

**Western University  
Faculty of Engineering  
Mechatronic Systems Engineering Program  
*MSE 2200Q – Engineering Shop Safety Training*  
Course Outline Fall 2026**

**COURSE DESCRIPTION:** This course serves to ensure that all students in the Mechatronic Systems Engineering program understand how to work safely in a shop environment. Students will have the opportunity to gain hands-on experience with basic shop machinery and will develop basic proficiency with SolidWorks computer-aided design software.

**ACADEMIC CALENDAR:**

[https://westerncalendar.uwo.ca/Courses.cfm?CourseAcadCalendarID=MAIN\\_027023\\_1&SelectedCalendar=Live&ArchiveID=](https://westerncalendar.uwo.ca/Courses.cfm?CourseAcadCalendarID=MAIN_027023_1&SelectedCalendar=Live&ArchiveID=)

This course will provide Mechatronic Systems Engineering undergraduate students with uniform training in the safe use of Engineering student shops.

**PREREQUISITES:** Entry into Year 2 of Mechatronic Systems Engineering program. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record.

**ANTIREQUISITES:** MME 2200Q/R/S/T

**CEAB ACADEMIC UNITS:** Engineering Science 100%

**INSTRUCTOR INFORMATION:**

Instructor:  
Office:  
Phone:  
Email:

Coordinator:  
Office:  
Phone:  
Email:

**CONTACT HOURS:** Timetable information is available at <https://draftmyschedule.uwo.ca/>.

LECTURE:

LAB:

**RECOMMENDED/REQUIRED TEXT:** None

**RECOMMENDED/ REQUIRED SOFTWARE:** SolidWorks. Available in the Faculty of Engineering general purpose computing labs; however, it is recommended that students install the package on their own computer. <https://www.eng.uwo.ca/itg/software/AppsAnywhere.html>

3D Printer Slicer software (Orca, Cura, or Prusa) will be used for group prototyping assignments. Students can retrieve and install the chosen software from appropriate publicly available websites.

**RECOMMENDED RESOURCES/REFERENCES:** Online materials. See course site on OWL.

**GENERAL LEARNING OBJECTIVES (CEAB GRADUATE ATTRIBUTES)**

|                  |  |                       |   |                             |   |
|------------------|--|-----------------------|---|-----------------------------|---|
| Knowledge Base   |  | Engineering Tools     | D | Impact on Society           |   |
| Problem Analysis |  | Individual & Teamwork |   | Ethics and Equity           |   |
| Investigation    |  | Communication         |   | Economics and Project Mgmt. |   |
| Design           |  | Professionalism       |   | Life-Long Learning          | D |

Notation: x represents the content level code as defined by the CEAB. blank = not applicable; I = introduced (introductory); D = developed (intermediate) and A = applied (advanced).

Rating: I – The instructor will introduce the topic at the level required. It is not necessary for the student to have seen the material before. D – There may be a reminder or review, but the student is expected to have seen and been tested on the material before taking the course. A – It is expected that the student can apply the knowledge without prompting (e. g. no review).

**COURSE MATERIALS:** Weekly content and guides for the laboratories will be available on the course OWL site. The material for this course will be taught in both lectures and labs; therefore, it is imperative that you attend each lecture and lab.

**UNITS:** SI

**COURSE TOPICS AND SPECIFIC LEARNING OUTCOMES:** The course is structured in three main parts: 1) an introduction to wood and metal shop safety, 2) advanced machine tool training, and 3) developing proficiency with SolidWorks.

The Mechatronic Systems Engineering Program has been accredited by Canadian Engineering Accreditation Board (CEAB) of Engineers Canada. Accredited programs provide the academic requirements for licensure as a professional engineer in Canada. Western Engineering has defined indicators of the 12 Graduate Attributes (GAs) that the CEAB expects graduating engineering students to demonstrate. The connections between course learning outcomes and [Western Engineering's GA Indicators](#) are identified below, with those in bold indicating the ones to be measured and reported annually.

| Course Topics and Specific Learning Outcomes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | CEAB Graduate Attribute Indicators |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <p><b>1. Emergency Procedures (Level 1 Theory Training)</b><br/> At the end of this section, students will be able to:</p> <ul style="list-style-type: none"> <li>a. Recall emergency procedures appropriate for personal injury in a shop setting.</li> <li>b. Recall emergency procedures appropriate for fire in a shop setting.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | KB3                                |
| <p><b>2. Safety Hazards (Level 1 Theory Training)</b><br/> At the end of this section, students will be able to:</p> <ul style="list-style-type: none"> <li>a. Identify general safety hazards present in a machine shop environment: electrical, pinching, entanglement, cutting and burning.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | KB3                                |
| <p><b>3. Wood and Metal Shop Hands-on (Level 2 Theory and Practical Training)</b><br/> At the end of this section, students will be able to:</p> <ul style="list-style-type: none"> <li>a. Understand and apply the major considerations when cutting or working with different materials: <ul style="list-style-type: none"> <li>i. Tool sharpness and tools for different materials</li> <li>ii. Cutting force and workpiece fixturing</li> <li>iii. Temperature and its effect on the cutting tool and workpiece</li> <li>iv. Cutting speed and its effect on the cutting tool and workpiece</li> </ul> </li> <li>b. Demonstrate the safe operation of hand tools and stationary power equipment such as bandsaws, grinders, sanders and drill presses.</li> </ul>                                                                                                                                                                                                 | KB3                                |
| <p><b>4. Advanced Machine Tools (Theory and Practical Training)</b><br/> At the end of this section, students will be able to:</p> <ul style="list-style-type: none"> <li>a. Understand the importance of cleanliness in the shops and the effects of fine particulate on machine tool fits, life and work quality.</li> <li>b. Understand the components of a mill and lathe</li> <li>c. Understand the importance of mill setup and the flexibility of a knee-type mill.</li> <li>d. Understand the basic theory behind the operation of mills and lathes: <ul style="list-style-type: none"> <li>i. Different chip types of various materials—discontinuous and continuous and the associated dangers</li> <li>ii. Cutting tool forms</li> <li>iii. Tool holding</li> <li>iv. Workpiece fixturing and different fixture tools available</li> <li>v. Clamping basics</li> <li>vi. Indicating</li> <li>vii. Workpiece locating—setting datums</li> </ul> </li> </ul> | KB3                                |



**CSWA Exam:** The CSWA exam is administered online, directly from the SolidWorks training site. The exam will take place on Monday, October 26 from 7:30–10:30 pm. Preparation for the exam is entirely self-directed learning on the part of the student. Links to official training materials and sample exam questions are provided on OWL.

| Name                                   | No. of Instances | Dates                                                             | CEAB GAs ASSESSED |
|----------------------------------------|------------------|-------------------------------------------------------------------|-------------------|
| Lecture Attendance                     | 3                |                                                                   |                   |
| Quizzes                                | 5                | Following theory modules on OWL, before hands-on training in labs |                   |
| Shop & Prototyping Skills Laboratories | 3                |                                                                   |                   |
| Prototyping Assignments                | 1                |                                                                   |                   |
| SolidWorks Assignments                 | 3                |                                                                   |                   |
| CSWA Exam                              | 1                |                                                                   | ET3, LL2          |

Note that the dates listed above are **tentative** and may be adjusted if needed.

**COURSE POLICIES:** The following course-specific policies will be enforced throughout the course:

**Lectures:**

- Attendance at all lectures is mandatory as safety material is covered.
- Students who miss a lecture are required to contact Dr. Jacques to arrange for an alternate means of obtaining the material covered in the lecture. Failure to do so will result in the lecture portion of the course being incomplete.

**Laboratory Sessions:**

- Attendance at all scheduled laboratory sessions is mandatory.
- Safety material is covered in the lab session. Students who arrive late will be denied entry to the lab, resulting in a missed session.
- Students who miss the lab without a legitimate reason will receive a mark of zero for that lab.
- Students who miss a lab with academic consideration are required to reschedule the lab by contacting Dr. Jacques. Failure to do so will result in a mark of zero for that lab.
- Failure to complete all assigned lab sessions will result in failure of the course.

**CSWA Exam:**

- If a student misses the CSWA exam, the student must follow the *Instructions for Students Unable to Write Tests* and **provide supporting documentation** to Undergraduate Services within 24 hours of the missed test.

- If no reasonable justification for missing the CSWA exam is provided, then the student will receive a mark of zero for that component.

**To pass the course, a passing grade on the CSWA exam must be obtained, all lectures must be attended, and all laboratories must be completed.**

**Prior Learning and Exemptions:** Students who have completed the Introduction to Wood and Metal Shop Training theory, will be required to retake all quizzes, as yearly refresher training is required by law. Students who have completed any lab session and/or advanced lectures may be eligible for exemption with prior written consent from the practical skills instructor (Dr. Jacques [djacque4@uwo.ca](mailto:djacque4@uwo.ca)). Do not make an assumption that you are exempt as you will not be able to make up any missed lab sessions for misinterpreting whether you qualify for an exemption. Contact the instructor within the first week of the course to inquire about exemptions. Students who hold a CSWA certificate from an exam that was proctored at Western will not need to complete this part of the course; all others will be required to repeat the exam.

**LATE SUBMISSION POLICY:** This course employs flexible deadlines for assignments. The assignment deadlines can be found above in the course outline. For each assignment, students are expected to submit the assignment by the deadline listed. Should illness or extenuating circumstances arise, students are permitted to submit their assignment up to 48 hours past the deadline without academic penalty. **As flexible deadlines are used in this course, requests for academic consideration will not be granted.** If you have a long-term academic consideration or an accommodation for disability that allows greater flexibility than provided here, please reach out to your instructor at least one week prior to the posted deadline.

**ATTENDANCE:** Attendance is mandatory for all lectures and laboratories.

**GENERAL FACULTY/UNIVERSITY POLICIES:** The Faculty of Engineering and Western University have overarching policies that prescribe how undergraduate courses should run. The course-specific policies described above should be considered *in addition to* those overarching policies, or as course-specific interpretations of them. In the event of contradictions or confusion between course-specific policies above and general Faculty / University policies, please contact your course instructor for clarification.

**Western Engineering's undergraduate policies can be found by navigating to:**

<https://www.eng.uwo.ca/undergraduate/academic-support-and-accommodations/policies.html>

and then clicking the “*Engineering Undergraduate Policies framework*” link.

**Note: The above topics and outline are subject to adjustments and changes as needed.**