**McMaster University**

**W Booth School of Engineering Practice and Technology**

**MASTER OF ENGINEERING in MANUFACTURING ENGINEERING**

Graduate Student Course Selection

2023

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

Student Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Program: **M.E.M.E.**

Student ID: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Supervisor: **Marjan Alavi**

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| --- | --- | --- | --- | --- |
| **Course Name** | **Course Code** | **Units** | **Term** | **Add (A) or**  **Drop (D)?** |
| **MANDATORY COURSES** | | | | |
| Academic Research Integrity and Ethics | SGS 101 | 0 | W23 | A |
| Accessibility for Ontarians with Disabilities Act (AODA) | SGS 201 | 0 | W23 | A |
| W Booth SEPT Practitioner’s forum, Part I  (only for full time students. “Add it” if you are one) | SEP 771 | 0 | W23 | A |
| W Booth SEPT Practitioner’s forum, part II  (only for full time students. “Add it” if you are one) | SEP 771 | 0 | S23 | A |
| **PROJECT COURSES Add these two courses if you are planning to take the Project Pathway to your degree.  Each course is 3 units** | | | | |
| Project, Part I | MANUFACT 701 |  | W23 |  |
| Project, Part II | MANUFACT 701 |  | S23 |  |
| **PROFESSIONAL DEVELOPMENT COURSES Two such courses are needed. Each course is 3 units** | | | | |
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| **CORE COURSES 3-4 such courses if you are taking the Project Pathway. 4-6 such courses if not doing a Project.  Each course is 3 units** | | | | |
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| **CROSS – DISCIPLINARY ELECTIVE COURSE 1 course is required. Course is 3 units selected from approved cross-disciplinary elective list.  CAREFUL, choose course from approved cross-disciplinary elective list!** | | | | |
|  |  |  |  |  |
| **ELECTIVE COURSES 1-2 such courses if you are taking the Project Pathway. 1-3 such courses if not doing a Project.  CAREFUL, a few courses are not worth 3 units!** | | | | |
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| **“PLACEHOLDER” COURSE**  **Add the course below if you are not taking any other courses during a term (i.e. taking a break from studies)** | | | | |
| Research/Writing | SGS 711 | 0 |  |  |
|  |  |  |  |  |
| **TOTAL UNITS**  **Sum up the total units you have added (do if you are taking the Project Pathway, the two project courses.)  30 units are required to graduate. You can take more, but that will increase your tuition.** | |  |

**Term code guide:**

W23 = Winter 2023

S23 = Spring/Summer 2023

F23 = Fall 2023

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**](https://macdrive.mcmaster.ca/u/d/eb9d1cc12bcd46668a42/) and department staff will gather the faculty member’s signature.

I approve these course selections

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Program Advisor Date

Master of Engineering Manufacturing Engineering

Students enrolling in the program can tailor their program of studies according to their career interests. Students can take maximum of 2 half courses (one term courses) at 600 level. Courses can be selected from W Booth SEPT, Chemical, Materials or Mechanical Engineering departments. Students wishing to take an elective course outside of the recommended electives need to obtain a permission from their program lead.

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

**Digital Manufacturing courses:**

There are 2 pathways towards the degree:

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

* 2 professional development courses
* 3 to 4 core courses
* 1 to 2 technical elective courses
* 1 cross-disciplinary elective
* 2 project courses

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

* [MANUF 701 / Project, Part I](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt1886)
* [MANUF 701 / Project, Part II](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt8427)

**10 courses (30 units)**

* 2 professional development courses
* 4 to 6 core courses
* 1 to 3 technical elective courses
* 1 cross-disciplinary elective

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

[SEP 771 SEP 771 / W Booth School of Engineering Practice and Technology Practitioner’s Forum Part I](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt370)

[SEP 771 SEP 771 / W Booth School of Engineering Practice and Technology Practitioner’s Forum Part II](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt9151)

(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.

**Professional Development courses in M.Eng. of Manufacturing Engineering, are listed below:**

* [SEP 6TC3 / Technical Communications](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 725 / Practical Project Management for Today’s Business Environment](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 773 / Leadership for Innovation](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 760 / Design Thinking](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* SEP 741/ Project Management for High Tech Projects

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#### Core Courses

The following are core courses:

* [MECH ENG 729 / Manufacturing Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)/[SEP 729 / Manufacturing Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt3857)
* [CHEM ENG 720 / Lean Six Sigma for Engineers](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)/[SEP 731 / Lean Six Sigma for Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt1909)
* [SEP 726 / Discrete Manufacturing Processes I](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 727 / Discrete Manufacturing Processes II](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 757 / Rapid Prototyping](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)[MECH ENG 759 / Rapid Prototyping](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt5778)
* [SEP 780 / Advanced Robotics and Automation](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 6I03 / Sustainable Manufacturing Processes](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)/[MATLS 6I03 / Sustainable Manufacturing Processes](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt3115)
* SEP 738 /Artificial Intelligence Methods in Advanced Manufacturing

#### Technical Elective Courses

Recommended technical elective courses are:

* [MATLS 6T03 / Properties and Processing of Composites](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)/[SEP 6T03 / Properties and Processing of Composites](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767#tt9764)
* [SEP 767 / Multivariate Statistical Methods for Big Data Analysis and Process Improvement](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 718 / Industrial Automation](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* SEP776 / Manufacturing Systems 2 – System Engineering, Process Integration and Simulation
* SEP777 / Cyber-Physical Systems and Industry 4.0

#### Cross-Disciplinary Elective Courses

* SEP709 / Emerging Issues, Technology and Public Policy
* SEP710 / International Governance and Environmental Sustainability
* SEP6X03 / Livable Cities, The Built and Natural Environment
* SEP793 / Entrepreneurial Opportunity Identification
* SEP 770 / Total Sustainability Management

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### Additional Elective Courses

Students can select additional elective courses from the following list, provided that the approval has been received prior from their program lead. Note that not all courses are offered every year.

##### School of Engineering Practice and Technology

* [SEP 6AS3 / Advanced System Components and Integration](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 6AT3 / Conceptual Design of Electric and Hybrid Electric Vehicles](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 6DM3 / Data Mining](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 735 / ADDITIVE MANUFACTURING](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 748 / Development of Sustainable Communities](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 751 / Process Design and Control for Operability](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 752 / Systems Modeling and Optimization](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 754 / Process Design and Integration for Minimal Environmental Impact](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 780 / Advanced Robotics and Automation](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 771 / W Booth School of Engineering Practice and Technology Practitioner’s Forum Part I](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [SEP 771 / W Booth School of Engineering Practice and Technology Practitioner’s Forum Part II](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

#### Chemical Engineering

* [CHEM ENG 6B03 / Polymer Reaction Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 6C03 / Statistics for Engineers](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 6E03 / Digital Computer Process Control](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 6X03 / Polymer Processing](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 6Z03 / Interfacial Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 742 / Membrane Based Bioseparations](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 752 / Optimization of Chemical Processes](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 753 / Systems Modeling and Optimization](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 761 / Multivariable, Stochastic and Adaptive Control of Chemical Processes](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 764 / Process Control and Design for Operability](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 765 / Multivariate Statistical Methods for Big Data Analysis and Process Improvement](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 770 / Selected Topics in Polymer Science and Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 773 / Advanced Concepts of Polymer Extrusion](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 774 / Advances in Polymeric Materials](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 782 / Biopharmaceuticals](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 786 / Artificial Intelligence and Machine Learning Fundamentals](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 787 / Machine Learning: Classification Models](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 788 / Neural Networks and Development Tools](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 789 / Deep Learning and Its Applications](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CHEM ENG 791 / Nanotechnology in Chemical Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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#### Materials Science and Engineering

* [MATLS 6C03 / Modern Iron and Steelmaking](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 6H03 / Thin Film Science and Engineering](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 6I03 / Sustainable Manufacturing Processes](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 6P03 / Properties of Polymeric Materials](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 6T03 / Properties and Processing of Composites](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ENGINEER 6T04 / Materials Selection in Design and Manufacturing](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 754 / Fracture Mechanics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 771 / Principles of Heterogeneous Kinetics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MATLS 780 / Metallic and Non-metallic Coatings](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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#### Mechanical Engineering

* [MECH ENG 6B03 / Topics in Product Development](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 6K03 / Robotics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 6L03 / Industrial Design](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 6Q03 / Mechanical Vibrations](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 6T03 / Finite Element Applications](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 6Z03 / CAD/CAM/CAE](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 702 / Advanced Dynamics of Machines](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 705 / Advanced Finite Element Analysis](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 710 / Machine Tool Analysis](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 714 / Solidification Processing](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 724 / Solid and Surface Modeling Techniques](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 728 / Manufacturing Processes I](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 729 / Manufacturing Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 734 / Theory of Plasticity](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 735 / Additive Manufacturing](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 738 / Manufacturing Processes II](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 743 / Advanced Mechatronics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 751 / Advanced Mechanical Engineering Control Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 752 / Advanced MEMS Fabrication and Microfluidics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 759 / Rapid Prototyping](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MECH ENG 760 / Electric Drive Vehicles](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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

##### Electrical Engineering

* [ECE 710 / Engineering Optimization](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ECE 732 / Non-linear Control Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ECE 736 / 3D Image Processing and Computer Vision](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ECE 744 / System-on-a-Chip (SOC) Design and Test: Part I - Methods](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ECE 772 / Neural Networks and Learning Machines](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [ECE 778 / Introduction to Nanotechnology](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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##### Software Engineering

* [SFWR ENG 6HC3 / The Human Computer Interface](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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##### Computer Science

* [COMP SCI 6F03 / Distributed Computer Systems](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [COMP SCI 6TE3 / Continuous Optimization](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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##### Computing and Software

* [CAS 767 / Information Privacy and Security](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [CAS 771 / Introduction to Big Data Systems and Applications](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)

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##### Manufacturing Engineering

* [MANUF 6RM3 / Robot Mechanics and Mechatronics](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)
* [MANUF 710 / SYSTEM ANALYSIS SIMULATION](https://academiccalendars.romcmaster.ca/preview_program.php?catoid=42&poid=22560&returnto=8767)