

**Western University
Faculty of Engineering
Mechatronic Systems Engineering Program**

**MSE 2200Q—Engineering Shop Safety Training
Course Outline 2023–2024**

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 Copy: This course will provide mechatronic systems engineering undergraduate students with uniform training in the safe use of Engineering student shops.

Contact Hours: Lectures: 3 session of 2-hour duration
Laboratory: 3-hour session (stationary power tools)
1.5-hour session (milling exercise)
Course Weighting: 0.25 course (non-credit)

Antirequisite: MME2200Q

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. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

CEAB Academic Units: Engineering Science 100%, Engineering Design 0%

Required Textbook: None.

Required Software: Solidworks. Available in Faculty of Engineering general purpose computing labs. However, it is recommended that students install the package on the own PC for convenience.
<https://www.eng.uwo.ca/itg/software/AppsAnywhere.html>

Recommended References: Online materials. See OWL Course site.

General Learning Objectives (CEAB Graduate Attributes):

Knowledge Base		Use of Engineering Tools	I	Impact on Society and the Environment	
Problem Analysis		Individual and Team Work		Ethics and Equity	
Investigation		Communication Skills		Economics and Project Management	
Design		Professionalism		Life-Long Learning	I

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).

Topics and Specific Learning Objectives:

1. Emergency Procedures (Level 1 Theory Training)

At the end of this section, students will be able to:

- a. Recall emergency procedures appropriate for personal injury in a shop setting.
- b. Recall emergency procedures appropriate for fire in a shop setting.

2. Safety Hazards (Level 1 Theory Training)

At the end of this section, students will be able to:

- a. Identify general safety hazards present in a machine shop environment: electrical, pinching, entanglement, cutting and burning.

3. Wood and Metal Shop Hands-on (Level 2 Theory and Practical Training)

At the end of this section, students will be able to:

- a. Understand and apply the major considerations when cutting or working with different materials:
 - i. Tool sharpness and tools for different materials
 - ii. Cutting force and workpiece fixturing
 - iii. Temperature and its effect on the cutting tool and workpiece
 - iv. Cutting speed and its effect on the cutting tool and workpiece
- b. Demonstrate the safe operation of hand tools and stationary power equipment such as bandsaws, grinders, sanders and drill presses.

4. Advanced Machine Tools (Level 3 Theory and Practical Training)

At the end of this section, students will be able to:

- a. Understand the importance of cleanliness in the shops and the effects of fine particulate on machine tool fits, life and work quality.
- b. Understand the components of a mill and lathe.
- c. Understand the importance of mill setup and the flexibility of a knee-type mill.

- d. Understand the basic theory behind the operation of mills and lathes:
 - i. Different chip types of various materials—discontinuous and continuous and the associated dangers
 - ii. Cutting tool forms, angles and their resultant cuts
 - iii. Tool holding
 - iv. Workpiece fixturing and different fixture tools available
 - v. Clamping basics
 - vi. Indicating
 - vii. Workpiece locating—setting datums
 - viii. Speeds and feeds
- e. Use a “Machine Tool Use Process Sheet”
- f. Observe a demonstration of milling machine and lathe use.

Perform simple operations on a knee-mill.

5. CAD Software: 3D Modeling

At the end of this section, students will be able to:

- a. Demonstrate competence with SolidWorks for CAD modelling of components and assemblies.
- b. **CEAB GA Indicators: LL2 and ET3 - CSWA certification exam**

Evaluation: This is a participation-based course with a resultant final grade of PASS/FAIL. The evaluation criteria and grading scales vary depending on the course component deliverable:

- **Lectures:** attendance at each lecture is mandatory and will be recorded.
- **Quizzes:** are delivered through the OWL Test & Quizzes model. Quizzes are scored to determine whether a student has sufficiently absorbed the corresponding learning module material. The minimum passing score for each quiz can vary between 80%-100% correct set of answers. Students must pass all quizzes to pass the course. Passing a given set of quizzes in a pre-requisite module is required before a student is allowed to progress to a subsequent model.
- **Laboratory:** component is hands-on work with stationary power tools and milling machine tools to demonstrate safe operation of those tools to cut features into various types of material. Attendance at all assigned lab exercise sessions is mandatory to pass the course. Students must come prepared with a printed copy of the lab manual to use as reference during the exercise. All pre-lab calculation and preparation must be complete prior to entry to the session. A student may be denied entry to the session if they arrive unprepared.
- **Assignments:** related to self-study progress towards the CSWA Exam will be provided. Three to four assignments are given at weekly intervals to aid students in their preparation for the exam. Submission of resultant CAD files will be online through the OWL Assignments module.

- **Exams:** component of the course consists of only the CSWA Exam. Exam date is TBD (expected week of October 19th) and students will be notified via the OWL course site once scheduling details are confirmed. The exam is administered online, directly from SolidWorks training site. Preparation for the exam is entirely **self-directed** learning on the part of the student (CEAB: LL2 and ET3 attributes). Students are directed to the SolidWorks official tutorial exercises to aid them in preparation. A prior sample exam is provided on the OWL site for reference.

Course Component Deliverable	# of Instances
Lecture attendance	3
Quizzes (minimum score requirements)	5
Laboratory	2
Solidworks Assignments	4
CSWA Exam	1

Course Polices: 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 lab resulting in a missed session.
- Students that 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 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: Student 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 section and or advanced lectures may be eligible for exemption with prior written consent from the practical skills instructor (Dr. Jacques djacque4@uwo.ca). Do not make assumptions 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. No exemptions will be made for the CSWA exam.

Use of English: In accordance with Senate and Faculty Policy, students may be penalized up to 10% of the marks on all assignments, tests, and examinations for improper use of English. Additionally, poorly written work with the exception of the final examination may be returned without grading. If resubmission of the work is permitted, it may be graded with marks deducted for poor English and/or late submission.

Attendance: All classes, laboratories, and tutorials are mandatory unless otherwise stated. Any student who, in the opinion of the instructor, is absent too frequently from class, laboratory, or tutorial periods will be reported to the Dean (after due warning has been given). On the recommendation of the program, and with the permission of the Dean, the student will be debarred from taking the regular final examination in the course.

Absence Due to Illness or Other Circumstances: Students should immediately consult with the instructor or program Director if they have any problems that could affect their performance in the course. Where appropriate, the problems should be documented (see the attached “Instructions for Students Unable to Write Tests or Examinations or Submit Assignments as Scheduled”). The student should seek advice from the instructor or program Director regarding how best to deal with the problem. Failure to notify the instructor or program Director immediately (or as soon as possible thereafter) will have a negative effect on any appeal.

For more information concerning medical accommodations, see the relevant section of the Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_medical.pdf

For more information concerning accommodations for religious holidays, see the relevant section of the Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

Cheating and Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. University policy states that cheating, including plagiarism, is a scholastic offence. The commission of a scholastic offence is attended by academic penalties, which might include expulsion from the program. If you are caught cheating, there will be no second warning.

All required papers may be subject to submission for textual similarity review to commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted will be included as source documents on the reference database for the purpose

of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between the University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, in the relevant section of the Academic Handbook:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Use of Electronic Devices: Turn off all sound for pagers and cell phones. Students may use laptops, tablet computers, or smart phones *only* to access the course OWL site during lectures and tutorials. Use of *nonprogrammable* calculators *only* is permitted during quizzes and examinations. No other electronic devices may be used at any time during lectures, tutorials, or examinations.

Policy on Repeating All Components of a Course: Students who are required to repeat an Engineering course must repeat all components of the course. No special permissions will be granted enabling a student to retain laboratory, assignment, or test marks from previous years. Previously completed assignments and laboratories cannot be resubmitted by the student for grading in subsequent years.

Internet and Electronic Mail: Students are responsible for regularly checking their Western e-mail and the course web site (<https://owl.uwo.ca/portal/>) and making themselves aware of any information that is posted about the course. If the student fails to act on information that has been posted on these sites and does so without a legitimate explanation (i.e., those covered under the illness/compassionate form), then there are NO grounds for an appeal.

Accessibility: Please contact the course instructor if you require material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 519-661-2111 ext. 82147 for any specific question regarding an accommodation.

Support Services: Office of the Registrar, <http://www.registrar.uwo.ca/>
Student Development Centre, <http://www.sdc.uwo.ca/>
Engineering Undergraduate Services, <http://www.eng.uwo.ca/undergraduate/>
USC Student Support Services, <http://westernusc.ca/services/>

Students who are in emotional/mental distress should refer to Mental Health @ Western, http://www.health.uwo.ca/mental_health/, for a complete list of options about how to obtain help.

STATEMENT ON GENDER-BASED AND SEXUAL VIOLENCE

Western [is committed to reducing incidents of gender-based and sexual violence](#) and providing compassionate support to anyone who has gone through these traumatic events. If you have experienced gender-based or sexual violence (either recently or in the past), you will find information about support services for survivors, including emergency contacts, [here](#). To connect with a case manager or set up an appointment, please contact support@uwo.ca.

**INSTRUCTIONS FOR STUDENTS UNABLE TO WRITE TESTS OR EXAMINATIONS OR SUBMIT ASSIGNMENTS
AS SCHEDULED**

If, on medical or compassionate grounds, you are unable to write term tests or final examinations or complete course work by the due date, you should follow the instructions listed below. You should understand that academic relief will not be granted automatically on request. You must demonstrate to your department (or the Undergraduate Services Office) that there are compelling medical or compassionate grounds that can be documented before academic relief will be considered. Different regulations apply to term tests, final examinations and late assignments. Please read the instructions carefully.

A. GENERAL REGULATIONS & PROCEDURES

1. All first-year students will report to the Undergraduate Services Office by submitting the [Academic Consideration Request Form](#), for all instances.
2. If you are an upper year student and you are missing a test/assignment/lab or examination you will report the absence by submitting [Academic Consideration Request Form](#). Absences worth LESS THAN 10% of your mark, will be processed by your department office. If your course work is worth 10% OR MORE of your final grade, your request will be processed by the Undergraduate Services Office.
3. Check the course outline to see if the instructor has a policy for missed tests, examinations, late assignments or attendance.
4. Documentation must be provided as soon as possible. If no one is available in your department office or the Undergraduate Services Office, leave a message clearly stating your name & student number and reason for your call. The department telephone numbers are given at the end of these instructions.
5. If you decide to write a test or an examination you should be prepared to accept the mark you earn. Rewriting tests or examinations or having the value of a test or examination reweighted on a retroactive basis is not permitted.

B. TERM/MIDTERM TESTS

1. If you are in first year and you are unable to write a midterm/term test, contact the Undergraduate Services Office, SEB 2097 PRIOR to the scheduled date of the test.
2. If you are an upper year student and you are unable to write a midterm/term test, inform your instructor PRIOR to the scheduled date of the test and request relief through the [Academic Consideration Request Form](#). If the instructor is not available, leave a message for him/her at the department office. If the test is worth LESS THAN 10% of your mark, your request for relief will be processed by your department office. If the test is worth MORE THAN 10% of your final grade your request for relief will be processed by the Undergraduate Services Office.
3. Be prepared to attach supporting documentation to the Department Chair and/or the Undergraduate Services Office through the online form (see next page for information on documentation).
4. Discuss with the instructor if and when the test can be rescheduled. The approval of the Chair or the Undergraduate Services Office is required when rescheduling midterm/term tests.

C. FINAL EXAMINATIONS

1. If you are unable to write a final examination, contact the Undergraduate Services Office PRIOR TO THE SCHEDULED EXAMINATION TIME to report your absence using the [Academic Consideration Request Form](#) and request permission to write a Special Final Examination. If no one is available in the Undergraduate Services Office, leave a message clearly stating your name & student number.
2. Be prepared to provide the Undergraduate Services Office with supporting documentation (see next page for information on documentation) the next day, or as soon as possible (in cases where students are hospitalized). The following circumstances are not considered grounds for missing a final examination or requesting special examinations: common cold, headache, sleeping in, misreading timetable and travel arrangements.
3. In order to receive permission to write a Special Examination, you must obtain the approval of the Chair of the Department **and** the Associate Dean and in order to apply you must submit an "[Application for a Special Exam](#)" form. The Undergraduate Services Office will then notify the course instructor(s) and reschedule the examination on your behalf.

PLEASE NOTE: It is the student's responsibility to check the date, time and location of the Special Examination.

D. LATE ASSIGNMENTS

1. Advise the instructor if you are having problems completing the assignment on time (**prior** to the due date of the assignment).
2. Be prepared to submit the [Academic Consideration Request Form](#) and provide documentation if requested by the instructor (see reverse side for information on documentation).
3. If you are granted an extension, establish a due date. The approval of the Chair of your Department (or the Assistant Dean, First Year Studies, if you are in first year) is not required if assignments will be completed prior to the last day of classes.
4.
 - i) Extensions beyond the end of classes must have the consent of the instructor, the department Chair and the Associate Dean, Undergraduate Studies. Documentation is mandatory.
 - ii) A Recommendation of Incomplete Form must be filled out indicating the work to be completed and the date by which it is due. This form must be signed by the student, the instructor, the department Chair and the Associate Dean, Undergraduate Studies.

E. SHORT ABSENCES

If you miss a class due to a minor illness or other problem, check your course outlines for information regarding attendance requirements and make sure you are not missing a test, laboratory or assignment. Cover any readings and arrange to borrow notes from a classmate.

F. EXTENDED ABSENCES

If you are absent more than one week or if you get too far behind to catch up, you should consider reducing your workload by dropping one or more courses. (Note drop deadlines listed below). You are strongly encouraged to seek advice from your Academic Counsellor in the Undergraduate Services Office.

G. DOCUMENTATION

If you consulted an off-campus doctor or Student Health Services regarding your illness or personal problem, **you must provide the doctor with a Student Medical Certificate** to complete at the time of your visit and then bring it to the Department (or the Undergraduate Services Office). **This note must contain the following information: severity of illness, effect on academic studies and duration of absence. Regular doctor's notes will not be accepted; only the Student Medical Certificate will be accepted.**

In Case of Serious Illness of a Family Member: Provide a Student Medical Certificate to your family member's physician to complete and bring it to the Department (or the Undergraduate Services Office if you are in first year).

In Case of a Death: Obtain a copy of the death certificate or the notice provided by the funeral director's office.

You must include your relationship to the deceased and bring it to the Department (or the Undergraduate Services Office if you are in first year).

For Other Extenuating Circumstances: If you are not sure what documentation to provide, ask the Departmental Office (or the Undergraduate Services Office if you are in first year) for direction.

Note: Forged notes and certificates will be dealt with severely. To submit a forged document is a scholastic offence (see below).

H. **ACADEMIC CONCERNS**

1. You need to know if your instructors have a policy on late penalties, missed tests, etc. This information may be included on the course outlines. If not, ask your instructor(s).
2. **You should also be aware of attendance requirements in some courses. You can be debarred from writing the final examination if your attendance is not satisfactory.**
3. If you are in academic difficulty, check out the minimum requirements for progression in the calendar. If in doubt, see your Academic Counsellor.

Calendar References: Check these regulations in your 2023 Western Academic Calendar available at www.westerncalendar.uwo.ca.

Absences Due to Illness:

https://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_135

Academic Accommodations for Students with Disabilities:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_10

Academic Accommodations for Religious or Holy Days:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_16

Course Withdrawals:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=6&SelectedCalendar=Live&ArchiveID=#Page_75

Examinations:

<http://www.westerncalendar.uwo.ca/PolicyPages.cfm?PolicyCategoryID=5&command=showCategory&SelectedCalendar=Live&ArchiveID=>

Scheduling of Term Assignments:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=5&SelectedCalendar=Live&ArchiveID=#SubHeading_78

Scholastic Offences:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_20

Student Medical Certificate:

<https://www.eng.uwo.ca/files/undergraduate/student-medical-certificate.pdf>

Engineering Academic Regulations:

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=4&SelectedCalendar=Live&ArchiveID=#Page_86

Note: These instructions apply to all students registered in the Faculty of Engineering regardless of whether the courses are offered by the Faculty of Engineering or other faculties in the University.

Add Deadlines:

First term half course (i.e. “A” or “F”)	September 15, 2023
Full courses and full-year half course (i.e. “E”, “Y” or no suffix)	September 15, 2023
Second term half course (i.e. “B” or “G”)	January 16, 2024

Drop Deadlines:

First term half course without penalty (i.e. “A” or “F”)	November 13, 2023
Full courses and full-year half courses without penalty (i.e. “E”, “Y” or no suffix)	November 30, 2023
Second term half or second term full course without penalty (i.e. “B” or “G”)	March 7, 2024

Contact Information:

Undergraduate Services Office: engugrad@uwo.ca	SEB 2097	Phone: 519-661-2130	E-mail:
Chemical & Green Process Engineering: cbeugrad@uwo.ca	TEB 477	Phone: 519-661-2131	E-mail:
Civil Engineering: civil@uwo.ca	SEB 3005	Phone: 519-661-2139	E-mail:
Computer, Electrical, Mechatronics Systems & Software Engineering ecceugrad@uwo.ca	TEB 279	Phone: 519-661-3758	E-mail:
Integrated Engineering engceli@uwo.ca	ACEB 2410	Phone: 519-661-6725	E-mail:
Mechanical Engineering: mmeundergraduate@uwo.ca	SEB 3002	Phone: 519-661-4122	E-mail:

Revised 06/25/2023