COURSE CATALOG

Course Code: CE 481				**Course Name**: Traffic Engineering			
Semester	**T + P + L**	**Credits**	**ECTS**	**Language of Instruction**	**Course Type**	**Instruction Methods**	**Prequisite(s)**
6-7-8	3 + 0 + 0	3	6	English	Departmental Elective (D2)	Lecture	None

Course Objectives	Components of traffic systems and characteristics. Traffic control methods. Traffic flow characteristics. Introduction to intelligent transportation systems. Statistical methods in traffic engineering. Traffic volume surveys. Speed, delay, travel time surveys. Accident investigations. Parking, signing and marking of roads. Signalisation at intersections, capacity analysis of intersections.
Topics Covered	Introduction to Traffic Engineering. Traffic Components and Characteristics. Road User and Vehicle Characteristics. Roadways and Their Geometric Characteristics. Introduction to Traffic Control Devices. Traffic Stream Characteristics. Introduction to Traffic Flow Theory. Traffic Studies and Programs. Statistical Applications in Traffic Engineering. Traffic Data Collection and Reduction Methodologies. Volume Studies and Characteristics. Speed, Travel Time, and Delay Studies. Highway Traffic Safety: Studies, Statistics, and Programs. Parking. Freeways and Rural Highways. Fundamental Concepts for Uninterrupted Flow Facilities. Basic Freeway Segments and Multilane Highways. Weaving, Merging, and Diverging Movements on Freeways and Multilane. Two-Lane Highways. Signing and Marking for Freeways and Rural Highways. The Intersection. The Hierarchy of Intersection Control. Elements of Intersection Design and Layout. Basic Principles of Intersection Signalization. Fundamentals of Signal Timing and Design: Pretimed Signals. Fundamentals of Signal Timing: Actuated Signals. Critical Movement Analysis of Signalized Intersections. Analysis of Signalized Intersections. Intelligent Transportation Systems in Support of Traffic Management and Control. Signal Coordination for Arterials and Networks: Undersaturated Conditions. Signal Coordination for Arterials and Networks: Oversaturated Conditions. Analysis of Streets in a Multimodal Context. Planning, Design, and Operation of Streets and Arterials. Traffic Impact Analysis.
Learning Outcomes of the Course	After the completion of this course, students should be able to: 1- have a solid grounding in the fundamentals of traffic engineering and contextual issues related to planning and managing transport operations [1,2,3,4,5,6] 2 - cover the theory of good traffic engineering practice [6,10,12] *[Note that the numbers in brackets refer to the bullet numbers in the program outcomes list.]*
ISCED Category of the Course	52 Engineering
Textbook	1- Roger P. Roess , Elena S. Prassas , and William R. McShane, Traffic Engineering, 4/E, Pearson
Recommended Sources	1- Roger P. Roess, Elena S. Prassas, William R. McShane, Traffic Engineering (4th Edition), Prentice Hall. 2- A.Tunç, Trafik Mühendisliği ve Uygulamaları, Asil Yayın Dağıtım, 2003. 3- M. Slinn, P. Matthews, P. Guest, Traffic Engineering Design, Elsevier, 2005. 4- F.L. Mannering, S.S. Washburn, W.P. Klareski, Principles of Highway Engineering and Traffic Analysis, Wiley, 2008.

WEEKLY SCHEDULE

Week	**Theoretical Topic**	**Applied / Laboratory Topics**
1	Introduction to Traffic Engineering. Traffic Components and Characteristics. Road User and Vehicle Characteristics. Roadways and Their Geometric Characteristics.	
2	Introduction to Traffic Control Devices. Traffic Stream Characteristics. Introduction to Traffic Flow Theory. Traffic Studies and Programs.	
3	Statistical Applications in Traffic Engineering. Traffic Data Collection and Reduction Methodologies.	
4	Volume Studies and Characteristics. Speed, Travel Time, and Delay Studies.	
5	Highway Traffic Safety: Studies, Statistics, and Programs.	
6	Parking. Freeways and Rural Highways. Fundamental Concepts for Uninterrupted Flow Facilities. Basic Freeway Segments and Multilane Highways.	
7	Weaving, Merging, and Diverging Movements on Freeways and Multilane. Two-Lane Highways. Signing and Marking for Freeways and Rural Highways.	
8	The Intersection. The Hierarchy of Intersection Control. Elements of Intersection Design and Layout.	
9	Basic Principles of Intersection Signalization. Fundamentals of Signal Timing and	

	Design: Pretimed Signals. Fundamentals of Signal Timing: Actuated Signals.	
10	Critical Movement Analysis of Signalized Intersections. Analysis of Signalized Intersections. Intelligent Transportation Systems in Support of Traffic Management and Control.	
11	Signal Coordination for Arterials and Networks: Undersaturated Conditions. Signal Coordination for Arterials and Networks: Oversaturated Conditions.	
12	Analysis of Streets in a Multimodal Context. Planning, Design, and Operation of Streets and Arterials.	
13	Case studies	
14	Traffic Impact Analysis.	

COURSE ASSESSMENT POLICY

	Activities	**Number**	**Contribution (%)**
Studies throughout the term	**Quizes**	-	-
	Term Homework/ Project	-	-
	Reports	-	-
	Graduation Thesis/ Project	-	-
	Seminar	-	-
	Homeworks	5	30
	Presentations	-	-
	Midterm Exams	2	35
	Project	-	-
	Laboratory	-	-
	Other (field work)	-	-
FINAL EXAM		1	35
Total			100

CONTRIBUTION OF THE COURSE TO CIVIL ENGINEERING PROGRAM OUTCOMES

	Program Outcomes	**1**	**2**	**3**
1	The ability to apply knowledge of mathematics, science, and engineering			X
2	The ability to identify, formulate, and solve engineering problems			X
3	The ability to design a system or component to meet desired needs with realistic constraints such as economic, environmental, social, ethical, health and safety, manufacturability and sustainability		X	
4	The ability to analyze and interpret data		X	
5	The ability to design and conduct experiments and apply experimental results to improve processes		X	
6	The ability to convey technical material through oral presentations and written papers/reports			X
7	The ability to function within multidisciplinary teams		X	
8	The understanding of professional and ethical responsibilities		X	
9	The understanding of the impact of engineering on society		X	
10	The understanding of the necessity to engage in life-long learning	X		
11	The understanding of management and leadership principles and techniques		X	
12	The appreciation of the role of research in civil engineering problems		X	
13	A knowledge of contemporary issues in civil engineering		X	
14	The ability to use modern engineering techniques, skills, and tools			X
15	The ability to understand and explain basic concepts in management, business, and leadership		X	
16	A commitment to quality, punctuality and continuous improvement		X	

Contribution Level: 1 low, 2 medium, 3 high

ECTS-WORKLOAD TABLE

ACTIVITIES	**Number**	**Duration (Hour)**	**Workload(Hour)**
Lecture Time	14	3	42
Final Exam (Including Prepation Time)	1	25	25
Quizes	-	-	-
Term Homework / Project	-	-	-

Reports	-	-	-
Graduation Thesis/Project	-	-	-
Seminar	-	-	-
Study Time Outside the Class	14	2	28
Homeworks	5	5	25
Presentations	-	-	-
Midterm Exams (Including Prepation Time)	2	15	30
Project	-	-	-
Laboratory	-	-	-
Total Workload			150
ECTS Credits of the Course (Total Workload / 25)			6

Last update on 22.01.2014	**Coordinator / PREPARED BY Devrim AKCA and Esin İNAN**	**APPROVED BY Esin İnan**