



## GRADUATE STUDY **TRANSPORT**

### **SEMESTER (II)**

### Syllabus

Academic year 2023/2024

Course: <b>Organizing Railway Passenger Transport</b>					
Head of course: Assoc. Prof. <b>Borna Abramović</b> , Ph.D. Asst. Prof. <b>Marjana Petrović</b> , Ph.D.					
Co-lecturers:					
Semester: <b>II</b>	Course code: <b>62815</b>	Lectures: <b>30</b>	Auditory exercises: <b>20</b>	Seminars: <b>10</b>	ECTS credits: <b>7</b>
Group for lectures: <b>20 students</b>			Group for auditory exercises and seminars: <b>20 students</b>		

#### The objective of the course:

- Understanding terms and methods in railway passenger technology
- Adopting and understanding the methodology of organising passenger transport
- Understanding the terms and methods of technology in integrated passenger transport
- Adopting and understanding ways of financing passenger transport

#### Learning outcomes:

After the completion of the course the students will be able to:

1. define basic terms regarding railway passengers transport
2. classified 4-step demand model
3. explore passengers' flows
4. comment organisation of railway passenger transport outside of Croatia
5. valorise quality of service in railway passenger transport
6. choose a variant of planning railway passenger transport from the infrastructure viewpoint
7. design PSO contract in railway passenger transport.





## LECTURES, EXERCISES and SEMINARS

Week	Syllabus	Form of classes	Performed by	Lessons	Remark
1.	<ul style="list-style-type: none"><li>Historical overview of the development of railway passenger transport</li></ul>	L	Borna Abramović	2	
	<ul style="list-style-type: none"><li>Explaining student responsibilities, examination and seminar</li><li>Introduction with the content of the course</li></ul>	AE	Marjana Petrović	2	
2.	<ul style="list-style-type: none"><li>Elements of organisation and technology of railway passenger transport</li></ul>	L	Marjana Petrović	2	
	<ul style="list-style-type: none"><li>Mobile and stable resources in railway passenger transport</li></ul>	L	Marjana Petrović	2	
3.	<ul style="list-style-type: none"><li>4-step model of transport demand</li></ul>	L	Borna Abramović	2	
	<ul style="list-style-type: none"><li>Passenger flows in railway transport</li></ul>	AE	Marjana Petrović	2	
4.	<ul style="list-style-type: none"><li>Passenger flows</li></ul>	L	Marjana Petrović	2	
	<ul style="list-style-type: none"><li>Passenger flows in railway transport</li></ul>	AE	Marjana Petrović	2	
5.	<ul style="list-style-type: none"><li>Passenger information system</li><li>Payment systems</li></ul>	L	Borna Abramović	2	





	<ul style="list-style-type: none"> <li>PSO contracts railway passenger transport</li> </ul>	L	Borna Abramović	2	
6.	<ul style="list-style-type: none"> <li>Determining quality of service in railway passenger transport</li> </ul>	L	Borna Abramović	2	
	<ul style="list-style-type: none"> <li>Passengers rights in railway passenger transport</li> </ul>	L	Borna Abramović	2	
7.	<ul style="list-style-type: none"> <li>Planning of railway passenger transport (infrastructure)</li> </ul>	L	Marjana Petrović	2	
	<ul style="list-style-type: none"> <li>Calculation of performance indicators</li> </ul>	AE	Marjana Petrović	2	
8.	<ul style="list-style-type: none"> <li>Benchmarking in railway passenger transport</li> </ul>	L	Borna Abramović	2	
	<ul style="list-style-type: none"> <li>Calculation of performance indicators</li> </ul>	AE	Marjana Petrović	2	
9.	<ul style="list-style-type: none"> <li>Planning of railway passenger transport (infrastructure)</li> </ul>	L	Marjana Petrović	2	
	<ul style="list-style-type: none"> <li>1st short exam</li> <li>Discussion with students about the exam</li> </ul>	AE	Marjana Petrović	2	
10.	<ul style="list-style-type: none"> <li>Organising railway passenger transport (HSR)</li> </ul>	L	Marjana Petrović	2	
	<ul style="list-style-type: none"> <li>Organising urban rail passenger transport</li> </ul>	AE	Marjana Petrović	2	





11.	▪ Organising railway passenger transport (HSR)	L	Marjana Petrović	2	
	▪ Organising urban rail passenger transport	AE	Marjana Petrović	2	
12.	▪ Organising railway passenger transport (regional transport)	L	Marjana Petrović	2	
	▪ Organising urban rail passenger transport	AE	Marjana Petrović	2	
13.	▪ 2 <sup>nd</sup> short exam ▪ Discussion with students about the exam	AE	Marjana Petrović	2	
	▪ Seminar	S	Marjana Petrović	2	
14.	▪ Seminar	S	Marjana Petrović	4	
15.	▪ Seminar	S	Marjana Petrović	4	

L = Lectures; AE = Auditory Exercises; LE = Laboratory Exercises; S = Seminars





## STUDENT OBLIGATIONS AND EXAMS

### Conditions for obtaining signatures:

Attendance is mandatory and students are required to attend at least 50% of the classes and make Seminar.

### Written exam:

#### There are two ways of passing the exam:

- a) **Student can attend two short written exams**, the 1st one in the middle of the semester and the 2<sup>nd</sup> one at the end. At each exam is possible to gain 10 points. Only those students that achieve minimum of 5 points on 1st exam can attend 2nd exam. In order to pass the written exam it is necessary to achieve minimum of 5 points on each short exam. Correlation between number of points and mark is shown in the table on the end of this document.
- b) **Student can attend one written exam after the end of the semester** on which is possible to gain 10 points. All students who met necessary conditions for obtaining signatures can attend this exam.

**Oral exam:** In order to attend oral exam student must pass written exam.

## LITERATURE

### a) Obligatory literature:

1. Abramović, B., Brnjac, N., Petrović, M.: Inženjersko - tehnološki proračuni u željezničkom prometu, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2009.
2. Badanjak, D., Bogović, B., Jenić, V.: Organizacija željezničkog prometa, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2006.
3. Gašparík, J., Majerčák, J., Široký, J., Abramović, B., Meško, P., Nachtigall, P., Zitrický, V.: Railway traffic operation, University of Žilina, 2016.
4. Mlinarić, T.J.: Osnove tehnologije željezničkog prometa, Fakultet prometnih znanosti, Zagreb, 2009.
5. Široky, J., Gašparik, J., Abramović, B., Nachtigall, P.: Transport Technology and Traffic Management, University of Pardubice, 2018.
6. Vuchic, V.R.: Urban Transit - Operations, Planning and Economics“, John Wiley&Sons, Inc., 2005.

### b) Recommended literature:

1. Abramović B, Šipuš D, Leko M. The Analysis of the Organisation of Railway Passenger Transport on the Liberalised Market. In 5th International Conference on Road and Rail Infrastructures– CETRA, 2018
2. Abramović, B., Petrović, M., Blašković Zavada, J: Use of railway for urban passenger transport, Urban Transport XIV - Urban Transport and the Environment in the 21st Century, 2008





3. Abramović, B., Petrović, M., Jenić, V.: Intermodal road-railway passenger service in Croatia, ICTS 2009 Transport Science, Profession and Practice
4. Brezina T, Abramović B, Shibayama T, Jelisić S, Šipuš D, Zlokapa B. BARRIERS TO TRANS-NATIONAL PASSENGER RAIL SERVICES IN THE WESTERN BALKANS–THE QUANTITATIVE BACKGROUND. In ICTTE Belgrade, 2018
5. Brons, M., Givoni, M., Rietveld, P. „Access to railway stations and its potential in increasing rail use“, Transportaion Research Part A 43, 2009., pp 136 - 149
6. Bruno, G., Gendreau, M., Laporte, G. „A heuristic for the location of a rapid transit line“, Computers & Operations Research 29. 2002., pp 1 – 12
7. Cerna L, Danis J, Abramovic B. The proposal of a tariff taking into account the risk from unoccupied capacity of passenger trains. Communications-Scientific letters of the University of Zilina. 19(2):90-5, 2017
8. Mohajeri, N., Amin, G. R. „Railway station site selection using analytical hierarchy process and data envelopment analysis“, Computers & Industrial Engineering 59, 2010., pp 107 – 114
9. Petrović, M., Jenić, V., Abramović, B.: Model of transporting person with disabilities in suburban rail traffic of the city of Zagreb, XVI PANAM - XVI Pan-American Conference of Traffic and Transportation Engineering and Logistics, 2010
10. Petrović, M., Jenić, V., Kaužljjar, D.: The role of railway station in increasing transport demand, Urban Transport XVI - Urban Transport and the Environment in the 21st Century, 2010
11. Šipuš D, Abramović B. Tariffing in Integrated Passenger Transport Systems: A Literature Review. Promet-Traffic&Transportation. 30(6):745-51, 2018
12. Vojtek M, Abramović B, Kendra M, Zitrický V. The purpose of long-distance passenger trains in public passenger transport system. Transport and Communications. 5(2), 2017





## **METHODOLOGY OF THE IMPLEMENTATION OF THE COURSE PLAN**

### **1. LECTURES**

In the course of the lectures the theoretical framework of the curriculum is presented and followed by practical examples. To this end Power Point presentations are used.

### **2. AUDITORIAL EXERCISES**

In the course of exercises students are required to practice diverse calculations solving challenges in order to define all necessary parameters for a railway transport system.

### **3. SEMINARS**

Each year students have different project to work on through joint research. Student are require to gather and analyse data and write a paper on the specific subject. The aim of the seminar is encouraging team work, creative way of thinking, solving problems and learning responsibilities that one student have towards the group.





#### 4. DOCUMENTATION

Attendance list is signed by students prior to every lecture.

#### 5. SCORING SYSTEM

**Table 1** The scoring system for the monitoring of students and explained credit values in ECTS credits

Activity		ECTS credits
Class attendance		2
Seminar		2
1. Short exam	Written exam	2
2. Short exam		
Oral exam		1
In total:		7

#### METHODS OF MONITORING QUALITY THAT ENSURE ACQUISITION OF EXIT COMPETENCES

The student's attendance record is kept during the semester. At the end of the semester an evaluation of the quality and efficiency of the course and the lecturers will be carried out. Information on the achievement of learning outcomes and student progress will be used by teachers for self-evaluation and improvement of teaching methods.

