CIVE450-001 Transportation Engineering

Department of Civil, Architectural & Environmental Engineering
College of Engineering and Computing

Course Syllabus

Term:	Fall 2026
Credit Hours:	3 credits
Class Meeting Days:	Tuesday, Thursday
Class Meeting Time:	16:30–17:50
Class Meeting Location:	Randell 114
Required or Elective:	Elective
Instructor:	Dr. Zhiwei Chen, Assistant Professor Department of Civil, Architectural & Environmental Engineering Drexel University Office: AEL 273-F Office hours: Tuesday 15:00–16:25 or by appointment Email: zc392@drexel.edu

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All contents (including the timeline) are subject to change during the term.

You can always reach me via email. If you want me to respond efficiently, please label your email title as follows: CIVE450: <Your Email Title>.

1. Course Description

This course introduces basic knowledge, mathematical models, and solution tools for highway transportation problems. It focuses on geometric design of highways and traffic capacity and flow theory. Topics include horizontal and vertical alignment, stopping sight distance, traffic flow basics, shockwaves and queuing, and highway capacity and level of service. Emerging transportation technologies may be used as examples within these topics.

The transportation sequence in Civil Engineering consists of Transportation Engineering, Transportation System Planning, and Traffic Signal Systems. Transportation Engineering is the first course in the sequence and is a prerequisite for the other two courses. This class helps students prepare for FE Civil exam questions on *geometric design* and *traffic capacity and flow theory*.

2. Prerequisites

None.

3. Course Objectives

By the end of this course, you will demonstrate the ability to:

- Apply horizontal and vertical highway design relationships.
- Analyze traffic flow, shockwaves, and queues.
- Analyze highway capacity and level of service.
- Use the FE reference handbook and check proposed solutions for errors.
- Understand emerging technologies in transportation systems.

4. Recommended Textbook

Mannering, F. L., & Washburn, S. S. (2020). *Principles of Highway Engineering and Traffic Analysis*, Seventh Edition. John Wiley & Sons.

5. Course Schedule

Week	Day	Topic	Deliverables
1	09/22/26	Course Overview	
	09/24/26	Module 1: Horizontal Alignment 1	
2	09/29/26	Module 1: Horizontal Alignment 2	
	10/01/26	Module 1: Horizontal Alignment 3	HW1
3	10/06/26	Module 1: Vertical Alignment 1	
	10/08/26	Module 1: Vertical Alignment 2	HW2
4	10/13/26	**Exam 1**	
	10/15/26	Module 2: Traffic System Parameters	
5	10/20/26	Module 2: Basic Traffic Models 1	
	10/22/26	Module 2: Basic Traffic Models 2	HW3
6	10/27/26	Module 2: Shockwave Theory Basics 1	
	10/29/26	Module 2: Shockwave Theory Basics 2	HW4
7	11/03/26	No Class: Election Day	
	11/05/26	Guest Lecture 1: Topic TBD	HW5
8	11/10/26	**Exam 2**	
	11/12/26	Module 3: Highway Capacity & LOS 1	
9	11/17/26	Module 3: Highway Capacity & LOS 2	
	11/19/26	Module 3: Queuing Theory	
10	11/24/26	No Class: Thanksgiving	HW6
	11/26/26	No Class: Thanksgiving	
11	12/01/26	Guest Lecture 2: Topic TBD	
	12/03/26	**Exam 3**	

6. Academic Performance

The final grade will be determined by the following weights:

Criteria	Percent of total grade
Homework assignments	50%
Exams	50% (best two of three; 25% each)
Total	**100%**

Grading scale

Score (%)	Grade
98+	A+
93–97	A
90–92	A−
88–89	B+
83–87	B
80–82	B−
78–79	C+
73–77	C
70–72	C−
68–69	D+
60–67	D
59 or below	F

7. Course Specific Policies

Attendance policy: Attendance is encouraged to ensure your performance in this class.

Late policy: You have 5 slip days to use across the quarter. Slip days are counted in calendar days, and any submission after the deadline consumes at least one slip day; partial days round up to a full day. Slip days may not be used for exams and in-class activities. After all five slip days are used, late work will not be accepted unless you have prior, approved accommodations. For documented emergencies or approved accommodations, contact me before the deadline whenever possible.

Questions about your grades: Assignments will typically be graded within one week after they are due. Questions about a grade must be received within one week after the grade is returned.

Homework submission: All homework must be submitted by 11:59 p.m. on the due date specified in the schedule. Submit through Canvas as a readable PDF. Handwritten solutions may be scanned and uploaded as a PDF. Show your governing relations, substitutions, units, and reasoning. **Other formats will not be graded.**

Homework resubmission: Once you receive your graded assignment, you will have the chance to revise and resubmit it. This resubmission is allowed only once and **must be done within a**

week of receiving the graded assignment. Slip days do not apply to resubmissions. The resubmission will be assessed independently of the original, and the final grade will be 50% of the original grade plus 50% of the resubmitted grade. A problem is eligible for resubmission only if the original submission shows an attempted solution. Blank or placeholder responses are not eligible.

AI use on homework: You may use AI tools to obtain explanations or check work unless an assignment gives narrower instructions. You remain responsible for all submitted work. Identify any substantial AI contribution and verify adopted calculations or claims using course materials, problem data, or the FE handbook. A submitted solution must show reasoning you can explain. AI tools are not permitted during exams.

Teaching improvement: I welcome feedback about the teaching and the course through conversation, email, notes, and course evaluations. Informal surveys may also be used for teaching improvement.

8. Academic Policies

Students are responsible for all academic policies on the Provost's website, not only those listed below.

Academic Integrity, Plagiarism, Dishonesty and Cheating Policy: Drexel policy

Disability Statement:
Students requesting disability accommodations must request a current Accommodations Verification Letter (AVL) through ClockWork before accommodations can be made. Disability Resources issues the AVL. For more information, contact Disability Resources at 215.895.1401 or disability@drexel.edu. See the Disability Resources syllabus statement.

Student Responsibilities:
It is a student's responsibility to assure that they are properly enrolled or de-enrolled in the course.

Course Add/Drop Policy: Drexel course and registration policies

Course and Co-op Withdrawal Policy: Drexel course and registration policies

Title IX, Discrimination, Harassment, and Bias Reporting: Drexel Civil Rights Compliance

Financial Obligations:
Students who do not satisfy financial obligations to Drexel University cannot be entitled to a grade.

Course Change Policy:
The instructor reserves the right to amend this syllabus as needed to reflect changes or omissions to course information, materials, or the schedule. Changes will be announced through Canvas, and updated materials will be made available there.