

COURSE SYLLABUS



COURSE TITLE: MENG 245 - Manufacturing Processes 3 and Quality Control

CLASS SECTION: BX01A and B

TERM: S2022

COURSE CREDITS: 3

DELIVERY METHOD(S): Lectures, Labs and Tutorials

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

For COVID-19 information please visit <https://camosun.ca/about/covid-19-updates>

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.

INSTRUCTOR DETAILS

NAME: Salah Elfurjani

EMAIL: ElfurjaniS@camosun.bc.ca

OFFICE: TEC261

HOURS: Tuesdays from 12:00 to 13:00 am.

Wednesdays from 11:30 to 12:30 am.

Thursdays from 12:00 to 13:00 am

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

The course will introduce students to the manufacturing processes, including welding and composites. This hands-on course will focus on the fundamentals of arc welding processes. Topics related to the weldability of metals (mild steel, carbon steel, stainless steel, alloy steel, and non-ferrous metals). Also, the welding processes covered are Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (MIG), and Gas Tungsten Arc Welding (TIG). Topics include safety, equipment setup, electrode selection, and shielding gases.

Furthermore, students will be introduced to the composite manufacturing processes and will be able to identify the safety procedures when working with composites. Processes will be demonstrated, including hand lay-up, bonding, and the composite layup process, explaining the role of matrix and resin, hardener, and how to prepare and lay out all materials and tools to work with composites.

In addition, the students will be introduced to the knowledge of corrosion phenomena and become familiar with the most common forms of corrosion that are encountered in industry. For how one can protect metals

and alloys against corrosion, experiments and exercises will enable students to observe the electrochemistry and types of corrosion.

Moreover, define, understand, and the importance of the concepts underlying the statistical quality control process in maintaining standards in today's industrial world. During the lectures and tutorial sessions, students will be able to apply the principles and tools to solve challenging industry-based quality control problems. Topics covered in the quality control course also emphasize Inspection tools – OC curve, DMAIC, Pareto Diagram, Histograms, Cause and Effect Diagram, and statistical thinking.

Specifically, students will learn to:

- Employ the vocabulary and terms used in the quality field correctly, like non-conformance, specifications, differentiate between quality assurance and quality control
- Develop OC curves to decide the probability of accepting the lot
- Illustrate the meaning of Lean Manufacturing, Six Sigma, and their relevance in today's business.
- Construct Pareto Diagram, Histogram, cause, and effect diagram, check sheet, flow charts, and tree diagrams
- Understand the mechanisms of corrosion; costs of corrosion across the industry
- Recognize the importance of corrosion prevention and control planning
- Considerations for different material selection and design to minimize corrosion
- Describe safe working practices in a welding shop
- Identify components of welding equipment
- Understand and explain the methods employed in composite fabrication
- Learn basic hand skills for the layup of composites materials using fiberglass, carbon fiber, and polyester resin.

PREREQUISITE(S): MENG 141
MATH 193

CO-REQUISITE(S): None

EXCLUSION(S): None

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course, the student will be able to:

1. Describe and specify commonly used welding processes used in manufacturing.
2. Identify and explain the types of composite materials and their characteristic features including advantages, disadvantages, and applications.
3. Prepare a mold and layup a composite part. (unavailable due to COVID-19 restrictions)
4. Describe the attributes of corrosion protection processes, including electroplating, painting, and powder coating, and specify the appropriate process when corrosion protection is required.
5. Specify quality control measures for a manufacturing operation.
6. Determine the average, range, and standard deviation of part characteristics

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

No textbook

I will post a variety of additional required readings and documents online, either as external links or as PDF files on the D2L site for the course.

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.

Lecture / Lab / Tutorials:

Tuesday 10:00 am – 11:50 pm. TEC175

Wednesday: 09:30am – 11:20am - X01B -Location TBA

Thursday: 10:00am – 11:50am - X01A -Location TBA

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

Lectures Lecture / Lab / Tutorials	OTHER NOTES
1	Introduction to Quality Control QC
2	Statistical Process Control and the design for Six Sigma
3	Quality assurance and quality control
4	Introduction to corrosion
5	Types of corrosion
6	Corrosion of metals and their protection
7	Midterm 1
8	Introduction to welding processes
9	Fundamentals of different types of welding processes
10	Welding Symbols
11	Introduction to Composites materials
12	Types and the classification of composites materials
13	Experimental setup for the Wet/Hand lay-up technique
14	Midterm 2

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
Midterms	50
Assignments	20
Projects	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](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) 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

In order to pass the course, attendance is mandatory during lectures, tutorials, and successful completion of any assigned labs.

Due Dates and Late Assignments

The due dates are established in accordance with the course and term duration. The purpose of the due dates is to help both you and I 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 in a timely manner, 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 on 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 with the exception of students requiring accommodation by CAL. It is understood that emergency circumstances do occur (e.g. severe illness or family emergency); for such circumstance's 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, 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.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

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.