

# COURSE SYLLABUS



COURSE TITLE: Transportation Engineering

CLASS SECTION: CIVE-152-X01/X02

TERM: Summer 2023

COURSE CREDITS: 3

DELIVERY METHOD(S): Lecture/Lab

For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>.

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and WSÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

---

*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: Perry Peterson

EMAIL: [petersonp@camosun.ca](mailto:petersonp@camosun.ca) Call/Text: 250 812 2214

OFFICE: TEC 105

HOURS: See Schedule on Office Door. Contact instructor for assistance outside of scheduled time. 250 812 2214

*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 are introduced to the analysis and design of transportation systems at several jurisdictional levels and design domains from rural divided highways to local urban roadways. Students learn how to design cross-sections and explore safety considerations, road drainage and mixed-mode uses. An overview of traffic operations is given to familiarize the student with current analysis methods.*

CO-REQUISITE(S): "C" in CIVE 132

## COURSE LEARNING OUTCOMES / OBJECTIVES

---

*Upon successful completion of this course, students will be able to:*

- *Identify legislative authorities and discuss relationships between municipal, regional, provincial and federal highway and transportation jurisdictions.*
- *Evaluate and select standard roadway cross-sections appropriate to meet classification, traffic volume and safety requirements.*
- *Propose appropriate roadway components related to aesthetics, environmental impact and cost, while considering pedestrians, cyclists, emergency vehicles, transit users, and utilities.*

- Design geometric elements of horizontal and vertical road alignments, incorporating appropriate design criteria, guidelines and best practices for low speed and high-speed urban and rural design domains.
- Discuss the goals and types of roadway drainage systems and describe their major components.
- Discuss environmental, social, and economic issues typically encountered within transportation systems related to alternate and mixed modes and users.
- Describe the design and general construction process undertaken for highway projects.
- Calculate and balance earthwork volumes and construct mass haul diagrams.
- Analyse and design intersections to meet required capacity, safety, physical constraints, and aesthetics.

## REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

---

Texts Recommended:

1. Course Presentations and Handouts posted to D2L

Other (recommended):

2. Transportation Association of Canada (TAC), *Geometric Design Guide for Canadian Roads*, TAC, 2017, ISBN 1978-1-55187-614-6
3. Kavanagh, Barry F., *Surveying with Construction Applications*, 8th Ed, Prentice-Hall, Toronto, 2015, ISBN-13: 9780132766982
4. British Columbia. Ministry of Transportation (MOT), *BC Supplement to TAC Geometric Design Guide*. – 2019 3rd Ed., MOT, 2019, ISBN 978-0-7726-7322-0 (available online)
5. Additional reference material posted to D2L or accessed on-line.

## 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. Please refer to the D2L for updates.

WEEK	ACTIVITY or TOPIC (Lecture/Lesson)	OTHER NOTES (Lab)
Week 1 (continued to Week 6)	<u>Introduction to Transportation Engineering Design and Analysis</u>	<u>Urban Roadway analysis investigations</u>
Week 2/3	<u>Planning Considerations - Classification of Highways, Design Speed, Route Analysis, Social/Environmental/Economic constraints</u> <u>Geometric Design – Horizontal Alignment (circular curves)</u> <ul style="list-style-type: none"> <li>• Locating PI Stations</li> <li>• Delta Angle</li> <li>• Minimum Radius</li> </ul>	<u>Introduction to Civil3D</u> <b>Project Step 1</b> Horizontal Alignment Compiling a Baseplan in Civil 3D (Data Sources) <ul style="list-style-type: none"> <li>• Surfaces</li> <li>• Points &amp; Feature Line</li> </ul> Setting Horizontal Alignment <ul style="list-style-type: none"> <li>• Alignment</li> </ul> <u>Assignment #1</u> Spreadsheet Circular Curves
Week 3/4	<u>Design Parameters – Design vehicles, regulations,</u> <u>Geometric Design – Horizontal Alignment (spiral curves)</u>	<u>Assignment #2</u> Spreadsheet Spiral Curves
Week 5/6	<u>Design Parameters - Sight distance, Sag/Crest, Highway Drainage</u>	<b>Project Step 2</b> Vertical Alignment <ul style="list-style-type: none"> <li>• Profile - Surface and Layout</li> </ul>

WEEK	ACTIVITY or TOPIC (Lecture/Lesson)	OTHER NOTES (Lab)
	<u>Geometric Design – Vertical Alignment</u> <ul style="list-style-type: none"> <li>Establishing VPI Elevation - <math>g_1, g_2</math></li> <li>Design Length/K Value</li> <li>Parabolic Formula</li> </ul>	<ul style="list-style-type: none"> <li>Profile View</li> </ul> <u>Assignment #3 Spreadsheet Vertical Curves</u>
Week 7/8/9	<u>Planning Considerations – Traffic capacity, measuring Level of Service: Counts, Volume, Speed, Flow and Velocity</u> <u>Design Parameters – Characteristics and components of a road cross-section</u> <u>Geometric design - Cross section design</u> <ul style="list-style-type: none"> <li>Superelevation (<math>e</math>)</li> <li>Max <math>e</math>, Friction factor (<math>f_0</math>)</li> <li>Tangent Runout and Runoff</li> </ul>	<b>Project Step 3</b> Cross-Section Design <ul style="list-style-type: none"> <li>Assemblies</li> <li>Corridor</li> </ul> <u>Assignment #4 Spreadsheet Superelevation</u>
TBD	Midterm Exam	
Week 10/11	<u>Geometric Design – Calculating Earth Quantities</u>	<b>Project Step 4</b> Earth Quantities <ul style="list-style-type: none"> <li>Sample Lines</li> <li>Section View</li> <li>Compute Material</li> <li>Mass Haul Diagram</li> </ul> <u>Assignment #5 Spreadsheet Mass Haul</u>
Week 12/13	Intersection Planning and Design Other Miscellaneous Topics	<b>Project Completion</b>
Week of Aug 8	Final Exam	

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
Analysis Investigations	10
Assignments	25
Project	20
Mid-Term Exam	20
Final Exam	25
<b>TOTAL</b>	<b>100%</b>

If you have a concern about a grade you have received for an evaluation, see instructor as soon as possible. Refer to the [Grade Review and Appeals](#) policy for more information.

## COURSE GUIDELINES & EXPECTATIONS

---

- Class attendance is expected and for labs, mandatory. If you plan to or do miss a lecture or lab you must notify instructor prior to. Note that demonstrations during labs are critical to completing the project. Student must notify instructor if they are to miss a class.
- Unless otherwise noted, all assignments are to be completed individually.
- No late assignments will be marked unless prior approval is obtained from the instructor.
- You must complete all assignments and submit project prior to qualify to write the final exam.
- You must achieve 50% on the final exam to pass the course.
- A mark of at least a C must be attained to gain credit for the purposes of continuing-on to courses for which this course is a pre-requisite.

## SCHOOL OR DEPARTMENTAL INFORMATION

---

Equity, diversity, and inclusion (EDI) are central to Camosun's culture and values. The Camosun community and the engineering community at large commit to pursuing equity in education regardless of race, heritage, religion, gender or gender identity, and ability. We learn best when we feel safe. Inappropriate, hateful, or demeaning comments or actions will not be tolerated. If your suggestions on how to make your experience here better are encouraged and appreciated. If you wish to know more about Camosun's EDI policy, please see the EDI page on the college's website: <http://camosun.ca/about/policies/equity-diversity-inclusion.html>

## 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/>.

Support Service	Website
Academic Advising	<a href="http://camosun.ca/advising">http://camosun.ca/advising</a>
Accessible Learning	<a href="http://camosun.ca/accessible-learning">http://camosun.ca/accessible-learning</a>
Counselling	<a href="http://camosun.ca/counselling">http://camosun.ca/counselling</a>
Career Services	<a href="http://camosun.ca/coop">http://camosun.ca/coop</a>
Financial Aid and Awards	<a href="http://camosun.ca/financialaid">http://camosun.ca/financialaid</a>
Help Centres (Math/English/Science)	<a href="http://camosun.ca/help-centres">http://camosun.ca/help-centres</a>
Indigenous Student Support	<a href="http://camosun.ca/indigenous">http://camosun.ca/indigenous</a>

Support Service	Website
International Student Support	<a href="http://camosun.ca/international/">http://camosun.ca/international/</a>
Learning Skills	<a href="http://camosun.ca/learningskills">http://camosun.ca/learningskills</a>
Library	<a href="http://camosun.ca/services/library/">http://camosun.ca/services/library/</a>
Office of Student Support	<a href="http://camosun.ca/oss">http://camosun.ca/oss</a>
Ombudsperson	<a href="http://camosun.ca/ombuds">http://camosun.ca/ombuds</a>
Registration	<a href="http://camosun.ca/registration">http://camosun.ca/registration</a>
Technology Support	<a href="http://camosun.ca/its">http://camosun.ca/its</a>
Writing Centre	<a href="http://camosun.ca/writing-centre">http://camosun.ca/writing-centre</a>

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](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto: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.