Department of Urban Transport
Chair of Urban Transport Engineering

UNIVERSITY OF ZAGREB
FACULTY OF TRANSPORT AND TRAFFIC SCIENCES

GRADUATE STUDY: TRANSPORT

(V.) semester

Syllabus

Academic year 2024/2025

Course:	**Managing the Transportation System in Urban Environments**				
Head of course:	Assist. Prof **Mario Ćosić,** Ph.D.				
Co-lecturers:	Assoc. Prof **Marko Šoštarić,** Ph.D. Assoc. Prof **Marko Ševrović,** Ph.D. Assist. Prof **Mario Ćosić,** Ph.D. **Matija Sikirić**, MSc				
Semester: **118237**	Course code: **118237**	Lecture: **30**	Exercise: **0**	Seminar: **15**	ECTS credits: **3**
Group for lectures: **6 students**		Group for exercises: **0 students**	Group for seminars: **6 students**		

The objectives of the course are:

- To present and familiarize students with the technology of managing overall traffic systems in urban environments.
- To demonstrate and prepare students, through various scenarios of traffic congestion on the network, for methods of addressing traffic on available infrastructure in urban areas, according to defined goal functions, with the support of ITS systems.

Learning outcomes:

1. Describe the role of traffic management in urban environments.
2. Interpret data relevant to traffic system management.
3. Analyse the concept of spatial-temporal traffic management.
4. Critically evaluate individual traffic management measures.
5. Devise a strategy for traffic system management.
6. Present the selected solution.

LECTURES and SEMINARS

week	Syllabus	Form of class	Performed by	hours	Remark
1.	▪ Introductory lecture (introduction to the course content, methods of work, as well as mandatory and supplementary literature)	L	Mario Ćosić	2	
2.	▪ Functional familiarization with the traffic system in urban environments, including road, urban and suburban rail, as well as other infrastructure (municipal, communication)	L	Mario Ćosić	2	
	▪ Overview and division of thematic groups, as well as introduction to the process of creating and the structure of seminar papers ▪ Defining deadlines, topics, and students	S	Mario Ćosić	1	Submission of selected seminar paper topics through the e-student application
3.	▪ Influential spatial-temporal factors of transport demand in urban environments	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Mario Ćosić	1	
4.	▪ Spatial-temporal events on the traffic infrastructure of urban environments	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Mario Ćosić	1	

5.	▪ Collecting, processing, integrating, and estimating data	L	Marko Ševrović	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Mario Ćosić	1	
6.	▪ Estimation of internal and external travel costs, assessment of queue tails and infrastructure capacity, evaluation of congestion or travel times	L	Mario Ćosić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Mario Ćosić	1	
7.	▪ Management of traffic systems supported by ITS technology (fixed, adaptive, based on various logics such as fuzzy logic, etc.)	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Marko Šoštarić	1	
8.	▪ Management of traffic during incident situations on urban traffic networks	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	

9.	▪ Traffic management in construction zones, regular and emergency situations	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	
10.	▪ Concept of restricted access to urban areas, parking supply management concept	L	Marko Šoštarić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	
11.	▪ Concept of managing public urban transportation in urban environments	L	Mario Ćosić	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	
12.	▪ Defining a set of travel information, including pre-travel, en-route, and real-time information services	L	Marko Ševrović	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	

13.	▪ Defining the objective function for the overall traffic system of urban areas and optimizing the system according to the defined objective function	L	Marko Ševrović	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	
14.	▪ Defining operational strategies for traffic system management	L	Marko Ševrović	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	1	
15.	▪ Defining operational strategies considering the spatiotemporal dimension of urban environments	L	Marko Ševrović	2	
	▪ Presentation of seminar papers, discussion, and comments	S	Matija Sikirić	2	

STUDENT OBLIGATIONS AND EXAMINATION PROCEDURE

Conditions for achieving the status of "attended" for a student:

The condition for achieving the "attended" status in the course " managing the transportation system in urban environments“ and thus the condition for taking the final written exam, is attending at least 70% of the lectures, 70% of seminar papers, and successfully assessing the seminar paper.

Written exam is conducted in two ways:

1. Through the pre-exam: The pre-exam takes place at the end of the semester. Students who achieve at least 60% correctness in the pre-exam are eligible to take the oral part of the exam.
2. Through the written final exam: All students who have not collected enough points individually in the pre-exam or are not satisfied with the points collected in the pre-exam or have not attended the written knowledge assessment via the pre-exam will take the written part of the exam. Students who achieve a correctness percentage greater than 60% have passed the written part of the exam.

Oral exam:

To access the oral part of the exam, it is necessary to achieve a minimum of 60% correctness on the exam through the pre-exam or written exam. The final grade is determined in the oral part of the exam by adding the achieved success in the written and oral knowledge assessments.

LITERATURE

a) Mandatory literature

1. Litman, T.: Mobility Management, GTZ, Eschborn, 2004.
2. Sayeg, P.: ITS, GTZ, Eschborn, 2009.
3. Broadus, A., Litman, T., Menon, G.: Transportation Demand Management, GTZ, Eschborn, 2009.
4. Sayeg, P., Charls, P.: Intelligent Transport System, GTZ, Eschborn, 2005.

b) Additional literature

1. Mobility Management & Commuting, GTZ, Echborn, Germany, 9/2011.
2. Button, K.J., Henser, D.A.: Handbook of transport systems and traffic control, Volume 3, Elsevier Ltd., Oxford, UK, 2006.
3. Litman, T.: Transport Elasitcities, Impacts on Travel Behaviour, BMZ, Berlin, 2013.

COURSE DELIVERY METHODOLOGY

1. LECTURES

Lectures are conducted using PowerPoint presentations. Discussions on the topics being presented are encouraged during the lecture.

2. SEMINAR PAPER

As part of the seminar paper, students are trained in preparing tasks that involve developing strategies for solving the traffic system in urban areas. Students defend their work through presentations using PowerPoint slides.

3. DOCUMENTATION

Attendance is recorded for lectures, seminar papers, and assignments.

4. COURSE GRADING

Monitoring student performance:

Activity/segment	ECTS credits
lectures + Seminar paper	1,5
Written exam	1
Oral exam	0,5
Total	***3***

Assessment and Evaluation of Student Work during Classes and on the Final Exam:

The grade from the written part of the exam is obtained based on the number of points achieved in the written part of the exam (according to the table). The final grade on the exam is obtained as the average grade from the written and oral parts of the exam.

Total points	Grade
93-100 %	5
85-92 %	4
73-84 %	3
60-72 %	2