



## ECTS COURSE INFORMATION FORM

<b>Faculty</b>	<b>Faculty of Engineering</b>	
<b>Program</b>	<b>B.Sc. in Civil Engineering</b>	<b>Required</b>
	<b>B.Sc. in Computer Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Electrical-Electronics Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Industrial Engineering</b>	<b>Elective</b>
	<b>B.Sc. in Mechanical Engineering</b>	<b>Elective</b>

<b>Course Code</b>	CE 403			
<b>Course Title in English</b>	Traffic and Transportation Engineering			
<b>Course Title in Turkish</b>	Trafik ve Ulaştırma Mühendisliği			
<b>Language of Instruction</b>	English			
<b>Type of Course</b>	Flipped Classroom/Lecture/Project			
<b>Level of Course</b>	Undergraduate			
<b>Course Category (by % of Content)</b>	Basic Science	Basic Engineering	Engineering Design	General Education
	-	50	50	-
<b>Semester Offered</b>	Fall			
<b>Contact Hours per Week</b>	Lecture: 3	Recitation:	Lab:	Other:
<b>Estimated Student Workload</b>	154 hours			
<b>Number of Credits</b>	6 ECTS			
<b>Grading Mode</b>	Standard Letter Grade			
<b>Pre-requisites</b>	None			
<b>Expected Prior Knowledge</b>	None			
<b>Co-requisites</b>	None			
<b>Registration Restrictions</b>	Only Undergraduate Students			
<b>Overall Educational Objective</b>	To become familiar with traffic engineering and transportation projects.			
<b>Course Description</b>	This course will familiarize the student with traffic systems and components, transportation demand and its characteristics, transportation economics, transportation models, sustainability, social and environmental factors of transportation, components of traffic stream, characteristics of road users and vehicles, vehicle dynamics, traffic flow theory and models, car following and queuing theories, operation of traffic, traffic data, capacity and level of service, traffic control methods and strategies, design of intersections, geometric design and standards, location survey and plan of a road, horizontal curves, profile of a road, vertical curves, cross sections and introduction to earthworks.			
<b>Course Description in Turkish</b>	Bu derste trafik sistemleri ve bileşenleri, ulaşım talebi ve özellikleri, ulaştırma ekonomisi, ulaşım modelleri, sürdürülebilirlik, toplum ve çevre ile olan etkileşim, trafik akışının bileşenleri, trafik akış özellikleri, araç dinamikleri, trafik akış teorisi ve modelleri, araç takip, trafik akışı, hacmi ve özellikleri, hizmet seviyesi, trafik kontrol yöntemleri, kavşak tasarımı, geometrik tasarım ve standartlar, güzergah tayini, plan hazırlama, yatay kurp tasarımı, düşey kurp hesabı, en kesit, boy kesit gösterimleri ve toprak işleri hesabı konuları işlenmektedir.			
<b>Course Learning Outcomes and Competencies</b>	Upon successful completion of this course, the learner is expected to: 1. demonstrate a solid grounding in the fundamentals of traffic engineering; 2. differentiate issues related to planning and managing transport operations; 3. identify the construction and inspection requirements of the transportation engineering; 4. demonstrate computational problem solving skills on geometric design of highway sections 5. plan and design a transportation project;			

6. explain global issues related to professional practice, infrastructure, environment and service populations;  
7. develop self-learning skills.

<b>Relationship of the Course with the Student Outcomes</b>		Level	Learning Outcome(s)	Assessed by
<b>Student Outcomes</b>		N=None S=Supportive H=High		Exam, Project, HW, Experiment, Presentation, etc.
(1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics		H	1,2,3,4	Exams
(2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors		H	5	Design Project
(3) an ability to communicate effectively with a range of audiences				
(4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts		S	6	Design Project
(5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives				
(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions				
(7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies		S	7	Design Project
<b>Prepared by and Date</b>	Asst. Prof. Hüseyin Can Ünen / September 2019			
<b>Semester</b>	Fall 2019-2020			
<b>Name of Instructor</b>	Asst. Prof. Hüseyin Can Ünen			
<b>Course Contents</b>	Week	Topic		
	1.	Introduction to transportation and transportation engineering, Transportation systems and its components		
	2.	Introduction to transportation planning, Transportation demand and its characteristics, Transportation economics, Transportation models		
	3.	Sustainability in transportation, Transport and society, Transport and environment		
	4.	Introduction to traffic engineering, Components of traffic stream, Characteristics of road users and vehicles, vehicle dynamics		
	5.	Traffic flow theory, Models of traffic flow, Car following and queuing theories		
	6.	Operation of traffic, Traffic data, Capacity and level of service		
	7.	Traffic control methods and strategies		
	8.	An overview of geometric design, Geometrical standards		
	9.	Location (route) survey and plan of a road (design project)		
	10.	Horizontal curves (design project)		
	11.	Profile of a road (design project)		
	12.	Vertical curves (design project)		
	13.	Cross sections (design project)		
	14.	Introduction to earthworks (design project)		
	15.	Final Exam / Project / Presentation Period		

	16.	Final Exam / Project / Presentation Period
<b>Required/Recommended Readings</b>		<ul style="list-style-type: none"> <li>N.J. Garber, L.A. Hoel, Traffic &amp; Highway Engineering, CL- Engineering, 2008.</li> <li>Karayolları Genel Müdürlüğü, Karayolu Tasarım El Kitabı, 2005.</li> <li>Ortuzar, J. D., and Willumsen, L. G., <i>Modelling Transport, 4<sup>th</sup> Edition</i>, John Wiley and Sons Ltd., West Sussex, 2011</li> <li>Arnott, R. and Kraus, M., Principles of Transport Economics, in Handbook of Transportation Science, p. 689-726, Ed. Randolph, W.H., Kluwer Academic Publishers, New Jersey, 2003</li> <li>Gartner, N., Messer, C. J. and Rathi, A. K., Traffic Flow Theory A State-of-the-Art Report (Revised Monograph on Traffic Flow Theory), The Federal Highway Administration, Washington D.C., 2001</li> </ul>
<b>Teaching Methods</b>		Lectures/contact hours using 'flipped classroom' as an active learning technique
<b>Homework and Projects</b>		Transportation design project
<b>Laboratory Work</b>		-
<b>Computer Use</b>		CAD Applications, Microsoft Office Applications
<b>Other Activities</b>		-
<b>Assessment Methods</b>		Design Project: 40% Midterm: 30% Quizzes: 30%
<b>Course Administration</b>		<p><b>Instructor's office:</b>  <b>Office hours:</b>  <b>E-mail address:</b> <a href="mailto:unenc@mef.edu.tr">unenc@mef.edu.tr</a>  <b>Rules for attendance:</b>  <b>Missing a midterm:</b> Provided that proper documents of excuse are presented, each missed midterm by the student will be given the grade of the final exam. No make-up will be given.  <b>Missing a final:</b> Faculty regulations.  <b>A reminder of proper classroom behavior, code of student conduct:</b> YÖK Regulations  <b>Statement on plagiarism:</b> YÖK Regulations (<a href="http://www.mef.edu.tr/tr/yonetmelikler">http://www.mef.edu.tr/tr/yonetmelikler</a>)</p>

ECTS Student Workload Estimation	Activity	No/Weeks	Hours			Calculation	Explanation
		No/Weeks per Semester (A)	Preparing for the Activity (B)	Spent in the Activity Itself (C)	Completing the Activity Requirements (D)		
	Lecture/Flipped Classroom	14	1	3		56	A*(B+C+D)
	Project	1	35			35	A*(B+C+D)
	Quizzes	5	7	1		40	A*(B+C+D)
	Midterm(s)	1	20	3		23	A*(B+C+D)
	Final Examination					0	A*(B+C+D)
	Total Workload					154	
	Total Workload/25					6.16	
	ECTS					<b>6</b>	