary differential equations. First and higher order differential equations. Nonlinear equations. Linear equations with constant and variable coefficients. Systems of linear equations. Applications involving simple dynamical systems and principles of mass, momentum and heat conservation will emphasize the role of ordinary differential equations in understanding the behaviour of physical systems. Introduction to the Laplace transform method for solving ordinary differential equations.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - ME201 - Advanced Calculus (0.50)
- Students must be in level 2B or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
    - **MTE202 - Ordinary Differential Equations (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- AMATH 350 - Differential Equations for Business and Economics

[View Program](#)

Prerequisites

- ME 303 - Advanced Engineering Mathematics
- ME 360 - Introduction to Control Systems

[View Program](#)
[View Program](#)

Antirequisites

- MTE 202 - Ordinary Differential Equations
- MATH 218 - Differential Equations for Engineers

[View Program](#)
[View Program](#)

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

Course Requirements (no units)

- Quantum Engineering Option - Quantum Engineering Option

ME 212 - Dynamics

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026

Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Consulted with Derek Wright, Director MTE, Maud Gorbet, BME Director and John Zelek, SYDE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
212

Course Level
200

Title
Dynamics

Abbreviated Title
Dynamics

Undergraduate Communication Requirement Identifier
No,

Description
An introduction to the kinematics of particle and rigid body motion. Impulse-momentum equations. Work-energy methods and Euler's equations. Simple gyroscopes. Vibrations.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - MATH118 - Calculus 2 for Engineering (0.50)
    - PHYS115 - Mechanics (0.50)
- Students must be in level 2B or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites
1. Not completed nor concurrently enrolled in:
    - **BME182 - Physics 2: Dynamics (0.50)**
    - **MTE182 - Physics 2: Dynamics (0.50)**
    - **SYDE182 - Physics 2: Dynamics (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- ME 524 - Advanced Dynamics and Vibrations   [View Program](#)
- ME 547 - Robot Manipulators: Kinematics, Dynamics, Control   [View Program](#)

Antirequisites

- BME 182 - Physics 2: Dynamics   [View Program](#)

Prerequisites

- ME 321 - Dynamics of Machines and Mechanical Vibrations   [View Program](#)
- BME 550 - Sports Engineering   [View Program](#)
- BME 551 - Biomechanics of Human Movement   [View Program](#)

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)   [View Program](#)

ME 250 - Thermodynamics 1   [Top](#)

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Consulted with Mohamad Araji, AE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
250

Course Level
200

Title
Thermodynamics 1

Abbreviated Title
Thermodynamics 1

Undergraduate Communication Requirement Identifier
No,

Description
The engineering science of energy. The scope and limitations of thermodynamics. Macroscopic approach to heat, work, energy and the First Law. Properties and state of simple substances. Control-mass and control-volume energy analysis. The Second Law of Thermodynamics, principle of increase of entropy, limiting cycle efficiencies, criteria for equilibrium.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - MATH118 - Calculus 2 for Engineering (0.50)
- Complete 1 of the following
    - Complete all of the following
        - Students must be in level 2A or higher
        - Enrolled in H-Management Engineering
    - Complete all of the following
        - Students must be in level 2B or higher
        - Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **AE279 - Energy and the Environment (0.50)**
   - MTE309 - Introduction to Thermodynamics and Heat Transfer (0.50)
   - SYDE381 - Thermodynamics (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- ECE 403 - Thermal Physics
- AE 279 - Energy and the Environment
- ENVE 279 - Energy and the Environment

View Program
View Program
View Program

Prerequisites

- ME 351 - Fluid Mechanics 1
- ME 353 - Heat Transfer 1
- ME 354 - Thermodynamics 2

View Program
View Program
View Program

Antirequisites

- SYDE 381 - Thermodynamics

View Program

Prerequisites

- PHYS 359 - Statistical Mechanics

View Program

Course Requirements (no units)

- Engineering Specialization - Engineering Specialization

View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

View Program

Course Requirements (no units)

- Physical Sciences Option - Physical Sciences Option

View Program

ME 262 - Digital Logic, Microcontrollers, and Programmable Logic Controllers

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The course is being updated to reflect what is taught in ME 262 and to remove outdated material. It should also be noted that having a working knowledge of microcontrollers is important for ME 380, ME 481 and ME 482 (design courses) yet microcontrollers are not explicitly taught in the mechanical curriculum.

Consultations

Consulted with Derek Wright, MTE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
262

Course Level
200

Proposed
Title Digital Logic, Microcontrollers, and Programmable Logic Controllers
Existing
Title Introduction to Microprocessors and Digital Logic

Proposed
Abbreviated Title Digital Logic, Microcontroller
Existing

Undergraduate Communication Requirement Identifier

No,

Proposed

Description
Number systems, logic gates, Boolean algebra. Karnaugh maps and combinational logic design. Sequential logic and state machines. Programmable Logic Controllers (PLCs) and PLC programming using ladder logic. Microcontroller I/O and interfacing. Laboratory work includes microcontroller and PLC programming.

Existing

Description
Number systems, logic gates, Boolean algebra. Karnaugh maps and combinational logic design. Sequential logic and state machines. Programmable Logic Controllers (PLCs) and PLC programming using ladder logic and statement list. Microcomputer structure and operation, I/O and interfacing. Assembly language programming. Laboratory work includes microcomputer and PLC programming.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - **ME123 - Electrical Engineering for Mechanical Engineers (0.50)**
   - **MTE120 - Circuits (0.75)**
   -
   - Students must be in level 2B or higher
   - Enrolled in H-Mechanical Engineering
   - ~~Must have completed the following:~~
   - ~~GENE123 - Electrical Circuits and Instrumentation (0.50)~~

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- MTE262 - Introduction to Digital Logic (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- ME 548 - Numerical Control of Machine Tools 1 | View Program
- MTE 460 - Mechatronic System Integration | View Program

Antirequisites

- MTE 262 - Introduction to Digital Logic | View Program

Prerequisites

- MTE 325 - Microprocessor Systems and Interfacing for Mechatronics Engineering | View Program

Antirequisites

- CS 251E - Computer Organization and Design (Enriched) | View Program
- CS 251 - Computer Organization and Design | View Program

Course Lists

- Computing Option - Computing Option | View Program
- Computer Engineering Option - Computer Engineering Option | View Program
- Software Engineering Option - Software Engineering Option | View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours) | View Program

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours) | View Program

ME 269 - Electromechanical Devices and Power Processing

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Pre-requisites are also being updated as this did not happen when GENE 123 for mechanical was renamed to ME 123.

Consultations

Consultation with Mahesh Tripunitara, ACUG ECE and Derek Wright, Director MTE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
269

Course Level
200

Title
Electromechanical Devices and Power Processing

Abbreviated Title
Electromech Dev & Power Proc

Undergraduate Communication Requirement Identifier
No,

Description
Review of circuit analysis. Basic electromagnetic theory. DC machines, synchronous generators, transformers, and induction motors. Introduction to typical speed and torque control techniques of machines using power electronic based devices.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components

Primary Component

LaboratoryLectureTutorial	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - GENE123 - Electrical Circuits and Instrumentation (0.50)
   - **ME123 - Electrical Engineering for Mechanical Engineers (0.50)**
   -
   - Students must be in level 2A or higher
   - Enrolled in H-Mechanical Engineering, or Mechatronics Option
   - ~~Must have completed the following:~~

Corequisites

No Rules

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **ECE260 - Electromechanical Energy Conversion (0.50)**
   - **MTE320 - Actuators and Power Electronics (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- MTE 320 - Actuators and Power Electronics   [View Program](#)
- ECE 260 - Electromechanical Energy Conversion   [View Program](#)

Course Requirements (no units)

- Mechatronics Option - Mechatronics Option   [View Program](#)

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

ME 351 - Fluid Mechanics 1

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The EUGO did a a review of Engineering courses that have anti-requisites to see if both courses list each other as anti-requisites. Thus, anti-requisites are being added.

Consultations

Consultation with Rania Al-Hammoud, ACUG CEE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
351

Course Level
300

Title
Fluid Mechanics 1

Abbreviated Title
Fluid Mechanics 1

Undergraduate Communication Requirement Identifier
No,

Description

Physical properties of fluids and fundamental concepts in fluid mechanics. Hydrostatics. Conservation laws for mass, momentum and energy. Flow similarity and dimensional analysis as applied to engineering problems in fluid mechanics. Laminar and turbulent flow. Engineering applications such as flow measurement, flow in pipes, and fluid forces on moving bodies.

Units	**Exceptions to Fees or Academic Progress Units**
0.50	No,

Components	**Primary Component**
LaboratoryLectureTutorial	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	**Consent to Drop**
No consent required,	Department consent required,

Prerequisites

Complete all of the following

- Complete 1 of the following
    - Must have completed the following:

- - - ME250 - Thermodynamics 1 (0.50)
    - See corequisites
  - Students must be in level 3A or higher
  - Enrolled in H-Mechanical Engineering, or H-Mechatronics Engineering

Corequisites

Completed or concurrently enrolled in:

- MTE309 - Introduction to Thermodynamics and Heat Transfer (0.50)

Antirequisites

1. Not completed nor concurrently enrolled in:
   - **CIVE280 - Fluid Mechanics (0.50)**
   - **ENVE280 - Fluid Mechanics (0.50)**
   - MTE352 - Fluid Mechanics 1 (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- ME 571 - Clean Air Technologies · View Program
- ME 561 - Fluid Power Control Systems · · · · · · · · · · · · · · · · · · · View Program
- ME 567 - Fire Safety Engineering · View Program
- ME 353 - Heat Transfer 1 · View Program
- ME 362 - Fluid Mechanics 2 · View Program

Antirequisites

- SYDE 383 - Fluid Mechanics · View Program
- MTE 352 - Fluid Mechanics 1 · View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

Course Lists

- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours)
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)

ME 360 - Introduction to Control Systems

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

The calendar description is being cleaned up to match what is taught in the course. The ME 360 instructors met in Spring 2023 to discuss what should remain in the course and the content that is not normally taught.

Consultations

Consulted with Maud Gorbet (BME Director), John Zelek (SYDE Director), Victoria Sakhnini (SE Director), Derek Wright (MTE Director) and Mahesh Tripunitara, ACUG ECE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
360

Course Level
300

Title
Introduction to Control Systems

Abbreviated Title
Intro Control Systems

Undergraduate Communication Requirement Identifier
No,

Proposed
Description Open loop and feedback control, controller design: proportional (P), integral (I), derivative (D), and lead/lag control. Modelling of mechanical and electrical systems. Review of Laplace transform methods. Analysis of engineering control systems using block diagram algebra. Time and frequency response of first, second, and higher order systems; transient and steady-state operation. Concept of stability and its analysis through analytical and graphical methods, for example, root locus, and/or Bode plots.
Existing
Description Open loop and feedback control. Laws governing mechanical, electrical, fluid and thermal control components. Analogies. Analysis of some engineering control systems using block diagram algebra, transient and steady-state operation. Different modes of control. Review of Laplace Transform methods. Concepts of stability. Principles of analog computer simulation. Brief treatment of linear flow graphs and bondgraphs.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - ME203 - Ordinary Differential Equations (0.50)
    - ME321 - Dynamics of Machines and Mechanical Vibrations (0.50)
- Students must be in level 3B or higher
- Enrolled in H-Mechanical Engineering

Corequisites

No Rules

Antirequisites
1. Not completed nor concurrently enrolled in:
    - **BME356 - Control Systems (0.50)**
    - **ECE380 - Analog Control Systems (0.50)**
    - **MTE360 - Automatic Control Systems (0.50)**
    - **SE380 - Introduction to Feedback Control (0.50)**
    - **SYDE352 - Introduction to Control Systems (0.50)**

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- ECE 380 - Analog Control Systems
View Program

Prerequisites

- ECE 484 - Digital Control Applications   View Program
- ECE 486 - Robot Dynamics and Control   View Program
- ECE 488 - Multivariable Control Systems   View Program
- ME 547 - Robot Manipulators: Kinematics, Dynamics, Control View Program
- ME 548 - Numerical Control of Machine Tools 1   View Program
- ME 561 - Fluid Power Control Systems   View Program
- MTE 460 - Mechatronic System Integration   View Program

Antirequisites

- MTE 360 - Automatic Control Systems
View Program

Prerequisites

- MTE 484 - Digital Control Applications
View Program

Antirequisites

- SE 380 - Introduction to Feedback Control
View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
View Program

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option
View Program

ME 362 - Fluid Mechanics 2 Top

Effective Date & Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2024	

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

CIVE 280, ENVE 280, and MTE 352 are anti-requisites for ME 351 (Fluid Mechanics 1). These three courses are being added as pre-requisites for ME 362 (Fluid Mechanics 2).

Consultations

Consulted with Rania Al-Hammoud, ACUG CEE. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
362

Course Level
300

Title
Fluid Mechanics 2

Abbreviated Title
Fluid Mechanics 2

Undergraduate Communication Requirement Identifier
No,

Description
Basic equations of two-dimensional flow, potential flow, exact viscous solutions. Introduction to lubrication, boundary layers, turbulence, and compressible flow. Turbomachinery fundamentals and applications. Selected advanced topics.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add

Consent to Drop

No consent required,   Department consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - **CIVE280 - Fluid Mechanics (0.50)**
   - **ENVE280 - Fluid Mechanics (0.50)**
   - ME351 - Fluid Mechanics 1 (0.50)
   - **MTE352 - Fluid Mechanics 1 (0.50)**
   -
   - Complete 1 of the following
   - Complete all of the following
   - Students must be in level 3B or higher
   - Enrolled in H-Mechanical Engineering
   -
   - Complete all of the following
   - Students must be in level 4A or higher
   - Enrolled in H-Mechatronics Engineering
   - ~~Must have completed the following:~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- ME 456 - Heat Transfer 2   [View Program](#)

- ME 557 - Combustion 1   View Program
  - ME 562 - Experimental Methods in Fluids   View Program
  - ME 563 - Turbomachines   View Program
  - ME 564 - Aerodynamics   View Program
  - ME 566 - Computational Fluid Dynamics for Engineering Design   View Program

Course Requirements (no units)

- Sports Engineering Specialization - Sports Engineering Specialization   View Program

Course Lists

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)   View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
                                                                        View Program

Course Lists

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)
                                                                        View Program

Course Requirements (no units)

- Chemical Process Modelling, Optimization & Control Specialization - Chemical Process Modelling, Optimization and Control Specialization   View Program

ME 423 - Mechanical Design 2

Effective Date & Career

Career
Undergraduate,

| Proposed |
| Effective Term and Year Fall 2026 |
| Existing |
| Effective Term and Year Fall 2024 |

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

Adding MTE 321 and Mechatronics Engineering 4A or higher as pre-requisites so that mechatronics students can take this course without having to consult with an advisor for enrolment.

Consultations

Consulted with Derek Wright, MTE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
423

Course Level
400

Title
Mechanical Design 2

Abbreviated Title
Mechanical Design 2

Undergraduate Communication Requirement Identifier
No,

Description
A continuation of the ME322 course in analysis and synthesis of machinery, including advanced analysis of machine elements such as clutches, brakes, couplings, journal bearings, and gears. Advanced machine design concepts such as reliability, optimization, and techniques for stimulating innovative design. A synthesis project involving the machine elements studied is usually included.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - ME322 - Mechanical Design 1 (0.50)
   - **MTE321 - Design and Dynamics of Machines (0.50)**
   -
   - Students must be in level 4A or higher
   - **Enrolled in H-Mechanical Engineering, or H-Mechatronics Engineering**
   - ~~Must have completed the following:~~
   - ~~Enrolled in H-Mechanical Engineering~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

View Program

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option

View Program

ME 526 - Fatigue and Fracture Analysis

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type	Academic Unit Approval
Change,	2024-11-27

Rationale for Change

Adding MTE 321 and Mechatronics Engineering 4A or higher so that mechatronics students can take ME 526 without having to consult with an advisor for enrolment.

Consultations

Consulted with Derek Wright, MTE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty	Academic Unit
Faculty of Engineering	Department of Mechanical and Mechatronics Engineering

Subject Code	Number	Course Level
ME	526	500

Title
Fatigue and Fracture Analysis

Abbreviated Title
Fatigue & Fracture Analysis

Undergraduate Communication Requirement Identifier
No,

Description
Fatigue and fracture analysis of metallic components including welded joints. Review of test and design procedures. Sources of cyclic loading. Cyclic counting procedures and cumulative damage. S-N curves and effects of mean, residual and multiaxial stressing. Stress concentrations; scatter and fatigue life distributions. Transition temperature concepts. Linear elastic fracture mechanics analysis of fatigue crack propagation and fracture initiation. Crack arrest.

Units **Exceptions to Fees or Academic Progress Units**

0.50	No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - ME322 - Mechanical Design 1 (0.50)
   - **MTE321 - Design and Dynamics of Machines (0.50)**
   -
   - Students must be in level 4A or higher
   - **Enrolled in H-Mechanical Engineering, or H-Mechatronics Engineering**
   - ~~Must have completed the following:~~
   - ~~Enrolled in H-Mechanical Engineering~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Biomaterials & Tissues Specialization - Biomaterials and Tissues Specialization   [View Program](#)
- Welding & Joining Specialization - Welding and Joining Specialization   [View Program](#)

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science   [View Program](#)
  - Honours)   [View Program](#)

ME 555 - Computer-Aided Design [Top](#)

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Offering Number
1

Existing

Effective Term and Year
Fall 2024

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

Adding MTE 321 as a pre-requisite to allow mechatronics students to enroll in ME 555 without having to consult with an advisor. We're taking this opportunity to update the calendar description to remove reference to specific software packages that are no longer being used.

Consultations

Consulted with Derek Wright, MTE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
555

Course Level
500

Title
Computer-Aided Design

Abbreviated Title
Computer-Aided Design

Undergraduate Communication Requirement Identifier
No,

Proposed

Description
Need for geometric modelling, historic developments; wire frame models; hidden line removed models; polyhedral models; surface models and solid models. Constructive solid geometry; boundary representation and decomposition modelling. Hybrid models. Data structures and their role in modelling. Curves and surfaces in modelling (Bezier, B-splines and NURBS). The role of geometric models in engineering. Parametric and feature-based design. The course has a heavy lab component which provides exposure to solid modelling on CAD software packages.

Existing

Description
Need for geometric modelling, historic developments; wire frame models; hidden line removed models; polyhedral models; surface models and solid models. Constructive solid geometry; boundary representation and decomposition modelling. Hybrid models. Data structures and their role in modelling. Curves and surfaces in modelling (Bezier, B-splines and NURBS). Geometric models and the role of engineers. Parametric and feature-based design. The course has a heavy lab component which provides exposure to solid modelling on SDRC IDEAS and PC-based CAD packages.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LaboratoryLecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?

No,

Enrolment Rules

Consent to Add

No consent required,

Consent to Drop

No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed at least 1 of the following:
   - ME321 - Dynamics of Machines and Mechanical Vibrations (0.50)
   - **MTE321 - Design and Dynamics of Machines (0.50)**
   -
   - Must have completed at least 1 of the following:
   - ME322 - Mechanical Design 1 (0.50)
   - MTE322 - Electromechanical Machine Design (0.50)
   -
   - Students must be in level 4A or higher
   - Enrolled in H-Mechanical Engineering, or H-Mechatronics Engineering
   - ~~Must have completed the following:~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path

Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

Course Requirements (no units)

[View Program](#)

- Biomechanics Option - Biomechanics Option

[View Program](#)

Course Lists

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

ME 561 - Fluid Power Control Systems [Top](#)

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Rationale for Change

The current pre-requisite for ME 561 is ME 351 (Fluids 1), ME 360 (Introduction to Control Systems), and MTE 360 (Automatic Control Systems). The instructors of ME 561 would like to drop ME 351 as a pre-requisite as little content in ME 561 depends on ME 351 and add in ECE 380 (Analog Control Systems), SYDE 352 (Introduction to Control

Systems), BME 356 (Control Systems), and SE 380 (Introduction to Feedback Control). Including a controls course as a pre-requisite to ME 561 is more appropriate than ME 351.

Consultations

Consulted with:

John Zelek, SYDE Director
Mahesh Tripunitara, ACUG ECE
Victoria Sakhnini, SE Director
Maud Gorbet, BME Director
Derek Wright, MTE Director
No concerns raised. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
561

Course Level
500

Title
Fluid Power Control Systems

Abbreviated Title
Fluid Power Control Systems

Undergraduate Communication Requirement Identifier
No,

Description
Properties of hydraulic fluids. Design and function of conventional hydraulic and pneumatic circuits. Characteristics of flow and pressure control valves. Speed control in fluid power circuits. Performance of pumps and fluid motors. Hydrostatic and hydrokinetic transmission systems. Principles of sealing, filtration and heat control in hydraulic circuits. Industrial applications of fluid power systems.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Complete all of the following
   - Must have completed at least 1 of the following:
     - **BME356 - Control Systems (0.50)**
     - **ECE380 - Analog Control Systems (0.50)**
     - ME360 - Introduction to Control Systems (0.50)
     - MTE360 - Automatic Control Systems (0.50)
     - **SE380 - Introduction to Feedback Control (0.50)**
     - **SYDE352 - Introduction to Control Systems (0.50)**
     -
   - Students must be in level 4A or higher
   - Enrolled in H-Mechanical Engineering, or H-Mechatronics Engineering
   - Must have completed the following:
   - ME351 - Fluid Mechanics 1 (0.50)

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Mechatronics Option - Mechatronics Option

[View Program](#)

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

[View Program](#)
[View Program](#)

ME 567 - Fire Safety Engineering

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year   Fall 2026
Existing
Effective Term and Year

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2024-11-27

Rationale for Change

Adding AE 279 (Energy and the Environment), AE 280 (Fluid Mechanics and Thermal Sciences), and Architectural Engineering level 3B or higher as pre-requisites to allow AE students to take ME 567 without having to consult with an advisor to enrol.

Consultations

Consulted with Mohamad Araji, AE Director. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
ME

Number
567

Course Level
500

Title
Fire Safety Engineering

Abbreviated Title
Fire Safety Engineering

Undergraduate Communication Requirement Identifier
No,

Description

The art and science of fire safety engineering. Fundamentals of fire behaviour, fuels and flammability, heat transfer and fluid dynamics of fires and fire modelling. Practical issues and applications of fire safety, fire control and hazard assessment in the design of buildings, industrial environments, and transportation systems.

Units	**Exceptions to Fees or Academic Progress Units**
0.50	No,
Components	**Primary Component**
LaboratoryLectureProject	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	**Consent to Drop**
No consent required,	No consent required,

Prerequisites

1. Complete 1 of the following
   - Complete all of the following
   - Must have completed the following:
   - **AE279 - Energy and the Environment (0.50)**
   - **AE280 - Fluid Mechanics and Thermal Sciences (0.50)**
   -
   - **Students must be in level 3B or higher**
   - **Enrolled in H-Architectural Engineering**

- Complete all of the following
- Must have completed the following:
- ME351 - Fluid Mechanics 1 (0.50)
- ME353 - Heat Transfer 1 (0.50)
  - **Students must be in level 4A or higher**
- Enrolled in H-Mechanical Engineering
- ~~Students must be in level 4A~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Building Systems Specialization - Building Systems Specialization   View Program

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
- H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science -   View Program
  Honours)   View Program

MSE 263 - Managerial Economics

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

A review of the course outlines has determined that ECON 201 and MSE 263 do not have sufficient overlap to warrant the anti-requisite. Instructors of both courses were consulted and they agree with this assessment. Removal of the anti-req will make it easier for management engineering students to complete the newly proposed Business Economics minor, which has ECON 201 as a requirement. For these students MSE 263 is a core course.

Consultations

Consulted with the Associate Chair of Economics, who consulted with the ECON 201 instructor.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code
MSE

Number
263

Course Level
200

Title
Managerial Economics

Abbreviated Title
Managerial Economics

Undergraduate Communication Requirement Identifier
No,

Description
This course introduces students to key concepts in microeconomics, with an emphasis on applications to managerial decision-making. Topics include basic analysis of supply and demand, demand functions and the theory of consumer behaviour, production and costs, market equilibrium, competition between industry participants, and pricing strategies of firms under different market structures.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

No Rules

Corequisites

No Rules

Antirequisites
1. Not completed nor concurrently enrolled in:
    - ECON101 - Introduction to Microeconomics (0.50)
    - ECON201 - Microeconomic Theory for Business and Policy (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Management Science Option - Management Science Option

Required Courses (Term by Term)

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)

Course Lists

- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements

MSE 401 - Management Engineering Design Project 1

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

The LEC component was initially added to the course to allow for scheduling of lectures on various design topics, in addition to the time allocated to the PRJ component. With the introduction of MSE 302 Engineering Design Methods to the Management Engineering curriculum, this content has been moved to that course, and therefore no significant time is required for scheduling lectures in MSE 401. The PRJ component still allows us to schedule up to 3 hours/week.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code

MSE

Number

401

Course Level

400

Title

Management Engineering Design Project 1

Abbreviated Title

Design Project 1

Undergraduate Communication Requirement Identifier

No,

Description

Teams formed in MSE302 conduct concept generation and detailed design iterations on the design problem formulated in MSE302, or on a new customer-defined problem. Project progress is communicated and evaluated in periodic design reviews. Teams establish and maintain suitable project control and team processes.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Primary Component

Project

Proposed
Components
Project

Existing
Components
Lecture   Project

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Complete 1 of the following
    - Must have completed the following:
        - MSE302 - Engineering Design Methods (0.50)
    - Must have completed the following: MSCI302
- Students must be in level 4A or higher
- Enrolled in H-Management Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- MSE 402 - Management Engineering Design Project 2   View Program

Required Courses (Term by Term)

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)
  View Program

MSE 402 - Management Engineering Design Project 2

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026

Existing
Effective Term and Year Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

The LEC component was initially added to the course to allow for scheduling of lectures on various design topics, in addition to the time allocated to the PRJ component. With the introduction of MSE 302 Engineering Design Methods to the Management Engineering curriculum, this content has been moved to that course, and therefore no significant time is required for scheduling lectures in MSE 402. The PRJ component still allows us to schedule up to 3 hours/week.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code
MSE

Number
402

Course Level
400

Title
Management Engineering Design Project 2

Abbreviated Title
Design Project 2

Undergraduate Communication Requirement Identifier
No,

Description
Student teams continue working on the design project begun in MSE302 and MSE401. They complete design iterations, plan and perform verification and validation of the solution, and deliver a final implementation of the design. Project progress and final design are communicated and evaluated in periodic design reviews and at a public symposium. Teams maintain suitable project control and team processes.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Proposed

Components

Project

Existing

Components

Primary Component

Project

Lecture   Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Complete 1 of the following
  - Must have completed the following:
    - MSE401 - Management Engineering Design Project 1 (0.50)
  - Must have completed the following: MSCI401
- Students must be in level 4B or higher
- Enrolled in H-Management Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

MSE 431 - Stochastic Models and Methods

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Offering Number
1

Proposal Details

Proposal Type

Change,

Academic Unit Approval

2025-10-06

Rationale for Change

The updated list of pre-requisites better reflects course requirements: knowledge of optimization is not required for this course. The probability and statistics requirement for MGTE students has been updated to MSE 253 (from MSE 251) since students take MSE 431 in their 3A term, once they have had a chance to take MSE 253 in 2B.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code

MSE

Number

431

Course Level

400

Title

Stochastic Models and Methods

Abbreviated Title

Stochastic Models & Methods

Undergraduate Communication Requirement Identifier

No,

Description

Introduction to operations research models and methods for problems with random, stochastic, and probabilistic components. Topics include birth and death processes, branching processes, waiting line models, and Markov decision processes. Applications include the design, modelling, and analysis of service and manufacturing systems, with emphasis on important functions such as queueing, inventory, reliability, equipment replacement, and maintenance.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components	Primary Component
LectureTutorial	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	Consent to Drop
No consent required,	Department consent required,

Prerequisites

1. Complete 1 of the following
   - Must have completed at least 1 of the following:
   - AE224 - Probability and Statistics (0.50)
   - BME213 - Statistics and Experimental Design (0.50)
   - CHE220 - Process Data Analysis (0.50)
   - CIVE224 - Probability and Statistics (0.50)
   - ECE203 - Probability Theory and Statistics 1 (0.50)
   - ENVE224 - Probability and Statistics (0.50)
   - ME202 - Statistics for Engineers (0.50)
   - **MSE253 - Probability and Statistics 2 (0.50)**
   - MTE201 - Experimental Measurement and Statistical Analysis (0.50)
   - NE215 - Probability and Statistics (0.50)
   - STAT206 - Statistics for Software Engineering (0.50)
   - STAT211 - Introductory Statistics and Sampling for Accounting (0.50)
   - STAT231 - Statistics (0.50)
   - STAT241 - Statistics (Advanced Level) (0.50)
   - SYDE212 - Probability and Statistics (0.50)
   -

- **Must have completed at least 1 of the following: ECE306, MSCI253, MSCI252**
- ~~BME411 - Optimization and Numerical Methods (0.50)~~
- ~~CHE521 - Process Optimization (0.50)~~
- ~~CIVE332 - Civil Systems and Project Management (0.50)~~
- ~~CO250 - Introduction to Optimization (0.50)~~
- ~~ENVE335 - Decision Making for Environmental Engineers (0.50)~~
- ~~MSE232 - Modelling in Operations Research (0.50)~~
- ~~MSE331 - Introduction to Optimization (0.50)~~
- ~~SYDE411 - Optimization and Numerical Methods (0.50)~~
- ~~Must have completed at least 1 of the following: MSCI232, MSCI331~~
- ~~MSE251 - Probability and Statistics 1 (0.50)~~
- ~~Must have completed at least 1 of the following: ECE306, MSCI251, MSCI252~~

Corequisites

No Rules

Antirequisites

Complete all of the following

- Not completed nor concurrently enrolled in:
    - STAT333 - Stochastic Processes 1 (0.50)
- Not open to students enrolled in Bachelor of Computer Science or Bachelor of Mathematics

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- MSE 531 - Stochastic Processes and Decision Making   View Program
- MSE 433 - Applications of Management Engineering   View Program

Course Requirements (no units)

- Statistics Option - Statistics Option   View Program

- Management Science Option - Management Science Option

Course Lists

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)
- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)
- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours)
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)

Required Courses (Term by Term)

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

Course Requirements (no units)

- Chemical Process Modelling, Optimization & Control Specialization - Chemical Process Modelling, Optimization and Control Specialization

MSE 435 - Practical and Large-Scale Optimization

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

Title and description are being changed to better communicate to students course motivation and contents. Course pre-requisites are updated to enable more students (outside of Management Engineering) to take the course. This is particularly helpful for students enrolled in the AI option, where this course is listed as an elective.

Consultations

Reached out to representatives (associate chairs/program directors). Peter Nelson, Combinatorics & Optimization (July 30th 2025), BME Director (Maud Gorbet), CHE ACUG (Eline Boghaert), CEE ACUG (Rania Al-Hammoud), SYDE Director (John Zelek) and did not receive any concerns. Presented at FOPS - October 3, 2025.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code
MSE

Number
435

Course Level
400

Proposed
Title Practical and Large-Scale Optimization
Existing
Title Advanced Optimization Techniques

Proposed
Abbreviated Title Practical & Large-Scale Opt
Existing
Abbreviated Title Adv Optimization Techniques

Undergraduate Communication Requirement Identifier

No,

Proposed
Description The course focuses on practical optimization that can solve real-world, complex problems. It covers techniques applicable in domains such as data-driven optimization and machine learning. Topics include modelling for

resolvability, decomposition and large-scale optimization, nonlinear search methods, soft computing, and metaheuristics. The course emphasizes the design of algorithms and their computer implementation.

Existing

Description
This course covers more advanced topics in optimization that go beyond the contents of MSE232, MSE331, and MSE332. The course will cover topics such as constraint programming, stochastic programming, large scale optimization, or complementarity problems.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites
    1. Complete 1 of the following

- **Must have completed at least 1 of the following:**
- **BME411 - Optimization and Numerical Methods (0.50)**
- **CHE521 - Process Optimization (0.50)**
- **CO250 - Introduction to Optimization (0.50)**
- **ENVE335 - Decision Making for Environmental Engineers (0.50)**
- **MSE331 - Introduction to Optimization (0.50)**
- MSE332 - Deterministic Optimization Models and Methods (0.50)
- **SYDE411 - Optimization and Numerical Methods (0.50)**
-
- Must have completed the following: MSCI332
- ~~Must have completed the following:~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Management Science Option - Management Science Option   [View Program](#)
- Artificial Intelligence Option - Artificial Intelligence Option   [View Program](#)

Course Lists

- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)   [View Program](#)
- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)
- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)   [View Program](#)   [View Program](#)

MSE 446 - Introduction to Machine Learning

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

There are two proposed changes:

i. The first change will make the course accessible to students from the faculty of Math. Currently, a similar course in Math - CS480 (introduction to machine learning) - is only open to CS and data science majors (and similar), not to Honours Math students. Similarly, the current MSE446 pre-requisite of CS240 is only open to CS and data science majors. We are adding data structures and algorithms (DS&A) courses that can be taken by Honours Math majors to the DS&A pre-req list: CS231 and CS234 (both, not either-or).
ii. The second change adds a new anti-requisite - CHE 523 - which is a new course in Chemical Engineering

Consultations

We have consulted with CS (by email with Ondrej Lhotak - CS Undergrad Studies Director, July 30, 2025) and they have not identified any issues.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code
MSE

Number
446

Course Level
400

Title
Introduction to Machine Learning

Abbreviated Title
Introduction Machine Learning

Undergraduate Communication Requirement Identifier
No,

Description
This course provides an introduction to machine learning, including supervised and unsupervised learning. Emphasis is placed on proper procedures for the training and testing of models. Topics covered may include data cleaning and transformation, overfitting and generalization, n-fold cross validation, regression, decision trees, neural networks, rule finding, and clustering. Students learn to apply machine learning methods to management engineering problems using common tools such as R and Python.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?

No,

Enrolment Rules

Consent to Add

No consent required,

Consent to Drop

No consent required,

Prerequisites

1. Complete all of the following
    - Complete 1 of the following
    - **Must have completed the following:**
    - **CS231 - Algorithmic Problem Solving (0.50)**
    - **CS234 - Data Types and Structures (0.50)**
    -
    - Must have completed at least 1 of the following:
    - BME122 - Data Structures and Algorithms (0.50)
    - CS240 - Data Structures and Data Management (0.50)
    - CS240E - Data Structures and Data Management (Enriched) (0.50)
    - ECE250 - Algorithms and Data Structures (0.50)
    - MSE240 - Algorithms and Data Structures (0.50)
    - MTE140 - Algorithms and Data Structures (0.50)
    - SYDE223 - Data Structures and Algorithms (0.50)
    -
    - Must have completed at least 1 of the following: MSCI240
    -
    - Complete 1 of the following
    - Must have completed at least 1 of the following:
    - AE224 - Probability and Statistics (0.50)
    - BME213 - Statistics and Experimental Design (0.50)
    - CHE220 - Process Data Analysis (0.50)
    - CIVE224 - Probability and Statistics (0.50)
    - ECE307 - Probability Theory and Statistics 2 (0.50)
    - ENVE224 - Probability and Statistics (0.50)
    - ME202 - Statistics for Engineers (0.50)
    - MSE253 - Probability and Statistics 2 (0.50)
    - MTE201 - Experimental Measurement and Statistical Analysis (0.50)
    - NE215 - Probability and Statistics (0.50)
    - STAT206 - Statistics for Software Engineering (0.50)
    - STAT231 - Statistics (0.50)
    - STAT241 - Statistics (Advanced Level) (0.50)
    - SYDE212 - Probability and Statistics (0.50)
    -
    - Must have completed at least 1 of the following: MSCI252, MSCI253
    -
    - Students must be in level 3A or higher

Corequisites

No Rules

Antirequisites

    1. Not completed nor concurrently enrolled in:
- **Course Not Found**
- **Course Not Found**
- CS480 - Introduction to Machine Learning (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- CS 480 - Introduction to Machine Learning   [View Program](#)

Prerequisites

- MSE 546 - Advanced Machine Learning   [View Program](#)

Course Requirements (no units)

- Medical Artificial Intelligence Specialization - Medical Artificial Intelligence Specialization   [View Program](#)
- Management Science Option - Management Science Option   [View Program](#)

Course Lists

- Computing Option - Computing Option   [View Program](#)
- Computer Engineering Option - Computer Engineering Option   [View Program](#)
- Software Engineering Option - Software Engineering Option   [View Program](#)

Course Requirements (no units)

- Artificial Intelligence Option - Artificial Intelligence Option   [View Program](#)

Course Lists

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

     [View Program](#)

Course Requirements (no units)

- Cognitive Science Minor - Cognitive Science Minor

Course Lists

- H-Biomedical Engineering - Biomedical Engineering (Bachelor of Applied Science - Honours)
- H-Electrical Engineering - Electrical Engineering (Bachelor of Applied Science - Honours)
- H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)
- H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours)

View Program

View Program

View Program

View Program

Required Courses (Term by Term)

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)

View Program

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)
- H-Systems Design Engineering - Systems Design Engineering (Bachelor of Applied Science - Honours)
- H-Software Engineering - Software Engineering (Bachelor of Software Engineering - Honours)

View Program

View Program

View Program

Course Requirements (no units)

- Modelling & Data Analytics Specialization - Modelling and Data Analytics Specialization

View Program

MSE 531 - Sequential Decision Making: Reinforcement Learning and Causal Inference

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Rationale for Change

The course title and description is updated to reflect changes to the topics covered in the course. The updated learning outcomes and list of topics are included in the attached file under Supporting Documentation. The updated content maintains key concepts in sequential decision making (Markov Decision Processes), and also covers new in-demand topics like reinforcement learning and causal inference.

The course pre-requisites are also updated, to reflect that that pre-requisite knowledge includes introductory probability and statistics and introductory optimization. The old pre-requisites effectively constrained access to the course to only Management Engineering students. The updated pre-requisite open up the course to students from Engineering and Math.

Consultations

Consultations with Steve Drekic, Associate Chair in Statistics and Actuarial Science and Peter Nelson, Combinatorics & Optimization (July 2025). Presented at FOPS - October 30, 2025.

Supporting Documentation

- MSE531 Learning outcomes and topics.docx

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Subject Code
MSE

Number
531

Course Level
500

Proposed
Title Sequential Decision Making: Reinforcement Learning and Causal Inference
Existing
Title Stochastic Processes and Decision Making

Proposed
Abbreviated Title Sequential Decision Making

Undergraduate Communication Requirement Identifier

No,

Abbreviated Title
Stochastic Process/Dec Making

Proposed

Description
This course explores the intersection of sequential decision making, reinforcement learning (RL), and causal inference. Through theory, programming exercises, and real-world case studies, students learn to model, optimize, and explain decisions under uncertainty using reinforcement learning and causal frameworks. Topics include Markov Decision Processes (MDPs), value approximation, policy evaluation, Q-learning, and structural causal models.

Existing

Description
This course builds on the material covered in MSE431. Students will learn how to construct and analyze a range of stochastic decision models that are useful in the design and control of a wide variety of systems. Applications areas include the design of inventory control systems, telecommunication networks, healthcare polices, manufacturing control, and reliability analysis. Topics include Renewal-Reward Processes, Markov Decision Processes, Matrix Analytic Methods with application areas noted above.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
LectureTutorial

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?

No,

Enrolment Rules

Consent to Add

No consent required,

Consent to Drop

No consent required,

Prerequisites

1. Complete all of the following
   - **Must have completed at least 1 of the following:**
   - **AE224 - Probability and Statistics (0.50)**
   - **BME213 - Statistics and Experimental Design (0.50)**
   - **CHE220 - Process Data Analysis (0.50)**
   - **CIVE224 - Probability and Statistics (0.50)**
   - **ECE203 - Probability Theory and Statistics 1 (0.50)**
   - **ENVE224 - Probability and Statistics (0.50)**
   - **ME202 - Statistics for Engineers (0.50)**
   - **MSE251 - Probability and Statistics 1 (0.50)**
   - **MTE201 - Experimental Measurement and Statistical Analysis (0.50)**
   - **NE215 - Probability and Statistics (0.50)**
   - **STAT206 - Statistics for Software Engineering (0.50)**
   - **STAT231 - Statistics (0.50)**
   - **STAT241 - Statistics (Advanced Level) (0.50)**
   - **SYDE212 - Probability and Statistics (0.50)**
   -
   - **Must have completed at least 1 of the following:**
   - **BME411 - Optimization and Numerical Methods (0.50)**
   - **CHE521 - Process Optimization (0.50)**
   - **CIVE332 - Civil Systems and Project Management (0.50)**
   - **CO250 - Introduction to Optimization (0.50)**
   - **ENVE335 - Decision Making for Environmental Engineers (0.50)**
   - **MSE331 - Introduction to Optimization (0.50)**
   - **MSE332 - Deterministic Optimization Models and Methods (0.50)**
   - **SYDE411 - Optimization and Numerical Methods (0.50)**
   - ~~Must have completed the following:~~
   - ~~MSE431 - Stochastic Models and Methods (0.50)~~
   - ~~Must have completed the following: MSCI431~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Management Science Option - Management Science Option   View Program

Course Lists

- H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)
                                                                 View Program

MTE 481 - Mechatronics Engineering Design Project 1

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026

Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-10

Rationale for Change

Updating course title (along with MTE 482) to match with 4th year design project course titles of other engineering programs.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code

MTE

Number

481

Course Level

400

Proposed
Title   Mechatronics Engineering Design Project 1
Existing
Title   Mechatronics Engineering Design Project

Proposed
Abbreviated Title   Design Project 1
Existing
Abbreviated Title   Design Project

Undergraduate Communication Requirement Identifier

No,

Description

This course is intended to reinforce the concepts learned in MTE380 and to extend the significant design experience obtained. Students work individually or in small groups applying the principles of engineering design and problem-solving to a design project of their own choosing. The project must incorporate all elements of mechatronics, namely, mechanical design, electronics, computers and software. In exceptional circumstances, one or more elements may be exempted by the course instructor. The students are required to consider a need analysis, search for prior art and

present alternate designs. The course ends with the selection of a final design. Projects are selected, approved, monitored, and marked by a course co-ordinator.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
    - MTE380 - Mechatronics Engineering Design Workshop (0.50)
- Students must be in level 4A or higher
- Enrolled in H-Mechatronics Engineering

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- ME481 - Mechanical Engineering Design Project 1 (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- ME 481 - Mechanical Engineering Design Project 1   [View Program](#)

Prerequisites

- MTE 482 - Mechatronics Engineering Project   [View Program](#)

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option   [View Program](#)

Required Courses (Term by Term)

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

MTE 482 - Mechatronics Engineering Design Project 2

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-10

Rationale for Change

Updating title to match with 4th year design project course titles in other Engineering programs. Adding MTE 481 (part 1 of 2) as a pre-req. as it is necessary.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Subject Code
MTE

Number
482

Course Level
400

Proposed

Title
Mechatronics Engineering Design Project 2

Existing

Title
Mechatronics Engineering Project

Proposed

Abbreviated Title
Design Project 2

Existing

Abbreviated Title
Project

Undergraduate Communication Requirement Identifier
No,

Description
This course is an extension of MTE481. Students work on prototyping the designs they proposed and finalized in MTE481. The students either individually or in small groups demonstrate the working prototypes; make a poster presentation for the design competition; and pitch their product on a website. The projects are monitored by the course instructor and evaluated by the instructor with feedback from an expert judging panel.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Project

Primary Component
Project

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

1. Complete all of the following
   - Must have completed the following:
   - MTE481 - Mechatronics Engineering Design Project (0.50)
   -
   - Students must be in level 4A or higher
   - Enrolled in H-Mechatronics Engineering
   - ~~MTE380 - Mechatronics Engineering Design Workshop (0.50)~~

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in:

- ME482 - Mechanical Engineering Design Project 2 (0.50)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- ME 482 - Mechanical Engineering Design Project 2   View Program

Required Courses (Term by Term)

- H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

View Program

Course Requirements (no units)

- Biomechanics Option - Biomechanics Option   View Program

Required Courses (Term by Term)

- H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

View Program

NE 334 - Statistical Thermodynamics Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-17

Rationale for Change

Update the anti-requisite for NE 334 Statistical Thermodynamics to include PHYS 357.
Physics is deactivating PHYS 359 and replacing it with PHYS 357.

Course Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Subject Code

NE

Number

334

Course Level

300

Title

Statistical Thermodynamics

Abbreviated Title

Statistical Thermodynamics

Undergraduate Communication Requirement Identifier

No,

Description

Statistical mechanics vs. thermodynamics. Review of statistical concepts. Canonical and grand canonical ensembles. Entropy. General formulation of statistical thermodynamics. Fermi-Dirac, Bose-Einstein, and Boltzmann statistics. Quantum ideal gases. Specific heat of solids. Electrons in metals and semiconductors. Radiation: the photon gas.

Units

0.50

Exceptions to Fees or Academic Progress Units

No,

Components

LectureOnline

Primary Component

Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
Department consent required,

Prerequisites

Complete all of the following

- Students must be in level 3B or higher
- Enrolled in H-Nanotechnology Engineering

Corequisites

No Rules

Antirequisites

1. Complete all of the following
   - Not completed nor concurrently enrolled in:
   - **Course Not Found**
   - PHYS359 - Statistical Mechanics (0.50)
   -
   - Not completed nor concurrently enrolled in: CHEM400 (Topic 20: Statistical Mechanics)

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Required Courses (Term by Term)

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

[View Program](#)

Course Requirements (no units)

- Physical Sciences Option - Physical Sciences Option

[View Program](#)

NE 451 - Simulation Methods [Top](#)

Effective Date & Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2025	

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-17

Rationale for Change

The current NE451/NE452 descriptions are too specific and tied to material taught by previous instructors. The goal is to keep the course descriptions more open-ended while capturing the current content of these courses better.

Consultations

Department of Chemistry

Course Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Subject Code
NE

Number
451

Course Level
400

Title
Simulation Methods

Abbreviated Title
Simulation Methods

Undergraduate Communication Requirement Identifier
No,

Proposed
Description
This course provides an introductory overview of computational methods that are currently employed to the structural and bulk properties of materials at the nanoscale, with particular emphasis on molecular dynamics (MD) and Monte Carlo (MC) simulations. The course also introduces density functional theory (DFT) and offers an introduction to machine learning.
Existing
Description
This course provides an introduction to and an overview of computational methods that are currently employed for the simulation of structural and bulk properties of matter, particularly as applied to physical and biological systems at the nanometer scale. Topics to be covered in this course include energy functions and force fields, geometry optimization, normal mode analysis, and reaction--path techniques at the molecular level, and an introduction to the simulation of static and dynamic properties of substances via both Monte Carlo and molecular dynamics (MD) methodologies.

Units

Exceptions to Fees or Academic Progress Units

0.50	No,

Components	**Primary Component**
Lecture	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	**Consent to Drop**
No consent required,	No consent required,

Prerequisites

Complete 1 of the following

- Complete all of the following
    - Students must be in level 3A or higher
    - Enrolled in H-Chemistry - Computational Specialization
- Complete all of the following
    - Students must be in level 3B or higher
    - Enrolled in H-Nanotechnology Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- NE 452 - Special Topics in Nanoscale Simulations   [View Program](#)

Course Lists

- H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)   [View Program](#)

Course Requirements (no units)

- H-Chemistry - Computational Specialization - Chemistry - Computational Specialization (Bachelor of Science - Honours)   [View Program](#)

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)   [View Program](#)

Course Requirements (no units)

- Chemical Process Modelling, Optimization & Control Specialization - Chemical Process Modelling, Optimization and Control Specialization   [View Program](#)

NE 452 - Special Topics in Nanoscale Simulations

Effective Date & Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2025

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-17

Rationale for Change

The current NE451/NE452 descriptions are too specific and tied to material taught by previous instructors. The goal is to keep the course descriptions more open-ended while capturing the current content of these courses better.

Consultations

Department of Chemistry

Course Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Subject Code
NE

Number
452

Course Level
400

Title
Special Topics in Nanoscale Simulations

Abbreviated Title
Topics: Nanoscale Simulations

Undergraduate Communication Requirement Identifier
No,

Description
Topics in this theme area include a sampling of modern computational methods and algorithms in nanoscale materials, using a selection of molecular dynamics, path integral approaches, density functional theory, and machine learning techniques. Real-world applications in materials discovery, catalysis, and biophysics will be highlighted.

Existing

Description
Topics in this theme area may include: an overview of modern computational methods and algorithms in nanoscale materials, such as steered molecular dynamics, ab initio molecular dynamics, multiscale modelling, dissipative particle dynamics, transition path sampling, phase-field modelling, quantum simulations using Feynman path integral techniques, condensed-phase spectroscopy, linking of simulations to experiment, simulations and their practical applications.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Must have completed the following:
  - NE451 - Simulation Methods (0.50)
- Complete 1 of the following
  - Complete all of the following
    - Students must be in level 3A or higher
    - Enrolled in H-Chemistry - Computational Specialization
  - Complete all of the following
    - Students must be in level 4B or higher
    - Enrolled in H-Nanotechnology Engineering

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- H-Chemistry - Computational Specialization - Chemistry - Computational Specialization (Bachelor of Science - Honours)   **View Program**

Course Lists

- H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)
  View Program

PDARCH 1 - Portfolio Development Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-24

Rationale for Change

A course description change is being proposed that reflects building CFE (Co-op Fundamentals for Engineering) into PDARCH1. Content very similar to CFE is currently delivered to ARCH students in their 2A term through PDARCH2. A separate proposal has been put forth to retire PDARCH2 and incorporate CFE into PDARCH1. This will allow students to create their resume while they create their portfolios and enter the 2A term informed about co-op.

Consultations

Consulted with Co-operative & Experiential Education.

Course Information

Faculty

Faculty of Engineering

Academic Unit

School of Architecture

Subject Code
PDARCH

Number
1

Course Level
00

Title
Portfolio Development

Abbreviated Title
Portfolio Development

Undergraduate Communication Requirement Identifier
No,

Proposed
Description
This course will elaborate upon the graphic and communication conventions established in the fundamental architecture curriculum. Intermediate investigations in two-dimensional representation and photographic manipulation are developed to enhance presentation skills within a professional and academic context. This course will also prepare students for being successful in co-op work terms through understanding Co-operative and Experiential Education policies and procedures, using Waterloo Works, preparing résumés, interviewing effectively, and meeting employers' expectations. The topics covered in the course culminate in an architectural portfolio, résumé, and readiness for job interviews.
Existing
Description
This course will elaborate upon the graphic and communication conventions established in the fundamental architecture curriculum. Intermediate investigations in two dimensional representation and photographic manipulation are developed to enhance presentation skills within a professional and academic context. The

topics covered in the course culminate in the generation of an architecture portfolio in readiness for job interviews.

Units
0.50

Exceptions to Fees or Academic Progress Units
Yes,

Components
LectureOnline

Primary Component
Lecture

Grading Information

Standard Course Grading
No,

Special Course Grading
Credit/No Credit

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

Complete all of the following

- Students must be in level 1B or higher
- Enrolled in H-Architectural Studies

Corequisites

No Rules

Antirequisites

Not completed nor concurrently enrolled in: ARCH114

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Prerequisites

- PDARCH 2 - Co-op Fundamentals for Architects
- PDARCH 3 - Electronic Communications and Web Design

[View Program](#)
[View Program](#)

STV 302 - Information Technology and Society

Top

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Rationale for Change

Removing pre-requisites will make STV 300-level courses more accessible. The background, expectations and demands of the 300-level courses are higher, but a) there will never not be a 100 or 200-level STV course available the same term for students who realize they are in over their head, and b) we have found that when a first-year or second-year student does want to take a 300-level course, they really do want to take it and are willing to put in the extra work to succeed. We've signed overrides for enough such students to get a sense of these things.

Course Information

Faculty

Vice-President Academic Office

Academic Unit

Centre for Society, Technology and Values

Subject Code
STV

Number
302

Course Level
300

Title
Information Technology and Society

Abbreviated Title
Info Technology & Society

Undergraduate Communication Requirement Identifier
No,

Description
The course has been designed to provide a framework or set of intellectual tools to help students understand and evaluate technological change. These tools will be applied to the development of information technology, its interaction with society, and possible future scenarios. Selected topics include understanding digitization as culture, visions of the future and the perils of prediction, as well as issues related to application areas such as the home, manufacturing, office

work, design and services, education, and law. The course will also consider some of the privacy and personal dignity issues associated with information technology.

Units	Exceptions to Fees or Academic Progress Units
Units	**Exceptions to Fees or Academic Progress Units**
0.50	No,

Components	**Primary Component**
Lecture	Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	**Consent to Drop**
No consent required,	No consent required,

Prerequisites

1. Students must be in level 2A or higher
   - Earned at least 0.50 units from STV 100 - 299
   - Students must be in level 3A

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- Intelligent & Automated Systems Specialization - Intelligent and Automated Systems Specialization

Course Lists   [View Program](#)

- Computer Engineering Option - Computer Engineering Option   [View Program](#)
- Software Engineering Option - Software Engineering Option   [View Program](#)

Course Requirements (no units)

- Artificial Intelligence Option - Artificial Intelligence Option   [View Program](#)
- H-Information Technology Management - Information Technology Management (Bachelor of Mathematics - Honours)   [View Program](#)
- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction [View Program](#)
  Specialization   [View Program](#)

Course Requirements (units)

- Ergonomics & Injury Prevention Minor - Ergonomics and Injury Prevention Minor   [View Program](#)

Course Lists

- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements   [View Program](#)

Course Requirements (units)

- Society, Technology & Values Diploma - Diploma in Society, Technology and Values   [View Program](#)

- Science, Technology, & Society Specialization - Science, Technology, and Society Specialization
- Collaborative Design Specialization - Collaborative Design Specialization

Course Requirements (no units)

- Society, Technology & Values Option - Society, Technology and Values Option

STV 304 - Technology in Canadian Society

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2023

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Rationale for Change

Removing pre-requisites will make STV 300-level courses more accessible. The background, expectations and demands of the 300-level courses are higher, but a) there will never not be a 100 or 200-level STV course available the same term for students who realize they are in over their head, and b) we have found that when a first-year or second-year student does want to take a 300-level course, they really do want to take it and are willing to put in the extra work to succeed. We've signed overrides for enough such students to get a sense of these things.

Course Information

Faculty

Vice-President Academic Office

Academic Unit

Centre for Society, Technology and Values

Subject Code
STV

Number
304

Course Level
300

Title
Technology in Canadian Society

Abbreviated Title
Technology in Canadian Society

Undergraduate Communication Requirement Identifier
No,

Description
The course begins by questioning whether or not there is anything distinctive about Canadian design and its context. Through the use of historical and contemporary cases, this course examines factors influencing design and technology choice in Canada and their outcomes. The future of design is also considered in terms of current trends, issues, challenges and opportunities.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Students must be in level 2A or higher
   - Earned at least 0.50 units from STV 100 - 299
   - Students must be in level 3A

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- H-Information Technology Management - Information Technology Management (Bachelor of Mathematics - Honours) [View Program]
- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization [View Program] [View Program]

Course Lists

- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements [View Program]

Course Requirements (units)

- Society, Technology & Values Diploma - Diploma in Society, Technology and Values [View Program]
- Science, Technology, & Society Specialization - Science, Technology, and Society Specialization [View Program]

Course Requirements (no units)

- Society, Technology & Values Option - Society, Technology and Values Option [View Program]

STV 305 - Technology, Society and the Modern City

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2023

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Rationale for Change

Removing pre-requisites will make STV 300-level courses more accessible. The background, expectations and demands of the 300-level courses are higher, but a) there will never not be a 100 or 200-level STV course available the same term for students who realize they are in over their head, and b) we have found that when a first-year or second-year student does want to take a 300-level course, they really do want to take it and are willing to put in the extra work to succeed. We've signed overrides for enough such students to get a sense of these things.

Course Information

Faculty

Vice-President Academic Office

Academic Unit

Centre for Society, Technology and Values

Subject Code
STV

Number
305

Course Level
300

Title
Technology, Society and the Modern City

Abbreviated Title
Tech, Society & Modern City

Undergraduate Communication Requirement Identifier
No,

Description
Cities may be humanity's most significant invention, where we shape our vision of the civilized life. At the same time, the demands of cities shape our lives in fundamental ways. As most of humanity now lives in cities, the technology of city living increasingly becomes the technology of human life itself. The purpose of this course is to examine the technology of civilized life, with the city itself as both a technological system and a scene of technological living. Topics explored include food, transport, cars, architecture, urban planning, public spaces, sanitation and health, civics and governance, sustainability, and information and communications technology. The Canadian city receives some emphasis.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading

Yes,

Cross-Listing Information

Is this course cross-listed?

No,

Repeatable Courses

Can this course be repeated for credit?

No,

Enrolment Rules

Consent to Add

No consent required,

Consent to Drop

No consent required,

Prerequisites

1. Students must be in level 2A or higher
   - ~~Earned at least 0.50 units from STV 100 - 299~~
   - ~~Students must be in level 3A~~

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Dependencies

Prerequisites

- ENVS 410 - Urban Futures Project   View Program

Course Requirements (no units)

- Societal & Environmental Systems Specialization - Societal and Environmental Systems Specialization
  View Program

Course Requirements (units)

- Urban Studies Minor - Urban Studies Minor   View Program

Course Requirements (no units)

- H-Information Technology Management - Information Technology Management (Bachelor of Mathematics - Honours)   View Program
- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction   View Program
  Specialization   View Program

Course Requirements (units)

- Future Cities Diploma - Diploma in Future Cities   View Program

Course Requirements (no units)

- Sustainable Cities Specialization - Sustainable Cities Specialization   View Program

Course Lists

- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements   View Program

Course Requirements (units)

- Society, Technology & Values Diploma - Diploma in Society, Technology and Values   View Program
- Science, Technology, & Society Specialization - Science, Technology, and Society Specialization
  View Program

Course Requirements (no units)

- Society, Technology & Values Option - Society, Technology and Values Option   View Program

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2023

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Rationale for Change

Removing pre-requisites will make STV 300-level courses more accessible. The background, expectations and demands of the 300-level courses are higher, but a) there will never not be a 100 or 200-level STV course available the same term for students who realize they are in over their head, and b) we have found that when a first-year or second-year student does want to take a 300-level course, they really do want to take it and are willing to put in the extra work to succeed. We've signed overrides for enough such students to get a sense of these things.

Course Information

Faculty

Vice-President Academic Office

Academic Unit

Centre for Society, Technology and Values

Subject Code

Number

Course Level

STV	306	300

Title
Biotechnology and Society

Abbreviated Title
Biotechnology & Society

Undergraduate Communication Requirement Identifier
No,

Description
Biotechnologies are currently migrating from the laboratory to a wide range of consumer products. In everything from foods to pharmaceuticals, genetic engineering is entering daily life. The biotechnology revolution will likely have as much of an impact on our lives as the information technology revolution. However, there is a wide and potentially dangerous gap between research and development on the one hand and societal awareness of its impact on the other. This course is intended to help students gain a deeper appreciation for the issues, including ethics, surrounding biotechnology and society. It will do this through an investigation of such interactions between biotechnologies and society as genetics and the law, foods and the media, and soil remediation and the environment. Consideration will also be given to the role of computing in biotech research and in the human genome project.

Units
0.50

Exceptions to Fees or Academic Progress Units
No,

Components
Lecture

Primary Component
Lecture

Grading Information

Standard Course Grading
Yes,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add
No consent required,

Consent to Drop
No consent required,

Prerequisites

1. Students must be in level 2A or higher
   - Earned at least 0.50 units from STV 100 - 299
   - Students must be in level 3A

Corequisites

No Rules

Antirequisites

No Rules

Course Notes

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Course Requirements (no units)

- CS-Software Engineering Specialization - Software Engineering Specialization

[View Program](#)

- H-Information Technology Management - Information Technology Management (Bachelor of Mathematics - Honours)

  View Program
- SE-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization
- CS-Human-Computer Interaction Specialization - Human-Computer Interaction Specialization

  View Program

  View Program

Course Lists

- Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements   View Program

Course Requirements (units)

- Society, Technology & Values Diploma - Diploma in Society, Technology and Values   View Program
- Science, Technology, & Society Specialization - Science, Technology, and Society Specialization

  View Program

Course Requirements (no units)

- Society, Technology & Values Option - Society, Technology and Values Option   View Program

WKRPT 300 - Work-term Report

Effective Date & Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2024

Offering Number
1

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-24

Rationale for Change

Updating requisites to reflect programs that still take this course. Updating note about promotion rules.

Course Information

Faculty

Vice-President Academic Office

Academic Unit

Co-operative Education and Centre for Career Action

Subject Code
WKRPT

Number
300

Course Level
300

Title
Work-term Report

Abbreviated Title
Work-term Report

Undergraduate Communication Requirement Identifier
No,

Proposed
Description
A work-term report presenting in detail a technical project, activity, or analysis engaged by the student normally during the preceding work term. The report is evaluated on the basis of written communication skills and technical proficiency in the subject matter as demonstrated by the report. Work-term reports are required courses for the degree but their grades are not included in the average. Details regarding the evaluation of the work-term reports can be obtained from the student's program advisor.

Existing
Description
A work-term report presenting in detail a technical project, activity, or analysis engaged by the student normally during the preceding work term. The report is evaluated on the basis of written communication skills and technical proficiency in the subject matter as demonstrated by the report. Work-term reports are required courses for the degree but their grades are not included in the average. However, failed work-term report evaluations may delay a student's progress as indicated in the Examinations and Promotions section of this calendar. Details regarding the evaluation of the work-term reports can be obtained from the student's program advisor.

Units

0.13

Exceptions to Fees or Academic Progress Units

Yes,

Components	**Primary Component**
Project	Project

Grading Information

Standard Course Grading
No,

Cross-Listing Information

Is this course cross-listed?
No,

Repeatable Courses

Can this course be repeated for credit?
No,

Enrolment Rules

Consent to Add	**Consent to Drop**
No consent required,	Department consent required,

Prerequisites

1. Enrolled in H-Architectural Engineering, H-Civil Engineering, H-Environmental Engineering, H-Geological Engineering, or H-Mechanical Engineering
   - ~~Students must be in level 3A or higher~~
   - ~~Enrolled in H-Biomedical Engineering, H-Chemical Engineering, H-Civil Engineering, H-Environmental Engineering, H-Geological Engineering, H-Management Engineering, H-Mechanical Engineering, H-Mechatronics Engineering, H-Nanotechnology Engineering, H-Software Engineering, or H-Systems Design Engineering~~

Corequisites

No Rules

Antirequisites

1. No Rules
   - ~~Not completed nor concurrently enrolled in:~~
   - ~~MSE392 - Work-Term Report (0.13)~~
   - ~~~~
   - ~~Not completed nor concurrently enrolled in: NE350, WKRPT301~~

Course Notes

Notes

- This course is considered as DRNA.

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Antirequisites

- MSE 392 - Work-Term Report   [View Program](#)
- NE 350 - Work-term Report 2   [View Program](#)
- WKRPT 301 - Work-term Report   [View Program](#)

Degree Reqs: BASc - Bachelor of Applied Science Degree Requirements

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Proposal Details

Proposal Type
Change,

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Removal of one PD requirement for all current BASc and BSE students - this will also be reflected in each plan page. Students will be informed that they are no longer required to complete one of their elective PD courses via email.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

Sequence changes - SYDE moving to 8X, BME moving to 8D. Consultation and approval from Eva Skuza, Faculty Relations Manager, Co-op & Experiential Education

Removal of PD course has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

1. Removing one elective PD requirement (retroactive for all active students)

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

The BASc requirements also apply to Software engineering students, who are also members of the Faculty of Mathematics, which requires 5 PD courses (including PD1 taken during the first recruiting term). Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term. This proposal therefore aligns the SE requirements with those (1 coop prep course, and 4 PD courses taken during work terms).

Reducing the number of PD courses is an effort to reduce workload for engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements. A similar proposal is being brought forward for architecture students.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a 5th PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and once approved at Faculty Council, all BASc and BSE plans will be updated accordingly.

2. Undergraduate Communication Requirement:

- CHE: The CHE communication elective is being replaced with **ENGL191**. This change, approved at the June 9 department meeting, will allow to **better integrate communication skills** (both oral and written) into the first-year curriculum and **collect data for the Communication Graduate Attribute** ** *approved by UCRG on Sept 25, 2025.*

3. SYDE change to Co-op sequence 8X and BME change to Coop sequence 8D. 8X will allow SYDE students more time to prepare before their first work term. 8D will move the 8 month work term after 3A instead of 3B, to allow more continuity between pre-capstone and capstone.

4. Adding information about CFE. ** consultation with Manager, Centre for Career Development, Associate Dean Co-op & Professional Affairs, and Director, First Year Engineering.

5. Adding STV 212 to CSE - List A. ** new course recommended by Director, Society, Technology and Values

6. Adding CHE380 to CSE - List B. ** new course recommended by Associate Chair, CHE

7. Adding COMM to the course codes eligible for Complementary Studies - List C ** approved by Math ADUG

8. Added GEOG311 to List C ** based on recommendation from Erin O'Connell (Geog Dept)

Please see the relevant program proposals for further information about changes 2, 3 and 6.

Consultations (Departmental)

2025-11-21 Math ADUG Benoit Charbonneau approved addition to COMM as allowed subject code for complementary studies elective, noting that some of the courses have program restrictions which won't be met by Engineering students.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Dean of Engineering Office

Faculty
Faculty of Engineering

Undergraduate Credential Type
Degree Requirements

Program/Plan Name
Bachelor of Applied Science Degree Requirements

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See promotion rules.

Proposed

Degree Requirements

Unit Requirements

- See major for minimum unit requirements.

Complementary Studies Elective Requirements

All Bachelor of Applied Science (BASc) and Bachelor of Software Engineering (BSE) students must satisfy the Complementary Studies Elective Requirement. Specific Engineering major requirements refer to one or more of the following lists of courses that contain substantial complementary studies content:

- List A: Impact of Technology and/or Engineering on Society
- List B: Engineering Economics
- List C: Humanities and Social Sciences (excluding courses concentrated on development of language or other skills)
- List D: Other Complementary Studies Courses

Notes

1. Course substitutions may be permitted with the approval of the Associate Chair.

2. Unless permitted otherwise in the specific major requirements, a course that appears in more than one of the four lists below may be counted only once; for example, STV100 may be counted as a List A course or a List C course, but not both.

Undergraduate Communication Requirement

All Bachelor of Applied Science students must meet the Undergraduate Communication Requirement by completing one of the following courses as outlined by their specific major requirements.

- Architectural Engineering: COMMST191/ENGL191
- Biomedical Engineering: BME101 and BME101L
- Chemical Engineering: COMMST191/ENGL191
- Civil Engineering: COMMST191/ENGL191
- Computer Engineering: COMMST192/ENGL192
- Electrical Engineering: COMMST192/ENGL192
- Environmental Engineering: COMMST191/ENGL191
- Geological Engineering: COMMST191/ENGL191
- Management Engineering: COMMST192/ENGL192
- Mechanical Engineering: ME100
- Mechatronics Engineering: MTE100
- Nanotechnology Engineering: One of COMMST100, COMMST223, EMLS101R, EMLS102R, EMLS129R, ENGL109, ENGL129R
- Systems Design Engineering: SYDE101 and SYDE101L

Existing

Degree Requirements

Unit Requirements

- See major for minimum unit requirements.

Complementary Studies Elective Requirements

All Bachelor of Applied Science (BASc) and Bachelor of Software Engineering (BSE) students must satisfy the Complementary Studies Elective Requirement. Specific Engineering major requirements refer to one or more of the following lists of courses that contain substantial complementary studies content:

- List A: Impact of Technology and/or Engineering on Society
- List B: Engineering Economics
- List C: Humanities and Social Sciences (excluding courses concentrated on development of language or other skills)
- List D: Other Complementary Studies Courses

Notes

1. Course substitutions may be permitted with the approval of the Associate Chair.
2. Unless permitted otherwise in the specific major requirements, a course that appears in more than one of the four lists below may be counted only once; for example, STV100 may be counted as a List A course or a List C course, but not both.

Undergraduate Communication Requirement

All Bachelor of Applied Science students must meet the Undergraduate Communication Requirement by completing one of the following courses as outlined by their specific major requirements.

- Architectural Engineering: COMMST191/ENGL191
- Biomedical Engineering: BME101 and BME101L
- Chemical Engineering: One of COMMST100, COMMST223, EMLS101R, EMLS102R, EMLS129R/ENGL129R, ENGL109
- Civil Engineering: COMMST191/ENGL191
- Computer Engineering: COMMST192/ENGL192
- Electrical Engineering: COMMST192/ENGL192
- Environmental Engineering: COMMST191/ENGL191
- Geological Engineering: COMMST191/ENGL191
- Management Engineering: COMMST192/ENGL192
- Mechanical Engineering: ME100
- Mechatronics Engineering: MTE100

- Nanotechnology Engineering: One of COMMST100, COMMST223, EMLS101R, EMLS102R, EMLS129R/ENGL129R, ENGL109
- Systems Design Engineering: SYDE101 and SYDE101L

Co-operative Education Program Requirements

For all Bachelor of Applied Science students:

1. Complete a minimum of five credited work terms:
   1. A minimum of three must be standard work terms.
2. Complete a minimum of four Professional Development (PD) courses:
   1. PD19: Must be taken during the first work term.
   2. PD20: Must be taken during the second work term.
   3. Two additional PD courses: To be taken during subsequent work terms; see plans for additional constraints.

Additional Constraints and Notes

1. Upon entry to Engineering (including advanced admission), a student is expected to follow the work-term and academic-term sequence which corresponds to their specific major.
2. A sixth work term, although not required as part of the degree requirement, is available to students willing to meet the requirements.
3. The PD courses are normally taken during work terms, and students are expected to enrol in one such course each work term until the requirement has been completed.
4. Students participate in *Co-op Fundamentals for Engineering (CFE)* prior to their first co-op experience.

Legend for Study/Work Sequences Chart

Key	Description
S/S	Sequence/stream.
F,W,S	Terms: F = September-December; W = January-April; S = May-August.
1,2,3,4 plus A or B	Academic year and term.
WT	Scheduled work term.

Study/Work Sequences Chart

Plan	S/S	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Architectural	4S	1A	WT	1B	WT	2A	WT	2B	WT	3A	WT	3B	4A	WT	4B
Management, Mechanical, Mechatronics, Systems Design	8X	1A	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B
Chemical	4D	1A	WT	1B	WT	2A	WT	2B	WT	3A	3B	WT	WT	4A	4B
Biomedical, Chemical	8D	1A	1B	WT	2A	WT	2B	WT	3A	WT	WT	3B	WT	4A	4B
Civil, Computer	8	1A	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	4A	WT	4B

Plan	S/S	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Computer, Electrical	4F	1A	WT	1B	WT	2A	WT	2B	WT	3A	3B	WT	4A	WT	4B
Environmental, Geological, Mechanical, Mechatronics	4	1A	WT	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	4A	4B
Nanotechnology	8S	1A	1B	WT	2A	WT	2B	WT	WT	3A	3B	WT	WT	4A	4B

Co-operative Education Program Requirements

For all Bachelor of Applied Science students:

1. Complete a minimum of five credited work terms:
    1. A minimum of three must be standard work terms.
2. Complete a minimum of five Professional Development (PD) courses:
    1. PD19: Must be taken during the first work term.
    2. PD20: Must be taken during the second work term.
    3. Three additional PD courses: To be taken during subsequent work terms; see plans for additional constraints.

Additional Constraints and Notes

1. Upon entry to Engineering (including advanced admission), a student is expected to follow the work-term and academic-term sequence which corresponds to their specific major.
2. A sixth work term, although not required as part of the degree requirement, is available to students willing to meet the requirements.
3. The PD courses are normally taken during work terms, and students are expected to enrol in one such course each work term until the requirement has been completed.

Legend for Study/Work Sequences Chart

Key	Description
S/S	Sequence/stream: 8=Stream 8, 4=Stream 4; 8D, 4D=two academic terms and two work terms back to back; 4F=both streams meet up in the 3B fall term; 8S and 4S=special sequencing of terms; 8X=one extended work term
F,W,S	Terms: F=September-December; W=January-April; S=May-August
1,2,3,4 plus A or B	Academic year and term.
WT	Scheduled work term.

Study/Work Sequences Chart

Plan	S/S	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Architectural	4S	1A	WT	1B	WT	2A	WT	2B	WT	3A	WT	3B	4A	WT	4B
Biomedical, Management, Mechanical, Mechatronics	8X	1A	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	4B
Chemical	4D	1A	WT	1B	WT	2A	WT	2B	WT	3A	3B	WT	WT	4A	4B
Chemical	8D	1A	1B	WT	2A	WT	2B	WT	3A	WT	WT	3B	WT	4A	4B

Plan	S/S	F	W	S	F	W	S	F	W	S	F	W	S	F	W
Civil, Computer	8	1A	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	4A	WT	4B
Computer, Electrical	4F	1A	WT	1B	WT	2A	WT	2B	WT	3A	3B	WT	4A	WT	4B
Environmental, Geological, Mechanical, Mechatronics, Systems Design	4	1A	WT	1B	WT	2A	WT	2B	WT	3A	WT	3B	WT	4A	4B
Nanotechnology	8S	1A	1B	WT	2A	WT	2B	WT	WT	3A	3B	WT	WT	4A	4B

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

Course Requirements (no units)

Required Courses

- No Rules

  1. Complementary Studies Electives List
     -
     - See major for specific requirements.
     -
     - List A
     -
     - Choose any of the following:
     - ANTH106 - Technologies of Being Human (0.50)
     - BET360 - Design Frameworks for Social Ventures (0.50)
     - BET420 - Entrepreneurship for Social Impact (0.50)
     - BME381 - Biomedical Engineering Ethics (0.50)
     - CS492 - The Social Implications of Computing (0.50)
     - ENVS105 - Environmental Sustainability and Ethics (0.50)
     - ENVS205 - Sustainability: The Future We Want (0.50)
     - ERS215 - Environmental and Sustainability Assessment 1 (0.50)
     - ERS315 - Environmental and Sustainability Assessment 2 (0.50)
     - GENE311A - Topics for List A Complementary Studies Courses Taken on Exchange by Engineering Students (0.50)
     - GEOG203 - Environment and Development in a Global Perspective (0.50)
     - GEOG207 - Climate Change Fundamentals (0.50)
     - GEOG306 - Human Dimensions of Natural Hazards (0.50)
     - GEOG368 - Ecology and Conservation for Planning (0.50)
     - GSJ205 - Technology, Gender, and Social Justice (0.50)
     - HIST212 - The Computing Society (0.50)

- MSE422 - Economic Impact of Technological Change and Entrepreneurship (0.50)
- MSE442 - Impact of Information Systems on Organizations and Society (0.50)
- NE109 - Societal and Environmental Impacts of Nanotechnology (0.50)
- PACS315 - Engineering and Peace (0.50)
- PHIL226 - Biomedical Ethics (0.50)
- PHIL228 - Ethics and Artificial Intelligence (0.50)
- PLAN341 - Ecology and Conservation for Planning (0.50)
- SOC232 - Technology and Social Change (0.50)
- SOC324 - Digital Cultures (0.50)
- STV100 - Society, Technology and Values: Introduction (0.50)
- STV202 - Design and Society (0.50)
- STV205 - Cybernetics and Society (0.50)
- STV208 - Artificial Intelligence and Society: Impact, Ethics, and Equity (0.50)
- STV210 - The Computing Society (0.50)
- **Course Not Found**
- STV302 - Information Technology and Society (0.50)
- STV304 - Technology in Canadian Society (0.50)
- STV305 - Technology, Society and the Modern City (0.50)
- STV306 - Biotechnology and Society (0.50)
- SYDE261 - Design, Systems, and Society (0.50)
-
- List B
-
- Choose any of the following:
- AE392 - Economics and Life Cycle Cost Analysis (0.50)
- BME364 - Engineering Biomedical Economics (0.50)
- **Course Not Found**
- CIVE392 - Economics and Life Cycle Cost Analysis (0.50)
- ENVE392 - Economics and Life Cycle Cost Analysis (0.50)
- GENE311B - Topics for List B Complementary Studies Courses Taken on Exchange by Engineering Students (0.50)
- GEOE392 - Economics and Life Cycle Cost Analysis (0.50)
- MSE261 - Engineering Economics: Financial Management for Engineers (0.50)
- SYDE262 - Engineering Economics of Design (0.50)
-
- List C
-
- Complete all of the following
- Choose any course (minimum 0.50 unit) with an eligible subject code for List C or listed individually below. Courses that appear on List D or the Exclusions list are ineligible. Courses that satisfy the University Communication Requirement for the student's major are ineligible.
- **Eligible subject codes for List C: ANTH, APPLS, ARTS, BET, BLKST, CDNST, CI, CLAS, CMW, COGSCI, COMM, COMMST, DAC, DUTCH, EASIA, ECON, ENBUS, ENGL, FINE, FR, GER, GERON, GRK, GSJ, HHUM, HIST, HRM, HRTS, HUMSC, INDENT, INDEV, INDG, INNOV, INTEG, INTST, ITALST, JS, LAT, LS, MEDVL, MENN, MGMT, MUSIC, PACS, PHIL, PSCI, PSYCH, RCS, REC, REES, SDS, SI, SOC, SPAN, SRF, STV, THPERF, VCULT**
- Choose any of the following:
- AE101 - History of the Built Environment (0.50)
- AE491 - Engineering Law and Ethics (0.50)
-
- Choose any of the following:
- AFM131 - Introduction to Business in North America (0.50)
- AFM333 - International Business (0.50)
-
- Choose any of the following:
- ARCH510 - Special Topics in Visual and Digital Media (0.50)
- ARCH520 - Special Topics in Urbanism and Landscape (0.50)
- ARCH540 - Special Topics in Architectural History and Theory (0.50)
- ARCH580 - Special Topics in Race, Equity, and Environmental Justice (0.50)
-
- Choose any of the following:
- AVIA100 - Introduction to Aviation (0.50)
-
- Choose any of the following:
- BME530 - The Healthcare System (0.50)
-
- Choose any of the following:
- CIVE491 - Engineering Law and Ethics (0.50)
-

- Choose any of the following:
- CS492 - The Social Implications of Computing (0.50)
-
- Choose any of the following:
- ENVE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
-
- Choose any of the following:
- ENVS105 - Environmental Sustainability and Ethics (0.50)
- ENVS195 - Introduction to Environmental Studies (0.50)
- ENVS201 - Introduction to Canadian Environmental Law (0.50)
- ENVS205 - Sustainability: The Future We Want (0.50)
- ENVS210 - Future Studies (0.50)
- ENVS220 - Ecological Economics (0.50)
- ENVS310 - Future Cities: Integrating Future Thinking into Urban Decisions (0.50)
- ENVS401 - Canadian Law, Indigenous Peoples, and Natural Resource Development (0.50)
-
- Choose any of the following:
- ERS215 - Environmental and Sustainability Assessment 1 (0.50)
- ERS222 - War and the Environment (0.50)
- ERS225 - Gendering Environmental Politics (0.50)
- ERS253 - Communities and Sustainability (0.50)
- ERS288 - Literature for an Ailing Planet (0.50)
- ERS294 - Spirituality, Religion, and Ecology (0.50)
- ERS315 - Environmental and Sustainability Assessment 2 (0.50)
- ERS320 - Economics and Sustainability (0.50)
- ERS328 - Environmental Politics and System Change (0.50)
- ERS361 - Food Systems and Sustainability (0.50)
- ERS365 - Water Governance (0.50)
- ERS370 - Corporate Sustainability: Issues and Prospects (0.50)
- ERS372 - First Nations and the Environment (0.50)
- ERS404 - Global Environmental Governance (0.50)
- ERS406 - Paths to Sustainability (0.50)
- ERS454 - Parks and Protected Areas: Issues and Trends (0.50)
- ERS460 - Sustainable Food: Regional Case Study (0.50)
- ERS462 - Global Food and Agricultural Politics (0.50)
-
- Choose any of the following:
- GENE311C - Topics for List C Complementary Studies Courses Taken on Exchange by Engineering Students (0.50)
- GENE315 - Special Directed Non-Technical Studies (0.50)
- GENE415 - Non-Technical Studies: Practical Analysis of Student Leadership Experiences (0.50)
-
- Choose any of the following:
- GEOE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
-
- Choose any of the following:
- GEOG101 - Human Geographies: People, Space and Change (0.50)
- GEOG202 - Geography of the Global Economy (0.50)
- GEOG203 - Environment and Development in a Global Perspective (0.50)
- GEOG207 - Climate Change Fundamentals (0.50)
- GEOG215 - China: Diverse and Dynamic (0.50)
- GEOG219 - How Pandemics Change the World (0.50)
- GEOG222 - Geographical Study of Canada (0.50)
- GEOG225 - Global Environment and Health (0.50)
- GEOG233 - Geography of Tourism (0.50)
- GEOG302 - Geographies of Work and Employment (0.50)
- GEOG306 - Human Dimensions of Natural Hazards (0.50)
- GEOG307 - Societal Adaptation to Climate Change (0.50)
- **GEOG311 - Economic Geography and Society (0.50)**
- GEOG314 - Climate Services (0.50)
- GEOG323 - Tourism Impacts - International Perspectives (0.50)
- GEOG325 - Geographies of Health (0.50)
- GEOG336 - Space, Power, and Politics: Citizenship in a Changing World (0.50)
- GEOG349 - Urban Form and Spatial Structure (0.50)
- GEOG361 - Food Systems and Sustainability (0.50)
- GEOG368 - Ecology and Conservation for Planning (0.50)
- GEOG411 - The Digital Economy (0.50)
- GEOG423 - Sustainable Tourism (0.50)
- GEOG432 - Health and the Built Environment (0.50)

- GEOG460 - Sustainable Food: Regional Case Study (0.50)
- GEOG462 - Global Food and Agricultural Politics (0.50)
-
- Choose any of the following:
- HEALTH107 - Sociology of Activity, Health, and Well-Being (0.50)
-
- Choose any of the following:
- HLTH101 - Introduction to Health 1 (0.50)
- HLTH102 - Introduction to Health 2 (0.50)
- HLTH201 - Aging and Health (0.50)
- HLTH218 - Psychology of Death and Dying (0.50)
- HLTH220 - Psychosocial Perspectives on Lifespan Development and Health (0.50)
- HLTH245 - Canadian Health Systems (0.50)
- HLTH253 - Demographic Change in Canada (0.50)
- HLTH260 - Social Determinants of Health (0.50)
- HLTH301 - Applied Health Promotion: Theory and Community Engagement (0.50)
- HLTH352 - Sociology of Aging (0.50)
- HLTH380 - Applied Public Health Ethics (0.50)
- HLTH412 - Comparative Health Systems (0.50)
- HLTH420 - Health and the Built Environment (0.50)
-
- Choose any of the following:
- KIN352 - Sociology of Aging (0.50)
- KIN354 - Psychology of Physical Activity (0.50)
-
- Choose any of the following:
- MSE211 - Organizational Behaviour (0.50)
- MSE263 - Managerial Economics (0.50)
- MSE311 - Organizational Design and Technology (0.50)
- MSE411 - Leadership and Influence (0.50)
- MSE422 - Economic Impact of Technological Change and Entrepreneurship (0.50)
- MSE442 - Impact of Information Systems on Organizations and Society (0.50)
- MSE454 - Technical Entrepreneurship (0.50)
-
- Choose any of the following:
- PLAN100 - Urbanization Today: Introduction to Cities and Regions (0.50)
- PLAN262 - Introduction to Global Emerging Cities (0.50)
- PLAN341 - Ecology and Conservation for Planning (0.50)
- PLAN349 - Urban Form and Spatial Structure (0.50)
- PLAN414 - Heritage Conservation Planning (0.50)
- PLAN415 - Urban Planning and Development in Transitional China (0.50)
- PLAN431 - Issues in Housing (0.50)
- PLAN432 - Health and the Built Environment (0.50)
- PLAN433 - Social Issues in Planning (0.50)
- PLAN471 - Planning and Municipal Law (0.50)
-
- Choose any of the following:
- SCI266 - Ancient Science (0.50)
- SCI267 - Introduction to the Philosophy of Science (0.50)
-
- List D
-
- Complete all of the following
- Choose any course (minimum 0.50 unit) with an eligible subject code for List D or listed individually below.
- Eligible subject codes for List D: ARABIC, ASL, CHINA, CROAT, EMLS, ITAL, JAPAN, KOREA, MOHAWK, PORT, RUSS
- Choose any of the following:
- BLKST308 - Writing Anti-Racism (0.50)
- BLKST380 - Black Theatre in Practice (0.50)
-
- Choose any of the following:
- COMMST100 - Interpersonal Communication (0.50)
- COMMST102 - Introduction to Performance (0.50)
- COMMST149 - Introduction to Critical Design Practices (0.50)
- COMMST220 - Performance Studies (0.50)
- COMMST223 - Public Speaking (0.50)
- COMMST225 - Interviewing (0.50)
- COMMST227 - Leadership (0.50)
- COMMST308 - Writing Anti-Racism (0.50)

- COMMST323 - Speech Writing (0.50)
- COMMST324 - Small Group Communication (0.50)
- COMMST325 - Organizational Communication (0.50)
- COMMST326 - Performing the Voice (0.50)
- COMMST433 - The Organizational Consultant (0.50)
- COMMST440 - Performative Inquiry and Practice (0.50)
-
- Choose any of the following:
- DAC203 - Designing Digital Sound (0.50)
- DAC209 - Introduction to Critical Design Practices (0.50)
-
- Choose any of the following:
- DUTCH101 - Elementary Dutch 1 (0.50)
- DUTCH102 - Elementary Dutch 2 (0.50)
-
- Choose any of the following:
- ENGL109 - Introduction to Academic Writing (0.50)
- ENGL119 - Communications in Mathematics and Computer Science (0.50)
- ENGL129R - Written Academic English (0.50)
- ENGL140R - The Use of English (0.50)
- ENGL209 - Advanced Academic Writing (0.50)
- ENGL210E - Genres of Technical Communication (0.50)
- ENGL210F - Genres of Business Communication (0.50)
- ENGL210G - Genres of Fundraising Communication (0.50)
- ENGL210H - Arts Writing (0.50)
- ENGL210I - Legal Writing (0.50)
- ENGL210J - Technical Editing (0.50)
- ENGL304 - Designing Digital Sound (0.50)
- ENGL306A - Introduction to Linguistics (0.50)
- ENGL306B - How English Grammar Works (0.50)
- ENGL306G - Critical Discourse Analysis (0.50)
- ENGL309E - Speech Writing (0.50)
- ENGL373 - Writing Anti-Racism (0.50)
- ENGL375 - Topics in Black Language and Linguistics (0.50)
- ENGL408B - The Discourse of Advertising (0.50)
- ENGL408C - The Rhetoric of Digital Design: Theory and Practice (0.50)
-
- Choose any of the following:
- ENVS131 - Communications for Environmental Professions (0.50)
-
- Choose any of the following:
- ERS318 - Photography for Sustainability (0.50)
-
- Choose any of the following:
- FINE100 - Studio Fundamentals (0.50)
- FINE130 - Introduction to Digital Imaging (0.50)
- FINE150 - Appreciation and Expression (0.50)
- FINE201 - Special Topics in Studio for Non-Fine Arts Majors (0.50)
- FINE202 - Painting (0.50)
- FINE204 - Topics in Studio Practice (0.50)
- FINE220 - Oil Painting (0.50)
- FINE221 - Acrylic and Mixed Media (0.50)
- FINE222 - Principles of Sculpture (0.50)
- FINE223 - Methods and Materials of Sculpture (0.50)
- FINE224 - Expressive Drawing (0.50)
- FINE225 - Observational Drawing (0.50)
- FINE226 - Experimental Drawing (0.50)
- FINE227 - Photography (0.50)
- FINE228 - Design and Imaging (0.50)
- FINE230 - Printmaking (0.50)
- FINE231 - Mixed Multiples (0.50)
- FINE232 - Video and Sound (0.50)
- FINE246 - Expanded Media: Site and Intervention (0.50)
- FINE247 - Expanded Media: Interaction (0.50)
- FINE271 - Ceramics: Studies in Material Practice (0.50)
- FINE272 - Clay Studies (0.50)
- FINE383 - Computational Digital Art Studio (0.50)
- FINE392 - Technology Art Studio (0.50)
-

- Choose any of the following:
- FR101 - Beginner French (0.50)
- FR151 - Basic French 1 (0.50)
- FR152 - Basic French 2 (0.50)
- FR192A - French Language 1: Module 1 (0.50)
- FR192B - French Language 1: Module 2 (0.50)
- FR203 - Introduction to Phonetics of French (0.50)
- FR250 - Intermediate Spoken French (0.50)
- FR251 - French Language 2: Module 1 (0.50)
- FR252 - French Language 2: Module 2 (0.50)
- FR255 - Business French 1 (0.50)
- FR303 - Introduction to Linguistics (0.50)
- FR351 - French Language 3 (0.50)
- FR353 - Introduction to Translation (0.50)
- FR355 - Business French 2 (0.50)
- FR400 - Translation Theory and Practice (0.50)
- FR403 - Sound Structure of French (0.50)
- FR452 - Advanced French Language (0.50)
-
- Choose any of the following:
- GENE311D - Topics for List D Complementary Studies Courses Taken on Exchange by Engineering Students (0.50)
-
- Choose any of the following:
- GEOG417 - Climate Change Communication (0.50)
-
- Choose any of the following:
- GER101 - Elementary German 1 (0.50)
- GER102 - Elementary German 2 (0.50)
- GER201 - Intermediate German 1 (0.50)
- GER202 - Intermediate German 2 (0.50)
- GER211 - Contemporary German Language and Culture (0.50)
- GER250 - Performance German 1 (0.50)
- GER261 - Understanding Conversation (0.50)
- GER303 - Interactive German Language and Culture (0.50)
- GER304 - Reading and Translating (0.50)
- GER307 - German for Professional Purposes (0.50)
- GER308 - German Through Comics (0.50)
- GER331 - Exploring German Language and Literature (0.50)
- GER350 - Performance German 2 (0.50)
-
- Choose any of the following:
- GRK101 - Introductory Ancient Greek 1 (0.50)
- GRK102 - Introductory Ancient Greek 2 (0.50)
- GRK105 - Introductory Modern Greek (0.50)
- GRK201 - Intermediate Greek (0.50)
- GRK351 - Greek Composition, Grammar and Reading (0.50)
- GRK451 - Senior Greek Composition, Grammar and Reading (0.50)
-
- Choose any of the following:
- HEALTH100 - Foundations of a Healthy Lifestyle (0.50)
- HEALTH105 - Mental Health Literacy (0.50)
-
- Choose any of the following:
- INDG101 - Mohawk Language 1 (0.50)
- INDG102 - Mohawk Language 2 (0.50)
-
- Choose any of the following:
- LAT101 - Introductory Latin 1 (0.50)
- LAT102 - Introductory Latin 2 (0.50)
- LAT201 - Intermediate Latin (0.50)
- LAT351 - Latin Composition, Grammar, and Reading (0.50)
- LAT451 - Senior Latin Composition, Grammar, and Reading (0.50)
-
- Choose any of the following:
- LS291 - Legal Writing (0.50)
-
- Choose any of the following:
- MUSIC111 - Fundamentals of Music Theory (0.50)

- MUSIC222 - Conducting 1 (0.50)
- MUSIC226 - Music Studio (0.50)
- MUSIC227 - Music Studio (0.50)
- MUSIC233 - Musical Rhythms of the World (0.50)
- MUSIC270 - Music Theory 1 (0.50)
- MUSIC271 - Music Theory 2 (0.50)
- MUSIC275 - Music and Technology (0.50)
- MUSIC322 - Conducting 2 (0.50)
- MUSIC370 - Music Theory 3 (19th Century) (0.50)
- MUSIC371 - Music Theory 4 (20th Century) (0.50)
- MUSIC376 - Composition Seminar (0.50)
-
- Choose any of the following:
- RCS101 - Introductory Ancient Greek 1 (0.50)
- RCS102 - Introductory Ancient Greek 2 (0.50)
- RCS223 - Intermediate Greek (0.50)
- RCS224 - Selections from Greek Authors (0.50)
-
- Choose any of the following:
- SPAN101 - Introduction to Spanish 1 (0.50)
- SPAN102 - Introduction to Spanish 2 (0.50)
- SPAN201A - Intermediate Spanish 1 (0.50)
- SPAN201B - Intermediate Spanish 2 (0.50)
- SPAN210 - Spanish Conversation (0.50)
- SPAN290 - Approaches to Translation (0.50)
- SPAN301A - Spanish in Context 1 (0.50)
- SPAN301B - Spanish in Context 2 (0.50)
- SPAN390 - Introduction to Spanish Business Translation (0.50)
- SPAN395 - Cultural Dimensions in English/Spanish Literary Translation (0.50)
- SPAN490 - Advanced Translation (0.50)
-
- Choose any of the following:
- THPERF100 - Introduction to Theatre (0.50)
- THPERF102 - Introduction to Performance (0.50)
- THPERF149 - Introduction to Critical Design Practices (0.50)
- THPERF220 - Performance Studies (0.50)
- THPERF221 - Performing Text (0.50)
- THPERF222 - Performing the Body (0.50)
- THPERF284 - Site-Specific Performance (0.50)
- THPERF301 - Performance Creation (0.50)
- THPERF321 - Approaches to Acting with Text (0.50)
- THPERF322 - Approaches to Acting with the Body (0.50)
- THPERF326 - Performing the Voice (0.50)
- THPERF343 - Stage Management (0.50)
- THPERF361 - Approaches to Directing (0.50)
- THPERF366 - Writing for Performance (0.50)
- THPERF368 - Collaborative Creation (0.50)
- THPERF379 - Mixed Reality Design (0.50)
- THPERF380 - Black Theatre in Practice (0.50)
- THPERF389 - Audience Engagement (0.50)
- THPERF440 - Performative Inquiry and Practice (0.50)
-
- Exclusions
-
- Complete all of the following
- The following lists of courses are ineligible as List C CSE courses.
- The following cannot be used towards this academic plan:
- ARTS280 - Statistics for Arts Students (0.50)
-
- The following cannot be used towards this academic plan:
- CMW201 - Worship Practicum 1 (0.25)
- CMW202 - Worship Practicum 2 (0.25)
-
- The following cannot be used towards this academic plan:
- ECON211 - Introduction to Mathematical Economics (0.50)
- ECON221 - Statistics for Economists (0.50)
- ECON311 - Mathematical Economics (0.50)
-
- The following cannot be used towards this academic plan:

- ERS316 - Urban Water and Wastewater Systems: Integrated Planning and Management (0.50)
- ERS317 - Waste Management (0.50)
-
- The following cannot be used towards this academic plan:
- GERON310 - Development, Aging, and Health (0.50)
- GERON355 - Biology of Human Aging (0.50)
-
- The following cannot be used towards this academic plan:
- INTEG340 - Research Design and Methods (0.50)
-
- The following cannot be used towards this academic plan:
- LS280 - Social Statistics (0.50)
-
- The following cannot be used towards this academic plan:
- MGMT171 - Fundamentals of Personal and Business Finance (0.50)
-
- The following cannot be used towards this academic plan:
- MUSIC116 - Music Ensemble (0.25)
- MUSIC117 - Music Ensemble (0.25)
- MUSIC216 - Music Ensemble (0.25)
- MUSIC217 - Music Ensemble (0.25)
- MUSIC316 - Music Ensemble (0.25)
- MUSIC317 - Music Ensemble (0.25)
- MUSIC416 - Music Ensemble (0.25)
- MUSIC417 - Music Ensemble (0.25)
-
- The following cannot be used towards this academic plan:
- PHIL252 - Quantum Mechanics for Everyone (0.50)
-
- The following cannot be used towards this academic plan:
- PSCI314 - Quantitative Analysis (0.50)
-
- The following cannot be used towards this academic plan:
- PSYCH207 - Cognitive Processes (0.50)
- PSYCH261 - Physiological Psychology (0.50)
- PSYCH292 - Basic Data Analysis (0.50)
- PSYCH306 - Perception (0.50)
- PSYCH307 - Human Neuropsychology (0.50)
- PSYCH335 - Developmental Neuropsychology (0.50)
- PSYCH391 - Advanced Data Analysis (0.50)
- PSYCH486 - Directed Studies - Advanced Statistics (0.50)
- PSYCH493 - Data Analysis and Graphing in R (0.50)
-
- The following cannot be used towards this academic plan:
- REC371 - Quantitative Data Analysis and Mobilization (0.50)
-
- The following cannot be used towards this academic plan:
- SDS150R - Lifespan Processes (0.50)
- SDS250R - Social Statistics (0.50)
- SDS251R - Social Research (0.50)
- SDS375R - Studies in Interdisciplinary Social Science (0.50)
-
- The following cannot be used towards this academic plan:
- SOC280 - Social Statistics (0.50)
-
- The following cannot be used towards this academic plan:
- SRF230 - Introduction to Statistics (0.50)
- Eligible subject codes for List C: ANTH, APPLS, ARTS, BET, BLKST, CDNST, CI, CLAS, CMW, COGSCI, COMMST, DAC, DUTCH, EASIA, ECON, ENBUS, ENGL, FINE, FR, GER, GERON, GRK, GSJ, HHUM, HIST, HRM, HRTS, HUMSC, INDENT, INDEV, INDG, INNOV, INTEG, INTST, ITALST, JS, LAT, LS, MEDVL, MENN, MGMT, MUSIC, PACS, PHIL, PSCI, PSYCH, RCS, REC, REES, SDS, SI, SOC, SPAN, SRF, STV, THPERF, VCULT
- COMM400 - Entrepreneurship, Technology and the Emerging Information Economy (0.50)

Are there cross-listed courses listed in requirements?	Cross-Listings Options

Yes,   All cross-listings to be displayed,

Specializations

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path	Faculty/AFIW Path(s) for Workflow
Committee approvals,	Faculty of Engineering

Dependencies

H-Architectural Studies - Architectural Studies (Bachelor of Architectural Studies - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-24

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove PD requirements (PDARCH2, PDARCH3) immediately. PDARCH 2 content will be included in PDARCH 1 going forward, and PDARCH 3 will be replaced by a PD elective for all current students.

Remove WKRPT 203 for all current students as well.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (for Architecture: PDARCH1, PDARCH2, PDARCH3 and 2 PD electives). We are proposing a reduction to 4 (Combine PDARCH2 into PDARCH1, remove PDARCH3 + three PD electives).

Reducing the number of PD courses is an effort to reduce workload for students, ensuring they still meet their graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering/Architecture Department Chairs, and based on approval at Faculty Council, all BASc, BSE and BAS plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

1. We will incorporate Co-op Fundamentals for Engineering into PDARCH 1, and remove PDARCH 2 from the curriculum. This will allow students to create their resume while creating their portfolios. Students will enter 2A recruitment term informed about Co-op. Centre for Career Development will work with School of Architecture to ensure all deliverables of CFE are delivered.

2. PDARCH 3 will be retired immediately, and replaced with an elective PD course. Students now required to take PDARCH1 + 3 elective PD.

3. WKRPT 203 will be removed.

Consultations (Departmental)

Consultation with CCD, Centre for WIL, Co-op.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

School of Architecture

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Architectural Studies

Program/Plan Name
Architectural Studies (Bachelor of Architectural Studies - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point

Direct Entry,

Admission Requirements: Minimum Requirements

The admission categories, requirements, and procedures of the University of Waterloo are outlined in detail in the Admissions section of this Calendar.

Course Requirements for Applicants

For up-to-date and detailed information of course requirements, see the School of Architecture future undergraduate students web page.

Admissions Process

Students wishing to apply to the School of Architecture will be initially screened on the basis of grades received in their required courses. By this process, approximately 450 students will be further considered for admission to the School of Architecture. These students are required to:

- Participate in an interview as part of the admissions process.
- Complete a test in the form of an English précis.
- Present a portfolio of creative work at the time of the interview.

Admission to the School depends equally on success in the précis test and the results of the interview. A completed questionnaire is required.

With the high number of applications, students will normally need an overall average of 80%, a grade of at least 75% (usually 80%) in English, and at least low 70s in physics and the two required mathematics courses to be considered for an interview. If offered admission, a final grade of at least 70% (but 75% in English) in each required course is needed to maintain an offer of admission. It is recommended that students take art, history, and other creative courses. The admission requirements from other provinces and countries is available. More information on the process, and portfolio requirements may be found on the School of Architecture website.

Accessing Incoming Transfer Credits

Generally, transfer credit can be given for courses completed at accredited post-secondary institutions in which a grade of 70% or better was obtained. Students transferring from other institutions may have their transferred courses count toward the University of Waterloo degree as determined by the associate director, undergraduate studies. Grades obtained in these courses will not be included in the calculation of the student's average. Transfer credit may be given towards elective course requirements, as well as core courses for which a precise matching of content can be proven.

Incoming students wishing to receive credit for previous courses should contact the associate director, undergraduate studies to have their transcripts and course outlines reviewed. The actual assessment and agreement to transfer credits will only be completed for students who have been accepted into the program.

Students transferring from faculties within the University, or former University of Waterloo students returning after an absence, may transfer previous University of Waterloo courses with 60% or better to fulfil Honours Bachelor of Architectural Studies (BAS) program requirements, whether core or elective. Generally, the grades from these courses are not included in the cumulative average.

Advanced Standing Applicants

Students wishing to apply for advanced standing (e.g., those having partially completed a professional degree in architecture at another institution), must apply in writing to the associate director, undergraduate studies to initiate the

process. The School of Architecture at the University of Waterloo will need copies of official transcripts and course outlines (fully translated), and samples of work to initiate the process. Transfer credits will only be assessed if an offer of admission is made. The applicant may be invited for an interview. Advanced standing applicants must also write the English précis test. Acceptances will depend on the quality of the applicants, as well as space available.

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 70.0%.
- For term-by-term requirements, see promotion rules.

Proposed

Graduation Requirements

- Complete a total of 27.50 units (excluding COOP, PD, PDARCH):
  - Complete all the required courses listed below.
  - Complete five approved electives:
    - Complete a minimum of four additional ARCH courses.
    - Complete no more than one non-ARCH course (0.5 unit).
  - Complete the Undergraduate Communication Requirement.
- Complete all co-operative education program requirements listed below.

Undergraduate Communication Requirement

All Bachelor of Architectural Studies students must meet the Undergraduate Communication Requirement by successfully completing ARCH120.

Existing

Graduation Requirements

- Complete a total of 27.50 units (excluding COOP, PD, PDARCH, WKRPT):
  - Complete all the required courses listed below.
  - Complete five approved electives:
    - Complete a minimum of four additional ARCH courses.
    - Complete no more than one non-ARCH course (0.5 unit).
  - Complete the Undergraduate Communication Requirement.
- Complete all co-operative education program requirements listed below.

Undergraduate Communication Requirement

All Bachelor of Architectural Studies students must meet the Undergraduate Communication Requirement by successfully completing ARCH120.

Co-operative Education Program Requirements

Work Terms

- Complete a total of five credited work terms.

Legend for Study/Work Sequence Information Chart

Key	Description
F,W,S	Terms: F=September-December; W=January-April; S=May-August
1,2,3,4 plus A or B	Denotes academic year and term.
WT	Work term.
Off	Neither an academic term nor a work term.

Study/Work Sequence Information Chart

F	W	S	F	W	S	F	W	S	F	W	S	F	W	S
1A	1B	off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	WT	4B

Additional Constraints and Notes

1. If architecture-related employment is obtained during the off term (arranged by the student), it will not be considered as a replacement for any subsequent work term requirement.

Professional Development

1. Complete PDARCH1.
2. Complete a total of three PD elective courses.

Additional Constraints and Notes

1. These courses are normally taken during work terms and students are expected to enrol in one such course each off term or work term until the requirement has been completed.
2. Students take PDARCH1 during the spring off term.

Co-operative Education Program Requirements

Work Terms

- Complete a total of five credited work terms.

Legend for Study/Work Sequence Information Chart

Key	Description
F,W,S	Terms: F=September-December; W=January-April; S=May-August
1,2,3,4 plus A or B	Denotes academic year and term.
WT	Work term.
Off	Neither an academic term nor a work term.

Study/Work Sequence Information Chart

F	W	S	F	W	S	F	W	S	F	W	S	F	W	S
1A	1B	off	2A	WT	2B	WT	3A	WT	3B	WT	WT	4A	WT	4B

Additional Constraints and Notes

1. If architecture-related employment is obtained during the off term (arranged by the student), it will not be considered as a replacement for any subsequent work term requirement.

Work Reports

- Complete a total of one work report: WKRPT203.

Additional Constraints and Notes

1. If students do not secure work-term employment, they may still submit a work report for credit. The Faculty of Engineering must first approve the topic. The work report will be evaluated as a professional document.
2. The work report will be evaluated in the Faculty of Engineering, School of Architecture.

Professional Development

- Complete a total of three PDARCH courses: PDARCH1, PDARCH2, PDARCH3.
- Complete a total of two PD elective courses.

Additional Constraints and Notes

1. These courses are normally taken during work terms and students are expected to enrol in one such course each off term or work term until the requirement has been completed.
2. In the event that students have taken a PDARCH course in each work term, but have failed the most recent PDARCH course, students may request permission to repeat in a subsequent academic term the PDARCH course that was failed. Students should contact their academic advisors to determine if they qualify for this alternative. Failed PDARCH and PD courses contribute towards the accumulated fail count.
3. Sequence: Students should begin by taking PDARCH1 during the spring off term, taking PDARCH courses in subsequent order, and end with the two PD courses.

Required Courses (Term by Term)

1A Term

- Complete all the following:
- ARCH110 - Visual and Digital Media 1 (0.50)
- ARCH120 - An Introduction to Architectural Ideas and Communications (0.50)
- ARCH142 - Introduction to Cultural History (0.50)
- ARCH172 - Building Construction 1 (0.50)

- ARCH192 - Design Studio (1.50)
- 1B Term
- Complete all the following:
- ARCH113 - Visual and Digital Media 2 (0.50)
- ARCH126 - Environmental Building Design (0.50)
- ARCH143 - Settlements, Sanctuaries, and Cities (1.00)
- ARCH173 - Building Construction 2 (0.50)
- ARCH193 - Design Studio (1.50)
- 2A Term
- Complete all the following:
- ARCH212 - Digital Fabrication (0.50)
- ARCH246 - Cultural Encounters 600-1600 (1.00)
- ARCH260 - Principles of Structures (0.50)
- ARCH292 - Design Studio (1.50)
- 2B Term
- Complete all the following:
- ARCH225 - Theory and Design of the Contemporary Landscape (0.50)
- ARCH243 - Indigenous Practices (0.50)
- ARCH248 - Cultural Encounters 1600-1914 (1.00)
- ARCH276 - Timber: Design, Structure and Construction (0.50)
- ARCH293 - Design Studio (1.50)
- 3A Term
- Complete all the following:
- ARCH327 - Architecture of the Urban Environment (0.50)
- ARCH342 - Modernisms: Local and Global (1.00)
- ARCH362 - Steel and Concrete: Design, Structure and Construction (0.50)
- ARCH364 - Building Science (0.50)
- ARCH392 - Design Studio (1.50)
- 3B Term
- Complete all of the following
- Complete all the following:
    - ARCH393 - Option Design Studio (1.50)
    - ARCH442 - Contemporary Architectural Theory (0.50)
- Complete 2 approved electives
- 4A Term
- Complete all of the following
- Complete all the following:
    - ARCH492 - Design Studio (1.50)
- Complete 2 approved electives
- 4B Term
- Complete all of the following
- Complete all the following:
    - ARCH463 - Integrated Environmental Systems (0.50)
    - ARCH473 - Technical Report (0.50)
    - ARCH493 - Design Studio/Comprehensive Building Design (1.50)
- Complete 1 approved elective

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?
No,

Additional Constraints

1. Exceptions to the requirements listed above require approval of the Architecture Associate Director, Undergraduate Studies.

Notes

- Students may take a minor with another program at the University. As most minors require 8-10 courses, and there are only six term course electives available in the Architecture program, students should expect to take additional time to complete the degree. Students interested in pursuing additional academic plans, see [invalid credential combinations](#).
- The 4A term is offered in Rome, Italy. For students unable to study in Rome, an alternative studio course for ARCH492 is offered in Cambridge.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Architectural Engineering - Architectural Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2025	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-30

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?

Yes,

Impact on Existing Students

Remove one PD requirement retroactively for all current students.

Remove wkrpt 400 retroactively for all current students.

Student communication will state the following:

"If you are an active student you are exempt from wkrpt 400. If you complete PD 11 you are also exempt with wkrpt 200"

AE300 is changing unit weight effective immediately, so current students will be exempt from 0.50 units from their graduation requirements.

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential

Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

wkrpt 200 and wkrpt 400 Rationale:

In their current form, work term reports have not helped students develop their technical writing skills and marking has been highly inconsistent. Reduced workload for both the students and faculty as well as the introduction of a peer review process will help alleviate these issues. This change also aligns with other engineering programs which have removed work term reports.

Adding PD 11 required course change rational:

WKRPT course requirements are being changed for students in CIVE/ENVE/GEOE/AE. PD 11 (Processes for Technical Report Writing) will replace WKRPT 200 and WKRPT 400 will be removed. WKRPT 300 will remain. We are requesting these changes take effect in Fall 2025 or later.

Switching terms for AE 303 and AE311 (the equivalent course of AE 310) Rational:

- Exposure to engineering/member design earlier
- 303 is typically the hardest course in the hardest term – could have good impact on students by moving back a term
- Could have positive impact in outcomes – students may have better grasp of moment diagrams/behaviour of structures if they see application in member design in CIVE/AE311

Reducing total units required for the program from 22.00 to 21.25 due to the following changes:

- Reducing AE 105 from 0.75 to 0.5
- Switching AE 310 (0.75 credits) with AE 311 (0.5 credits)
- Changing AE 100 from 0.5 to 0.75
- Reducing AE 300 from 1.0 to 0.50
- All led to a total program reduction of 0.75 units

Taking out the choice of number of electives in 4A & 4B as the promotion rules are more flexible now.

General Program/Plan Information

Faculty   **Academic Unit**

Faculty
Faculty of Engineering

Undergraduate Credential Type   **Program Type**   **Degree**
Major   Honours   Bachelor of Applied Science

Program/Plan Name
Architectural Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Proposed

Graduation Requirements

- Complete a total of 21.25 academic units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 10 approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List A, C, or D.
    - Complete one course from the Natural Science list.
    - Complete seven courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 22.00 academic units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 10 approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List A, C, or D.
    - Complete one course from the Natural Science list.
    - Complete seven courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- Complete one WKRPT course: WKRPT300 (3A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses: WKRPT200 (2B), WKRPT300 (3A), WKRPT400 (3B).
- See Bachelor of Applied Science co-operative education program requirements.

1. 1A Term
   -
     - Complete all the following:
     - AE100 - Concepts Studio (0.50)
     - AE101 - History of the Built Environment (0.50)
     - AE104 - Mechanics 1 (0.25)
     - AE115 - Linear Algebra (0.25)
     - CHE102 - Chemistry for Engineers (0.50)
     - MATH116 - Calculus 1 for Engineering (0.50)
     -
     - 1B Term
     -
     - Complete all of the following
     - Complete all the following:
     - AE105 - Mechanics 2 (0.75)
     - AE121 - Computational Methods (0.50)
     - AE125 - Structural Design Studio (0.50)
     - AE199 - Seminar (0.00)
     - MATH118 - Calculus 2 for Engineering (0.50)
     -
     - Complete 1 of the following:
     - AE123 - Electrical Circuits and Instrumentation (0.50)
     - CIVE123 - Electrical Circuits and Instrumentation (0.50)
     - ENVE123 - Electrical Circuits and Instrumentation (0.50)
     - GEOE123 - Electrical Circuits and Instrumentation (0.50)
     -
     - 2A Term
     -
     - Complete all of the following
     - Complete all the following:
     - AE200 - Enclosure Design Studio (0.50)
     - AE204 - Solid Mechanics 1 (0.50)
     - AE221 - Advanced Calculus (0.50)
     - AE224 - Probability and Statistics (0.50)
     - AE280 - Fluid Mechanics and Thermal Sciences (0.50)
     - AE298 - Seminar (0.00)
     -
     - Complete 1 of the following:
     - COMMST191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
     - ENGL191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
     -
     - 2B Term
     -
     - Complete all of the following
     - Complete all the following:
     - AE205 - Solid Mechanics 2 (0.50)
     - AE223 - Differential Equations and Balance Laws (0.50)
     - AE225 - Environmental Building Systems Studio (0.50)
     - AE265 - Structure and Properties of Materials (0.50)
     - AE299 - Seminar (0.00)
     -
     - Complete 1 approved elective
     -
     - 3A Term

- -
  - Complete all of the following
  - Complete all the following:
  - AE279 - Energy and the Environment (0.50)
  - AE300 - Architectural Engineering Studio 1 (1.00)
  - AE353 - Soil Mechanics and Foundations (0.50)
  - AE377 - Structural Timber Design (0.50)
  - AE398 - Seminar (0.00)
  -
  - Complete 1 of the following:
  - **Course Not Found**
  - **Course Not Found**
  -
  - 3B Term
  -
  - Complete all of the following
  - Complete all the following:
  - AE303 - Structural Analysis (0.50)
  - AE325 - Architectural Engineering Studio 2 (0.50)
  - AE399 - Seminar (0.00)
  - CIVE507 - Building Science and Technology (0.50)
  -
  - Complete 1 of the following:
  - AE392 - Economics and Life Cycle Cost Analysis (0.50)
  - CIVE392 - Economics and Life Cycle Cost Analysis (0.50)
  - ENVE392 - Economics and Life Cycle Cost Analysis (0.50)
  - GEOE392 - Economics and Life Cycle Cost Analysis (0.50)
  -
  - Complete 1 approved elective
  -
  - 4A Term
  -
  - Complete all of the following
  - Complete all the following:
  - AE400 - Project Studio 1 (0.50)
  - AE491 - Engineering Law and Ethics (0.50)
  - AE498 - Seminar (0.00)
  -
  - **Complete 4 approved electives**
  -
  - 4B Term
  -
  - Complete all of the following
  - Complete all the following:
  - AE425 - Project Studio 2 (0.50)
  - AE499 - Seminar (0.00)
  -
  - **Complete 4 approved electives**
  - ~~AE310 - Introduction to Structural Design (0.75)~~
  - ~~Complete 3 or 4 approved electives~~
  - ~~Complete 4 or 5 approved electives~~

1. Natural Science List
   -
   - Complete 1 of the following
   - Complete 1 of the following:
   - BIOL130 - Introductory Cell Biology (0.50)
   - BIOL150 - Organismal and Evolutionary Ecology (0.50)
   - BIOL240 - Fundamentals of Microbiology (0.50)
   - BIOL273 - Principles of Human Physiology 1 (0.50)
   - CHE161 - Engineering Biology (0.50)
   - CHEM209 - Introductory Spectroscopy and Structure (0.50)
   - CHEM262 - Organic Chemistry for Engineering (0.50)
   - EARTH221 - Introductory Geochemistry (0.50)
   - EARTH270 - Disasters and Natural Hazards (0.50)

- EARTH281 - Geological Impacts on Human Health (0.50)
- ENVS200 - Field Ecology (0.50)
- GEOG357 - River Management (0.50)
- SCI206 - The Physics of How Things Work (0.50)
- SCI207 - Physics, the Universe, and Everything (0.50)
- SCI238 - Introductory Astronomy (0.50)
- SCI250 - Environmental Geology (0.50)
-
- Complete all the following:
- KIN100 - Regional Human Anatomy (0.50)
- KIN100L - Regional Human Anatomy Laboratory (0.25)
-
- Technical Electives List
-
- Complete a total of 7 Technical Electives.
-
- List 1
-
- Complete 3 of the following:
- AE301 - Building Enclosure Systems (0.50)
- AE315 - Building Structural Systems (0.50)
- AE405 - Building Performance Measurement Lab (0.50)
- AE450 - Building Service Systems (0.50)
- AE495 - Design Intensive Special Topics in Architectural Engineering (0.50)
- AE572 - Building Energy Analysis (0.50)
- AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- ARCH570 - Special Topics in Building Technology and Environmental (0.50)
- CIVE332 - Civil Systems and Project Management (0.50)
- ME436 - Welding and Joining Processes (0.50)
- ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
- ME567 - Fire Safety Engineering (0.50)
- ME572 - Building Energy Analysis (0.50)
- ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- SYDE532 - Introduction to Complex Systems (0.50)
-
- List 2
-
- Complete 2 of the following:
- ARCH463 - Integrated Environmental Systems (0.50)
- CIVE413 - Structural Steel Design (0.50)
- CIVE414 - Structural Concrete Design (0.50)
- CIVE415 - Structural System Design (0.50)
- CIVE460 - Engineering Biomechanics (0.50)
- CIVE495 - Design Intensive Special Topics in Civil Engineering (0.50)
- CIVE512 - Rehabilitation of Structures (0.50)
- CIVE596 - Construction Engineering (0.50)
- ME574 - Engineering Biomechanics (0.50)
-
- List 3
-
- Complete all of the following
- **The remaining 2 Technical Electives can be from List 1, List 2, or List 3.**
- Choose any of the following:
- AE497 - Special Topics in Architectural Engineering (0.50)
- CIVE422 - Finite Element Analysis (0.50)
- CIVE484 - Physical Infrastructure Planning (0.50)
- CIVE497 - Special Topics in Civil Engineering (0.50)
- CIVE505 - Structural Dynamics (0.50)
- PLAN484 - Physical Infrastructure Planning (0.50)
- ~~The remaining 2 Technical Electives can be from List 1, List 2, or List 3. See Additional Constraints.~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Architectural Engineering Director, or Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

Existing

Additional Constraints

1. Some terms indicate a choice in the number and type of elective courses to be taken; program requirements can be found in the Graduation Requirements section.
2. Exceptions to the requirements and electives listed above require prior approval of the Architectural Engineering Director, or Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one (or more) of two available specializations.

Specializations List

Building Structures Specialization, or Building Systems Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Biomedical Engineering - Biomedical Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Reduction in required PD courses. All active students will be able to graduate with one less PD elective.

Is the credential name changing?
No,

Academic Unit Approval
2025-09-26

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential

Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

Rationale: The Biomedical Engineering program welcomed their first incoming cohort in 2014. Since the inception of the program, we have continuously gathered feedback from students and the program also went to two professional accreditation reviews as well as IQAP in 2022. Our advisory program committee composed of industry and healthcare stakeholders has also provided valuable insights.

Through our consultation with stakeholders (current students, alumni, industry and healthcare stakeholders) and program analysis, we identified critical elements that our curriculum and program needed to address:

- balancing workload across terms, all the more so in 1st year between 1A and 1B

- providing opportunities for students to learn more about and develop skills specific to biomedical engineering

- allowing a path to develop depth into a specific area of application of biomedical engineering.

Our program committee composed of members from partnering departments (CHE, ECE, MME, BIOL) worked on this curriculum since late 2023. Meetings and consultations also included the school of anatomy and faculty members from the host department (SYDE).

To allow us to achieve our objectives, (1) two courses are being removed (1 CSE and BME 411: optimization), (2) some course are being moved to different terms and (3) an experiential learning sequence has been created: AXIHS (Applications, e Xperience, Implications, Healthcare Systems: BME 141, 142, 241, 341 and 342) and (4) students have opportunities to specialize earlier (with more depth, i.e., 7 courses) starting in 3A. These changes address the needs that were identified by our stakeholders. With the new curriculum, teaching content and program objectives remain similar while providing more opportunity better connections between courses as well as in-depth and experiential learning and a more balanced workload.

Summary of changes per term

1A - 1B: moved term of offering for BME186 and BME181, SYDE 111, 112, 113, 114 courses (1.5 units) have be replaced with a sequence of courses taught by Math (1.5 units). This will reduce complications around clearing course failures. BME101 (communication course is moving to 1B). Introduce new experiential learning course BME 141(CR/NCR) in 1A and an intro to AI course (BME 123) in 1B for students

2A: moved some courses to reduce workload with lab courses, and added experiential learning course BME 241. Moving BME 182 to 2A (New course name: BME 288)

2B: swapped statistics (BME 213, moved to 2A) with AXIHS course 241

3A - 3B: moved courses between terms, removed two core courses and replaced by electives to be selected from lists. Courses offered as TE are becoming core and taught as smaller unit courses (BME341 and BME342)

4A: Removed BME411 and BME 364 engineering economics has moved to 4A to allow for alignment with project course deliverables

Students have 9 electives: 7 technical electives to select from curated lists and 2 CSEs.

Please see attachment for details around course creation/move/modifications. Amendment to plan after November FUGS regarding UCR planned change.

Consultations (Departmental)

The BME program committee has representative of departments involved in the delivery of the program (CHE, ECE, MTE and BIOL). The committee held retreats and meetings throughout the past 2 years to develop the new curriculum. Additionally, retreats/consultation meetings were held with the SYDE department (staff and faculty members) as well as discussion with engineering department chairs. The school of anatomy director also participated in our committee retreat.

Supporting Documentation

- Final Summary Curriculum Changes BME F25.pdf

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Biomedical Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Proposed

Graduation Requirements

- Complete a total of 21.88 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete nine approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List C.
      - One course from List A, C, or D.

Existing

Graduation Requirements

- Complete a total of 22.13 units (excluding COOP, PD):
    - Complete all the required courses listed below.
    - Complete nine approved electives:
        - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
            - One course from List C.
            - Two courses from List A, C, or D.
        - Complete six courses from the Technical Electives (TEs) lists.
        - Choices must meet the Canadian Engineering Accreditation Board (CEAB) requirements (see below).
- Complete all co-operative education program requirements listed below.

CEAB planner

Elective course selections must meet CEAB requirements, including a minimum number of instruction hours in the various CEAB categories. To determine the suitability of elective courses, students should complete the [CEAB planner](#). Two planners must be completed and submitted to the Director of Biomedical Engineering, one planner for approval purposes in the student's 2B or 3A term, and one planner for graduation purposes at the end of the student's 4A term. Students that have combinations of electives that result in a plan that does not meet CEAB criteria will not be permitted to graduate.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD courses.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD11, PD19, PD20, and two additional PD courses.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

1. 1A Term
    -
        - Complete all the following:
        - BME121 - Digital Computation (0.50)
        - **Course Not Found**
        - BME161 - Introduction to Biomedical Design (0.50)
        - BME186 - Chemistry Principles (0.50)
        - **MATH115 - Linear Algebra for Engineering (0.50)**
        - **MATH117 - Calculus 1 for Engineering (0.50)**
        -

- 1B Term
-
- Complete all the following:
- BME101 - Communications in Biomedical Engineering-Written and Oral (0.25)
- BME101L - Communications in Biomedical Engineering-Visualization (0.25)
- BME122 - Data Structures and Algorithms (0.50)
- **Course Not Found**
- BME162 - Human Factors in the Design of Biomedical and Health Systems (0.50)
- BME181 - Physics 1: Statics (0.50)
- **MATH119 - Calculus 2 for Engineering (0.50)**
-
- 2A Term
-
- Complete all the following:
- **Course Not Found**
- BME213 - Statistics and Experimental Design (0.50)
- BME281 - Mechanics of Deformable Solids (0.50)
- BME285 - Engineering Biology (0.50)
- BME285L - Engineering Biology Laboratory (0.25)
- BME182 - Physics 2: Dynamics (0.50)
- **MATH218 - Differential Equations for Engineers (0.50)**
-
- 2B Term
-
- Complete all the following:
- **Course Not Found**
- BME252 - Linear Systems and Signals (0.50)
- BME261 - Prototyping, Simulation and Design (0.50)
- BME284 - Physiological and Biological Systems (0.50)
- BME284L - Physiology and Anatomy Laboratory (0.25)
- BME294 - Circuits, Instrumentation, and Measurements (0.50)
- BME294L - Circuits, Instrumentation, and Measurements Laboratory (0.25)
-
- 3A Term
-
- Complete all of the following
- Complete all the following:
- **Course Not Found**
- **Course Not Found**
- BME356 - Control Systems (0.50)
- BME356L - Control Systems Laboratory (0.25)
- BME361 - Biomedical Product Design and Regulation (0.50)
- **Course Not Found**
- **Course Not Found**
-
- Complete 1 approved elective
-
- 3B Term
-
- Complete all of the following
- Complete all the following:
- BME355 - Physiological Systems Modelling (0.50)
- BME362 - Biomedical Engineering Design Workshop 1 (0.50)
- BME381 - Biomedical Engineering Ethics (0.50)
- BME384 - Biomedical Transport: Biofluids and Mass Transfer (0.50)
-
- Complete 1 approved elective
-
- 4A Term
-
- Complete all of the following
- Complete all the following:
- BME364 - Engineering Biomedical Economics (0.50)
- BME400 - Work-Term Presentation (0.13)
- BME461 - Biomedical Engineering Design Workshop 2 (0.50)
-
- Complete 3 approved electives
-
- 4B Term

- ○
  - ○ Complete all of the following
  - ○ Complete all the following:
  - ○ BME462 - Biomedical Engineering Design Workshop 3 (0.50)
  - ○
  - ○ Complete 4 approved electives
  - ○ ~~SYDE111 - Calculus 1 (0.50)~~
  - ○ ~~SYDE113 - Elementary Engineering Mathematics (0.25)~~
  - ○ ~~BME102 - Seminar (0.00)~~
  - ○ ~~SYDE112 - Calculus 2 (0.50)~~
  - ○ ~~SYDE114 - Matrices and Linear Systems (0.25)~~
  - ○ ~~BME201 - Seminar (0.00)~~
  - ○ ~~BME281L - Mechanics of Deformable Solids Laboratory (0.25)~~
  - ○ ~~BME282 - Materials Science for Biomedical Engineers (0.50)~~
  - ○ ~~SYDE211 - Calculus 3 (0.50)~~
  - ○ ~~BME202 - Seminar (0.00)~~
  - ○ ~~BME301 - Seminar (0.00)~~
  - ○ ~~BME393 - Digital Systems (0.50)~~
  - ○ ~~BME393L - Digital Systems Laboratory (0.25)~~
  - ○ ~~BME302 - Seminar (0.00)~~
  - ○ ~~BME386 - The Physics of Medical Imaging (0.50)~~
  - ○ ~~BME401 - Seminar (0.00)~~
  - ○ ~~BME411 - Optimization and Numerical Methods (0.50)~~
  - ○ ~~BME402 - Seminar (0.00)~~

1. Technical Electives List
   - ○
   - ○ **Complete a total of seven technical electives.**
   - ○
   - ○ **List 1**
   - ○
   - ○ **Complete 1 of the following:**
   - ○ **BME386 - The Physics of Medical Imaging (0.50)**
   - ○ **BME393 - Digital Systems (0.50)**
   - ○
   - ○ **List 2**
   - ○
   - ○ **Complete 1 of the following:**
   - ○ BME499 - Elective Biomedical Research Project (0.50)
   - ○ **Course Not Found**
   - ○ BME540 - Fundamentals in Neural and Rehabilitation Engineering (0.50)
   - ○ BME544 - Biomedical Measurement and Signal Processing (0.50)
   - ○ BME550 - Sports Engineering (0.50)
   - ○ BME551 - Biomechanics of Human Movement (0.50)
   - ○ BME552 - Computational Biomechanics (0.50)
   - ○ BME553 - Introductory Mechanics of Biomedical and Biological Materials (0.50)
   - ○ BME561 - Biomaterials and Tissue Engineering (0.50)
   - ○ BME564 - Biocompatibility and Biomedical Design (0.50)
   - ○ BME581 - Ultrasound in Medicine and Biology (0.50)
   - ○ BME582 - Biomedical Optics (0.50)
   - ○ BME587 - Special Topics in Biomedical Signals (0.50)
   - ○ BME588 - Special Topics in Biomechanics (0.50)
   - ○ BME589 - Special Topics in Biomedical Devices (0.50)
   - ○ **BME599 - Special Topics in Biomedical Engineering (0.50)**
   - ○
   - ○ **List 3**
   - ○
   - ○ **Complete 1 course (at least 0.5 units) of BIOL, CHEM, HLTH, or KIN courses at the 200-level or above**
   - ○
   - ○ **List 4**
   - ○
   - ○ **Complete 1 of the following:**
   - ○ **AMATH382 - Computational Modelling of Cellular Systems (0.50)**
   - ○ **AMATH451 - Introduction to Dynamical Systems (0.50)**

- CHE361 - Bioprocess Engineering (0.50)
- CHE541 - Introduction to Polymer Science and Properties (0.50)
- CHE565 - Synthetic Biology Project Design (0.50)
- CIVE460 - Engineering Biomechanics (0.50)
- ECE417 - Image Processing (0.50)
- ECE457C - Reinforcement Learning (0.50)
- ME362 - Fluid Mechanics 2 (0.50)
- ME435 - Industrial Metallurgy (0.50)
- ME526 - Fatigue and Fracture Analysis (0.50)
- ME531 - Physical Metallurgy Applied to Manufacturing (0.50)
- ME533 - Non-Metallic and Composite Materials (0.50)
- ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
- ME559 - Finite Element Methods (0.50)
- ME574 - Engineering Biomechanics (0.50)
- ME598 - Special Topics in Mechanical Engineering (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MTE325 - Microprocessor Systems and Interfacing for Mechatronics Engineering (0.50)
- NE222 - Organic Chemistry for Nanotechnology Engineers (0.50)
- NE466 - Tactile Sensors and Transducers (0.50)
- NE481 - Nanomedicine and Nanobiotechnology (0.50)
- NE486 - Biosensors (0.50)
- NE487 - Microfluidic and Nanobiotechnological Systems (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE537 - Artificial Life: Biology and Computation (0.50)
- SYDE542 - Interface Design (0.50)
- SYDE543 - Cognitive Ergonomics (0.50)
- SYDE548 - User Centred Design Methods (0.50)
- SYDE552 - Computational Neuroscience (0.50)
- SYDE553 - Advanced Dynamics (0.50)
- SYDE556 - Simulating Neurobiological Systems (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE575 - Image Processing (0.50)
- SYDE577 - Deep Learning (0.50)
- SYDE586 - Material Selection for Design (0.50)
-
- **List 5**
-
- **Complete 3 additional courses from the above lists, including no more than 2 from List 3.**
- Complete 6 of the following:
- ECE224 - Embedded Microprocessor Systems (0.50)
- ECE252 - Systems Programming and Concurrency (0.50)
- ECE350 - Real-Time Operating Systems (0.50)
- ECE356 - Database Systems (0.50)
- ECE358 - Computer Networks (0.50)
- ECE406 - Algorithm Design and Analysis (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE484 - Digital Control Applications (0.50)
- MSE343 - Human-Computer Interaction (0.50)
- MSE432 - Production and Service Operations Management (0.50)
- MSE555 - Scheduling: Theory and Practice (0.50)
- MTE241 - Introduction to Computer Structures and Real-Time Systems (0.50)
- MTE544 - Autonomous Mobile Robots (0.50)
- MTE545 - Introduction to MEMS Fabrication (0.50)
- SYDE322 - Software Design (0.50)
- SYDE334 - Applied Statistics (0.50)
- SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)
- SYDE532 - Introduction to Complex Systems (0.50)
- SYDE533 - Conflict Resolution (0.50)
- SYDE599 - Special Topics in Systems Design Engineering (0.50)

Are there cross-listed courses listed in requirements?	Cross-Listings Options	Proposed
Yes,	Some cross-listings not to be counted,	**Removing Cross-Lists**

ME540 (CL with BME540) and BIOL487 (CL with SYDE552) removed at Feb 2024 SUC. BIOL349 (CL with CHE565) to explicitly prevent the cross-listing to work in the spirit of our science course listing, which should be more about science than engineering science - Feb 2026 SUC.

Proposed

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Biomedical Engineering Program Director.
2. If no specialization is taken, students must take BME386, BME393, and two courses from Technical Elective List 2.

Existing

Additional Constraints

1. There are a variety of technical electives with biomedical content, but students can also take technical electives on other topics. Only courses from Engineering will contribute towards CEAB hours in the categories of "Engineering Science" and "Engineering Design".
2. To accommodate an elective reduced load, BME213, BME282, and BME384 may be taken out of sequence.
3. Exceptions to the requirements and electives listed above require prior approval of the Director, Biomedical Engineering program.

Notes

- BME342 may be taken in 3A, 3B, or 4A.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one of five available specializations.

1. Biomaterials & Tissues Specialization,
    - **Not Found**
    - **, Medical Artificial Intelligence Specialization, Medical Devices Specialization, Neural Engineering Specialization, or Sports Engineering Specialization**

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Chemical Engineering - Chemical Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-06-09

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

The removal of PD course requirement will apply to all current students.

The removal of a CSE from the degree requirements will be applied to all students currently registered in the program/plan.

The addition of CHE523 an approved technical elective will be applied to all students currently registered in the program/plan.

We will inform students of these changes during our scheduled Seminar hour, on our Seminar LEARN page and through the degree checklist we have prepared for the CHE students.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

Currently CHE101 includes the lab and lecture component of the course. While they are identified as one course in the undergraduate calendar, the course and the lab are run separately (there are even two separate outlines published). Separating the courses makes things easier logistically and more accurately reflects the workload for this course. Note while it appears we are adding an extra course, the intention is to keep the workload for the students the same. There is no change to the number of AUs. We have revised the description for CHE101 and would like to add the new course CHE191 to separate the lecture and lab components. (Motion passed at Feb. 10, 2025 department meeting)

There is significant redundancy in the physical chemistry content in our curriculum. We are proposing to remove CHE231 from the curriculum. Some of the content previously in CHE231 will now be in CHE230. Some of the content previously in CHE230 that was covered elsewhere has been removed. Removing a course from the curriculum reduces the student workload and provides more flexibility. The CHE231 spot in the curriculum will be replaced by a CSE. Note we are not adding an additional CSE. Students would have the option to take the CSE in 2B or to wait and take this CSE in 3B, 4A or 4B. (Motion passed at April 14, 2025 department meeting)

We are removing a CSE from the program. CHE students currently take 1 communication course, MSE261, 1 List A CSE, 1 List C CSE and 2 CSE from List A,C or D. The CS AU are well above the threshold required for accreditation. To reduce the student workload and increase flexibility we propose to remove 1 CSE. In 4th year a student will typically need to complete 5 electives. We recommend that a student complete 2 electives in 4A and 3 electives in 4B. (Motion passed at May 12, 2025 department meeting)

We are replacing the communication elective with ENGL191.This change will allow us to work with the English department to create a course that better integrates into our first-year curriculum. Currently students may choose between courses focused on oral and written communication skills, while ultimately they need to develop both. Additionally this provides us with an opportunity to collect data related to the Communication Graduate Attribute. (Motion passed at June 9 department meeting)

CHE523 is a new course that we would like to add to our list of technical electives. (Motion passed at Sept. 15, 2025 department meeting)

CHE380 is a new course that will replace MSE261 in our curriculum. Currently students take a course focused solely on economics with minimal connection to chemical engineering. Environmental and safety considerations are equally important and should be considered alongside economics when considering chemical engineering processes. (Motion passed at Sept. 15, 2025 department meeting)

Consultations (Departmental)

Megan Selinger (Associate Chair, Undergraduate Communication Requirement) and George Lamont (Director, Undergraduate Communication Requirement) attended the April CHE URC meeting. They are in support of this

proposed change.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Chemical Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Proposed

Graduation Requirements

- Complete a total of 22.88 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete seven approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - One course from List A, C, or D.
    - Complete four courses from the Technical Electives (TEs) list.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 23.63 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete eight approved electives:
    - Complete four Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - Two courses from List A, C, or D.
    - Complete four courses from the Technical Electives (TEs) list.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD11, PD19, PD20, and two additional PD courses.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

1. 1A Term
   -
   - Complete all the following:
   - CHE100 - Chemical Engineering Concepts 1 (0.50)
   - CHE102 - Chemistry for Engineers (0.50)
   - CHE120 - Computer Literacy and Programming for Chemical Engineers (0.50)
   - CHE180 - Chemical Engineering Design Studio 1 (0.50)
   - MATH115 - Linear Algebra for Engineering (0.50)
   - MATH116 - Calculus 1 for Engineering (0.50)
   -
   - 1B Term
   -
   - Complete all of the following
   - Complete all the following:
   - CHE101 - Chemical Engineering Concepts 2 (0.50)
   - CHE161 - Engineering Biology (0.50)
   - CHE181 - Chemical Engineering Design Studio 2 (0.50)
   - **Course Not Found**
   - MATH118 - Calculus 2 for Engineering (0.50)
   - PHYS115 - Mechanics (0.50)
   -
   - Complete 1 of the following:
   - **COMMST191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)**
   - **ENGL191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)**
   -
   - 2A Term
   -
   - Complete all the following:
   - CHE200 - Equilibrium Stage Operations (0.50)
   - CHE220 - Process Data Analysis (0.50)
   - CHE230 - Physical Chemistry 1 (0.50)
   - **CHE290 - Chemical Engineering Laboratory 1 (0.25)**
   - CHEM262 - Organic Chemistry for Engineering (0.50)
   - CHEM262L - Organic Chemistry Laboratory for Engineering Students (0.25)
   - MATH217 - Calculus 3 for Chemical Engineering (0.50)
   -
   - 2B Term
   -
   - Complete all of the following
   - Complete all the following:
   - CHE211 - Fluid Mechanics (0.50)

- CHE225 - Strategies for Process Improvement and Product Development (0.50)
- CHE241 - Materials Science and Engineering (0.50)
- **CHE291 - Chemical Engineering Laboratory 2 (0.25)**
- MATH218 - Differential Equations for Engineers (0.50)
-
- Complete 1 approved elective
-
- 3A Term
-
- Complete all the following:
- CHE312 - Mathematics of Heat and Mass Transfer (0.50)
- CHE314 - Chemical Reaction Engineering (0.50)
- CHE322 - Numerical Methods for Process Analysis and Design (0.50)
- CHE330 - Chemical Engineering Thermodynamics (0.50)
- **Course Not Found**
- **CHE390 - Chemical Engineering Laboratory 3 (0.50)**
-
- 3B Term
-
- Complete all of the following
- Complete all the following:
- CHE313 - Applications of Heat and Mass Transfer (0.50)
- CHE331 - Electrochemical Engineering (0.50)
- CHE341 - Introduction to Process Control (0.50)
- CHE361 - Bioprocess Engineering (0.50)
- CHE383 - Chemical Engineering Design Workshop (0.25)
-
- Complete 1 approved elective
-
- 4A Term
-
- Complete all of the following
- Complete all the following:
- CHE450 - Technical Work-Term Report (0.13)
- CHE480 - Process Analysis and Design (0.50)
- **CHE490 - Chemical Engineering Laboratory 4 (0.50)**
-
- Complete 1 of the following:
- CHE482 - Group Design Project (0.50)
- GENE403 - Interdisciplinary Design Project 1 (0.50)
-
- **Complete 2 approved electives**
-
- 4B Term
-
- Complete all of the following
- Complete all the following:
- **CHE491 - Chemical Engineering Laboratory 5 (0.50)**
-
- Complete 1 of the following:
- CHE483 - Group Design Project and Symposium (0.50)
- GENE404 - Interdisciplinary Design Project 2 (0.50)
-
- Complete 3 approved electives
- ~~COMMST100 - Interpersonal Communication (0.50)~~
- ~~COMMST223 - Public Speaking (0.50)~~
- ~~EMLS101R - Oral Communications for Academic Purposes (0.50)~~
- ~~EMLS102R - Clear Communication in English Writing (0.50)~~
- ~~EMLS129R - Written Academic English (0.50)~~
- ~~ENGL109 - Introduction to Academic Writing (0.50)~~
- ~~ENGL129R - Written Academic English (0.50)~~
- ~~CHE290 - Chemical Engineering Lab 1 (0.25)~~
- ~~CHE231 - Physical Chemistry 2 (0.50)~~
- ~~CHE291 - Chemical Engineering Lab 2 (0.25)~~
- ~~CHE390 - Chemical Engineering Lab 3 (0.50)~~
- ~~MSE261 - Engineering Economics: Financial Management for Engineers (0.50)~~
- ~~CHE490 - Chemical Engineering Lab 4 (0.50)~~
- ~~CHE491 - Chemical Engineering Lab 5 (0.50)~~
- ~~Complete 4 approved electives~~

1. Ethics List
   -
     - Complete 1 of the following:
     - ARBUS202 - Professional and Business Ethics (0.50)
     - PD22 - Professionalism and Ethics in Engineering Practice (0.50)
     - PHIL215 - Professional and Business Ethics (0.50)
     - PHIL219J - Practical Ethics (0.50)
     - PHIL315 - Ethics and the Engineering Profession (0.50)
     -
     - Technical Electives List
     -
     - Complete a total of 4 Technical Electives.
     -
     - List 1
     -
     - Complete 2 of the following:
     - CHE500 - Special Topics in Chemical Engineering (0.50)
     - CHE514 - Fundamentals of Petroleum Production (0.50)
     - CHE516 - Energy Systems Engineering (0.50)
     - CHE520 - Process Modelling and Simulation (0.50)
     - CHE521 - Process Optimization (0.50)
     - CHE522 - Advanced Process Dynamics and Control (0.50)
     - **Course Not Found**
     - CHE524 - Process Control Laboratory (0.50)
     - CHE541 - Introduction to Polymer Science and Properties (0.50)
     - CHE543 - Polymer Production: Polymer Reaction Engineering (0.50)
     - CHE560 - Nanomedicine and Nanobiotechnology (0.50)
     - CHE561 - Biomaterials and Tissue Engineering (0.50)
     - CHE562 - Advanced Bioprocess Engineering (0.50)
     - CHE564 - Food Process Engineering (0.50)
     - CHE565 - Synthetic Biology Project Design (0.50)
     - CHE571 - Industrial Ecology (0.50)
     - CHE572 - Air Pollution Control (0.50)
     - CHE574 - Industrial Wastewater Pollution Control (0.50)
     -
     - List 2
     -
     - Complete all of the following
     - Complete 2 additional courses from List 1 or List 2. See Additional Constraints.
     - Choose any of the following:
     - CHE499 - Elective Research Project (0.50)
     - EARTH456 - Numerical Methods in Hydrogeology (0.50)
     - EARTH458 - Physical Hydrogeology (0.50)
     - EARTH459 - Chemical Hydrogeology (0.50)
     - ENVE376 - Biological Processes (0.50)
     - ENVE573 - Contaminant Transport (0.50)
     - ENVE577 - Engineering for Solid Waste Management (0.50)
     - ME362 - Fluid Mechanics 2 (0.50)
     - ME435 - Industrial Metallurgy (0.50)
     - ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
     - ME459 - Energy Conversion (0.50)
     - ME531 - Physical Metallurgy Applied to Manufacturing (0.50)
     - ME533 - Non-Metallic and Composite Materials (0.50)
     - ME559 - Finite Element Methods (0.50)
     - ME566 - Computational Fluid Dynamics for Engineering Design (0.50)
     - ME571 - Clean Air Technologies (0.50)
     - MSE332 - Deterministic Optimization Models and Methods (0.50)
     - MSE431 - Stochastic Models and Methods (0.50)
     - MSE432 - Production and Service Operations Management (0.50)
     - MSE551 - Quality Management and Control (0.50)
     - NE352 - Surfaces and Interfaces (0.50)
     - NE451 - Simulation Methods (0.50)
     - SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

Some cross-listings not to be counted,

Removing Cross-Lists

NE481 (CL with CHE560) not to be listed in TE List 2 (per Nov 2023 SUC); BIOL349 (CL with CHE565) not to be listed in TE List 2 (per Feb 2024 SUC); NE488 (CL with CHE561) not to be listed in TE List 2 (per Feb 2024 SUC)

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. Exceptions to the requirements and electives listed above require prior approval of the Chemical Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major

Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one of three available specializations.

Specializations List

Chemical Process Modelling, Optimization & Control Specialization, Energy & Environmental Systems & Processes Specialization, or Materials & Manufacturing Processes Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
Yes,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Civil Engineering - Civil Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove one PD requirement retroactively for all current students.

Remove wkrpt 400 retroactively for all current students.

Student communication will state the following:

"If you are an active student you are exempt from wkrpt 400. If you complete PD 11 you are also exempt with wkrpt 200"

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet

graduation requirements. If students choose to take a 5*th* PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

wkrpt 200 and wkrpt 400 Rationale:

In their current form, work term reports have not helped students develop their technical writing skills and marking has been highly inconsistent. Reduced workload for both the students and faculty as well as the introduction of a peer review process will help alleviate these issues. This change also aligns with other engineering programs which have removed work term reports.

Adding PD 11 required course change rational:

WKRPT course requirements are being changed for students in CIVE/ENVE/GEOE/AE. PD 11 (Processes for Technical Report Writing) will replace WKRPT 200 and WKRPT 400 will be removed. WKRPT 300 will remain. We are requesting these changes take effect in Fall 2025 or later.

Adding AE 450 as a TE list 1. Students are allowed to take the course as part of the Building Science Specialization but it is not available in the TE lists. It has enough design content to count as TE list 1.

Switching terms for CIVE 303 and CIVE 311(the equivalent of CIVE 310) Rational:

- Exposure to engineering/member design earlier
- 303 is typically the hardest course in the hardest term – could have good impact on students by moving back a term
- Could have positive impact in outcomes – students may have better grasp of moment diagrams/behaviour of structures if they see application in member design in CIVE/AE311

Changing total number of credits required for the program from 21.30 to 20.75 due to the following changes:

- Reducing CIVE100 from 0.8 to 0.75
- Reducing CIVE 105 from 0.75 to 0.5
- Replacing CIVE 310 (0.75 credits) with CIVE 311 (0.5 credits)
- All led to a total program reduction of 0.55 units

Adding AE/ENVE585, ENVE 481 to TE List 1. Adding ENVE417/418 to TE List 2. *Approval date: October 16, 2025

- AE/ENVE 585 - Air Quality Engineering and Impacts is a new course that have been previously added to the Env E TE's List 1 and civil students are showing interest in it

- ENVE 481 - Open Channel Hydraulics , just added to TE List 1 for the Env E program but also potential interest for civil students. (commonly taken by CIVEs because it is Hydraulics, which is classically a Civil engineering field and deals a lot with fluid stresses and conservation law-based equations on fluid flow. Also has units on culvert and bridge hydraulic design and risk of scour around embankments/piers) .

- ENVE 417 and ENVE 418 have also just been added to the TE list 2 for the ENVE students but has also potential interest within the civil engineering students

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Civil Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Graduation Requirements

- Complete a total of 20.75 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 11 approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - One course from List A, C, or D.
    - Complete one course from the Natural Science list.
    - Complete seven courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 21.30 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.

- Complete 11 approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
        - One course from List A.
        - One course from List C.
        - One course from List A, C, or D.
    - Complete one course from the Natural Science list.
    - Complete seven courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD 11, PD19, PD20 and one additional PD course.
- Complete a total of five credited work terms.
- Complete one WKRPT course: WKRPT300 (3B).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses: WKRPT200 (3A), WKRPT300 (3B), WKRPT400 (4A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

1. 1A Term
    -
    - Complete all of the following
    - Complete all the following:
    - CHE102 - Chemistry for Engineers (0.50)
    - CIVE100 - Civil Engineering Concepts (0.80)
    - CIVE104 - Mechanics 1 (0.25)
    - MATH116 - Calculus 1 for Engineering (0.50)
    -
    - Complete 1 of the following:
    - CIVE115 - Linear Algebra (0.25)
    - ENVE115 - Linear Algebra (0.25)
    - GEOE115 - Linear Algebra (0.25)
    -
    - Complete 1 of the following:
    - COMMST191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
    - ENGL191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
    -
    - 1B Term
    -
    - Complete all of the following
    - Complete all the following:
    - CIVE105 - Mechanics 2 (0.75)
    - CIVE199 - Seminar (0.00)
    - MATH118 - Calculus 2 for Engineering (0.50)
    -
    - Complete 1 of the following:
    - AE123 - Electrical Circuits and Instrumentation (0.50)

- CIVE123 - Electrical Circuits and Instrumentation (0.50)
- ENVE123 - Electrical Circuits and Instrumentation (0.50)
- GEOE123 - Electrical Circuits and Instrumentation (0.50)
-
- Complete 1 of the following:
- CIVE121 - Computational Methods (0.50)
- ENVE121 - Computational Methods (0.50)
- GEOE121 - Computational Methods (0.50)
-
- Complete 1 of the following:
- CIVE153 - Earth Engineering (0.50)
- ENVE153 - Earth Engineering (0.50)
- GEOE153 - Earth Engineering (0.50)
-
- 2A Term
-
- Complete all of the following
- Complete all the following:
- CIVE204 - Solid Mechanics 1 (0.50)
- CIVE224 - Probability and Statistics (0.50)
- CIVE241 - Transport Principles and Applications (0.50)
- CIVE265 - Structure and Properties of Materials (0.50)
- CIVE298 - Seminar (0.00)
-
- Complete 1 of the following:
- CIVE221 - Advanced Calculus (0.50)
- GEOE221 - Advanced Calculus (0.50)
-
- 2B Term
-
- Complete all of the following
- Complete all the following:
- CIVE205 - Solid Mechanics 2 (0.50)
- CIVE222 - Differential Equations (0.50)
- CIVE230 - Engineering and Sustainable Development (0.50)
- CIVE280 - Fluid Mechanics (0.50)
- CIVE299 - Seminar (0.00)
-
- Complete 1 of the following:
- AE392 - Economics and Life Cycle Cost Analysis (0.50)
- CIVE392 - Economics and Life Cycle Cost Analysis (0.50)
- ENVE392 - Economics and Life Cycle Cost Analysis (0.50)
- GEOE392 - Economics and Life Cycle Cost Analysis (0.50)
-
- 3A Term
-
- Complete all of the following
- Complete all the following:
- CIVE332 - Civil Systems and Project Management (0.50)
- CIVE341 - Transportation Engineering Applications (0.50)
- CIVE398 - Seminar (0.00)
-
- Complete 1 of the following:
- **Course Not Found**
- **Course Not Found**
-
- Complete 1 of the following:
- CIVE353 - Geotechnical Engineering 1 (0.50)
- GEOE353 - Geotechnical Engineering 1 (0.50)
-
- Complete 1 of the following:
- CIVE382 - Hydrology and Open Channel Flow (0.50)
- ENVE382 - Hydrology and Open Channel Flow (0.50)
-
- Complete 1 approved elective
-
- 3B Term
-
- Complete all of the following

- Complete all the following:
- CIVE303 - Structural Analysis (0.50)
- CIVE375 - Environmental Engineering Principles (0.50)
- CIVE399 - Seminar (0.00)
-
- Complete 3 approved electives
-
- 4A Term
-
- Complete all of the following
- Complete all the following:
- CIVE400 - Civil Engineering Design Project 1 (0.50)
- CIVE491 - Engineering Law and Ethics (0.50)
- CIVE498 - Seminar (0.00)
-
- Complete 3 approved electives
-
- 4B Term
-
- Complete all of the following
- Complete all the following:
- CIVE401 - Civil Engineering Design Project 2 (0.50)
- CIVE499 - Seminar (0.00)
-
- Complete 4 approved electives
- ~~CIVE310 - Introduction to Structural Design (0.75)~~

1. Natural Science List
-
- Complete 1 of the following
- Complete 1 of the following:
- BIOL130 - Introductory Cell Biology (0.50)
- BIOL150 - Organismal and Evolutionary Ecology (0.50)
- BIOL240 - Fundamentals of Microbiology (0.50)
- BIOL273 - Principles of Human Physiology 1 (0.50)
- CHE161 - Engineering Biology (0.50)
- CHEM209 - Introductory Spectroscopy and Structure (0.50)
- CHEM262 - Organic Chemistry for Engineering (0.50)
- EARTH221 - Introductory Geochemistry (0.50)
- EARTH270 - Disasters and Natural Hazards (0.50)
- EARTH281 - Geological Impacts on Human Health (0.50)
- ENVS200 - Field Ecology (0.50)
- GEOG357 - River Management (0.50)
- SCI206 - The Physics of How Things Work (0.50)
- SCI207 - Physics, the Universe, and Everything (0.50)
- SCI238 - Introductory Astronomy (0.50)
- SCI250 - Environmental Geology (0.50)
-
- Complete all the following:
- KIN100 - Regional Human Anatomy (0.50)
- KIN100L - Regional Human Anatomy Laboratory (0.25)
-
- Technical Electives List
-
- Complete a total of 7 Technical Electives.
-
- List 1
-
- Complete 3 of the following:
- **AE450 - Building Service Systems (0.50)**
- AE572 - Building Energy Analysis (0.50)
- AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- **AE585 - Air Quality Engineering and Impacts (0.50)**
- CIVE343 - Traffic Simulation Modelling and Applications (0.50)
- CIVE354 - Geotechnical Engineering 2 (0.50)

- CIVE413 - Structural Steel Design (0.50)
  - CIVE414 - Structural Concrete Design (0.50)
  - CIVE415 - Structural System Design (0.50)
  - CIVE460 - Engineering Biomechanics (0.50)
  - CIVE495 - Design Intensive Special Topics in Civil Engineering (0.50)
  - CIVE512 - Rehabilitation of Structures (0.50)
  - CIVE517 - Structural Wood Design (0.50)
  - CIVE542 - Pavement Structural Design (0.50)
  - CIVE554 - Geotechnical Engineering 3 (0.50)
  - CIVE583 - Design of Urban Water Systems (0.50)
  - CIVE596 - Construction Engineering (0.50)
  - EARTH438 - Engineering Geology (0.50)
  - **ENVE481 - Open Channel Hydraulics (0.50)**
  - ENVE577 - Engineering for Solid Waste Management (0.50)
  - ENVE583 - Design of Urban Water Systems (0.50)
  - **ENVE585 - Air Quality Engineering and Impacts (0.50)**
  - GEOE354 - Geotechnical Engineering 2 (0.50)
  - GEOE554 - Geotechnical Engineering 3 (0.50)
  - ME572 - Building Energy Analysis (0.50)
  - ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
  - ME574 - Engineering Biomechanics (0.50)
  - SYDE533 - Conflict Resolution (0.50)
  -
  - List 2
  -
  - Complete all of the following
  - **The remaining 4 Technical Electives can be from List 1 or 2.**
  - Choose any of the following:
  - BIOL462 - Applied Wetland Science (0.50)
  - CIVE306 - Solid Mechanics 3 (0.50)
  - CIVE422 - Finite Element Analysis (0.50)
  - CIVE440 - Transit Planning and Operations (0.50)
  - CIVE484 - Physical Infrastructure Planning (0.50)
  - CIVE497 - Special Topics in Civil Engineering (0.50)
  - CIVE505 - Structural Dynamics (0.50)
  - CIVE507 - Building Science and Technology (0.50)
  - EARTH444 - Applied Wetland Science (0.50)
  - EARTH458 - Physical Hydrogeology (0.50)
  - ENVE277 - Air Quality Engineering (0.50)
  - ENVE279 - Energy and the Environment (0.50)
  - ENVE376 - Biological Processes (0.50)
  - ENVE383 - Hydrologic Modelling (0.50)
  - **Course Not Found**
  - **Course Not Found**
  - ENVE573 - Contaminant Transport (0.50)
  - GEOG209 - Hydroclimatology (0.50)
  - GEOG305 - Fluvial Geomorphology (0.50)
  - GEOG371 - Advanced Remote Sensing Techniques (0.50)
  - GEOG381 - Advanced Geographic Information Systems (0.50)
  - GEOG453 - Urban Stormwater Management (0.50)
  - ME559 - Finite Element Methods (0.50)
  - PLAN381 - Advanced Geographic Information Systems (0.50)
  - PLAN416 - Modelling the City (0.50)
  - PLAN453 - Urban Stormwater Management (0.50)
  - PLAN477 - Freight Planning and Policy (0.50)
  - PLAN478 - Transit Planning and Operations (0.50)
  - PLAN483 - Land Development Planning (0.50)
  - PLAN484 - Physical Infrastructure Planning (0.50)
  - ~~The remaining 4 Technical Electives can be from List 1 or 2. See Additional Constraints.~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one (or more) of five available specializations.

Specializations List

Building Science Specialization, Geotechnical Specialization, Structural Specialization, Transportation Specialization, or CIVE-Water Resources Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Computer Engineering - Computer Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2025	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-25

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?

Yes,

Impact on Existing Students

Number of required PD courses is being reduced from 5 to 4.

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Reduce the total number of required PD courses from 5 to 4 as per Fo E guidance.

Adding 3 new ECE courses to TE list: ECE 407, ECE 457D and ECE 487.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Electrical and Computer Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Computer Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
Yes,

List of Invalid Combinations

Computing Option

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Graduation Requirements

- Complete a total of 21.25 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete 13 approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - Two courses from List C.
      - One course from List A, C, or D.
    - Complete two courses from the Natural Science list.
    - Complete eight courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD19, PD20, and two additional PD courses.
- Complete a total of five credited work terms.
- See Bachelor of [Applied Science co-operative education program requirements](#).

Required Courses (Term by Term)

1A Term

- Complete all of the following
- Complete all the following:
    - ECE105 - Classical Mechanics (0.50)
    - ECE150 - Fundamentals of Programming (0.50)
    - ECE190 - Engineering Profession and Practice (0.25)
    - ECE198 - Project Studio (0.25)
    - MATH115 - Linear Algebra for Engineering (0.50)
    - MATH117 - Calculus 1 for Engineering (0.50)
- Complete 1 of the following:
    - COMMST192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
    - ENGL192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
- 1B Term
- Complete all the following:
- ECE102 - Information Session (0.00)
- ECE106 - Electricity and Magnetism (0.50)
- ECE108 - Discrete Mathematics and Logic 1 (0.50)
- ECE124 - Digital Circuits and Systems (0.50)
- ECE140 - Linear Circuits (0.50)
- ECE192 - Engineering Economics and Impact on Society (0.25)
- MATH119 - Calculus 2 for Engineering (0.50)
- 2A Term
- Complete all of the following
- Complete all the following:
    - ECE109 - Materials Chemistry for Engineers (0.25)
    - ECE201 - Information Session (0.00)
    - ECE204 - Numerical Methods (0.50)
    - ECE222 - Digital Computers (0.50)
    - ECE240 - Electronic Circuits 1 (0.50)
    - ECE250 - Algorithms and Data Structures (0.50)
- Complete 1 of the following:
    - ECE205 - Advanced Calculus 1 for Electrical and Computer Engineers (0.50)
    - MATH211 - Advanced Calculus 1 for Electrical and Computer Engineers (0.50)
- 2B Term
- Complete all the following:
- ECE202 - Information Session (0.00)
- ECE203 - Probability Theory and Statistics 1 (0.50)
- ECE207 - Signals and Systems (0.50)
- ECE208 - Discrete Mathematics and Logic 2 (0.50)
- ECE224 - Embedded Microprocessor Systems (0.50)
- ECE252 - Systems Programming and Concurrency (0.50)
- ECE298 - Instrumentation and Prototyping Laboratory (0.25)
- 3A Term

- Complete all of the following
- Complete all the following:
    - ECE301 - Information Session (0.00)
    - ECE318 - Communication Systems (0.50)
    - ECE327 - Digital Hardware Systems (0.50)
    - ECE350 - Real-Time Operating Systems (0.50)
    - ECE380 - Analog Control Systems (0.50)
- Complete 1 approved elective
- 3B Term
- Complete all of the following
- Complete all the following:
    - ECE302 - Information Session (0.00)
    - ECE307 - Probability Theory and Statistics 2 (0.50)
- Complete 2 Technical Electives from List 1
- Complete 1 Technical Elective from List 1 or List 2
- Complete 1 approved elective
- 4A Term
- Complete all of the following
- Complete all the following:
    - ECE401 - Information Session (0.00)
- Complete 1 of the following:
    - ECE498A - Engineering Design Project (0.50)
    - GENE403 - Interdisciplinary Design Project 1 (0.50)
- Complete 4 approved electives
- 4B Term
- Complete all of the following
- Complete all the following:
    - ECE402 - Information Session (0.00)
- Complete 1 of the following:
    - ECE498B - Engineering Design Project (0.50)
    - GENE404 - Interdisciplinary Design Project 2 (0.50)
- Complete 4 approved electives

1. Ethics List
    -
    - Complete 1 of the following:
    - ARBUS202 - Professional and Business Ethics (0.50)
    - PD22 - Professionalism and Ethics in Engineering Practice (0.50)
    - PHIL215 - Professional and Business Ethics (0.50)
    - PHIL219J - Practical Ethics (0.50)
    - PHIL315 - Ethics and the Engineering Profession (0.50)
    -
    - Natural Science List
    -
    - Complete all of the following
    - Complete a total of 2 lecture courses (see Additional Constraints)
    - Choose any of the following:
    - BIOL110 - Biodiversity, Biomes, and Evolution (0.50)
    - BIOL130 - Introductory Cell Biology (0.50)
    - BIOL130L - Cell Biology Laboratory (0.25)
    - BIOL150 - Organismal and Evolutionary Ecology (0.50)
    - BIOL165 - Diversity of Life (0.50)
    - BIOL211 - Introductory Vertebrate Zoology (0.50)
    - BIOL220 - Introduction to Plant Structure and Function (0.50)
    - BIOL239 - Genetics (0.50)
    - BIOL240 - Fundamentals of Microbiology (0.50)
    - BIOL240L - Microbiology Laboratory (0.25)
    - BIOL241 - Introduction to Applied Microbiology (0.50)
    - BIOL273 - Principles of Human Physiology 1 (0.50)
    - BIOL280 - Introduction to Biophysics (0.50)
    - BIOL373 - Principles of Human Physiology 2 (0.50)
    - BIOL373L - Human Physiology Laboratory (0.25)
    - CHE102 - Chemistry for Engineers (0.50)
    - CHE161 - Engineering Biology (0.50)
    - CHEM123 - General Chemistry 2 (0.50)

- CHEM123L - General Chemistry Laboratory 2 (0.25)
- CHEM209 - Introductory Spectroscopy and Structure (0.50)
- CHEM237 - Introductory Biochemistry (0.50)
- CHEM237L - Introductory Biochemistry Laboratory (0.25)
- CHEM254 - Introductory Chemical Thermodynamics (0.50)
- CHEM262 - Organic Chemistry for Engineering (0.50)
- CHEM262L - Organic Chemistry Laboratory for Engineering Students (0.25)
- CHEM266 - Basic Organic Chemistry 1 (0.50)
- CHEM356 - Introductory Quantum Mechanics (0.50)
- EARTH121 - Introductory Earth Sciences (0.50)
- EARTH122 - Introductory Environmental Sciences (0.50)
- EARTH123 - Introductory Hydrology (0.50)
- EARTH221 - Introductory Geochemistry (0.50)
- EARTH270 - Disasters and Natural Hazards (0.50)
- EARTH281 - Geological Impacts on Human Health (0.50)
- ECE231 - Semiconductor Physics and Devices (0.50)
- ECE305 - Introduction to Quantum Mechanics (0.50)
- ECE403 - Thermal Physics (0.50)
- ECE404 - Geometrical and Physical Optics (0.50)
- ENVE275 - Aquatic Chemistry (0.50)
- ENVS200 - Field Ecology (0.50)
- NE222 - Organic Chemistry for Nanotechnology Engineers (0.50)
- PHYS124 - Modern Physics (0.50)
- PHYS233 - Introduction to Quantum Mechanics (0.50)
- PHYS234 - Quantum Physics 1 (0.50)
- PHYS263 - Classical Mechanics and Special Relativity (0.50)
- PHYS275 - Planets (0.50)
- PHYS280 - Introduction to Biophysics (0.50)
- PHYS334 - Quantum Physics 2 (0.50)
- PHYS335 - Condensed Matter Physics (0.50)
- PHYS375 - Stars (0.50)
- PHYS380 - Molecular and Cellular Biophysics (0.50)
- PSYCH207 - Cognitive Processes (0.50)
- PSYCH261 - Physiological Psychology (0.50)
- PSYCH306 - Perception (0.50)
- SCI238 - Introductory Astronomy (0.50)
- SCI250 - Environmental Geology (0.50)
-
- Technical Electives List
-
- Complete a total of 8 Technical Electives. At least one TE, to a maximum of two, must be from an engineering plan other than Computer Engineering or Electrical Engineering (see Additional Constraints)
-
- List 1
-
- Complete 2 of the following:
- ECE320 - Computer Architecture (0.50)
- ECE351 - Compilers (0.50)
- ECE356 - Database Systems (0.50)
- ECE358 - Computer Networks (0.50)
-
- List 2
-
- Complete all of the following
- Complete one course from this list or an additional course from List 1
- Choose any of the following:
- ECE313 - Digital Signal Processing (0.50)
- ECE331 - Electronic Devices (0.50)
- ECE360 - Power Systems and Smart Grids (0.50)
- ECE373 - Radio Frequency and Microwave Circuits (0.50)
-
- List 3
-
- Complete 3 of the following:
- ECE406 - Algorithm Design and Analysis (0.50)
- **Course Not Found**
- ECE409 - Cryptography and System Security (0.50)
- ECE414 - Wireless Communications (0.50)
- ECE416 - Advanced Topics in Networking (0.50)

- ECE417 - Image Processing (0.50)
- ECE423 - Embedded Computer Systems (0.50)
- ECE432 - Radio Frequency Integrated Devices and Circuits (0.50)
- ECE433 - Fabrication Technologies for Micro and Nano Devices (0.50)
- ECE444 - Integrated Analog Electronics (0.50)
- ECE445 - Integrated Digital Electronics (0.50)
- ECE451 - Software Requirements Specification and Analysis (0.50)
- ECE452 - Software Design and Architectures (0.50)
- ECE453 - Software Testing, Quality Assurance, and Maintenance (0.50)
- ECE454 - Distributed Computing (0.50)
- ECE455 - Embedded Software (0.50)
- ECE457A - Co-operative and Adaptive Algorithms (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE457C - Reinforcement Learning (0.50)
- **Course Not Found**
- ECE458 - Computer Security (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE462 - Electrical Distribution Systems (0.50)
- ECE463 - Design and Applications of Power Electronic Converters (0.50)
- ECE464 - High Voltage Engineering and Power System Protection (0.50)
- ECE467 - Power Systems Analysis, Operations, and Markets (0.50)
- ECE474 - Radio and Wireless Systems (0.50)
- ECE475 - Radio-Wave Systems (0.50)
- ECE477 - Photonic Devices and Systems (0.50)
- ECE481 - Digital Control Systems (0.50)
- ECE486 - Robot Dynamics and Control (0.50)
- **Course Not Found**
- ECE488 - Multivariable Control Systems (0.50)
- ECE493 - Special Topics in Electrical and Computer Engineering (0.50)
- ECE495 - Autonomous Vehicles (0.50)
- ECE499 - Engineering Project (0.50)
-
- List 4
-
- Complete 1 of the following:
- BME411 - Optimization and Numerical Methods (0.50)
- BME581 - Ultrasound in Medicine and Biology (0.50)
- CHE522 - Advanced Process Dynamics and Control (0.50)
- CHE524 - Process Control Laboratory (0.50)
- ME351 - Fluid Mechanics 1 (0.50)
- ME459 - Energy Conversion (0.50)
- ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
- MSE331 - Introduction to Optimization (0.50)
- MSE431 - Stochastic Models and Methods (0.50)
- MSE432 - Production and Service Operations Management (0.50)
- MSE435 - Advanced Optimization Techniques (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MSE452 - Decision Making Under Uncertainty (0.50)
- MSE541 - Search Engines (0.50)
- MSE546 - Advanced Machine Learning (0.50)
- MTE544 - Autonomous Mobile Robots (0.50)
- NE345 - Photonic Materials and Devices (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)
- SYDE542 - Interface Design (0.50)
- SYDE544 - Biomedical Measurement and Signal Processing (0.50)
- SYDE552 - Computational Neuroscience (0.50)
- SYDE556 - Simulating Neurobiological Systems (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE575 - Image Processing (0.50)
-
- List 5
-
- Complete all of the following
- Complete one course from this list or any additional course from List 1, 2, 3, or 4
- Choose any of the following:
- ACTSC446 - Mathematics of Financial Markets (0.50)
- CO250 - Introduction to Optimization (0.50)

- CO342 - Introduction to Graph Theory (0.50)
- CO456 - Introduction to Game Theory (0.50)
- CO463 - Convex Optimization and Analysis (0.50)
- CO466 - Continuous Optimization (0.50)
- CS349 - User Interfaces (0.50)
- CS442 - Principles of Programming Languages (0.50)
- CS448 - Database Systems Implementation (0.50)
- CS452 - Real-Time Programming (0.50)
- CS480 - Introduction to Machine Learning (0.50)
- CS484 - Computational Vision (0.50)
- CS485 - Statistical and Computational Foundations of Machine Learning (0.50)
- CS486 - Introduction to Artificial Intelligence (0.50)
- CS488 - Introduction to Computer Graphics (0.50)
- ECE260 - Electromechanical Energy Conversion (0.50)
- ECE340 - Electronic Circuits 2 (0.50)
- ECE375 - Electromagnetic Fields and Waves (0.50)
- STAT340 - Stochastic Simulation Methods (0.50)
- STAT341 - Computational Statistics and Data Analysis (0.50)
- STAT440 - Computational Inference (0.50)
- STAT441 - Statistical Learning - Classification (0.50)
- STAT444 - Statistical Learning - Advanced Regression (0.50)

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. For the Natural Science requirement, if a 0.25-laboratory course accompanies a lecture course, the laboratory course must also be taken and the pair together count as one course towards the two-course requirement (e.g., BIOL130 with BIOL130L).
3. At least one TE, to a maximum of two, must be from another engineering (other than Computer Engineering or Electrical Engineering) plan; such courses must have sufficiently advanced engineering science or engineering design content to be allowed, and must be approved by the Electrical and Computer Engineering Undergraduate Office.
4. Exceptions to the requirements and electives listed above require prior approval of the Electrical and Computer Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one (or more) of two available specializations.

Specializations List

CE-Communications & Signal Processing Specialization, or CE-Quantum Engineering Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-25

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Number of required PD courses is being reduced from 5 to 4.

Is the credential name changing?
No,

Co-operative System of Study and Requirements

Co-operative Education Consultation

Yes,

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take [Co-op Fundamentals for Engineering](#) in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Reduce the total number of required PD courses from 5 to 4 as per Fo E guidance.

Adding 3 new ECE courses to TE list: ECE 407, ECE 457D and ECE 487.

Adding ECE 477 to TE list.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Electrical and Computer Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Electrical Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See promotion rules.

Graduation Requirements

- Complete a total of 21.25 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete 13 approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the Complementary Studies Course Lists for Engineering:
      - Two courses from List C.
      - One course from List A, C, or D.
    - Complete two courses from the Natural Science list.
    - Complete eight courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD19, PD20, and two additional PD courses.
- Complete a total of five credited work terms.
- See Bachelor of Applied Science co-operative education program requirements.

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- See Bachelor of Applied Science co-operative education program requirements.

Required Courses (Term by Term)

1A Term

- Complete all of the following
- Complete all the following:
    - ECE105 - Classical Mechanics (0.50)
    - ECE150 - Fundamentals of Programming (0.50)
    - ECE190 - Engineering Profession and Practice (0.25)
    - ECE198 - Project Studio (0.25)
    - MATH115 - Linear Algebra for Engineering (0.50)
    - MATH117 - Calculus 1 for Engineering (0.50)
- Complete 1 of the following:
    - COMMST192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
    - ENGL192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
- 1B Term
- Complete all the following:
- ECE102 - Information Session (0.00)
- ECE106 - Electricity and Magnetism (0.50)
- ECE108 - Discrete Mathematics and Logic 1 (0.50)
- ECE124 - Digital Circuits and Systems (0.50)
- ECE140 - Linear Circuits (0.50)
- ECE192 - Engineering Economics and Impact on Society (0.25)
- MATH119 - Calculus 2 for Engineering (0.50)
- 2A Term
- Complete all of the following
- Complete all the following:
    - ECE109 - Materials Chemistry for Engineers (0.25)
    - ECE201 - Information Session (0.00)
    - ECE204 - Numerical Methods (0.50)
    - ECE222 - Digital Computers (0.50)
    - ECE240 - Electronic Circuits 1 (0.50)
    - ECE250 - Algorithms and Data Structures (0.50)
- Complete 1 of the following:
    - ECE205 - Advanced Calculus 1 for Electrical and Computer Engineers (0.50)
    - MATH211 - Advanced Calculus 1 for Electrical and Computer Engineers (0.50)
- 2B Term
- Complete all of the following
- Complete all the following:
    - ECE202 - Information Session (0.00)
    - ECE203 - Probability Theory and Statistics 1 (0.50)
    - ECE207 - Signals and Systems (0.50)
    - ECE231 - Semiconductor Physics and Devices (0.50)
    - ECE260 - Electromechanical Energy Conversion (0.50)
    - ECE298 - Instrumentation and Prototyping Laboratory (0.25)
- Complete 1 of the following:
    - ECE206 - Advanced Calculus 2 for Electrical Engineers (0.50)
    - MATH212 - Advanced Calculus 2 for Electrical Engineers (0.50)
- 3A Term
- Complete all of the following
- Complete all the following:
    - ECE301 - Information Session (0.00)
    - ECE318 - Communication Systems (0.50)
    - ECE340 - Electronic Circuits 2 (0.50)
    - ECE375 - Electromagnetic Fields and Waves (0.50)
    - ECE380 - Analog Control Systems (0.50)
- Complete 1 approved elective
- 3B Term
- Complete all of the following
- Complete all the following:
    - ECE302 - Information Session (0.00)
    - ECE307 - Probability Theory and Statistics 2 (0.50)
- Complete 2 Technical Electives from List 1
- Complete 1 Technical Elective from List 1 or List 2
- Complete 1 approved elective
- 4A Term
- Complete all of the following
- Complete all the following:
    - ECE401 - Information Session (0.00)
- Complete 1 of the following:

- - ECE498A - Engineering Design Project (0.50)
    - GENE403 - Interdisciplinary Design Project 1 (0.50)
  - Complete 4 approved electives
  - 4B Term
  - Complete all of the following
  - Complete all the following:
    - ECE402 - Information Session (0.00)
  - Complete 1 of the following:
    - ECE498B - Engineering Design Project (0.50)
    - GENE404 - Interdisciplinary Design Project 2 (0.50)
  - Complete 4 approved electives

1. Ethics List
   -
     - Complete 1 of the following:
     - ARBUS202 - Professional and Business Ethics (0.50)
     - PD22 - Professionalism and Ethics in Engineering Practice (0.50)
     - PHIL215 - Professional and Business Ethics (0.50)
     - PHIL219J - Practical Ethics (0.50)
     - PHIL315 - Ethics and the Engineering Profession (0.50)
     -
     - Natural Science List
     -
     - Complete all of the following
     - Complete a total of 2 lecture courses (see Additional Constraints)
     - Choose any of the following:
     - BIOL110 - Biodiversity, Biomes, and Evolution (0.50)
     - BIOL130 - Introductory Cell Biology (0.50)
     - BIOL130L - Cell Biology Laboratory (0.25)
     - BIOL150 - Organismal and Evolutionary Ecology (0.50)
     - BIOL165 - Diversity of Life (0.50)
     - BIOL211 - Introductory Vertebrate Zoology (0.50)
     - BIOL220 - Introduction to Plant Structure and Function (0.50)
     - BIOL239 - Genetics (0.50)
     - BIOL240 - Fundamentals of Microbiology (0.50)
     - BIOL240L - Microbiology Laboratory (0.25)
     - BIOL241 - Introduction to Applied Microbiology (0.50)
     - BIOL273 - Principles of Human Physiology 1 (0.50)
     - BIOL280 - Introduction to Biophysics (0.50)
     - BIOL373 - Principles of Human Physiology 2 (0.50)
     - BIOL373L - Human Physiology Laboratory (0.25)
     - CHE102 - Chemistry for Engineers (0.50)
     - CHE161 - Engineering Biology (0.50)
     - CHEM123 - General Chemistry 2 (0.50)
     - CHEM123L - General Chemistry Laboratory 2 (0.25)
     - CHEM209 - Introductory Spectroscopy and Structure (0.50)
     - CHEM237 - Introductory Biochemistry (0.50)
     - CHEM237L - Introductory Biochemistry Laboratory (0.25)
     - CHEM254 - Introductory Chemical Thermodynamics (0.50)
     - CHEM262 - Organic Chemistry for Engineering (0.50)
     - CHEM262L - Organic Chemistry Laboratory for Engineering Students (0.25)
     - CHEM266 - Basic Organic Chemistry 1 (0.50)
     - CHEM356 - Introductory Quantum Mechanics (0.50)
     - EARTH121 - Introductory Earth Sciences (0.50)
     - EARTH122 - Introductory Environmental Sciences (0.50)
     - EARTH123 - Introductory Hydrology (0.50)
     - EARTH221 - Introductory Geochemistry (0.50)
     - EARTH270 - Disasters and Natural Hazards (0.50)
     - EARTH281 - Geological Impacts on Human Health (0.50)
     - ECE305 - Introduction to Quantum Mechanics (0.50)
     - ECE403 - Thermal Physics (0.50)
     - ECE404 - Geometrical and Physical Optics (0.50)
     - ENVE275 - Aquatic Chemistry (0.50)
     - ENVS200 - Field Ecology (0.50)
     - NE222 - Organic Chemistry for Nanotechnology Engineers (0.50)

- PHYS124 - Modern Physics (0.50)
- PHYS233 - Introduction to Quantum Mechanics (0.50)
- PHYS234 - Quantum Physics 1 (0.50)
- PHYS263 - Classical Mechanics and Special Relativity (0.50)
- PHYS275 - Planets (0.50)
- PHYS280 - Introduction to Biophysics (0.50)
- PHYS334 - Quantum Physics 2 (0.50)
- PHYS335 - Condensed Matter Physics (0.50)
- PHYS375 - Stars (0.50)
- PHYS380 - Molecular and Cellular Biophysics (0.50)
- PSYCH207 - Cognitive Processes (0.50)
- PSYCH261 - Physiological Psychology (0.50)
- PSYCH306 - Perception (0.50)
- SCI238 - Introductory Astronomy (0.50)
- SCI250 - Environmental Geology (0.50)
-
- Technical Electives List
-
- Complete a total of 8 Technical Electives. At least one TE, to a maximum of two, must be from an Engineering plan other than Computer Engineering or Electrical Engineering (see Additional Constraints)
-
- List 1
-
- Complete 2 of the following:
- ECE313 - Digital Signal Processing (0.50)
- ECE331 - Electronic Devices (0.50)
- ECE360 - Power Systems and Smart Grids (0.50)
- ECE373 - Radio Frequency and Microwave Circuits (0.50)
-
- List 2
-
- Complete all of the following
- Complete one course from this list or an additional course from List 1
- Choose any of the following:
- ECE320 - Computer Architecture (0.50)
- ECE351 - Compilers (0.50)
- ECE356 - Database Systems (0.50)
- ECE358 - Computer Networks (0.50)
-
- List 3
-
- Complete 3 of the following:
- ECE406 - Algorithm Design and Analysis (0.50)
- **Course Not Found**
- ECE409 - Cryptography and System Security (0.50)
- ECE414 - Wireless Communications (0.50)
- ECE416 - Advanced Topics in Networking (0.50)
- ECE417 - Image Processing (0.50)
- ECE423 - Embedded Computer Systems (0.50)
- ECE432 - Radio Frequency Integrated Devices and Circuits (0.50)
- ECE433 - Fabrication Technologies for Micro and Nano Devices (0.50)
- ECE444 - Integrated Analog Electronics (0.50)
- ECE445 - Integrated Digital Electronics (0.50)
- ECE451 - Software Requirements Specification and Analysis (0.50)
- ECE452 - Software Design and Architectures (0.50)
- ECE453 - Software Testing, Quality Assurance, and Maintenance (0.50)
- ECE454 - Distributed Computing (0.50)
- ECE455 - Embedded Software (0.50)
- ECE457A - Co-operative and Adaptive Algorithms (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE457C - Reinforcement Learning (0.50)
- **Course Not Found**
- ECE458 - Computer Security (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE462 - Electrical Distribution Systems (0.50)
- ECE463 - Design and Applications of Power Electronic Converters (0.50)
- ECE464 - High Voltage Engineering and Power System Protection (0.50)
- ECE467 - Power Systems Analysis, Operations, and Markets (0.50)
- ECE474 - Radio and Wireless Systems (0.50)

- ECE475 - Radio-Wave Systems (0.50)
- **ECE477 - Photonic Devices and Systems (0.50)**
- ECE481 - Digital Control Systems (0.50)
- ECE486 - Robot Dynamics and Control (0.50)
- **Course Not Found**
- ECE488 - Multivariable Control Systems (0.50)
- ECE493 - Special Topics in Electrical and Computer Engineering (0.50)
- ECE495 - Autonomous Vehicles (0.50)
- ECE499 - Engineering Project (0.50)
-
- List 4
-
- Complete 1 of the following:
- BME411 - Optimization and Numerical Methods (0.50)
- BME581 - Ultrasound in Medicine and Biology (0.50)
- CHE522 - Advanced Process Dynamics and Control (0.50)
- CHE524 - Process Control Laboratory (0.50)
- ME351 - Fluid Mechanics 1 (0.50)
- ME459 - Energy Conversion (0.50)
- ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
- MSE331 - Introduction to Optimization (0.50)
- MSE431 - Stochastic Models and Methods (0.50)
- MSE432 - Production and Service Operations Management (0.50)
- MSE435 - Advanced Optimization Techniques (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MSE452 - Decision Making Under Uncertainty (0.50)
- MSE541 - Search Engines (0.50)
- MSE546 - Advanced Machine Learning (0.50)
- MTE544 - Autonomous Mobile Robots (0.50)
- NE345 - Photonic Materials and Devices (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)
- SYDE542 - Interface Design (0.50)
- SYDE544 - Biomedical Measurement and Signal Processing (0.50)
- SYDE552 - Computational Neuroscience (0.50)
- SYDE556 - Simulating Neurobiological Systems (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE575 - Image Processing (0.50)
-
- List 5
-
- Complete all of the following
- Complete one course from this list or any additional course from List 1, 2, 3, or 4
- Choose any of the following:
- ACTSC446 - Mathematics of Financial Markets (0.50)
- CO250 - Introduction to Optimization (0.50)
- CO342 - Introduction to Graph Theory (0.50)
- CO456 - Introduction to Game Theory (0.50)
- CO463 - Convex Optimization and Analysis (0.50)
- CO466 - Continuous Optimization (0.50)
- CS343 - Concurrent and Parallel Programming (0.50)
- CS349 - User Interfaces (0.50)
- CS442 - Principles of Programming Languages (0.50)
- CS448 - Database Systems Implementation (0.50)
- CS452 - Real-Time Programming (0.50)
- CS480 - Introduction to Machine Learning (0.50)
- CS484 - Computational Vision (0.50)
- CS485 - Statistical and Computational Foundations of Machine Learning (0.50)
- CS486 - Introduction to Artificial Intelligence (0.50)
- CS488 - Introduction to Computer Graphics (0.50)
- ECE224 - Embedded Microprocessor Systems (0.50)
- ECE252 - Systems Programming and Concurrency (0.50)
- ECE327 - Digital Hardware Systems (0.50)
- ECE350 - Real-Time Operating Systems (0.50)
- STAT340 - Stochastic Simulation Methods (0.50)
- STAT341 - Computational Statistics and Data Analysis (0.50)
- STAT440 - Computational Inference (0.50)
- STAT441 - Statistical Learning - Classification (0.50)

- STAT444 - Statistical Learning - Advanced Regression (0.50)

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. For the Natural Science requirement, if a 0.25-laboratory course accompanies a lecture course, the laboratory course must also be taken and the pair together count as one course towards the two-course requirement (e.g., BIOL130 with BIOL130L).
3. At least one TE, to a maximum of two, must be from another engineering (other than Computer Engineering or Electrical Engineering) plan; such courses must have sufficiently advanced engineering science or engineering design content to be allowed, and must be approved by the Electrical and Computer Engineering Undergraduate Office.
4. Exceptions to the requirements and electives listed above require prior approval of the Electrical and Computer Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major

Specialization Details

Yes - Optional,

Students may choose to focus their elective choices by completing one (or more) of two available specializations.

Specializations List

EE-Communications & Signal Processing Specialization, or EE-Quantum Engineering Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Environmental Engineering - Environmental Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove one PD requirement for all current students.

Remove wkrpt 400 retroactively for all current students.

Student communication will state the following:

"If you are an active student you are exempt from wkrpt 400. If you complete PD 11 you are also exempt with wkrpt 200"

Technical Elective Additions - New courses have been created and conversations with other departments have taken place regarding courses that may be of interest to our students.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take [Co-op Fundamentals for Engineering](#) in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a 5*th* PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

wkrpt 200 and wkrpt 400 Rationale:

In their current form, work term reports have not helped students develop their technical writing skills and marking has been highly inconsistent. Reduced workload for both the students and faculty as well as the introduction of a peer review process will help alleviate these issues. This change also aligns with other engineering programs which have removed work term reports.

Adding PD 11 required course change rational:

WKRPT course requirements are being changed for students in CIVE/ENVE/GEOE/AE. PD 11 (Processes for Technical Report Writing) will replace WKRPT 200 and WKRPT 400 will be removed. WKRPT 300 will remain. We are requesting these changes take effect in Fall 2025 or later.

Changing total required credits from 20.55 academic units to 20.50 academic units due to the following change:

- Reducing ENVE100 from 0.8 to 0.75

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Environmental Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Proposed

Graduation Requirements

- Complete a total of 20.50 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 12 approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List C.
      - One course from List A, C, or D.
    - Complete nine courses from the Technical Electives (TEs) lists.
    - Complete one elective chosen from any 0.5-unit course.
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 20.55 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 12 approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List C.
      - One course from List A, C, or D.
    - Complete nine courses from the Technical Electives (TEs) lists.
    - Complete one elective chosen from any 0.5-unit course.
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- Complete one WKRPT course: WKRPT300 (3A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses: WKRPT200 (2B), WKRPT300 (3A), WKRPT400 (4A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Required Courses (Term by Term)

1A Term

- Complete all of the following
- Complete all the following:
    - CIVE104 - Mechanics 1 (0.25)
    - ENVE175 - Introduction to Environmental Chemistry (0.50)
    - MATH116 - Calculus 1 for Engineering (0.50)
- Complete 1 of the following:
    - COMMST191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
    - ENGL191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
- Complete 1 of the following:
    - ENVE100 - Environmental and Geological Engineering Concepts (0.80)
    - GEOE100 - Environmental and Geological Engineering Concepts (0.80)
- Complete 1 of the following:
    - CIVE115 - Linear Algebra (0.25)
    - ENVE115 - Linear Algebra (0.25)
    - GEOE115 - Linear Algebra (0.25)
- 1B Term
- Complete all of the following
- Complete all the following:
    - ENVE176 - Microbial Biology for Environmental Engineers (0.50)
    - MATH118 - Calculus 2 for Engineering (0.50)
- Complete 1 of the following:
    - AE123 - Electrical Circuits and Instrumentation (0.50)
    - CIVE123 - Electrical Circuits and Instrumentation (0.50)
    - ENVE123 - Electrical Circuits and Instrumentation (0.50)
    - GEOE123 - Electrical Circuits and Instrumentation (0.50)
- Complete 1 of the following:
    - CIVE121 - Computational Methods (0.50)
    - ENVE121 - Computational Methods (0.50)
    - GEOE121 - Computational Methods (0.50)
- Complete 1 of the following:
    - CIVE153 - Earth Engineering (0.50)
    - ENVE153 - Earth Engineering (0.50)
    - GEOE153 - Earth Engineering (0.50)
- 2A Term
- Complete all of the following
- Complete all the following:
    - ENVE200 - Sustainability Analysis and Solutions (0.50)
    - ENVE275 - Aquatic Chemistry (0.50)
    - ENVE298 - Seminar (0.00)
- Complete 1 of the following:
    - ENVE223 - Differential Equations and Balance Laws (0.50)
    - GEOE223 - Differential Equations and Balance Laws (0.50)
- Complete 1 of the following:
    - ENVE224 - Probability and Statistics (0.50)
    - GEOE224 - Probability and Statistics (0.50)
- Complete 1 of the following:
    - ENVE280 - Fluid Mechanics (0.50)
    - GEOE280 - Fluid Mechanics (0.50)
- 2B Term
- Complete all of the following
- Complete all the following:

- ENVE225 - Environmental Modelling (0.75)
- ENVE277 - Air Quality Engineering (0.50)
- ENVE279 - Energy and the Environment (0.50)
- ENVE299 - Seminar (0.00)
- Complete 1 of the following:
  - CIVE382 - Hydrology and Open Channel Flow (0.50)
  - ENVE382 - Hydrology and Open Channel Flow (0.50)
- Complete 1 approved elective
- 3A Term
- Complete all of the following
- Complete all the following:
  - ENVE330 - Lab Analysis and Field Sampling Techniques (0.50)
  - ENVE375 - Physico-Chemical Processes (0.50)
  - ENVE398 - Seminar (0.00)
- Complete 1 of the following:
  - AE392 - Economics and Life Cycle Cost Analysis (0.50)
  - CIVE392 - Economics and Life Cycle Cost Analysis (0.50)
  - ENVE392 - Economics and Life Cycle Cost Analysis (0.50)
  - GEOE392 - Economics and Life Cycle Cost Analysis (0.50)
- Complete 1 of the following:
  - CIVE353 - Geotechnical Engineering 1 (0.50)
  - GEOE353 - Geotechnical Engineering 1 (0.50)
- Complete 1 approved elective
- 3B Term
- Complete all of the following
- Complete all the following:
  - ENVE335 - Decision Making for Environmental Engineers (0.50)
  - ENVE376 - Biological Processes (0.50)
  - ENVE399 - Seminar (0.00)
- Complete 1 of the following:
  - ENVE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
  - GEOE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
- Complete 2 approved electives
- 4A Term
- Complete all of the following
- Complete all the following:
  - ENVE400 - Environmental Engineering Design Project 1 (0.50)
  - ENVE498 - Seminar (0.00)
- Complete 4 approved electives
- 4B Term
- Complete all of the following
- Complete all the following:
  - ENVE401 - Environmental Engineering Design Project 2 (0.50)
  - ENVE499 - Seminar (0.00)
- Complete 4 approved electives

1. Technical Electives List
   -
   - Complete a total of 9 Technical Electives.
   -
   - List 1
   -
   - Complete 5 of the following:
   - AE572 - Building Energy Analysis (0.50)
   - AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
   - AE585 - Air Quality Engineering and Impacts (0.50)
   - **Course Not Found**
   - CHE361 - Bioprocess Engineering (0.50)
   - CHE514 - Fundamentals of Petroleum Production (0.50)
   - CHE571 - Industrial Ecology (0.50)
   - CHE572 - Air Pollution Control (0.50)
   - CHE574 - Industrial Wastewater Pollution Control (0.50)
   - CIVE241 - Transport Principles and Applications (0.50)
   - CIVE341 - Transportation Engineering Applications (0.50)
   - CIVE354 - Geotechnical Engineering 2 (0.50)

- CIVE554 - Geotechnical Engineering 3 (0.50)
- CIVE583 - Design of Urban Water Systems (0.50)
- EARTH438 - Engineering Geology (0.50)
- **ENVE383 - Hydrologic Modelling (0.50)**
- **ENVE481 - Open Channel Hydraulics (0.50)**
- ENVE495 - Design Intensive Special Topics in Environmental Engineering (0.50)
- ENVE577 - Engineering for Solid Waste Management (0.50)
- ENVE583 - Design of Urban Water Systems (0.50)
- ENVE585 - Air Quality Engineering and Impacts (0.50)
- GEOE354 - Geotechnical Engineering 2 (0.50)
- GEOE554 - Geotechnical Engineering 3 (0.50)
- ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
- ME571 - Clean Air Technologies (0.50)
- ME572 - Building Energy Analysis (0.50)
- ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- MSE240 - Algorithms and Data Structures (0.50)
- MSE245 - Databases and Software Design (0.50)
- MSE332 - Deterministic Optimization Models and Methods (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MSE452 - Decision Making Under Uncertainty (0.50)
- SYDE223 - Data Structures and Algorithms (0.50)
- SYDE252 - Linear Systems and Signals (0.50)
- SYDE322 - Software Design (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE532 - Introduction to Complex Systems (0.50)
- SYDE533 - Conflict Resolution (0.50)
- **SYDE535 - Computational Simulations for Societal and Environmental Systems (0.50)**
-
- List 2
-
- Complete all of the following
- **The remaining 4 Technical Electives can be from List 1 or 2.**
- Choose any of the following:
- **AMATH362 - Mathematics of Climate Change (0.50)**
- BIOL354 - Environmental Toxicology (0.50)
- BIOL447 - Environmental Microbiology (0.50)
- BIOL455 - Ecological Risk Assessment and Management (0.50)
- **BIOL458 - Quantitative Ecology (0.50)**
- BIOL462 - Applied Wetland Science (0.50)
- BIOL470 - Methods of Aquatic Ecology (0.50)
- CHE516 - Energy Systems Engineering (0.50)
- CHE521 - Process Optimization (0.50)
- CIVE105 - Mechanics 2 (0.75)
- CIVE422 - Finite Element Analysis (0.50)
- CIVE440 - Transit Planning and Operations (0.50)
- CIVE484 - Physical Infrastructure Planning (0.50)
- CIVE507 - Building Science and Technology (0.50)
- EARTH342 - Geomorphology and GIS Applications (0.50)
- **EARTH355 - Water: Data to Decisions (0.50)**
- EARTH439 - Flow and Transport Through Fractured Rocks (0.50)
- EARTH444 - Applied Wetland Science (0.50)
- EARTH456 - Numerical Methods in Hydrogeology (0.50)
- EARTH458 - Physical Hydrogeology (0.50)
- EARTH458L - Field Methods in Hydrogeology (0.25)
- EARTH459 - Chemical Hydrogeology (0.50)
- **Course Not Found**
- **Course Not Found**
- ENVE497 - Special Topics in Environmental Engineering (0.50)
- ENVE573 - Contaminant Transport (0.50)
- **ERS335 - Restoration Ecology (0.50)**
- **ERS337 - ReWilding and Ecological Restoration (0.50)**
- GEOG209 - Hydroclimatology (0.50)
- GEOG304 - Carbon in the Biosphere (0.50)
- GEOG305 - Fluvial Geomorphology (0.50)
- GEOG371 - Advanced Remote Sensing Techniques (0.50)
- GEOG381 - Advanced Geographic Information Systems (0.50)
- GEOG408 - Earth's Future Climates (0.50)
- GEOG409 - Energy Balance Climatology (0.50)
- GEOG453 - Urban Stormwater Management (0.50)

- GEOG471 - Remote Sensing Project (1.00)
- ME354 - Thermodynamics 2 (0.50)
- ME459 - Energy Conversion (0.50)
- PLAN381 - Advanced Geographic Information Systems (0.50)
- PLAN453 - Urban Stormwater Management (0.50)
- PLAN478 - Transit Planning and Operations (0.50)
- PLAN484 - Physical Infrastructure Planning (0.50)
- SYDE334 - Applied Statistics (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)
- SYDE599 - Special Topics in Systems Design Engineering (0.50)
- ~~The remaining 4 Technical Electives can be from List 1 or 2. See Additional Constraints.~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Civil and Environmental Engineering Associate Chair, Undergraduate Studies or the Environmental Engineering Program Director.

Existing

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Civil and Environmental Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one of five available specializations.

Specializations List

Energy & Climate Change Specialization, Modelling & Data Analytics Specialization, Pollution & Restoration Specialization, Sustainable Cities Specialization, or ENVE-Water Resources Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Geological Engineering - Geological Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2025	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-07-17

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove the requirement of one PD coures for all active sudents.

Remove wkrpt 400 retroactively for all current students.

Student communication will state the following:

"If you are an active student you are exempt from wkrpt 400. If you complete PD 11 you are also exempt with wkrpt 200"

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take [Co-op Fundamentals for Engineering](#) in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
Yes,

Invalid Combinations Consultations

Earth Sciences Minor:

There are so many core EARTH course requirements, outside the technical elective options, in the Geological Engineering major, that overlap it almost completely with the Earth Sciences minor, therefore both can not be awarded.

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Earth Science Minor, Rationale:

To date, there has never been a graduate from Honours Geological Engineering that has graduated with an Earth Sciences minor.

wkrpt 200 and wkrpt 400 Rationale:

In their current form, work term reports have not helped students develop their technical writing skills and marking has been highly inconsistent. Reduced workload for both the students and faculty as well as the introduction of a peer review process will help alleviate these issues. This change also aligns with other engineering programs which have removed work term reports.

Adding PD 11 required course change rational:

WKRPT course requirements are being changed for students in CIVE/ENVE/GEOE/AE. PD 11 (Processes for Technical Report Writing) will replace WKRPT 200 and WKRPT 400 will be removed. WKRPT 300 will remain. We are requesting these changes take effect in Fall 2025 or later.

Reducing total credits required from 21.80 to 21.75 due to the following change:

- Reducing GEOE100 from 0.8 to 0.75

RO dependency work: Removing EARTH460 (retired at Dec 2025 SUC meeting).

Consultations (Departmental)

Earth Science Minor:

The request for this invalid combination was initiated by Engineering (January 2025) in response to a student requesting the Earth Sciences minor with a Geological Engineering major. Both Engineering (T. Szarka, L. Schneider, J. Grove) and the Department of Earth and Environmental Sciences (A. Mar, J. Johnston, J. Parks) are in agreement that there is too much overlap to allow granting of both credentials.

Verification that no there have been no past graduates with this combination of major and minor was made by the R.O. (L. Campbell Jan. 20, 2025).

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type	**Program Type**	**Degree**
Major	Honours	Bachelor of Applied Science

Program/Plan Name
Geological Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Proposed
Invalid Combinations Yes,
Existing
Invalid Combinations No,

List of Invalid Combinations

Earth Sciences Minor

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See promotion rules.

Graduation Requirements

- Complete a total of 21.75 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete nine approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - One course from List A, C, or D.
    - Complete six courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 21.80 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete nine approved electives:
    - Complete three Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - One course from List A, C, or D.
    - Complete six courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- Complete one WKRPT course: WKRPT300 (3A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses: WKRPT200 (2B), WKRPT300 (3A), WKRPT400 (4A).
- See [Bachelor of Applied Science co-operative education program requirements](#).

Required Courses (Term by Term)

1A Term

- Complete all of the following
- Complete all the following:
    - CHE102 - Chemistry for Engineers (0.50)
    - CIVE104 - Mechanics 1 (0.25)
    - MATH116 - Calculus 1 for Engineering (0.50)
- Complete 1 of the following:
    - COMMST191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
    - ENGL191 - Communication in the Engineering Profession (AE, CIVE, ENVE, GEOE) (0.50)
- Complete 1 of the following:
    - ENVE100 - Environmental and Geological Engineering Concepts (0.80)
    - GEOE100 - Environmental and Geological Engineering Concepts (0.80)
- Complete 1 of the following:
    - CIVE115 - Linear Algebra (0.25)
    - ENVE115 - Linear Algebra (0.25)
    - GEOE115 - Linear Algebra (0.25)
- 1B Term
- Complete all of the following
- Complete all the following:
    - CIVE105 - Mechanics 2 (0.75)
    - MATH118 - Calculus 2 for Engineering (0.50)
- Complete 1 of the following:
    - AE123 - Electrical Circuits and Instrumentation (0.50)
    - CIVE123 - Electrical Circuits and Instrumentation (0.50)
    - ENVE123 - Electrical Circuits and Instrumentation (0.50)
    - GEOE123 - Electrical Circuits and Instrumentation (0.50)
- Complete 1 of the following:
    - CIVE121 - Computational Methods (0.50)
    - ENVE121 - Computational Methods (0.50)
    - GEOE121 - Computational Methods (0.50)
- Complete 1 of the following:
    - CIVE153 - Earth Engineering (0.50)
    - ENVE153 - Earth Engineering (0.50)
    - GEOE153 - Earth Engineering (0.50)
- 2A Term
- Complete all of the following
- Complete all the following:
    - EARTH238 - Introductory Structural Geology (0.50)
    - GEOE298 - Seminar (0.00)
- Complete 1 of the following:
    - ENVE223 - Differential Equations and Balance Laws (0.50)
    - GEOE223 - Differential Equations and Balance Laws (0.50)
- Complete 1 of the following:
    - ENVE224 - Probability and Statistics (0.50)
    - GEOE224 - Probability and Statistics (0.50)
- Complete 1 of the following:
    - ENVE280 - Fluid Mechanics (0.50)
    - GEOE280 - Fluid Mechanics (0.50)
- Complete 1 approved elective
- 2B Term
- Complete all of the following
- Complete all the following:
    - CIVE204 - Solid Mechanics 1 (0.50)
    - EARTH231 - Mineralogy (0.50)
    - EARTH235 - Stratigraphic Approaches to Understanding Earth's History (0.50)
    - EARTH260 - Introductory Applied Geophysics (0.50)
    - GEOE299 - Seminar (0.00)
- Complete 1 of the following:
    - CIVE221 - Advanced Calculus (0.50)
    - GEOE221 - Advanced Calculus (0.50)
- Complete 1 approved elective
- 3A Term
- Complete all of the following
- Complete all the following:
    - EARTH232 - Introductory Petrography (0.50)
    - EARTH458 - Physical Hydrogeology (0.50)
    - EARTH458L - Field Methods in Hydrogeology (0.25)

- GEOE398 - Seminar (0.00)
  - Complete 1 of the following:
    - CIVE353 - Geotechnical Engineering 1 (0.50)
    - GEOE353 - Geotechnical Engineering 1 (0.50)
  - Complete 1 of the following:
    - CIVE392 - Economics and Life Cycle Cost Analysis (0.50)
    - ENVE392 - Economics and Life Cycle Cost Analysis (0.50)
    - GEOE392 - Economics and Life Cycle Cost Analysis (0.50)
  - Complete 1 approved elective
  - 3B Term
  - Complete all of the following
  - Complete all the following:
    - EARTH333 - Introductory Sedimentology (0.50)
    - EARTH437 - Rock Mechanics (0.50)
    - EARTH438 - Engineering Geology (0.50)
    - ENVE382 - Hydrology and Open Channel Flow (0.50)
    - GEOE399 - Seminar (0.00)
  - Complete 1 approved elective
  - Complete all of the following
    - Complete all the following:
      - EARTH390 - Methods in Geological Mapping (0.50)
    - Note: EARTH390 is offered after winter term exams. It is 10 days long and finishes before the spring term begins.
  - 4A Term
  - Complete all of the following
  - Complete all the following:
    - GEOE400 - Geological Engineering Design Project 1 (0.50)
    - GEOE498 - Seminar (0.00)
  - Complete 1 of the following:
    - CIVE354 - Geotechnical Engineering 2 (0.50)
    - GEOE354 - Geotechnical Engineering 2 (0.50)
  - Complete 3 approved electives
  - 4B Term
  - Complete all of the following
  - Complete all the following:
    - GEOE401 - Geological Engineering Design Project 2 (0.50)
    - GEOE499 - Seminar (0.00)
  - Complete 1 of the following:
    - CIVE554 - Geotechnical Engineering 3 (0.50)
    - GEOE554 - Geotechnical Engineering 3 (0.50)
  - Complete 1 of the following:
    - ENVE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
    - GEOE391 - Law and Ethics for Environmental and Geological Engineers (0.50)
  - Complete 2 approved electives

1. Technical Electives List
    -
    - Complete 6 of the following:
    - BIOL462 - Applied Wetland Science (0.50)
    - CHE514 - Fundamentals of Petroleum Production (0.50)
    - CIVE205 - Solid Mechanics 2 (0.50)
    - CIVE303 - Structural Analysis (0.50)
    - CIVE306 - Solid Mechanics 3 (0.50)
    - CIVE310 - Introduction to Structural Design (0.75)
    - CIVE332 - Civil Systems and Project Management (0.50)
    - CIVE375 - Environmental Engineering Principles (0.50)
    - CIVE422 - Finite Element Analysis (0.50)
    - CIVE460 - Engineering Biomechanics (0.50)
    - CIVE507 - Building Science and Technology (0.50)
    - CIVE542 - Pavement Structural Design (0.50)
    - CIVE583 - Design of Urban Water Systems (0.50)
    - EARTH221 - Introductory Geochemistry (0.50)
    - EARTH331 - Volcanology and Igneous Petrology (0.50)
    - EARTH332 - Metamorphic Petrology (0.50)
    - EARTH342 - Geomorphology and GIS Applications (0.50)

- EARTH421 - Advanced Geochemistry (0.50)
- EARTH435 - Advanced Structural Geology (0.50)
- EARTH439 - Flow and Transport Through Fractured Rocks (0.50)
- EARTH440 - Quaternary Geology (0.50)
- EARTH444 - Applied Wetland Science (0.50)
- EARTH456 - Numerical Methods in Hydrogeology (0.50)
- EARTH459 - Chemical Hydrogeology (0.50)
- EARTH461 - Near-Surface Geophysics (0.50)
- EARTH471 - Mineral Deposits (0.50)
- ENVE383 - Hydrologic Modelling (0.50)
- ENVE573 - Contaminant Transport (0.50)
- ENVE577 - Engineering for Solid Waste Management (0.50)
- ENVE583 - Design of Urban Water Systems (0.50)
- GEOE495 - Design Intensive Special Topics in Geological Engineering (0.50)
- GEOE497 - Special Topics in Geological Engineering (0.50)
- ME559 - Finite Element Methods (0.50)
- ME574 - Engineering Biomechanics (0.50)
- ~~EARTH460 - Geophysical Data Analysis (0.50)~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Civil and Environmental Engineering Associate Chair, Undergraduate Studies or the Geological Engineering Program Director.

Existing

Additional Constraints

1. Exceptions to the requirements and electives listed above require prior approval of the Civil and Environmental Engineering Associate Chair, Undergraduate Studies or the Geological Engineering program Director.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one (or more) of three available specializations.

Specializations List

Geology Specialization, Hydrogeology Specialization, or Soil, Rock & Structures Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Management Engineering - Management Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-06

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Required PD courses dropping from five to four.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We

are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Changes to Co-operative Education Program Requirements:

- The Faculty of Engineering is changing co-op requirements such that students need only complete 4 PD courses. Previously MGTE students had to take 4 "core" PD courses and one elective. Which this change, the elective PD course is removed from the requirements, and only the 4 core remain.

Change to the natural sciences elective list:

- PHYS223: Waves is being added to the list of electives. This is a new proposed course from the department of Physics and Astronomy: A course already on the list - PHYS122 - is being renamed "Electricity and Magnetism" and the "Waves" portion is being PHYS223

Changes to the technical electives list:

- Previously students could only choose their 6 technical electives from a list of senior MSE courses with significant engineering science and engineering design content. The list is being expanded through the addition of electives from other engineering departments, giving students more choice.

Consultations (Departmental)

Have reached out to department representatives responsible for all courses included in list and have received their permission to add those courses. This includes Steve Drekic, Associate Chair, Statistics and Actuarial Science, October 24, 2023.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Management Science and Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Management Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point

Direct Entry,

Requirements Information

Invalid Combinations

Yes,

List of Invalid Combinations

Management Science Option

Average Requirement

Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See promotion rules.

Graduation Requirements

- Complete a total of 20.75 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete 10 approved electives:
    - Complete one Complementary Studies Electives (CSEs) from the Complementary Studies Course Lists for Engineering:
      - One course from List A.
    - Complete three courses from the Natural Science list.
    - Complete six courses from the Technical Electives (TEs) list.
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, PD22.
- Complete a total of five credited work terms.
- See Bachelor of Applied Science co-operative education program requirements.

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD11, PD19, PD20, PD22, and one additional PD course.

- Complete a total of five credited work terms.
- See Bachelor of Applied Science co-operative education program requirements.

Required Courses (Term by Term)

1A Term

- Complete all the following:
- CHE102 - Chemistry for Engineers (0.50)
- MATH115 - Linear Algebra for Engineering (0.50)
- MATH116 - Calculus 1 for Engineering (0.50)
- MSE100 - Management Engineering Concepts (0.75)
- MSE121 - Introduction to Computer Programming (0.50)
- 1B Term
- Complete all of the following
- Complete all the following:
    - GENE123 - Electrical Circuits and Instrumentation (0.50)
    - MATH118 - Calculus 2 for Engineering (0.50)
    - MSE100B - Seminar (0.00)
    - MSE131 - Work Design and Facilities Planning (0.50)
    - PHYS115 - Mechanics (0.50)
- Complete 1 of the following:
    - COMMST192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
    - ENGL192 - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
    - UCR192E - Communication in the Engineering Profession (COMPE, ELE, MGTE) (0.50)
- Complete 1 course from the Natural Science list.
- 2A Term
- Complete all of the following
- Complete all the following:
    - MSE200A - Seminar (0.00)
    - MSE240 - Algorithms and Data Structures (0.50)
    - MSE251 - Probability and Statistics 1 (0.50)
    - MSE261 - Engineering Economics: Financial Management for Engineers (0.50)
    - MSE271 - Advanced Calculus and Numerical Methods (0.50)
- Complete 1 course from the Natural Science list.
- 2B Term
- Complete all of the following
- Complete all the following:
    - MSE200B - Seminar (0.00)
    - MSE232 - Modelling in Operations Research (0.50)
    - MSE245 - Databases and Software Design (0.50)
    - MSE253 - Probability and Statistics 2 (0.50)
    - MSE263 - Managerial Economics (0.50)
- Complete 1 course from the Natural Science list.
- 3A Term
- Complete all the following:
- MSE211 - Organizational Behaviour (0.50)
- MSE300A - Seminar (0.00)
- MSE334 - Operations Planning and Inventory Control (0.50)
- MSE342 - Principles of Software Engineering (0.50)
- MSE431 - Stochastic Models and Methods (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- 3B Term
- Complete all of the following
- Complete all the following:
    - MSE300B - Seminar (0.00)
    - MSE302 - Engineering Design Methods (0.50)
    - MSE332 - Deterministic Optimization Models and Methods (0.50)
    - MSE333 - Simulation Analysis and Design (0.50)
    - MSE343 - Human-Computer Interaction (0.50)
- Complete 1 approved elective

- 4A Term
- Complete all of the following
- Complete all the following:
    - MSE400A - Seminar (0.00)
    - MSE434 - Supply Chain Management (0.50)
- Complete 1 of the following:
    - GENE403 - Interdisciplinary Design Project 1 (0.50)
    - MSE401 - Management Engineering Design Project 1 (0.50)
- Complete 3 approved electives
- 4B Term
- Complete all of the following
- Complete all the following:
    - MSE311 - Organizational Design and Technology (0.50)
    - MSE400B - Seminar (0.00)
- Complete 1 of the following:
    - GENE404 - Interdisciplinary Design Project 2 (0.50)
    - MSE402 - Management Engineering Design Project 2 (0.50)
- Complete 3 approved electives

1. Natural Science List
    -
        - Complete 3 of the following:
        - BIOL110 - Biodiversity, Biomes, and Evolution (0.50)
        - BIOL130 - Introductory Cell Biology (0.50)
        - BIOL150 - Organismal and Evolutionary Ecology (0.50)
        - BIOL165 - Diversity of Life (0.50)
        - BIOL211 - Introductory Vertebrate Zoology (0.50)
        - BIOL220 - Introduction to Plant Structure and Function (0.50)
        - BIOL239 - Genetics (0.50)
        - BIOL240 - Fundamentals of Microbiology (0.50)
        - BIOL273 - Principles of Human Physiology 1 (0.50)
        - CHE161 - Engineering Biology (0.50)
        - CHEM262 - Organic Chemistry for Engineering (0.50)
        - EARTH121 - Introductory Earth Sciences (0.50)
        - EARTH122 - Introductory Environmental Sciences (0.50)
        - EARTH123 - Introductory Hydrology (0.50)
        - EARTH221 - Introductory Geochemistry (0.50)
        - ENVS200 - Field Ecology (0.50)
        - PHYS112 - Physics 2 (0.50)
        - PHYS122 - Waves, Electricity and Magnetism (0.50)
        - PHYS124 - Modern Physics (0.50)
        - PHYS175 - Introduction to the Universe (0.50)
        - **Course Not Found**
        - PHYS233 - Introduction to Quantum Mechanics (0.50)
        - PHYS275 - Planets (0.50)
        - PSYCH207 - Cognitive Processes (0.50)
        - PSYCH261 - Physiological Psychology (0.50)
        - SCI238 - Introductory Astronomy (0.50)
        - SCI250 - Environmental Geology (0.50)
        -
        - Technical Electives List
        -
        - **Complete a total of 6 Technical Electives.**
        -
        - **List 1**
        -
        - **Complete 4 of the following:**
        - MSE433 - Applications of Management Engineering (0.50)
        - MSE435 - Advanced Optimization Techniques (0.50)
        - MSE436 - Decision Support Systems (0.50)
        - MSE452 - Decision Making Under Uncertainty (0.50)
        - MSE531 - Stochastic Processes and Decision Making (0.50)
        - MSE541 - Search Engines (0.50)
        - MSE543 - Analytics and User Experience (0.50)
        - MSE546 - Advanced Machine Learning (0.50)

- MSE551 - Quality Management and Control (0.50)
- MSE555 - Scheduling: Theory and Practice (0.50)
- MSE598 - Special Topics in Management Engineering (0.50)
-
- **List 2**
-
- **Complete all of the following**
- **The remaining 2 Technical Electives can be from List 1 or List 2.**
- **Choose any of the following:**
- **CIVE343 - Traffic Simulation Modelling and Applications (0.50)**
- **CIVE440 - Transit Planning and Operations (0.50)**
- **ECE252 - Systems Programming and Concurrency (0.50)**
- **ECE358 - Computer Networks (0.50)**
- **ECE406 - Algorithm Design and Analysis (0.50)**
- **ECE451 - Software Requirements Specification and Analysis (0.50)**
- **ECE452 - Software Design and Architectures (0.50)**
- **ECE453 - Software Testing, Quality Assurance, and Maintenance (0.50)**
- **ECE454 - Distributed Computing (0.50)**
- **ECE457A - Co-operative and Adaptive Algorithms (0.50)**
- **ECE457C - Reinforcement Learning (0.50)**
- **ECE458 - Computer Security (0.50)**
- **ECE459 - Programming for Performance (0.50)**
- **MTE241 - Introduction to Computer Structures and Real-Time Systems (0.50)**
- **SE463 - Software Project Management, Requirements, and Analysis (0.50)**
- **SE464 - Software Design and Architectures (0.50)**
- **SE465 - Software Testing and Quality Assurance (0.50)**
- **STAT331 - Applied Linear Models (0.50)**
- **STAT341 - Computational Statistics and Data Analysis (0.50)**
- **STAT435 - Statistical Methods for Process Improvements (0.50)**
- **STAT440 - Computational Inference (0.50)**
- **STAT443 - Forecasting (0.50)**
- **STAT444 - Statistical Learning - Advanced Regression (0.50)**
- **SYDE535 - Computational Simulations for Societal and Environmental Systems (0.50)**
- **SYDE542 - Interface Design (0.50)**
- **SYDE543 - Cognitive Ergonomics (0.50)**
- **SYDE548 - User Centred Design Methods (0.50)**
- **SYDE552 - Computational Neuroscience (0.50)**
- **SYDE572 - Introduction to Pattern Recognition (0.50)**
- **SYDE577 - Deep Learning (0.50)**
- ~~Complete 6 of the following:~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Additional Constraints

1. To accommodate an elective reduced load, MSE211, MSE261, and MSE263 may be taken out of sequence.
2. Exceptions to the requirements and electives listed above require prior approval of the Management Science and Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Mechanical Engineering - Mechanical Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove WKRPT 100 retroactively for all current students.

Student communication will state the following:

"If you are an active student you are exempt from WKRPT 100. If you complete PD 11 you are also exempt from WKRPT 200, or WKRPT 300 if you have already completed WKRPT 200."

Reduce the technical electives requirement to 6 from 7 resulting in a reduction of the plan credit weight to 21.5 from 22.0. Student communication will state the following:

"Effective Fall 2026 the technical elective requirement for mechanical engineering has been reduced to 6 technical electives from 7. This may be applied retroactively such that mechanical students that started in Fall 2022 and later have the choice of reducing their technical elective requirement to 6. Please inform an academic advisor if you decide to reduce your technical elective requirement to 6. You may decide, of course, to still take 7 technical electives. If you started your studies prior to Fall 2022, please reach out to an academic advisor."

Is the credential name changing?

No,

Co-operative System of Study and Requirements

Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

Updating the technical elective list, moving a few courses (courses that are similar to MME courses) from List 2 to List 1. MTE 484 was left off the Technical Elective List 1 when the Mechatronics courses were re-labeled, now it is being added.

Drop WKRPT 100 and replacing WKRPT 200 with PD 11, PD 11 to be taken as the third PD course. Reduce the PD requirement by one.

These changes have been approved on several different dates. November 27 2024 (technical elective list updates, requisite updates, course description updates) and September 26 2025 (plan changes - reducing work report requirements, reduce the PD requirement to 4 from 5, adding PD 11, moving ECE controls courses to List 1 TEs, requisites updates, reducing the technical elective requirement), and October 14, 2025 (reducing the technical elective requirement from List 2 and applying this change retroactively).

Editorial changes to notes.

Consultations (Departmental)

Relevant departments have been consulted with the technical elective list:

Mahesh Tripunitara, ACUG ECE
Derek Wright, MTE Director
John Zelek, SYDE Director
No Concerns raised.
All changes brought to FOPS - October 3, 2025.

Consulted with Work Integrated Learning and the instructor of PD 11 to add PD 11.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Mechanical Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Regular, Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See promotion rules.

Proposed

Graduation Requirements

- Complete a total of 21.50 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 10 approved electives:
    - Complete four Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - Two courses from List A, C, or D.
    - Complete six courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 22.00 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete 11 approved electives:
    - Complete four Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - Two courses from List A, C, or D.
    - Complete seven courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Proposed

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD19, PD20, PD11, and one additional PD course.
- Complete a total of five credited work terms.
- Complete one WKRPT course: WKRPT 300 (3A for stream 4, 3B for stream 8X)
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses:
  - WKRPT100 (2A for stream 4, 2B for stream 8X)
  - WKRPT200 (2B for stream 4, 3A for stream 8X)
  - WKRPT300 (3A for stream 4, 3B for stream 8X)
- See [Bachelor of Applied Science co-operative education program requirements](#).

1. 1A Term
   -
     - Complete all the following:
     - CHE102 - Chemistry for Engineers (0.50)

- MATH115 - Linear Algebra for Engineering (0.50)
- MATH116 - Calculus 1 for Engineering (0.50)
- ME100 - Introduction to Mechanical Engineering Practice 1 (0.75)
- PHYS115 - Mechanics (0.50)
-
- 1B Term
-
- Complete all of the following
- Complete all the following:
- MATH118 - Calculus 2 for Engineering (0.50)
- ME100B - Seminar (0.00)
- ME101 - Introduction to Mechanical Engineering Practice 2 (0.75)
- ME115 - Structure and Properties of Materials (0.50)
- ME123 - Electrical Engineering for Mechanical Engineers (0.50)
-
- Complete 1 approved elective
-
- 2A Term
-
- Complete all of the following
- Complete all the following:
- ME200A - Seminar (0.00)
- ME201 - Advanced Calculus (0.50)
- ME202 - Statistics for Engineers (0.50)
- ME219 - Mechanics of Deformable Solids 1 (0.50)
- ME230 - Control of Properties of Materials (0.50)
- ME269 - Electromechanical Devices and Power Processing (0.50)
-
- Complete 1 approved elective
-
- 2B Term
-
- Complete all the following:
- ME200B - Seminar (0.00)
- ME203 - Ordinary Differential Equations (0.50)
- ME212 - Dynamics (0.50)
- ME220 - Mechanics of Deformable Solids 2 (0.50)
- ME250 - Thermodynamics 1 (0.50)
- ME262 - Introduction to Microprocessors and Digital Logic (0.50)
-
- 3A Term
-
- Complete all the following:
- ME300A - Seminar (0.00)
- ME303 - Advanced Engineering Mathematics (0.50)
- ME321 - Dynamics of Machines and Mechanical Vibrations (0.50)
- ME340 - Manufacturing Processes (0.50)
- ME351 - Fluid Mechanics 1 (0.50)
- ME354 - Thermodynamics 2 (0.50)
-
- 3B Term
-
- Complete all the following:
- ME300B - Seminar (0.00)
- ME322 - Mechanical Design 1 (0.50)
- ME353 - Heat Transfer 1 (0.50)
- ME360 - Introduction to Control Systems (0.50)
- ME362 - Fluid Mechanics 2 (0.50)
- ME380 - Mechanical Engineering Design Workshop (0.50)
- MSE261 - Engineering Economics: Financial Management for Engineers (0.50)
-
- 4A Term
-
- Complete all of the following
- Complete all the following:
- ME400A - Seminar (0.00)
-
- Complete 1 of the following:
- GENE403 - Interdisciplinary Design Project 1 (0.50)

- ME481 - Mechanical Engineering Design Project 1 (0.50)
- MTE481 - Mechatronics Engineering Design Project (0.50)
-
- **Complete 4 approved electives**
-
- 4B Term
-
- Complete all of the following
- Complete all the following:
- ME400B - Seminar (0.00)
-
- Complete 1 of the following:
- GENE404 - Interdisciplinary Design Project 2 (0.50)
- ME482 - Mechanical Engineering Design Project 2 (0.50)
- MTE482 - Mechatronics Engineering Project (0.50)
-
- **Complete 4 approved electives**
- ~~Complete 4 or 5 approved electives~~
- ~~Complete 4 or 5 approved electives~~

1. Ethics List
    -
    - Complete 1 of the following:
    - PD22 - Professionalism and Ethics in Engineering Practice (0.50)
    - PHIL315 - Ethics and the Engineering Profession (0.50)
    -
    - Technical Electives List
    -
    - **Complete a total of 6 Technical Electives.**
    -
    - List 1
    -
    - Complete 4 of the following:
    - AE572 - Building Energy Analysis (0.50)
    - AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
    - CIVE460 - Engineering Biomechanics (0.50)
    - ECE481 - Digital Control Systems (0.50)
    - ECE484 - Digital Control Applications (0.50)
    - ECE486 - Robot Dynamics and Control (0.50)
    - ECE488 - Multivariable Control Systems (0.50)
    - ME423 - Mechanical Design 2 (0.50)
    - ME435 - Industrial Metallurgy (0.50)
    - ME436 - Welding and Joining Processes (0.50)
    - ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
    - ME456 - Heat Transfer 2 (0.50)
    - ME459 - Energy Conversion (0.50)
    - ME524 - Advanced Dynamics and Vibrations (0.50)
    - ME526 - Fatigue and Fracture Analysis (0.50)
    - ME531 - Physical Metallurgy Applied to Manufacturing (0.50)
    - ME533 - Non-Metallic and Composite Materials (0.50)
    - ME535 - Welding Metallurgy (0.50)
    - ME538 - Welding Design, Fabrication and Quality Control (0.50)
    - ME540 - Fundamentals in Neural and Rehabilitation Engineering (0.50)
    - ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
    - ME548 - Numerical Control of Machine Tools 1 (0.50)
    - ME555 - Computer-Aided Design (0.50)
    - ME557 - Combustion 1 (0.50)
    - ME559 - Finite Element Methods (0.50)
    - ME561 - Fluid Power Control Systems (0.50)
    - ME562 - Experimental Methods in Fluids (0.50)
    - ME563 - Turbomachines (0.50)
    - ME564 - Aerodynamics (0.50)
    - ME566 - Computational Fluid Dynamics for Engineering Design (0.50)
    - ME567 - Fire Safety Engineering (0.50)
    - ME571 - Clean Air Technologies (0.50)

- ME572 - Building Energy Analysis (0.50)
- ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- ME574 - Engineering Biomechanics (0.50)
- ME595 - Special Topics in Mechanical Engineering (0.50)
- ME596 - Special Topics in Mechanical Engineering (0.50)
- ME597 - Special Topics in Mechanical Engineering (0.50)
- ME598 - Special Topics in Mechanical Engineering (0.50)
- ME599 - Special Topics in Mechanical Engineering (0.50)
- MTE420 - Power Electronics and Motor Drives (0.50)
- MTE421 - Introduction to Analog and Digital Transistor-Level Design (0.50)
- MTE460 - Mechatronic System Integration (0.50)
- **MTE484 - Digital Control Applications (0.50)**
- MTE544 - Autonomous Mobile Robots (0.50)
- MTE545 - Introduction to MEMS Fabrication (0.50)
- MTE546 - Multi-Sensor Data Fusion (0.50)
- SYDE553 - Advanced Dynamics (0.50)
-
- List 2
-
- Complete all of the following
- **The remaining 2 Technical Electives can be from List 1 or List 2.**
- **Complete no more than 2 from the following:**
- **Course Not Found**
- ECE305 - Introduction to Quantum Mechanics (0.50)
- ECE406 - Algorithm Design and Analysis (0.50)
- ECE457A - Co-operative and Adaptive Algorithms (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE495 - Autonomous Vehicles (0.50)
- MSE331 - Introduction to Optimization (0.50)
- MSE431 - Stochastic Models and Methods (0.50)
- MSE432 - Production and Service Operations Management (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MSE452 - Decision Making Under Uncertainty (0.50)
- MSE551 - Quality Management and Control (0.50)
- MSE555 - Scheduling: Theory and Practice (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE532 - Introduction to Complex Systems (0.50)
- SYDE543 - Cognitive Ergonomics (0.50)
- SYDE548 - User Centred Design Methods (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE584 - Physiological Systems and Biomedical Design (0.50)
- ~~Complete a total of 7 Technical Electives.~~
- ~~The remaining 3 Technical Electives can be from List 1 or List 2 (see Additional Constraints).~~
- ~~Complete no more than 3 from the following:~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. With permission of the Associate Chair Undergraduate Studies, one graduate-level course may be used towards the Technical Electives List 2 choices.
3. Exceptions to the requirements and electives listed above require prior approval of the Mechanical Engineering Associate Chair, Undergraduate Studies.

Existing

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. A graduate-level course may be used towards the Technical Electives List 2 choices.
3. Students who are contemplating graduate studies or who complete the Welding and Joining Specialization, can request permission to take a graduate-level course. It is recommended that students discuss their study plans with a faculty member.
4. Some terms indicate a choice in the number and type of elective courses to be taken; program requirements can be found in the Graduation Requirements section.
5. Exceptions to the requirements and electives listed above require prior approval of the Mechanical Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing the available specialization.

Specializations List

Welding & Joining Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Mechatronics Engineering - Mechatronics Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-11

Quality Assurance Designation

Is there an impact to existing students?
Yes,

Impact on Existing Students

Remove one PD course from all current students.

WKRPT courses no longer required.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a 5*th* PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

<u>Background</u>

The MTE curriculum has three Work Term Reports: WKRPT 100, 200, and 300. WKRPT 100 is a ~5-page technical brief, whereas WKRPT 200 and 300 are ~20-page technical documents. There are pedagogical and curricular issues with the current WKRPT format:

1. Technical writing is taught and individually assessed in MTE 100 only. It is then individually assessed in WKRPT 100, 200, and 300, but with no further teaching or formative assessment. It is also in numerous other group formats throughout the curriculum (e.g., lab and project write-ups and the more substantive design documents of MTE 380, 481, and 482).
2. Students' co-op terms often do not involve the substantive design experience expected in such lengthy reports, so there is pressure to make up projects and data.
3. The skill to create technical documents with a coherent style and logical flow is relevant and deserves more instruction. The specific format or medium may evolve over time, but the core skills are essential.

<u>Proposed Changes</u>

The following program changes are proposed to address the issues described above:

1. Remove WKRPT 100, 200, and 300.
2. Add PD 11 as the third required PD course. This excellent course, Processes for Technical Report Writing, provides intermediate teaching and individual assessment points (MTE 100 provides introductory teaching and individual assessment).
3. Additionally, reduce the total number of required PD courses from 5 to 4 as per Fo E guidance.

<u>Miscellaneous Changes</u>

The ethics list was updated to include two additional courses currently in the CHE ethics list:

- PHIL215 - Professional and Business Ethics (0.50)
- PHIL219J - Practical Ethics (0.50)

<u>Impact on Student Workload</u>

Note the net reduction in student workload with the removal of WKRPT 100, 200, and 300. The total number of required PD courses drops to 4.

Consultations (Departmental)

The change is supported by the Engineering Undergraduate Office, Lauren Broderick from Co-op & Experiential Education, and the MTE student cohorts consulted informally termly from Winter 2024 through Spring 2025,

including formal polling in Fall 2024. These changes were approved by the MTE Curriculum Committee, consisting of the ME, ECE, and SYDE Associate Chairs, on September 11, 2025.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Mechanical and Mechatronics Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Mechatronics Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Proposed

Graduation Requirements

- Complete a total of 21.50 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete nine approved electives:
    - Complete four Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - Two courses from List A, C, or D.
    - Complete five courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Existing

Graduation Requirements

- Complete a total of 21.50 units (excluding COOP, PD, WKRPT):
  - Complete all the required courses listed below.
  - Complete nine approved electives:
    - Complete four Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List A.
      - One course from List C.
      - Two courses from List A, C, or D.
    - Complete five courses from the Technical Electives (TEs) lists.
- Complete one course from the Ethics list (see Additional Constraints).
- Complete all co-operative education program requirements listed below.

Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

Co-operative Education Program Requirements

- Complete a total of five PD courses: PD19, PD20, and three additional PD courses.
- Complete a total of five credited work terms.
- Complete a total of three WKRPT courses:
  - WKRPT100 (2A for stream 4, 2B for stream 8X).
  - WKRPT200 (2B for stream 4, 3A for stream 8X).
  - WKRPT300 (3A for stream 4, 3B for stream 8X).
- See [Bachelor of Applied Science co-operative education program requirements](#).

1. 1A Term
   -
   - Complete all the following:
   - CHE102 - Chemistry for Engineers (0.50)
   - MATH115 - Linear Algebra for Engineering (0.50)
   - MATH116 - Calculus 1 for Engineering (0.50)
   - MTE100 - Mechatronics Engineering (0.75)
   - MTE121 - Digital Computation (0.50)
   -
   - 1B Term
   -
   - Complete all the following:
   - MATH118 - Calculus 2 for Engineering (0.50)
   - MTE100B - Seminar (0.00)
   - MTE111 - Structure and Properties of Materials (0.50)
   - MTE119 - Statics (0.50)
   - MTE120 - Circuits (0.75)
   - MTE140 - Algorithms and Data Structures (0.50)
   -
   - 2A Term
   -
   - Complete all of the following
   - Complete all the following:
   - MTE182 - Physics 2: Dynamics (0.50)
   - MTE200A - Seminar (0.00)
   - MTE201 - Experimental Measurement and Statistical Analysis (0.50)
   - MTE202 - Ordinary Differential Equations (0.50)
   - MTE219 - Mechanics of Deformable Solids (0.50)
   - MTE262 - Introduction to Digital Logic (0.50)
   -
   - Complete 1 approved elective
   -
   - 2B Term
   -

- Complete all the following:
- MTE200B - Seminar (0.00)
- MTE203 - Advanced Calculus (0.50)
- MTE204 - Numerical Methods (0.50)
- MTE220 - Sensors and Instrumentation (0.50)
- MTE241 - Introduction to Computer Structures and Real-Time Systems (0.50)
- MTE252 - Linear Systems and Signals (0.50)
-
- 3A Term
-
- Complete all the following:
- MTE300A - Seminar (0.00)
- MTE309 - Introduction to Thermodynamics and Heat Transfer (0.50)
- MTE320 - Actuators and Power Electronics (0.50)
- MTE321 - Design and Dynamics of Machines (0.50)
- MTE325 - Microprocessor Systems and Interfacing for Mechatronics Engineering (0.50)
- MTE351 - Systems Models 1 (0.50)
-
- 3B Term
-
- Complete all of the following
- Complete all the following:
- MSE261 - Engineering Economics: Financial Management for Engineers (0.50)
- MTE300B - Seminar (0.00)
- MTE322 - Electromechanical Machine Design (0.50)
- MTE352 - Fluid Mechanics 1 (0.50)
- MTE360 - Automatic Control Systems (0.50)
- MTE380 - Mechatronics Engineering Design Workshop (0.50)
-
- Complete 1 approved elective
-
- 4A Term
-
- Complete all of the following
- Complete all the following:
- MTE400A - Seminar (0.00)
- MTE484 - Digital Control Applications (0.50)
-
- **Complete 1 of the following:**
- **GENE403 - Interdisciplinary Design Project 1 (0.50)**
- **ME481 - Mechanical Engineering Design Project 1 (0.50)**
- MTE481 - Mechatronics Engineering Design Project (0.50)
-
- Complete 3 approved electives
-
- 4B Term
-
- Complete all of the following
- Complete all the following:
- MTE400B - Seminar (0.00)
-
- **Complete 1 of the following:**
- **GENE404 - Interdisciplinary Design Project 2 (0.50)**
- **ME482 - Mechanical Engineering Design Project 2 (0.50)**
- MTE482 - Mechatronics Engineering Project (0.50)
-
- Complete 4 approved electives

1. Ethics List
   -
   - Complete 1 of the following:
   - **ARBUS202 - Professional and Business Ethics (0.50)**
   - PD22 - Professionalism and Ethics in Engineering Practice (0.50)
   - **PHIL215 - Professional and Business Ethics (0.50)**
   - **PHIL219J - Practical Ethics (0.50)**

- PHIL315 - Ethics and the Engineering Profession (0.50)
-
- Technical Electives List
-
- Complete 5 of the following:
- **Course Not Found**
- ECE327 - Digital Hardware Systems (0.50)
- ECE358 - Computer Networks (0.50)
- ECE406 - Algorithm Design and Analysis (0.50)
- ECE423 - Embedded Computer Systems (0.50)
- ECE452 - Software Design and Architectures (0.50)
- ECE455 - Embedded Software (0.50)
- ECE457A - Co-operative and Adaptive Algorithms (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE463 - Design and Applications of Power Electronic Converters (0.50)
- ECE486 - Robot Dynamics and Control (0.50)
- ECE488 - Multivariable Control Systems (0.50)
- ECE493 - Special Topics in Electrical and Computer Engineering (0.50)
- ECE495 - Autonomous Vehicles (0.50)
- ME362 - Fluid Mechanics 2 (0.50)
- ME436 - Welding and Joining Processes (0.50)
- ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
- ME459 - Energy Conversion (0.50)
- ME524 - Advanced Dynamics and Vibrations (0.50)
- ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
- ME548 - Numerical Control of Machine Tools 1 (0.50)
- ME555 - Computer-Aided Design (0.50)
- ME559 - Finite Element Methods (0.50)
- ME561 - Fluid Power Control Systems (0.50)
- ME563 - Turbomachines (0.50)
- ME564 - Aerodynamics (0.50)
- MTE420 - Power Electronics and Motor Drives (0.50)
- MTE421 - Introduction to Analog and Digital Transistor-Level Design (0.50)
- MTE460 - Mechatronic System Integration (0.50)
- MTE544 - Autonomous Mobile Robots (0.50)
- MTE545 - Introduction to MEMS Fabrication (0.50)
- MTE546 - Multi-Sensor Data Fusion (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE533 - Conflict Resolution (0.50)
- SYDE542 - Interface Design (0.50)
- SYDE543 - Cognitive Ergonomics (0.50)
- SYDE544 - Biomedical Measurement and Signal Processing (0.50)
- SYDE548 - User Centred Design Methods (0.50)
- SYDE556 - Simulating Neurobiological Systems (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE575 - Image Processing (0.50)
- SYDE584 - Physiological Systems and Biomedical Design (0.50)

Are there cross-listed courses listed in requirements?

No,

Additional Constraints

1. The course taken in the Ethics List can also be used towards the CSE or the PD requirements.
2. Exceptions to the requirements and electives listed above require prior approval of the Mechatronics Engineering Director or Mechanical and Mechatronics Engineering Associate Chair, Undergraduate Studies.

Specializations

Specializations for this Major
No,

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

H-Nanotechnology Engineering - Nanotechnology Engineering (Bachelor of Applied Science - Honours)

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year Fall 2026
Existing
Effective Term and Year Fall 2025

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-24

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
Yes,

Impact on Existing Students

Required PD courses dropping from five to four.

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Yes,

Co-operative Education Consultation

The Faculty of Engineering currently requires all students to take 5 PD courses (PD19, PD20 and 3 electives). We are proposing a reduction to 4 (PD19, PD20 and 2 electives). Some programs specify additional required courses (e.g., PD10, PD11, PD22) which reduce the number of electives.

Most faculties take PD1 during the first recruiting term. Instead of PD1, Engineering students take Co-op Fundamentals for Engineering in their 1A term.

Reducing the number of PD courses is an effort to reduce workload for Engineering students, ensuring they still meet their CEAB and Co-op (CEWIL) graduation requirements.

This change will be made for all active students, effective immediately. Current students will be told that they only require 4 PD courses (in addition to CFE) to meet graduation requirements. If students choose to take a $5th$ PD course, that will be permitted.

This change has been approved by the Provost, Centre for WIL, IAP and the AVP Co-operative & Experiential Education. This change has been approved by Engineering Department Chairs, and based on approval at Faculty Council, all BASc and BSE plans are being updated accordingly.

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Reduce the total number of required PD courses from 5 to 4 as per Fo E guidance.

RO dependency work: Removing CHE425 (retired at Dec 2025 SUC meeting).

TE list is being updated to reflect course changes (re-numbering, retirement and a new cross-list).

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Chemical Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Major

Program Type
Honours

Degree
Bachelor of Applied Science

Program/Plan Name
Nanotechnology Engineering (Bachelor of Applied Science - Honours)

Systems of Study
Co-operative,

Admissions

Admissions Entry Point
Direct Entry,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum cumulative overall average of 60.0%.
- A minimum term average of 60.0%. See [promotion rules](#).

Graduation Requirements

- Complete a total of 23.00 units (excluding COOP, PD):
  - Complete all the required courses listed below.
  - Complete 10 approved electives:
    - Complete two Complementary Studies Electives (CSEs) from the [Complementary Studies Course Lists for Engineering](#):
      - One course from List C.
      - One course from List A, C, or D.
    - Complete eight courses from the Technical Electives (TEs) lists.
- Complete all co-operative education program requirements listed below.

Proposed
Co-operative Education Program Requirements

- Complete a total of four PD courses: PD11, PD19, PD20, and one additional PD course.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

Existing
Co-operative Education Program Requirements

- Complete a total of five PD courses: PD11, PD19, PD20, and two additional PD courses.
- Complete a total of five credited work terms.
- See [Bachelor of Applied Science co-operative education program requirements](#).

Required Courses (Term by Term)

1A Term

- Complete all the following:
- MATH117 - Calculus 1 for Engineering (0.50)
- NE100 - Introduction to Nanotechnology Engineering (0.50)
- NE109 - Societal and Environmental Impacts of Nanotechnology (0.50)
- NE111 - Introduction to Programming for Engineers (0.25)
- NE112 - Linear Algebra for Nanotechnology Engineers (0.50)
- NE121 - Chemical Principles (0.50)
- 1B Term
- Complete all the following:
- MATH119 - Calculus 2 for Engineering (0.50)
- NE110 - Introduction to Nanomaterials Health Risks (0.50)
- NE113 - Introduction to Computational Methods (0.50)
- NE125 - Introduction to Materials Science and Engineering (0.50)
- NE131 - Physics for Nanotechnology Engineering (0.50)
- NE140 - Linear Circuits (0.50)
- 2A Term
- Complete all of the following
- Complete all the following:
    - NE215 - Probability and Statistics (0.50)
    - NE216 - Advanced Calculus and Numerical Methods 1 (0.50)
    - NE220L - Materials Science and Engineering Laboratory (0.25)
    - NE222 - Organic Chemistry for Nanotechnology Engineers (0.50)
    - NE241 - Electromagnetism (0.50)
- Complete 1 of the following:
    - COMMST100 - Interpersonal Communication (0.50)
    - COMMST223 - Public Speaking (0.50)
    - EMLS101R - Oral Communications for Academic Purposes (0.50)
    - EMLS102R - Clear Communication in English Writing (0.50)
    - EMLS129R - Written Academic English (0.50)
    - ENGL109 - Introduction to Academic Writing (0.50)
    - ENGL129R - Written Academic English (0.50)
- 2B Term
- Complete all the following:
- NE217 - Advanced Calculus and Numerical Methods 2 (0.50)
- NE225 - Structure and Properties of Nanomaterials (0.50)
- NE226 - Characterization of Materials (0.50)
- NE226L - Laboratory Characterization Methods (0.25)
- NE242 - Semiconductor Physics and Devices (0.50)
- NE281 - Biology for Nanotechnology Engineers (0.50)
- 3A Term
- Complete all the following:
- MSE261 - Engineering Economics: Financial Management for Engineers (0.50)
- NE318 - Continuum Mechanics for Nanotechnology Engineering (0.50)
- NE320L - Characterization of Materials Laboratory (0.25)
- NE332 - Quantum Mechanics (0.50)
- NE333 - Macromolecular Science (0.50)
- NE343 - Microfabrication and Thin-Film Technology (0.50)
- 3B Term
- Complete all of the following
- Complete all the following:
    - NE307 - Introduction to Nanosystems Design (0.25)
    - NE330L - Macromolecular Science Laboratory (0.25)
    - NE334 - Statistical Thermodynamics (0.50)
    - NE336 - Micro and Nanosystem Computer-Aided Design (0.50)
    - NE352 - Surfaces and Interfaces (0.50)
- Complete 2 approved electives
- 4A Term
- Complete all of the following
- Complete 1 of the following:
    - GENE403 - Interdisciplinary Design Project 1 (0.50)
    - NE408 - Nanosystems Design Project (0.50)
- Complete 2 of the following:
    - NE454A - Nano-Electronics Laboratory 1 (0.25)
    - NE454B - Nano-Instrumentation Laboratory 1 (0.25)

- ○ NE454C - Nanobiosystems Laboratory 1 (0.25)
- ○ NE454D - Nanostructured Materials Laboratory 1 (0.25)
- Complete 4 approved electives
- 4B Term
- Complete all of the following
- Complete 1 of the following:
  - ○ GENE404 - Interdisciplinary Design Project 2 (0.50)
  - ○ NE409 - Nanosystems Design Project and Symposium (0.50)
- Complete 2 of the following:
  - ○ NE455A - Nano-Electronics Laboratory 2 (0.25)
  - ○ NE455B - Nano-Instrumentation Laboratory 2 (0.25)
  - ○ NE455C - Nanobiosystems Laboratory 2 (0.25)
  - ○ NE455D - Nanostructured Materials Laboratory 2 (0.25)
- Complete 4 approved electives

1. Technical Electives List
   - ○
   - ○ Complete a total of 8 Technical Electives, with a minimum of 4 taken from List 1 (see Additional Constraints).
   - ○
   - ○ List 1
   - ○
   - ○ Complete 4 of the following:
   - ○ NE335 - Soft Nanomaterials (0.50)
   - ○ NE344 - Electronic Circuits (0.50)
   - ○ NE345 - Photonic Materials and Devices (0.50)
   - ○ NE353 - Nanoprobing and Lithography (0.50)
   - ○ NE381 - Introduction to Nanoscale Biosystems (0.50)
   - ○ NE451 - Simulation Methods (0.50)
   - ○ NE452 - Special Topics in Nanoscale Simulations (0.50)
   - ○ NE453 - Special Topics in Nanotechnology Engineering (0.50)
   - ○ NE459 - Nanotechnology Engineering Research Project (0.50)
   - ○ NE461 - Micro and Nano-Instrumentation (0.50)
   - ○ NE466 - Tactile Sensors and Transducers (0.50)
   - ○ NE471 - Nano-Electronics (0.50)
   - ○ NE476 - Organic Electronics (0.50)
   - ○ NE481 - Nanomedicine and Nanobiotechnology (0.50)
   - ○ NE486 - Biosensors (0.50)
   - ○ NE487 - Microfluidic and Nanobiotechnological Systems (0.50)
   - ○ NE488 - Biomaterials and Tissue Engineering (0.50)
   - ○ NE491 - Nanostructured Materials (0.50)
   - ○ NE496 - Nanomaterials for Electrochemical Energy Systems (0.50)
   - ○
   - ○ List 2
   - ○
   - ○ Complete no more than 1 from the following:
   - ○ AMATH456 - Calculus of Variations (0.50)
   - ○ BIOL240 - Fundamentals of Microbiology (0.50)
   - ○ CHE225 - Strategies for Process Improvement and Product Development (0.50)
   - ○ CIVE204 - Solid Mechanics 1 (0.50)
   - ○ CIVE230 - Engineering and Sustainable Development (0.50)
   - ○ CO487 - Applied Cryptography (0.50)
   - ○ ECE222 - Digital Computers (0.50)
   - ○ ECE224 - Embedded Microprocessor Systems (0.50)
   - ○ ECE250 - Algorithms and Data Structures (0.50)
   - ○ ECE252 - Systems Programming and Concurrency (0.50)
   - ○ ECE260 - Electromechanical Energy Conversion (0.50)
   - ○ ECON371 - Business Finance 1 (0.50)
   - ○ KIN255 - Fundamentals of Neuroscience (0.50)
   - ○ KIN340 - Musculoskeletal Injuries in Sport and Activity (0.50)
   - ○ ME262 - Introduction to Microprocessors and Digital Logic (0.50)
   - ○ MSE240 - Algorithms and Data Structures (0.50)
   - ○ MSE245 - Databases and Software Design (0.50)
   - ○ MTE241 - Introduction to Computer Structures and Real-Time Systems (0.50)
   - ○ MTE262 - Introduction to Digital Logic (0.50)

- STAT341 - Computational Statistics and Data Analysis (0.50)
- SYDE223 - Data Structures and Algorithms (0.50)
-
- List 3
-
- Complete no more than 4 from the following:
- **Course Not Found**
- BIOL487 - Computational Neuroscience (0.50)
- BME384 - Biomedical Transport: Biofluids and Mass Transfer (0.50)
- BME386 - The Physics of Medical Imaging (0.50)
- BME393 - Digital Systems (0.50)
- **Course Not Found**
- BME544 - Biomedical Measurement and Signal Processing (0.50)
- BME550 - Sports Engineering (0.50)
- BME587 - Special Topics in Biomedical Signals (0.50)
- CHE314 - Chemical Reaction Engineering (0.50)
- CHE331 - Electrochemical Engineering (0.50)
- CHE361 - Bioprocess Engineering (0.50)
- CHE480 - Process Analysis and Design (0.50)
- CHE514 - Fundamentals of Petroleum Production (0.50)
- CHE516 - Energy Systems Engineering (0.50)
- CHE521 - Process Optimization (0.50)
- CHE543 - Polymer Production: Polymer Reaction Engineering (0.50)
- CHE562 - Advanced Bioprocess Engineering (0.50)
- CHE571 - Industrial Ecology (0.50)
- CHE572 - Air Pollution Control (0.50)
- CHE574 - Industrial Wastewater Pollution Control (0.50)
- **Course Not Found**
- CIVE460 - Engineering Biomechanics (0.50)
- CIVE512 - Rehabilitation of Structures (0.50)
- ECE327 - Digital Hardware Systems (0.50)
- ECE340 - Electronic Circuits 2 (0.50)
- ECE350 - Real-Time Operating Systems (0.50)
- ECE356 - Database Systems (0.50)
- ECE358 - Computer Networks (0.50)
- ECE360 - Power Systems and Smart Grids (0.50)
- ECE373 - Radio Frequency and Microwave Circuits (0.50)
- ECE375 - Electromagnetic Fields and Waves (0.50)
- ECE405A - Quantum Information Processing Devices (0.50)
- ECE405B - Fundamentals of Experimental Quantum Information (0.50)
- ECE405C - Programming of Quantum Computing Algorithms (0.50)
- ECE405D - Superconducting Quantum Circuits (0.50)
- ECE406 - Algorithm Design and Analysis (0.50)
- ECE409 - Cryptography and System Security (0.50)
- ECE416 - Advanced Topics in Networking (0.50)
- ECE417 - Image Processing (0.50)
- ECE423 - Embedded Computer Systems (0.50)
- ECE432 - Radio Frequency Integrated Devices and Circuits (0.50)
- ECE444 - Integrated Analog Electronics (0.50)
- ECE451 - Software Requirements Specification and Analysis (0.50)
- ECE452 - Software Design and Architectures (0.50)
- ECE457A - Co-operative and Adaptive Algorithms (0.50)
- ECE457B - Fundamentals of Computational Intelligence (0.50)
- ECE459 - Programming for Performance (0.50)
- ECE474 - Radio and Wireless Systems (0.50)
- ECE477 - Photonic Devices and Systems (0.50)
- ECE484 - Digital Control Applications (0.50)
- ECE488 - Multivariable Control Systems (0.50)
- ME340 - Manufacturing Processes (0.50)
- ME435 - Industrial Metallurgy (0.50)
- ME459 - Energy Conversion (0.50)
- ME526 - Fatigue and Fracture Analysis (0.50)
- ME531 - Physical Metallurgy Applied to Manufacturing (0.50)
- ME533 - Non-Metallic and Composite Materials (0.50)
- ME574 - Engineering Biomechanics (0.50)
- ME596 - Special Topics in Mechanical Engineering (0.50)
- MSE331 - Introduction to Optimization (0.50)
- MSE332 - Deterministic Optimization Models and Methods (0.50)
- MSE333 - Simulation Analysis and Design (0.50)

- MSE342 - Principles of Software Engineering (0.50)
- MSE343 - Human-Computer Interaction (0.50)
- MSE431 - Stochastic Models and Methods (0.50)
- MSE432 - Production and Service Operations Management (0.50)
- MSE435 - Advanced Optimization Techniques (0.50)
- MSE446 - Introduction to Machine Learning (0.50)
- MSE452 - Decision Making Under Uncertainty (0.50)
- MTE322 - Electromechanical Machine Design (0.50)
- MTE325 - Microprocessor Systems and Interfacing for Mechatronics Engineering (0.50)
- MTE360 - Automatic Control Systems (0.50)
- MTE420 - Power Electronics and Motor Drives (0.50)
- MTE544 - Autonomous Mobile Robots (0.50)
- MTE545 - Introduction to MEMS Fabrication (0.50)
- SE464 - Software Design and Architectures (0.50)
- SYDE322 - Software Design (0.50)
- SYDE334 - Applied Statistics (0.50)
- SYDE522 - Foundations of Artificial Intelligence (0.50)
- SYDE531 - Design Optimization Under Probabilistic Uncertainty (0.50)
- SYDE533 - Conflict Resolution (0.50)
- SYDE542 - Interface Design (0.50)
- SYDE543 - Cognitive Ergonomics (0.50)
- SYDE548 - User Centred Design Methods (0.50)
- SYDE552 - Computational Neuroscience (0.50)
- SYDE556 - Simulating Neurobiological Systems (0.50)
- SYDE572 - Introduction to Pattern Recognition (0.50)
- SYDE575 - Image Processing (0.50)
- SYDE584 - Physiological Systems and Biomedical Design (0.50)
- ~~CHE425 - Strategies for Process Improvement and Product Development (0.50)~~
- ~~CIVE310 - Introduction to Structural Design (0.75)~~

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

Some cross-listings not to be counted,

Removing Cross-Lists

CHE 561 (CL with NE 488) removed from TE List 1 at Feb 2024 SUC

Additional Constraints

1. If taking ME596, students must enrol in "ME596B Topic: Intro. Fabrication and Characterization of Nanostructures".
2. Exceptions to the requirements and electives listed above require prior approval of the Nanotechnology Engineering Director.

Specializations

Specializations for this Major
Yes - Optional,

Specialization Details

Students may choose to focus their elective choices by completing one (or more) of four available specializations.

Specializations List

Nanobiosystems Specialization, Nanoelectronics Specialization, Nanofabrication Specialization, or Nanomaterials Specialization

Undergraduate Plan Guidelines

Workflow Information

Change to Undergraduate Communication Requirement
No,

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Biomaterials & Tissues Specialization - Biomaterials and Tissues Specialization

Effective Date and Career

Career
Undergraduate,

Proposed
Effective Term and Year   Fall 2026
Existing
Effective Term and Year   Fall 2024

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

The biomaterials and tissues specialization has been revised due to the change in our overall program/degree requirements, where students now have 7 technical electives. The revisions to the specialization have been designed (1) to allow our students to seamlessly engaged in the specialization (by removing the capstone requirement) and (2) to redesign the lists based on the number of electives.

(1) We have removed the capstone requirement: this constrained students in their capstone design project, a team-based project, making it difficult at times to scope problems and/or be able to claim they met the capstone requirement for the specialization. Additionnally, tracking this requirement was difficult and complicated the degree audit.

(2) Updated lists of elective, including more electives to provide more knowledge in natural sciences

Consultations (Departmental)

The revised specialization was approved by the BME undergraduate program committee and by the SYDE department.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Faculty

Faculty of Engineering

Undergraduate Credential Type

Specialization

Program/Plan Name

Biomaterials and Tissues Specialization

Admissions

Specialization is available for students in the following majors

H-Biomedical Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Proposed

Graduation Requirements

- Complete a total of seven courses according to the requirements below.

Existing

Graduation Requirements

- Complete a total of five courses according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
   -
   - **Complete a total of seven courses according to the requirements below.**
   -
   - **List 1**
   -
   - **Complete all the following:**
   - **BME386 - The Physics of Medical Imaging (0.50)**
   - BME564 - Biocompatibility and Biomedical Design (0.50)
   -
   - **List 2**
   -
   - Complete 2 of the following:
   - **BIOL235 - Foundations of Molecular Biology (0.50)**
   - **BIOL239 - Genetics (0.50)**
   - BIOL240 - Fundamentals of Microbiology (0.50)
   - BIOL302 - Functional Histology (0.50)
   - BIOL308 - Principles of Molecular Biology (0.50)
   - **BIOL341 - Fundamentals of Immunology (0.50)**
   - BIOL355 - Biology of Human Aging (0.50)
   - BIOL373 - Principles of Human Physiology 2 (0.50)
   - BIOL376 - Cellular Neurophysiology (0.50)
   - **CHEM233 - Fundamentals of Biochemistry (0.50)**
   - **CHEM237 - Introductory Biochemistry (0.50)**
   - **CHEM262 - Organic Chemistry for Engineering (0.50)**
   - **CHEM267 - Basic Organic Chemistry 2 (0.50)**
   - KIN406 - Physiology of Muscle Aging and Disease (0.50)
   - **NE222 - Organic Chemistry for Nanotechnology Engineers (0.50)**
   -
   - **List 3**
   -
   - Complete 1 of the following:
   - BME552 - Computational Biomechanics (0.50)
   - BME553 - Introductory Mechanics of Biomedical and Biological Materials (0.50)
   - BME561 - Biomaterials and Tissue Engineering (0.50)
   - BME589 - Special Topics in Biomedical Devices (0.50)
   - **CHE565 - Synthetic Biology Project Design (0.50)**
   - NE481 - Nanomedicine and Nanobiotechnology (0.50)
   -
   - **List 4**
   -
   - Complete 1 of the following:
   - **CHE361 - Bioprocess Engineering (0.50)**
   - CHE541 - Introduction to Polymer Science and Properties (0.50)

- ME435 - Industrial Metallurgy (0.50)
- ME526 - Fatigue and Fracture Analysis (0.50)
- ME531 - Physical Metallurgy Applied to Manufacturing (0.50)
- ME533 - Non-Metallic and Composite Materials (0.50)
- ME559 - Finite Element Methods (0.50)
- ME598 - Special Topics in Mechanical Engineering (0.50)
-
- List 5
-
- Complete all of the following
- The remaining course can be taken from List 3, 4, or 5.
- Choose any of the following:
- BME393 - Digital Systems (0.50)
- BME499 - Elective Biomedical Research Project (0.50)
- BME599 - Special Topics in Biomedical Engineering (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE586 - Material Selection for Design (0.50)
- SYDE537 - Artificial Life: Biology and Computation (0.50)
- ~~GERON355 - Biology of Human Aging (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Proposed

Additional Constraints

1. To have BME499, BME589, and BME599 count towards the Specialization, only certain topics are permitted. See the Biomedical Engineering Program Director for details.
2. To enrol in a second topic of BME589 requires approval from the Biomedical Engineering Program Director.

Existing

Additional Constraints

1. To have BME589 and ME598 count towards the Specialization, only certain topics are permitted. See the Specialization co-ordinator for details.
2. To enrol in a second topic of BME589 and ME598 requires approval from the Specialization co-ordinator.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Sports Engineering Specialization - Biomechanics and Rehabilitation Specialization

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2024	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
Yes,

Impact of Credential Name Change
The name change applies only to future students (current students may opt in),

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
Yes,

Invalid Combinations Consultations

Too much overlap with existing Biomechanics Option (part of Faculty of Engineering).

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

The specialization is being renamed following consultation with students and faculty members. The specialization has had limited uptake since it was created in 2015 but has had limited students declaring/taking the specialization. Some see it as too narrow (doesn't include broader application of biomechanics and rehabilitation beyond sports injury) or too broad (some applications of sports engineering are not related to BME).

The specialization has also been revised due to the change in our overall program/degree requirements, where students now have 7 technical electives. The revisions to the specialization have been designed (1) to allow our students to seamlessly engaged in the specialization (by removing the capstone requirement) and (2) to provide choice of electives that represent the application areas of biomechanics and rehabiltation.

(1) We have removed the capstone requirement: this constrained students in their capstone design project, a team-based project, making it difficult at times to scope problems and/or be able to claim they met the capstone requirement for the specialization. Additionnally, tracking this requirement was difficult and complicated the degree audit.

(2) Updated lists of elective

Consultations (Departmental)

The revised specialization was approved by the BME undergraduate program committee and by the SYDE department.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Specialization

Proposed

Program/Plan Name
Biomechanics and Rehabilitation Specialization

Existing

Program/Plan Name
Sports Engineering Specialization

Admissions

Specialization is available for students in the following majors

H-Biomedical Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Proposed

List of Invalid Combinations

Biomechanics Option

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Proposed

Graduation Requirements

- Complete a total of seven courses according to the requirements below.

Existing

Graduation Requirements

- Complete a total of five courses and one capstone or research project according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
   - ○
   - ○ **Complete a total of seven courses according to the requirements below.**
   - ○
   - ○ **List 1**
   - ○
   - ○ **Complete 1 of the following:**
   - ○ **BME386 - The Physics of Medical Imaging (0.50)**
   - ○ **BME393 - Digital Systems (0.50)**
   - ○
   - ○ **List 2**
   - ○
   - ○ **Complete 3 of the following:**
   - ○ BME499 - Elective Biomedical Research Project (0.50)
   - ○ **BME540 - Fundamentals in Neural and Rehabilitation Engineering (0.50)**
   - ○ BME544 - Biomedical Measurement and Signal Processing (0.50)
   - ○ BME550 - Sports Engineering (0.50)
   - ○ BME551 - Biomechanics of Human Movement (0.50)
   - ○ BME552 - Computational Biomechanics (0.50)

- BME553 - Introductory Mechanics of Biomedical and Biological Materials (0.50)
- BME588 - Special Topics in Biomechanics (0.50)
-
- List 3
-
- Complete 1 of the following:
- KIN310 - Development, Aging, and Health (0.50)
- KIN312 - Introduction to Neurological Disorders (0.50)
- KIN327 - Trauma Biomechanics (0.50)
- KIN340 - Musculoskeletal Injuries in Sport and Activity (0.50)
- KIN357 - Motor Learning and Neuroplasticity (0.50)
- KIN359 - Cognition, Cognitive Dysfunction, and Movement (0.50)
- KIN406 - Physiology of Muscle Aging and Disease (0.50)
- KIN418 - Physical Activity and Aging (0.50)
- KIN420 - Occupational Biomechanics (0.50)
- KIN428 - Upper Extremity Disorders (0.50)
-
- List 4
-
- Complete all of the following
- Complete 1 of the following:
- CIVE460 - Engineering Biomechanics (0.50)
- ECE417 - Image Processing (0.50)
- ME362 - Fluid Mechanics 2 (0.50)
- ME533 - Non-Metallic and Composite Materials (0.50)
- ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)
- ME574 - Engineering Biomechanics (0.50)
- ME559 - Finite Element Methods (0.50)
- SYDE411 - Optimization and Numerical Methods (0.50)
- SYDE553 - Advanced Dynamics (0.50)
- SYDE575 - Image Processing (0.50)
- MTE420 - Power Electronics and Motor Drives (0.50)
-
- Complete 1 additional course from Lists 1, 2, 3, or 4
- ~~Complete 2 of the following:~~
- ~~Complete 1 of the following~~
- ~~Complete all the following:~~
- ~~BME461 - Biomedical Engineering Design Workshop 2 (0.50)~~
- ~~BME462 - Biomedical Engineering Design Workshop 3 (0.50)~~
- ~~Complete all the following:~~
- ~~Complete all the following:~~
- ~~GENE403 - Interdisciplinary Design Project 1 (0.50)~~
- ~~GENE404 - Interdisciplinary Design Project 2 (0.50)~~
- ~~Complete all the following:~~
- ~~SYDE461 - Systems Design Capstone Project 1 (0.50)~~
- ~~SYDE462 - Systems Design Capstone Project 2 (0.50)~~
- ~~Complete 3 courses from the following lists~~
- ~~Choose any of the following:~~
- ~~Complete no more than 1 from the following:~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?
Yes,

Cross-Listings Options
All cross-listings to be displayed,

Proposed

Additional Constraints

1. To have BME499 and BME 588 count towards the Specialization, only certain topics are permitted. See the Biomedical Engineering Program Director for details.
2. To enrol in a second topic of BME588 requires approval from the Biomedical Engineering Program Director.

Existing

Additional Constraints

1. No one course may fulfil more than one requirement within the Specialization.
2. The capstone project and research project must have a focus on sports engineering and be approved by the Specialization co-ordinator.

Notes

1. Students can only claim one of the following: Sports Engineering Specialization or Biomechanics and Rehabilitation Specialization.

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Medical Artificial Intelligence Specialization - Biomedical Artificial Intelligence Specialization

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2024	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-09-26

Quality Assurance Designation

Is there an impact to existing students?
No,

Is the credential name changing?
Yes,

Impact of Credential Name Change
The name change applies only to future students (current students may opt in),

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
Yes,

Invalid Combinations Consultations

Within Engineering

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

The medical AI specialization is being renamed to biomedical AI to add elements of bioinformatics to the specialization that aligns with students' interest as well as where AI is being applied within the field of BME. The specialization is also being revised due to the change in our overall program/degree requirements, where students now have 7 technical electives. The revisions to the specialization have been designed (1) to allow our students to seamlessly engaged in the specialization (by removing the capstone requirement) and (2) to provide choice of electives that represent broader areas of BME applications.

(1) We have removed the capstone requirement: this constrained students in their capstone design project, a team-based project, making it difficult at times to scope problems and/or be able to claim they met the capstone requirement for the specialization. Additionally, tracking this requirement was difficult and complicated the degree audit.

(2) Updated lists of elective to include electives related to computional biology/bioinformatics.

Consultations (Departmental)

The ACUG of the Biology department is a member of the BME undergraduate committee and contributed to the development of the specialization. The revised specialization was approved by the BME undergraduate program committee and by the SYDE department.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Specialization

Proposed

Program/Plan Name
Biomedical Artificial Intelligence Specialization

Existing

Program/Plan Name
Medical Artificial Intelligence Specialization

Admissions

Specialization is available for students in the following majors

H-Biomedical Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Proposed
Invalid Combinations Yes,
Existing
Invalid Combinations No,

List of Invalid Combinations

Artificial Intelligence Option

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Proposed
Graduation Requirements • Complete a total of eight courses according to the requirements below.
Existing
Graduation Requirements • Complete a total of five courses and one capstone or research project according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - ○
    - ○ **Complete a total of eight courses according to the requirements below.**
    - ○
    - ○ List 1
    - ○
    - ○ Complete all the following:
    - ○ **BME386 - The Physics of Medical Imaging (0.50)**
    - ○ **Course Not Found**
    - ○
    - ○ List 2
    - ○
    - ○ **Complete 2 of the following:**
    - ○ ECE457C - Reinforcement Learning (0.50)
    - ○ SYDE572 - Introduction to Pattern Recognition (0.50)
    - ○ SYDE577 - Deep Learning (0.50)
    - ○
    - ○ **List 3**
    - ○
    - ○ Complete 1 of the following:
    - ○ **BIOL239 - Genetics (0.50)**
    - ○ **BIOL266 - Introduction to Computational Biology (0.50)**
    - ○ **BIOL365 - Methods in Bioinformatics (0.50)**
    - ○ **BIOL382 - Computational Modelling of Cellular Systems (0.50)**
    - ○ **BIOL469 - Genomics (0.50)**
    - ○ HLTH230 - Introduction to Health Informatics (0.50)
    - ○
    - ○ **List 4**
    - ○
    - ○ Complete all of the following
    - ○ Complete 1 of the following:
    - ○ BME499 - Elective Biomedical Research Project (0.50)
    - ○ MSE446 - Introduction to Machine Learning (0.50)
    - ○ **SYDE411 - Optimization and Numerical Methods (0.50)**
    - ○ **SYDE537 - Artificial Life: Biology and Computation (0.50)**
    - ○ SYDE552 - Computational Neuroscience (0.50)
    - ○ SYDE556 - Simulating Neurobiological Systems (0.50)
    - ○ **SYDE575 - Image Processing (0.50)**
    - ○
    - ○ **Complete 1 additional course from Lists 2, 3, or 4**
    - ○
    - ○ **List 5**
    - ○
    - ○ Complete 1 of the following:
    - ○ **STV205 - Cybernetics and Society (0.50)**
    - ○ STV208 - Artificial Intelligence and Society: Impact, Ethics, and Equity (0.50)
    - ○ **STV210 - The Computing Society (0.50)**
    - ○ **STV302 - Information Technology and Society (0.50)**
    - ○ ~~BME530 - The Healthcare System (0.50)~~
    - ○ ~~Complete 1 of the following~~
    - ○ ~~BME461 - Biomedical Engineering Design Workshop 2 (0.50)~~
    - ○ ~~BME462 - Biomedical Engineering Design Workshop 3 (0.50)~~
    - ○ ~~GENE403 - Interdisciplinary Design Project 1 (0.50)~~
    - ○ ~~GENE404 - Interdisciplinary Design Project 2 (0.50)~~
    - ○ ~~SYDE461 - Systems Design Capstone Project 1 (0.50)~~
    - ○ ~~SYDE462 - Systems Design Capstone Project 2 (0.50)~~
    - ○ ~~CS486 - Introduction to Artificial Intelligence (0.50)~~

- ~~ECE457B - Fundamentals of Computational Intelligence (0.50)~~
- ~~SYDE522 - Foundations of Artificial Intelligence (0.50)~~
- ~~CS485 - Statistical and Computational Foundations of Machine Learning (0.50)~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

Some cross-listings not to be counted,

Proposed

Removing Cross-Lists BIOL487 (CL with SYDE552) removed at Feb 2024 SUC. SYDE 522 (SL with BME522) to be removed, the BME version is the only one that allows student to meet degree requirements - Feb 2026 SUC.

Existing

Removing Cross-Lists BIOL487 (CL with SYDE552) removed at Feb 2024 SUC.

Proposed

Additional Constraints

1. To have BME499 count towards Specialization, only certain research topics are permitted. See the Biomedical Engineering Program Director for details.

Existing

Additional Constraints

1. The capstone project and research project must have a focus on medical artificial intelligence and be approved by the Specialization co-ordinator.
2. No one course may fulfil more than one requirement within the Specialization.
3. Alternatively, students can take zero courses from List 1 and two courses from List 2.

Notes

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Building Science Specialization - Building Science Specialization

Effective Date and Career

Career
Undergraduate,

Proposed	
Effective Term and Year Fall 2026	
Existing	
Effective Term and Year Fall 2023	

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-16

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations

No,

Change to Learning Outcomes

No,

Rationale and Background for Change(s)

Add AE/ENVE 585

- The course description stated below fits within the mandate for the building science specialization:

This course introduces air quality, design of engineering solutions, and associated health and economic impacts. It includes topics focused on the indoor environment, the outdoor environment, or both, such as air pollution sources, emission estimation, control strategies, measurement, modelling methods, health impact assessment, cost-benefit analysis, technical policy analysis, and co-impacts with climate change.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty

Faculty of Engineering

Undergraduate Credential Type

Specialization

Program/Plan Name

Building Science Specialization

Admissions

Specialization is available for students in the following majors

H-Civil Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Graduation Requirements

- Complete a total of four courses according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
   -
     - Complete 4 of the following:
     - AE405 - Building Performance Measurement Lab (0.50)
     - AE450 - Building Service Systems (0.50)
     - AE572 - Building Energy Analysis (0.50)
     - AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
     - **AE585 - Air Quality Engineering and Impacts (0.50)**
     - CIVE507 - Building Science and Technology (0.50)
     - ENVE277 - Air Quality Engineering (0.50)
     - ENVE279 - Energy and the Environment (0.50)
     - **ENVE585 - Air Quality Engineering and Impacts (0.50)**
     - ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
     - ME572 - Building Energy Analysis (0.50)
     - ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Building Systems Specialization - Building Systems Specialization

Top

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year

Proposal Details

Proposal Type
Change,

Academic Unit Approval
2025-10-16

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
No,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

Add AE/ENVE 585 to TE List 1

- The course description stated below fits within the mandate for the building system specialization and can be added to the TE List 1:

This course introduces air quality, design of engineering solutions, and associated health and economic impacts. It includes topics focused on the indoor environment, the outdoor environment, or both, such as air pollution sources,

emission estimation, control strategies, measurement, modelling methods, health impact assessment, cost-benefit analysis, technical policy analysis, and co-impacts with climate change.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Civil and Environmental Engineering

Faculty
Faculty of Engineering

Undergraduate Credential Type
Specialization

Program/Plan Name
Building Systems Specialization

Admissions

Specialization is available for students in the following majors

H-Architectural Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Graduation Requirements

- Complete a total of four courses according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
   - ○
     - ○ Complete 4 of the following:
     - ○ AE301 - Building Enclosure Systems (0.50)
     - ○ AE315 - Building Structural Systems (0.50)
     - ○ AE405 - Building Performance Measurement Lab (0.50)

- AE450 - Building Service Systems (0.50)
- AE572 - Building Energy Analysis (0.50)
- AE573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)
- **AE585 - Air Quality Engineering and Impacts (0.50)**
- **ENVE585 - Air Quality Engineering and Impacts (0.50)**
- ME452 - HVAC Load Analysis and Design Fundamentals (0.50)
- ME567 - Fire Safety Engineering (0.50)
- ME572 - Building Energy Analysis (0.50)
- ME573 - HVAC Systems, Equipment, and Energy Efficiency (0.50)

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?

Yes,

Cross-Listings Options

All cross-listings to be displayed,

Specializations

Undergraduate Plan Guidelines

Workflow Information

Workflow Path
Committee approvals,

Faculty/AFIW Path(s) for Workflow

Faculty of Engineering

Dependencies

Medical Devices Specialization - Medical Devices Specialization

Effective Date and Career

Career
Undergraduate,

Proposed

Effective Term and Year
Fall 2026

Existing

Effective Term and Year
Fall 2024

Proposal Details

Proposal Type

Academic Unit Approval

Quality Assurance Designation
Minor Modification Qad

Is there an impact to existing students?
No,

Is the credential name changing?
No,

Co-operative System of Study and Requirements
Not Applicable,

Creating or Changing Invalid Combinations
No,

Change to Learning Outcomes
No,

Rationale and Background for Change(s)

The medical device specialization has been revised due to the change in our overall program/degree requirements, where students now have 7 technical electives. The revisions to the specialization have been designed (1) to allow our students to seamlessly engaged in the specialization (by removing the capstone requirement) and (2) to provide choice of electives that focus on the design and fabrication of medical devices (but not for imaging devices/technologies)

(1) We have removed the capstone requirement: this constrained students in their capstone design project, a team-based project, making it difficult at times to scope problems and/or be able to claim they met the capstone requirement for the specialization. Additionnally, tracking this requirement was difficult and complicated the degree audit.

(2) Updated lists of elective to reflect changes to the specialization with a focus on devices for implantation/therapeutics rather than imaging (new specialization created)

The specialization was revised by a subgroup of the BME undergraduate program committee with expertise in the area.

Consultations (Departmental)

The revised specialization was approved by the BME undergraduate program committee and by the SYDE department.

General Program/Plan Information

Faculty

Faculty of Engineering

Academic Unit

Department of Systems Design Engineering

Faculty

Faculty of Engineering

Undergraduate Credential Type

Specialization

Program/Plan Name

Medical Devices Specialization

Admissions

Specialization is available for students in the following majors

H-Biomedical Engineering

Admissions Entry Point
Declare Plan,

Requirements Information

Invalid Combinations
No,

Average Requirement
Yes,

Minimum Average(s) Required

- A minimum average of 60.0% in the specialization courses.

Proposed

Graduation Requirements

- Complete a total of seven courses according to the requirements below.

Existing

Graduation Requirements

- Complete a total of five courses and one capstone or research project according to the requirements below.

Course Requirements (units)

Required Courses

- 0Units to Complete
- No Rules

1. Required Courses
    - ○
        - ○ Complete all of the following

- Complete all the following:
- **BME393 - Digital Systems (0.50)**
- BME564 - Biocompatibility and Biomedical Design (0.50)
-
- Complete 1 of the following:
- BME553 - Introductory Mechanics of Biomedical and Biological Materials (0.50)
- **ME526 - Fatigue and Fracture Analysis (0.50)**
- **ME533 - Non-Metallic and Composite Materials (0.50)**
- **ME559 - Finite Element Methods (0.50)**
- **ME598 - Special Topics in Mechanical Engineering (0.50)**
- SYDE586 - Material Selection for Design (0.50)
-
- Complete 2 of the following:
- **BME386 - The Physics of Medical Imaging (0.50)**
- BME499 - Elective Biomedical Research Project (0.50)
- BME540 - Fundamentals in Neural and Rehabilitation Engineering (0.50)
- **BME544 - Biomedical Measurement and Signal Processing (0.50)**
- **BME552 - Computational Biomechanics (0.50)**
- **BME561 - Biomaterials and Tissue Engineering (0.50)**
- BME581 - Ultrasound in Medicine and Biology (0.50)
- BME582 - Biomedical Optics (0.50)
- BME589 - Special Topics in Biomedical Devices (0.50)
- **BME599 - Special Topics in Biomedical Engineering (0.50)**
-
- Complete 1 of the following:
- **ME547 - Robot Manipulators: Kinematics, Dynamics, Control (0.50)**
- MTE545 - Introduction to MEMS Fabrication (0.50)
- NE466 - Tactile Sensors and Transducers (0.50)
- **NE481 - Nanomedicine and Nanobiotechnology (0.50)**
- NE486 - Biosensors (0.50)
- NE487 - Microfluidic and Nanobiotechnological Systems (0.50)
- **SYDE411 - Optimization and Numerical Methods (0.50)**
- **SYDE522 - Foundations of Artificial Intelligence (0.50)**
- **SYDE577 - Deep Learning (0.50)**
- **MTE546 - Multi-Sensor Data Fusion (0.50)**
-
- **Complete 1 course (at least 0.50 units) of BIOL or KIN at the 200-level or above.**
- ~~Complete 1 of the following~~
- ~~BME461 - Biomedical Engineering Design Workshop 2 (0.50)~~
- ~~BME462 - Biomedical Engineering Design Workshop 3 (0.50)~~
- ~~GENE403 - Interdisciplinary Design Project 1 (0.50)~~
- ~~GENE404 - Interdisciplinary Design Project 2 (0.50)~~
- ~~SYDE461 - Systems Design Capstone Project 1 (0.50)~~
- ~~SYDE462 - Systems Design Capstone Project 2 (0.50)~~
- ~~List 1~~
- ~~List 2~~
- ~~List 3~~
- ~~Complete 2 additional courses from List 1, List 2, or List 3. See Additional Constraints.~~
- ~~Choose any of the following:~~

Course Lists

Required Courses

- No Rules

Are there cross-listed courses listed in requirements?
Yes,

Cross-Listings Options
Some cross-listings not to be counted,

BME522 (CL with SYDE 522) to not be added to List 4 - Feb 2026 SUC.

Removing Cross-Lists
ME540 (CL with BME540) removed at Feb 2024 SUC.

Proposed

Additional Constraints

1. To have BME499, BME589, and BME599 count towards the Specialization, only certain topics are permitted. See the Biomedical Engineering Program Director for details.

Existing

Additional Constraints

1. The capstone project and research project must have a focus on biomedical devices and be approved by the Specialization co-ordinator.
2. To have BME589 count towards the Specialization, only certain topics are permitted. See the Specialization co-ordinator for details.
3. To enrol in a second topic of BME589 requires approval from the Specialization co-ordinator.