

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

**MSE 2200Q—Engineering Shop Safety Training
Course Outline 2021**

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.

Instructor: Dr. Lyndon Brown, Duane Jacque
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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: 0.25 lecture hours/week, 0.75 lab hours/week, quarter course, non-credit
Lecture: T 2:30–4:30 pm ACEB 1410
Hands-on: fill in

Prerequisites: Entry into Year 2 of the 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.

Text: None. Students will be given access to all lecture notes on OWL.

General Learning Objectives (CEAB Graduate Attributes):

Knowledge Base	I	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	

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

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

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. Level 1 and 2 Shop 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 band saws, grinders, sanders and drill presses.

4. Machine Tool 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 minute 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 chips 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.
- g. Perform simple operations on a knee-mill.

5. CAD Software

At the end of this section, students will be able to: CEAB ET2, LL2

- a. Demonstrate competence with SolidWorks for CAD modelling of components and assemblies.

Evaluation: Attendance at each session is mandatory and will be recorded.

Level 1 Shop Training Theory lecture:

online week of September 13, 2019

Level 2 Shop Training laboratory:

Held in CMLP 63, during early September 2021 by reservation

Machine Tool training theory and quizzes:

This consists of 5 modules, done in OWL. Details will be explained in the Introductory Lecture.

Machine Tool Training lecture:

Online, week of October 11. This is a follow up lecture to the theory where materials will be reviewed and applied in case study format

Machine Tool laboratory:

Held in CMLP 63 by reservation mid September 2021.

Certified SolidWorks Associate exam:

All students will be expected to prepare themselves to take the Certified SolidWorks Associate (CSWA) examination. The examination will take the week of October 18th

Course Polices: The following course-specific policies will be enforced throughout the course:

Lectures:

- Attendance at all lectures is mandatory.
- Students who miss a lecture are required to contact Clayton Cook 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.
- Students who arrive late to a lab or 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 Clayton Cook. Failure to do so will result in a mark of zero for that lab.

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 midterm test is provided, then the student will receive a mark of zero for the test.

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.

In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, the lectures will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The hands on material will be postponed til Sept. of 2022. The grading scheme will not change. Any remaining assessments will also be conducted online at the discretion of the course instructor”

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 instructing technician (Clayton Cook cjcook@uwo.ca). Do not make assumptions that you are exempt as you will not be able to make up any missed lab sections. Contact a technician no less than 1 week prior to your scheduled lab session(s) for information. No exemptions will be made for the CSWA exam.

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.

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: [Academic Accommodation for Students with Disabilities](#).

Academic Consideration for Student Absence

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the term, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate

grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For Western University policy on Consideration for Student Absence, see

[Policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs](#)

and for the Student Medical Certificate (SMC), see:

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

Religious Accommodation

Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the [Western Multicultural Calendar](#).

Use of Recordings

All of the remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals under special circumstances. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

Statements concerning Online Etiquette

Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please “arrive” to class on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- [suggested for classes larger than 30 students] In order to give us optimum bandwidth and web quality, please turn off your video camera for the entire class unless you are invited to speak
- [suggested for cases where video is used] please be prepared to turn your video camera off at the instructor’s request if the internet connection becomes unstable
- unless invited by your instructor, do **not** share your screen in the meeting

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the “raise hand” function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

General considerations of “netiquette”:

- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

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.

Use of Personal Response Devices (“Clickers”): If clickers are used in a course, include a statement describing how they will be used that conforms to the requirements given on p. 2 and p. 4 of the course outlines policies in the Academic Handbook,

http://www.uwo.ca/univsec/pdf/academic_policies/exam/courseoutlines.pdf

Omit this section if your course does not use clickers.

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.