

IZMIR INSTITUTE OF TECHNOLOGY
CIVIL ENGINEERING DEPARTMENT

CE 524 – URBAN TRAFFIC MANAGEMENT AND CONTROL
SYLLABUS
FALL 2025

Class Meeting Time: Wednesdays 13:30 – 16:15

Location: CZ13

Instructors: Asst. Prof. Dr. Tolga ERCAN – Email: tolgaercan@iyte.edu.tr

Office Hours: By appointment only

Description: The purpose of the course is to advance the graduate student's knowledge on urban traffic management and control application around the globe using intelligent transportation system design and operations. Also, the students will implement Transportation Management Center (TMC) applications using real-world data and case studies.

Textbook:

- Traffic Engineering by Roess, Prassas, and McShane. Pearson. Fourth Edition.
- An introduction to traffic flow theory by Elefteriadou, Lily. Vol. 84. Springer, 2014.

References: 2918 Sayili Karayolları Trafik Kanunu
Karayolları Trafik Yonetmeligi
Highway Capacity Manual 6th and 7th Editions
Highway Safety Manual, 1st Edition, 2010, (including 2016 Errata)
Manual of Uniform Traffic Control Devices (MUTCD), 2023
<https://mutcd.fhwa.dot.gov/>

Learning Outcome:

- Fundamentals of traffic flow theory and stream characteristics
- Traffic data collection and interpretation
- Shockwave theory and bottleneck analysis
- Develop the basics of signal phasing and timing plans

Grading Policy:

- Class Project (Individual Project) **(25% of GRADE):** Using Izmir's real time traffic volume and signal phase information on a selected intersection, student will prepare a traffic simulation study using PTV Vissim or SUMO to study current delays and provide future improvement suggestions.
- 2 Take Home Homeworks: **10% of GRADE**
- Midterm Exam: **25% of GRADE (In Class Exam)**
- Final Exam: **40% of GRADE (In Class Exam)**

Date	Week	Lecture Content
1/10/2025	Week 1	Introduction to Class - Introduction of Traffic Engineering Concepts
8/10/2025	Week 2	Components of the Traffic System and Roadway - Traffic Stream Characteristics
15/10/2025	Week 3	Traffic Stream Characteristics - Traffic Flow Theory - Queuing Theory
22/10/2025	Week 4	Car Following Theory
29/10/2025	Week 5	Holiday – NO Class
5/11/2025	Week 6	Car Following Theory & Lane Changing Theory
12/11/2025	Week 7	Intelligent Transportation Systems
19/11/2025	Week 8	Intelligent Transportation Systems in Numbers
26/11/2025	Week 9	Practice Problems – Exam Recap
3/12/2025	Week 10	Mid-Term Exam – In Class Exam
10/12/2025	Week 11	Intelligent Transportation Systems and Dynamic Traffic Assignment
17/12/2025	Week 12	Dynamic Traffic Assignment and Traffic simulation applications
24/12/2025	Week 13	Class Project Presentations
31/12/2025	Week 14	TMS&O Practices and Traffic Impact Studies
7/1/2026	Week 15	Class Recap & Practices
12/1/2026 – 23/1/2026	Final Exams Week	TBD