



## AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Computer Software Applications in Transportation Engineering							
Course Code		MCE552		Couse Level		Second Cycle (Master's Degree)			
ECTS Credit	8	Workload	195 ( <i>Hours</i> )	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		To teach the basic concepts related to simulation models; To teach both the utilization and the methods of Simulation Models applications in developing transportation infrastructure; To teach both the utilization and the methods of Simulation Models applications in developing transportation planning process							
Course Content		Introduction to simulation (definitions and principles); the art of building simulation models; statistical analysis of simulation data; simulation models for capacity analysis (concepts and definitions); signal timing models (review of basic concepts); HCS, SIDRA and Synchro software; TRANSYT-7F and SimTraffic software; comparison of simulation models; transportation planning models (review of basic concepts); Dynasmart-P, DynusT, TransCAD, VISUM and QRS II software, comparisons of simulation models and programs.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Demonstration, Discussion, Project Based Study, Individual Study, Problem Solving					
Name of Lecturer(s)		Lec. Cenk OZAN							

### Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	30
Final Examination	1	40
Assignment	2	30

### Recommended or Required Reading

1	TRANSYT-7F User Guide. Uni of Florida Transportation Center, Gainesville, FL, USA.
2	Akcelik, R. Calibrating SIDRA. ARRB Research Report No. 180. March 1990
3	Highway Capacity Manual 2010 . 5th Edition, TRB, 2010,Washington, D.C.
4	VISUM 14 - User Manual, Karlsruhe: PTV Planung Transport Verkehr AG. PTV AG., 2014.
5	VISSIM - User Manual, Karlsruhe: PTV Planung Transport Verkehr AG. PTV AG.
6	DynaSmart-P User manual
7	DynusT User Manual

Week	Weekly Detailed Course Contents	
1	Theoretical	Introduction to simulation (definitions and general principles)
2	Theoretical	Introduction to simulation (definitions and general principles)
3	Theoretical	The art of building simulation models
4	Theoretical	Statistical analysis of simulation data, general principles
5	Theoretical	Simulation models for capacity analysis (concepts and definitions)
6	Theoretical	HCS2010 and Synchro applications
7	Theoretical	Signal timing models (review of basic concepts)
8	Theoretical	SIDRA and TRANSYT-7F applications
9	Theoretical	Sim Traffic ve Synchro applications
10	Intermediate Exam	Midterm exam
11	Theoretical	Junction Design and Planning models
12	Theoretical	VISSIM Microsimulation model and applications
13	Theoretical	Transportation planning and Transit Planning models (review of basic concepts)
14	Theoretical	Dynasmart-P, DynusT, Transcad, VISUM application and some examples from Turkey
15	Theoretical	Comparisons of simulation models and programs
16	Theoretical	Final Exam



**Workload Calculation**

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	0	3	42
Assignment	2	0	30	60
Individual Work	14	0	3	42
Midterm Examination	1	23	2	25
Final Examination	1	24	2	26
Total Workload (Hours)				195
[Total Workload (Hours) / 25*] = ECTS				8

\*25 hour workload is accepted as 1 ECTS

**Learning Outcomes**

1	will be able to specify the fundamental flowchart of a simulation model that is composed of several processes
2	will be able to plan a simulation model with the appropriate advanced data collection equipments specific to problem being dealt with
3	will be able to propose the appropriate real-time solution strategy and/or method specific for a simulation model
4	will be able to write and review a paper on the fundamental applications of simulation models
5	To use simulation models and to evaluate simulation models' results

**Programme Outcomes (Civil Engineering (English) Master)**

1	To be able to develop expertise knowledge in a civil engineering area founded on their graduate competence.
2	To be able to use the theoretical and practical expertise knowledge gained in their specialty area.
3	To be able to use the information, problem solving and / or practical skills from the field, in interdisciplinary studies.
4	To be able to create new knowledge by integrating their knowledge area with the knowledge coming from different disciplines; and solve problems that need expertise by using scientific research methods
5	To be able to solve the problems related to his/her area by using appropriate research methods
6	To be able to devise a problem in their specialty area, develop a solution methodology, solve the problem, and interpret the results and take action if necessary
7	To be able to criticize the knowledge in their specialty area, guide the learning process, and independently direct high level studies
8	To be able to systematically communicate the recent developments in their specialty area and their own studies to groups both inside and outside their specialty area, orally, in writing and visually
9	To be able to use computer software at a level required by their specialty area with drawing upon information and communication technology at a high level
10	To be able to introduce scientific, technological, social and cultural advancements in the field of civil engineering and to contribute to the process of being an information of the society and to sustain it.
11	To be conscious of professional and ethical responsibility and contribute to the establishment of this consciousness.
12	To be able to protect social, scientific, and ethical values during collection, interpretation, and dissemination stages of the data associated with their specialty area; instruct and supervise these values
13	To be able to use at least one foreign language in a level to follow current developments related to the field.

**Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High**

	L1	L2	L3	L4	L5
P1	5	4	5	4	5
P2	4	5	4	5	4
P3	5	4	5	4	5
P4	4	5	4	5	4
P5	5	4	5	4	5
P6	4	5	4	5	4
P7	5	5	5	4	5
P8	4	4	4	5	4
P9	5	5	5	5	5
P10	4	4	4	4	4
P11	5	5	5	5	5
P12	4	4	4	5	4
P13	5	5	5	5	5

