

COURSE SYLLABUS



COURSE TITLE: MENG 141 - Manufacturing Processes 1

CLASS SECTION: X01, and X02

TERM: F2024

COURSE CREDITS: 3

DELIVERY METHOD(S): Lecture, Labs

For Communicable Disease Prevention information please visit <https://camosun.ca/about/communicable-disease-prevention>

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.
Learn more about Camosun's

Camosun College requires mandatory attendance for the first-class meeting of each course. If you do not attend and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTORS DETAILS

Salah Elfurjani - Lectures and Labs (X01, and X02)

Lectures:

Friday X01 A, B, and C from 10:30 - 12:20 am. - TEC110

Friday X02 A, and B from 14:30 - 17:20 am. - CBA 118

Lab timetable:

Tuesday, X01 A from 08:30 – 11:20 am. – TEC129

Tuesday, X01 C from 14:30 – 17:20 am. – TEC129

Wednesday, X02 A from 08:30– 11:20 am. – TEC129

Wednesday, X02 B from 14:30 – 17:20 am. – TEC129

Thursday, X01 B from 14:30 – 17:20 am. – TEC129

Contacts:

Salah Elfurjani Email: elfurjanis@camosun.ca

Office: TEC 261

Office Hours: Schedule on the office door or email me to arrange an appointment.

Laboratory assistant: Anika Anderson aandersen@camosun.ca

Pat Nicholson NicholsonP@camosun.ca

Murray Love lovem@camosun.ca

Salah Elfurjani elfurjanis@camosun.ca

As your course instructor, I endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

Students will be introduced to manufacturing processes and basic measuring tools. The safe and effective use of common manufacturing tools (such as manual lathes, milling machines, mills, drills, saws, and hand tools) is emphasized. Students then work with machines and hand tools to manufacture a project set by the instructor.

PREREQUISITE(S): one of

C in English 10

C in Camosun Alternative

And one of:

B in Foundations of Math and Pre-calculus 10

C in Pre-calculus 11

B in MATH 053

C in MATH 073

C in MATH 077

C in MATH 137

C in MATH 139

CO-REQUISITE(S):

EXCLUSION(S):

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon successful completion of this course a student will be able to:

- Interpret drawings and plan operations required to make parts.
- Operate measuring and layout tools to prepare parts for machining.
- Select an appropriate hand tool for the task and operate it safely and effectively.
- Operate machine tools including drill press, grinder, band saw, manual lathe, milling machine, shear, and press brake safely and effectively.
- Calculate cutting feeds and speeds to operate machine tools at optimum effectiveness.
- Identify thread forms for diameter, handedness, pitch, and the number of starts.
- Select and use appropriate drills, taps, and reamers to create plain and threaded holes.
- Discuss the purpose of tolerances and calculate appropriate tolerances in manufactured parts.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Texts: Technology of Machine Tools, 8th Edition, by Steve Krar (Author), Arthur Gill (Author), Peter Smid (Author), Robert J. Gerritsen (Author)

Other: Safety glasses and 6" Digital Caliper

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Lab Topics (Spread over the 14-week term):

Students will obtain hands-on experience working on projects using typical machine shop equipment. Lab experience will reinforce understanding of lecture topics

WEEK or DATE RANGE	ACTIVITY or TOPIC
1	Drawings: Read and interpret assembly and part drawings based on drawing geometry and title block information. Development of orthographic projection and the difference between 1st angle and 3rd angle projection. Understand the use of different line types, drawing symbols, annotations, and dimensioning methods for both engineering and manufacturing drawings. Interpret technical information presented by different drawing views (detail, auxiliary, section). Both Metric and Imperial units will be covered.
2	Common Industrial Measuring Equipment: Rulers, calipers, center and prick punches, layout equipment. Micrometers, Vernier micrometers, verniers. Gauges include Optical comparators, gauge blocks, sine bars, and dial test indicators.
3	Tolerances: Definitions of terms including nominal size, basic size, limit dimensions, bilateral tolerance, unilateral tolerance, clearance, and force fits. Calculating tolerances. Relationship between tolerance and cost.
4	Drilling Operations: Different drilling machines including bench press, radial arm, and gang drilling machines. Drill bit types. Drilling, reaming, countersinking, counter-boring, tapping, and spot-facing. Feed, speed, and time calculations. Work holding devices.
5	Lathe Types and Equipment: Various lathe types include engine, turret, copy, and CNC lathes. Work and tool holding equipment including faceplates, collets, three-jaw universal, and four-jaw independent chucks. Ancillary equipment includes steady and follower rests dead and live centers and mandrels.
6	Turning Operations: Common operations that can be performed on a lathe include turning, facing, parting off, thread cutting, knurling, drilling, reaming, and tapping. Calculations of turning speeds and feeds and machining time.
7	Milling Machines: Differences between the horizontal, vertical, and universal milling machines. Description of the types of machining operations that can be carried out on each. Description of the various work and tool holding equipment including rotary table, dividing head, and split collets. Simple indexing calculations. Calculations of milling speeds and feeds and machining time.
8	Band Saws: Description of saw blade types. Explanation of set and form. Explanation of various band saw type operations including high speed, friction and electro band sawing, band filing, and polishing.
9	Abrasives: Types of abrasive, grit sizes, bond types, grade, and structure. Description of various manufacturing processes that use abrasives including surface, cylindrical, centreless, and plunge grinding, lapping, honing, super-finishing, tumbling, and shot-blasting.

WEEK or DATE RANGE	ACTIVITY or TOPIC
10	Non-Traditional Manufacturing Processes (NTMP): Introduction and applications of more recent manufacturing techniques including water jet cutting, laser machining, electric discharge machining, rapid prototyping, and chemical grinding.
11	Sheet Metal forming Operations: Cutting operations, forming operations, and bending operations using shear and break. Precision sheet metal processes and equipment.
12	Forging and Casting: Purpose of and differences in forging processes. Explanation of more common casting techniques including sand, investment, permanent mold, resin shell, and die casting. Advantages and limitations of each.

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Assignments	20
Quizzes	10
Midterm	15
Final Exam	25
Labs and Project	30
TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](#) Policy for more information.
<http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

Lecture, laboratories, and tutorials Attendance

To pass the course, attendance is mandatory during lectures and successful completion of any assigned labs.

Due Dates and Late Assignments

The due dates are established by the course and term duration. The purpose of the due dates is to help both you and me to get the assignments done so that they can be assessed in a timely manner. Just as you need time to complete the assignments, I need enough time to grade them. As such, the due dates are fixed (unless you have an approved academic accommodation through CAL) and it is expected that students will hand in assignments

on time. Assignment marks, comments, and feedback will be returned to students on time, usually within 1-3 weeks, depending on the length of the assignment.

All assignments must be handed in by the time indicated (on the assignment, or D2L). Late assignments may be graded but marks equivalent to 10% of the total value of the assignment will be deducted for each day, inclusive of days on the weekend, past the deadline. If assignments have already been marked and returned, a late assignment will not be accepted. Assignments will not be accepted that are late more than three days, inclusive of days over the weekend.

Exam Procedures

All exams must be written at the scheduled times except for students requiring accommodation by CAL. It is understood that emergency circumstances do occur (e.g. severe illness or family emergency); for such circumstance, accommodation may be offered at the discretion of the instructor, provided the student:

- a) notifies the instructor in advance of the exam (not after), and
- b) provides documented evidence of the circumstance (e.g. medical certificate).

If an exam is missed with an excused absence, it is up to the instructor's discretion as to how the mark will be made up. In most cases, an oral exam will be scheduled for the student as soon as possible.

Be sure not to make travel plans for the end of the semester until the final exam schedules are finalized and posted. Please ask any family members who might make travel plans on your behalf to consult you before booking tickets.

Please note: the use of cell phones during a test or quiz is not allowed and may result in a zero for that assessment.

Study Habits

Good and regular study habits are essential to do well in this course. You should plan on a weekly minimum of 6 hours outside of scheduled class time for the completion of readings, and assignments, and for general studying. Joining a study group can help make this more achievable.

Lecture presentations will be uploaded to the course website. These should be used as a study guide, not as your sole source of information. You will need to write down additional keywords for examples and explanations given during the lecture and review text and videos to support your understanding. It is also recommended practice to transform lecture notes into a study-friendly format after each lecture, incorporating additional information from your textbook. Study these notes before the next class to prepare yourself for new material, which will often build on previously covered material.

Please take advantage of office hours if you need extra clarification and help.

SCHOOL OR DEPARTMENTAL INFORMATION

Taking Good Care of Yourself:

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep, and taking some time to relax like meditation and yoga. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centers (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](#) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit

<http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.