CIVE 452-001 & 552-001 Traffic Signal Systems
Department of Civil, Architectural & Environmental Engineering
College of Engineering

COURSE SYLLABUS

Term:	Spring 2026
Credit Hours:	3 credits
Class Meeting Days:	Monday, Wednesday
Class Meeting Time:	04:00 pm - 05:20 pm
Class Meeting Location:	Curtis 344 or Online
Required or Elective:	Elective

Instructor: Dr. Zhiwei Chen, Assistant Professor
Department of Civil, Architectural & Environmental Engineering
Drexel University
Office: AEL 273-F
Office hours: Wednesday 11:00 am - 12:00 pm or by appointment
Email: zc392@drexel.edu

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: Traffic Signal Systems: <Your Email Title>.

1. Course Description

The transportation sequence in Civil Engineering consists of three courses – Transportation Engineering, Transportation System Planning, and Traffic Singal Systems. Traffic Signal Systems is the third course in the sequence. This course introduces topics, concepts, and models related to signalized intersections, including signal timing concepts, signal design, signal timing plans, and uncoordinated signal timing. This is a project-based course. Students are expected to work as teams of 4 (ideally) to analyze and redesign a signalized intersection within or around Drexel campus. Detailed guidance of these activities will be provided throughout the quarter.

2. Prerequisites

NA.

3. Course Objectives

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

- Understand design principles of a traffic signal system.
- Understand signal timing concepts such as movements, ring-and-barrier diagrams.
- Collect data needed for analyzing and designing signalized intersections.
- Perform signal timing design for uncoordinated intersections.

4. Textbooks

Urbanik et al. (2015). NCHRP Report 812. Signal Timing Manual – Second Edition (2015).

5. Course Schedule

Week	Day	Topic	Deliverables
1	03/30/26	**Course Overview**	
	04/01/26	Project Activity 0: Teaming & Site Selection	
2	04/06/26	Module 1: Traffic Detection Technologies	
	04/08/26	Module 1: Traffic Detection Technologies (Cont.)	
3	04/13/26	Module 1: Traffic Controller & Display	
	04/15/26	Project Activity 1: Site Selection & Visit	Note 1
4	04/20/26	**Guest Lecture 1: Field Visit**	
	04/22/26	Module 2: Ring-&-Barrier Diagram, Left-Turn Phasing	Report 1
5	04/27/26	Module 2: Left-Turn Phasing (Cont.) & Overlap	
	04/29/26	**Midterm Presentation**	
6	05/04/26	Project Activity 2: Data Collection (Planning)	Note 2
	05/06/26	Project Activity 2: Data Collection (Implementation)	
7	05/11/26	Module 3: Movement & Lane Group, Flow Rate	
	05/13/26	Module 3: Flow Rate (Cont.)	Report 2
8	05/18/26	Module 3: Capacity, Delay, & Level of Service	
	05/20/26	**Guest Lecture 2: TBD**	Note 3
9	05/25/26	Project Activity 3: Capacity & LOS Evaluation	
	05/27/26	Project Activity 3: Capacity & LOS Evaluation	
10	06/01/26	**Final Presentation**	
	06/03/26	**Final Presentation**	Report 3

6. Academic Performance

The final grade will be determined by the following weights:

Criteria	Percent of total grade
Lecture Notes	45% (15% each)
Project Report	35% (10% + 10% + 15%)
Presentation	20% (10% each)
Attendance	Extra Credit
Total	100%

Grading Scale (%)	
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 a total of 5 slip days to use over the quarter. Slip days are counted in calendar days, and any submission after the deadline uses at least 1 slip day; partial days are rounded up to a full day. Slip days cannot be used for exams, in-class activities, or the final project. Once you have used all 5 slip days, late work will not be accepted unless you have prior approved accommodations. If you have a documented emergency or an approved accommodation, please contact me before the deadline whenever possible. For group assignments, if the submission is 1 day late, 1 slip day will be deducted from each group member.

Questions about your grades: Assignments will be typically graded within one week after they are due. Any questions about your grades must be received by me within one week after you receive your grades. For example, if I tell you your grade on Assignment 1 on date X, and you want to talk to me about it, you should do it within X+7 (days).

Homework submission: All homework must be submitted by 11:59 pm on the due date as specified in the schedule. All submissions must be made on Learn in the form of a PDF. If you prefer to handwrite your solutions, you may scan and upload them as a PDF. However, make sure your handwriting is clear and legible to avoid potential deductions due to illegibility. ***Assignments submitted in other formats will NOT be graded.***

Teaching improvement: I would like to improve my teaching as much as possible. Therefore, I highly appreciate your comments and feedback regarding my teaching style or anything related to this class. You can freely tell me what you think about the class in any way you feel is the best: face-to-face conversations, emails, notes, etc. In addition to the Course Evaluation, informal surveys will be conducted by me for teaching improvement purposes.

8. Academic Policies
Students are responsible to be aware of all academic policies as posted on the Provost's website and not just the ones listed below.

Academic Integrity, Plagiarism, Dishonesty and Cheating Policy:
https://drexel.edu/provost/policies-calendars/policies/academic-integrity/

Student with Disability Statement:
https://drexel.edu/disability-resources/support-accommodations/student-family-resources/

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

Course Add/Drop Policy:
https://drexel.edu/provost/policies-calendars/policies/course-add-drop/

Course Withdrawal Policy:
https://drexel.edu/provost/policies-calendars/policies/course-withdrawal/

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

Course Change Policy:
From time to time, the instructor of this course reserves the right to change and amend this Syllabus on an as needed basis to reflect any changes or omissions to information, course materials, schedule, etc. throughout the duration of the semester. The instructors will inform their students when such changes have occurred and will assure the revisions are available to all students.