

**McMaster University**  
**W Booth School of Engineering Practice and Technology**  
**MASTER OF ENGINEERING IN SYSTEMS AND TECHNOLOGY**

Graduate Student Course Selection  
2022 – 2023

Date: \_\_\_\_\_ Stream: \_\_\_\_\_

Student Name: \_\_\_\_\_ Program: \_\_\_\_\_

Student ID: \_\_\_\_\_ Supervisor: \_\_\_\_\_

Course Name	Course Number	Term	Units	Add (A) or Drop (D)?
Research/Writing	SGS 711*			A
Academic Research Integrity and Ethics	SGS 101	1	0	A
Accessibility for Ontarians with Disabilities Act (AODA)	SGS 201	1	0	A
W Booth SEPT Practitioner’s forum, Part I (full time students)	SEP 771	1	0	A
W Booth SEPT Practitioner’s forum, part II (full time students)	SEP 771	2	0	A
Cyber Physical Systems	SEP 769		3	A
M.Eng. Project in Systems and Technology, Part I	SEP 799**		3	A
M.Eng. Project in Systems and Technology, Part II	SEP 799**		3	A

\*SGS 711 must be added when the student is not enrolled in any courses for the term.  
\*\*SEP 799, part I & II must be added for the **project based stream** in the two terms you are completing your project.

Graduate students must register for courses online via Mosaic. **Students must consult with the Program Advisor regarding course selection.** It is the responsibility of the student to ensure that the courses meet the program requirements, and that their course selections are recorded correctly on mosaic. Any addition or deletion of courses should be approved by the Program Advisor. Once an agreement is reached with the Program Advisor, **students must upload this document to [this link](#)** and department staff will gather the faculty member’s signature.

I approve these course selections

\_\_\_\_\_

Program Advisor

\_\_\_\_\_

Date

## Master of Engineering in Systems Technology

Students completing the Program on a course-only basis will be required to complete 10 courses from the approved list of courses. Course selection must be done in consultation with the program lead.

Students completing the Program through course and project work will be required to complete 8 courses from the approved list of courses, plus successful completion of the project. Course and project selection must be done in consultation with the program lead.

McMaster students may receive advanced standing for up to two courses (note that a maximum of two 600-level courses can count towards a SEPT graduate program) with the approval of the Associate Dean of Graduate Studies.

### Curriculum

Students enrolling in the program choose their courses in one of the following streams:

- Automation and Smart Systems
- Automotive
- Digital Manufacturing
- Process Systems

Each stream has a set of core courses and a set of recommended elective courses. Students can take maximum of 2 half courses (one term courses) at 600 level.

Students wishing to take an elective course outside of the recommended electives need to obtain a written permission from their program lead.

Students have to complete the minimum required number of core courses in order to complete the program

**There are 2 pathways towards the degree:**

#### **8 courses (24 units) + project (6 units)**

- 1 required course
- 2 professional development courses
- 3 to 4 core courses
- 0 to 1 elective course
- 1 cross-disciplinary elective

Students pursuing this option, in addition to taking 8 courses specified below, must register for the project courses:

- SEP 799 / M. Eng. Project in Systems and Technology, Part I
- SEP 799 / M. Eng. Project in Systems and Technology, Part II

#### **10 courses (30 units)**

- 1 required course
- 2 professional development courses
- 4 to 6 core courses
- 0 to 2 elective courses
- 1 cross-disciplinary elective

All full-time students must register for the seminar series courses (attendance is mandatory), which are:

SEP 771 / W Booth School of Engineering Practice and Technology Practitioner's Forum Part I (seminar series, full-time students only)

SEP 771 / W Booth School of Engineering Practice and Technology Practitioner's Forum Part II (seminar series, full-time students only)

SEP 771 is a seminar series presented by guest speakers, invited by the School, of relevance to all M. Eng. programs at the School. All full-time students are required to take these courses. Course grades are either 'pass' or 'fail'. In order to pass the course, the student must attend a minimum of 80% of the seminars.

Students should note that not all courses are offered every year.

**Required core course for all streams:**

- SEP 769 / Cyber Physical Systems

**Professional Development courses, common to all streams in M.Eng. S&T, are listed below:**

- SEP 6TC3 / Technical Communications
- SEP 725 / Practical Project Management for Today's Business Environment
- SEP 773 / Leadership for Innovation
- SEP 760 / Design Thinking
- SEP 741/ Project Management for High Tech Projects

**Technical Courses - Automotive stream****Core courses:**

- SEP 6AE3 / Internal Combustion Engines
- SEP 6DV3 / Vehicle Dynamics
- SEP 711 / Electric Powertrain Components Design
- SEP 716 / Automotive Safety Design
- SEP 722 / Electric Drive Vehicles / MECH ENG 760 / Electric Drive Vehicles
- SEP 724 / Intelligent Transportation Systems
- SEP 734 / Issues in Vehicle Productions
- SEP 740 / Deep Learning
- SEP 742 / Visual Perception for Autonomous Vehicles
- SEP 775 / Introduction to Computational Natural Language Processing

**Recommended electives are:**

- MECH ENG 6Z03 / CAD/CAM/CAE
- SEP 780 / Advanced Robotics and Automation
- SEP 783 / Sensors and Actuators
- SEP 791 / Augmented Reality, Virtual Reality and Mixed Reality

**Cross-Disciplinary Elective Course**

Candidates are required to complete one half course (3 units) which should be selected from the following approved cross-disciplinary elective list.

- SEP 709 / Emerging Issues, Technology and Public Policy
- SEP 710 / International Governance and Environmental Sustainability
- SEP 6X03 / LIVABLE CITIES, THE BUILT AND NATURAL ENVIRONMENT
- SEP 793 / Entrepreneurial Opportunity Identification
- SEP 770 / Total Sustainability Management
- SEP 729 / Manufacturing Systems

**Technical Courses - Automation and Smart Systems****Required core course:**

- SEP 769 / Cyber Physical Systems

**Core courses:**

- SEP 720 - Cloud Computing (1.5 units)
- SEP 721 - Data Analytics, Machine Learning and AI on Cloud Platforms (1.5 units)
- SEP 728 - Internet of Things (IoT) and industrial Internet of Things (ioT) Systems (3 units)
- SEP 767 - Multivariate Statistical Methods for Big Data Analysis and Process Improvement (3 units)
- SEP 780 - Advanced Robotics and Automation (3 units)
- SEP 786 - Artificial Intelligence and Machine Learning Fundamentals (1.5 units)
- SEP 787 - Machine Learning: Classification Models (1.5 units)
- SEP 791 - Augmented reality, virtual reality, mixed reality (3 units)
- CAS 771 - Introduction to Big Data Systems and Applications (3 units)
- SEP 740 – Deep Learning

- SEP 775 – Introduction to Computational Natural Language Processing
- SEP 742 - Visual Perception for Autonomous Vehicles

**Recommended electives are:**

- SEP 718 / Industrial Automation
- SEP 723 / Industrial Components, Networks, and Interoperability / MECH ENG 761 / Industrial Components, Networks, and Interoperability
- SEP 783 / Sensors and Actuators
- SEP 6CS3 – Computer Security (3 units)
- SEP 6DA3 - Data Analytics and Big Data (3 units)
- SEP 6DM3 - Data Mining (3 units)

**Cross-Disciplinary Elective Course**

Candidates are required to complete one half course (3 units) which should be selected from the following approved cross-disciplinary elective list.

- SEP 709 / Emerging Issues, Technology and Public Policy (3 units)
- SEP 710 / International Governance and Environmental Sustainability (3 units)
- SEP 6X03 / LIVABLE CITIES, THE BUILT AND NATURAL ENVIRONMENT (3 units)
- SEP 793 / Entrepreneurial Opportunity Identification (3 units)
- SEP 770 / Total Sustainability Management (3 units)
- SEP 729 / Manufacturing Systems (3 units)

**Technical Courses - Digital Manufacturing**

**Required core course:**

- SEP 769 / Cyber Physical Systems

**Other core courses:**

- SEP 718 - Industrial Automation (3 units)
- SEP 723 - Industrial components, networks and interoperability (3 units)
- SEP 728 - Internet of Things (IoT) and industrial Internet of Things (IIoT) systems (3 units)
- SEP 735 - Additive Manufacturing (3 units)
- SEP 738 - Artificial Intelligence Methods in Advanced Manufacturing (3 units)
- SEP 740 – Deep Learning (3 units)
- SEP 780 - Advanced robotics and automation (3 units)
- SEP 783 - Sensors and actuators (3 units)
- SEP 791 - Augmented reality, virtual reality, mixed reality (3 units)

**Recommended electives are:**

- SEP 6FM3 - Computer Integrated Manufacturing (CIM) and Flexible Manufacturing (3 units)
- SEP 742 - Visual Perception for Autonomous Vehicles (3 units)
- SEP 767 - Multivariate Statistical Methods for Big Data Analysis and Process Improvement (3 units)
- SEP 775 – Introduction to Computational Natural Language Processing (3 units)
- SEP 786# - Artificial Intelligence and Machine Learning Fundamentals (1.5 units)
- SEP 787# - Machine Learning: Classification Models (1.5 units)

**Cross-Disciplinary Elective Courses:**

Candidates are required to complete one half course (3 units) which should be selected from the following approved cross-disciplinary elective list.

- SEP 709 / Emerging Issues, Technology and Public Policy (3 units)
- SEP 710 / International Governance and Environmental Sustainability (3 units)

- SEP 6X03 / LIVABLE CITIES, THE BUILT AND NATURAL ENVIRONMENT (3 units)
- SEP 793 / Entrepreneurial Opportunity Identification (3 units)
- SEP 770 / Total Sustainability Management (3 units)
- SEP 729 / Manufacturing Systems (3 units)

### **Courses - Process Systems Stream**

- SEP 750 / Model Predictive Control Design and Implementation (3 units)
- SEP 751 / Process Design and Control for Operability CHEM ENG 764 / Process Control and Design for Operability (3 units)
- SEP 752 / Systems Modeling and Optimization (3 units)
- SEP 767 / Multivariate Statistical Methods for Big Data Analysis and Process Improvement (3 units)
- SEP 718 / Industrial Automation (3 units)
- SEP 783 / Sensors and Actuators (3 units)
- SEP 739 / Distributed Computing for Process Control (3 units)
- SEP 754 / Process Design and Integration for Minimal Environmental Impact (3 units)
- SEP 740 / Deep Learning (3 units)

### **Recommended Electives**

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- SEP 730 / Reliability and Risk Management
- CHEM ENG 773 / Advanced Concepts of Polymer Extrusion
- CHEM ENG 740 / Advanced PSE Tools and Methods
- SEP 6IT3 / Internet Technologies and Databases

### **Cross-Disciplinary Elective Course**

Candidates are required to complete one half course (3 units) which should be selected from the following approved cross-disciplinary elective list.

- SEP 709 / Emerging Issues, Technology and Public Policy (3 units)
- SEP 710 / International Governance and Environmental Sustainability (3 units)
- SEP 6X03 / LIVABLE CITIES, THE BUILT AND NATURAL ENVIRONMENT (3 units)
- SEP 793 / Entrepreneurial Opportunity Identification (3 units)
- SEP 770 / Total Sustainability Management (3 units)
- SEP 729 / Manufacturing Systems (3 units)

Students can take other elective courses with permission of their program lead.

A maximum of two courses can be selected from the following list:

## Electrical Engineering

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ECE 710 / Engineering Optimization

ECE 732 / Non-linear Control Systems

ECE 736 / 3D Image Processing and Computer Vision

ECE 744 / System-on-a-Chip (SOC) Design and Test: Part I - Methods

ECE 778 / Introduction to Nanotechnology

## Software Engineering

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SFWR ENG 6HC3 / The Human Computer Interface

## Computer Science

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COMP SCI 6F03 / Distributed Computer Systems

COMP SCI 6TE3 / Continuous Optimization

## Computing and Software

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CAS 767 / Information Privacy and Security

CAS 771 / Introduction to Big Data Systems and Applications