



CAMOSUN COLLEGE
School of Trades and Technology
Department of Civil Engineering Technology

CIVE 152
Transportation Engineering
Summer 2021

COURSE OUTLINE

Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1 Instructor Information

Instructor	Perry Peterson	
Office hours	24/7 contact Perry by email or text	
Location	Online Course Zoom Room Link	
Phone	250-812-2214	Alternative: _____
E-mail	petersonp@camosun.bc.ca	
Website	https://online.camosun.ca/d2l/home/198976	

2 Prerequisites and Corequisites

Pre/Co-requisite: 'C' in CIVE 132

3 Hours and Credits

Course Activity

- Lecture (Direct Instruction)
- Seminar (Direct Instruction)
- Lab /Collaborative Learning
- Supervised Field Practice
- Workplace Integrated Learning (Coop, Internship, etc.)
- Other*(please note):

Hours / Week	Instruction – No of Weeks
2	14
3	14

Credits = 3

4 Short 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.

5 Intended Learning Outcomes

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.

6 Course Content and Schedule

a) Refer to the course website for course content and updates to the schedule

Class	Lecture Topic	Lab Topic
Week 1	Introduction to Transportation Engineering Planning (Analysis) and Design. Role of the Technologist	Geometric Design – Horizontal Alignment (circular curves) • Locating PI Stations • Delta Angle • Minimum R
Week 2	Stakeholders and Regulatory Environment, The Planning and Design Process. Design Considerations - Physical, Traffic, Human, Economic Factors	Continue. Interactive Road Drainage
Week 3	Route Analysis - Classification of Highways, Rural/Urban, Design Speed, Drainage, Land Use	Geometric Design – Horizontal Alignment (spiral curves)
Week 4	Roadway Components - Usage and Modalities: Aesthetics, Cost, Environmental Impact	Continue. Interactive Road Allowance, Multi Modes, and Utilities
Week 5	Design Parameters - Design Vehicle, Sight distances and reaction times, Safety, Road Allowance, Cross section considerations	Geometric Design - Cross section design • Superelevation • Max e • Friction factor f • Tangent Runout and Runoff
Week 6	Continue	Continue. Interactive Controlled Intersection
Week 7	Characteristics of Traffic - Level of Service and Capacity: Traffic Counts, PHF, Volume, Speed, Flow and Density Relationship	Geometric Design – Vertical Alignment (parabolic curves) • Establishing VPI Elevation - g1, g2 • Design Length/K Value • Parabolic Formula

Week 8	Midterm	Civil 3D Introduction and Surfaces: Importing TIN, DEM; MapConnect: Connecting to remote web map services
Week 9	Intersection Design	Civil 3D - Horizontal Alignment • Setup and Compiling a Baseplan in Civil 3D • Alignments and circular curves
		Geometric Design - Intersection design, turning templates. Interactive Traffic Counts.
Week 10	Earthworks design: Intro to Materials, Cut/Fill, Road Construction Practices, Mass Haul Diagram	Civil 3D - Vertical Alignment • Surface Profile • Layout Profile
		Mass Haul Diagram in Spreadsheet
Week 11	Characteristics and Components of a Highway Cross Section	Civil 3D - Cross-Section • Assemblies • Corridor
Week 12	Continue	Civil 3D - Earth Quantities • Sample Lines • Section View • Compute Material • Mass Haul
Week 13	Review	Project
Week 14	Final Exam August 9	

Notes: 1) This course schedule is subject to change. Please refer to the D2L for updates.

7 Basis of Student Assessment

Component	Weighting %	Comments
Analysis Investigations	10	
Assignments	25	
Project	20	
Mid-Term Exam	20	
Final Exam	25	
TOTAL	100	

8 Required Materials to Assist Students to Succeed Throughout the Course

- a) Texts Recommended:
 1. Course Presentations and Handouts posted to D2L
- b) Other (Recommended):
 1. Transportation Association of Canada (TAC), *Geometric Design Guide for Canadian Roads*, TAC, 2017, ISBN 1978-1-55187-614-6
 2. Kavanagh, Barry F., *Surveying with Construction Applications*, 8th Ed, Prentice-Hall, Toronto, 2015, ISBN-13: 9780132766982
 3. 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)
 4. Additional reference material posted to course webpage or accessed on-line.

9 College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

10 Grading System

- Standard Grading System (GPA)*
- Competency Based Grading System*

See [Camosun Grading Policy E-1.5](#)

11 Class Policies

- Unless otherwise noted, all assignments are to be completed individually.
- Assignments are due at the start of the applicable lecture or lab period, unless otherwise noted. Late assignments will have 10% deducted. Assignments submitted after graded assignments have been returned or solutions are posted are worth 0.
- You must complete all assignments in order to qualify to write the final exam.
- You must achieve 50% on the final exam in order to pass the course. In addition, a weighted average of 50% on the mid-term and final exam must be achieved in order 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.
- Attendance for the lectures is expected and for labs is mandatory. If you plan to or do miss a lecture or lab you must notify instructor prior to class.

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. Your suggestions on how to make your experience here better are encouraged and

appreciated. Please let me or the department chair know ways to improve your experience at Camosun. 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>