

COURSE SYLLABUS



COURSE TITLE: ENGR 293 – Project Management & Design

CLASS SECTION:

TERM: 2024W

COURSE CREDITS: 3

DELIVERY METHOD(S): Lecture

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

The COVID-19 pandemic has presented many challenges, and Camosun College is committed to helping you safely complete your education. Following guidelines from the Provincial Health Officer, WorkSafe BC, and the B.C. Government to ensure the health and wellbeing of students and employees, Camosun College is providing you with every possible protection to keep you safe. Our measures include COVID Training for students and employees, health checks, infection control protocols including sanitization of spaces, PPE and ensuring physical distancing. For details on these precautions please follow this link: <http://camosun.ca/covid19/faq/covid-faqs-students.html>. However, if you're at all uncomfortable being on campus, please share your concerns with your Instructor. If needed, alternatives will be discussed.

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: Scott Li, Ph.D., P.ENG

EMAIL: Scott.Li@camosun.ca

OFFICE: TEC 261

HOURS: 3

As your course instructor, I endeavour 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

PREREQUISITE(S): N/A

CO-REQUISITE(S): None

EXCLUSION(S): Only open to students in Camosun Engineering Bridge program to UBC

This course covers mechanical design, including design methodology, synthesis and analysis. The design projects will represent both mechanical mechanism design and thermo-fluid systems.

COURSE LEARNING OUTCOMES / OBJECTIVES

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

- Describe the engineering design process and related tools;
- Apply the design process and related tools to solve unstructured open-ended problems with specific goals but multiple potential solutions;
- Demonstrate practical applications of key engineering concepts from technology programs in fluids, thermodynamics, solid mechanics and dynamics;
- Demonstrate effective and professional communication skills through oral presentations and written documents;
- Work effectively in a group and apply strategies to improve group dynamics;
- Describe the role of an engineer as a professional in society.

ENGR 293 is equivalent to the course MECH 223 of UBC "Introduction to the Mechanical Design Process" at UBC. The teaching material of ENGR 293 is mainly based on those of MECH 223. Therefore, the credit of ENGR 293 earned from Camosun can be transferred to their UBC credits when students in the Camosun Engineering Bridge program starts their third year of Mechanical Engineering at UBC.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

The Engineering Design Process: An Introduction for mechanical engineers. Third Edition, (2018) – by P. Ostafichuk, etc.

This edition is recommended, but previous versions of the textbook will also suffice for the course.

Please note: The course is taught using Team Based Learning (TBL) and you will need the textbook to complete reading assignments prior to class. By the end of the course, you will have covered the entire text. This textbook is required for MECH 223 of UBC. It is also used as a reference in MECH 328, MECH 454, 457, 458 and 459 of UBC so be sure to hang onto it after ENGR 293.

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.

| WEEK or DATE RANGE | ACTIVITY or TOPIC | OTHER NOTES |
|--------------------|--|-------------|
| 1 | <ul style="list-style-type: none"> • Team Formation – Team Structure • Team Formation: Charter, Assessment, • Project Management: CPM, Gantt Chart • Generating Project Ideas, Identify Needs and Research • Design process | |
| 2 | <ul style="list-style-type: none"> • Winnowing Process • Concept Ranking – Pugh Charts, • Concept Scoring – WDM, Value • Evaluation and decision making • RAP 1 | |
| 3 | <ul style="list-style-type: none"> • Design Process • Uncertainty analysis • Engineering economics • Formal design methods | |
| 4 | <ul style="list-style-type: none"> • TRIZ • Statistical Basics • Team Presentation 1 - Project Proposal Presentation • RAP 2 | |
| 5 | <ul style="list-style-type: none"> • Minimum constraint design • Estimating performance • Material selection | |
| 6 | <ul style="list-style-type: none"> • RAP 3 | |
| 7 | Reading Week No Class | |
| 8 | <ul style="list-style-type: none"> • Optimization • Mitigating failure • Design for manufacture, assembly, and usability | |
| 9 | <ul style="list-style-type: none"> • Team Presentation 2 - Project Design Presentation • RAP 4 | |
| 10 | <ul style="list-style-type: none"> • Mechanisms • Making parts • Material selection • Team Presentation 3 - Project Fabrication Plan Presentation | |
| 11 | <ul style="list-style-type: none"> • OpenBOM • McMaster-Carr • 3D Printing • RAP 5 | |
| 12 | <ul style="list-style-type: none"> • Societal context • Patents and bringing ideas to market • Social Responsibility – TBL • Engineering Ethics • IP, and IP Protection • RAP 6 | |

| WEEK or DATE RANGE | ACTIVITY or TOPIC | OTHER NOTES |
|--------------------|--|-------------|
| 13 | <ul style="list-style-type: none"> • Poster (One-pager) • Individual reflections • Team Assessments | |
| 14 | <ul style="list-style-type: none"> • RAP Final • Final Project Presentation | |

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 noticed is required. Deadlines scan 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 |
|---|-------------|
| Module RAPs | 10% |
| Final RAP | 15% |
| Logbook | 10% |
| Project Milestone Documents | 15% |
| Milestone Presentations | 15% |
| Prototype | 10% |
| Final Presentation (including the Poster) | 10% |
| Final Project Report | 15% |
| 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

N/A

SCHOOL OR DEPARTMENTAL INFORMATION

N/A

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 Centres (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](http://camosun.ca/services/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.