



**GRADUATE STUDY: TRANSPORT, ITS AND LOGISTICS**  
**SEMESTER (I)**

**Syllabus**

Academic year 2024/2025

Course: <b>Integral and Intermodal Transport</b>					
Head of course: Prof. <b>Nikolina Brnjac</b> , PhD					
Co-lecturers: Prof. <b>Jasmina Pašagić Škrinjar</b> , PhD Prof. <b>Borna Abramović</b> , PhD <b>Martina Jakara</b> , MSc Traff. Eng.					
Semester: <b>W/S</b>	Course code: <b>47740</b>	Lectures: <b>45</b>	Auditory exercises: <b>5</b>	Seminars: <b>10</b>	ECTS credits: <b>4</b>
Group for lectures: <b>1 group</b>			Group for auditory and laboratory exercises: <b>1 group</b>		

**Objective of the course:**

- The course goal is for the student to learn the methods of researching the requirements of the commodity flows market and the application of intermodal technologies.
- Introduction to the methodology of planning, management, control, and analysis of all processes in transport chains and intermodal transportation systems
- Introduction to the requirements, concepts and technologies of individual subsystems of intermodal transport.
- Introduction to the methodology of identifying the parameters of intermodal terminals.

**Learning outcomes:**

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

1. State the functioning and design of intermodal transport
2. Analyze the structure of intermodal transport
3. Break down the advantages and disadvantages of intermodal technologies
4. Valorise the Trans-European Transport Network
5. Recommend the establishment of new intermodal terminals
6. Organize an intermodal transport network
7. To justify the application of intermodal transport
8. Present the advantages of intermodal transport





**LECTURES, EXERCISES and SEMINARS**

Week	Syllabus	Form of classes	Preformed by	Lessons	Remark
1.	<ul style="list-style-type: none"> <li>Introductory lecture (familiarization with the course, literature and expectation of the student)</li> <li>General concepts and definition of modern transport technology</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Analysis the need for the development of intermodal transport</li> </ul>	S	Martina Jakara	1	
2.	<ul style="list-style-type: none"> <li>Historical development of intermodal transport</li> <li>System quality factors</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Defining a seminar topic</li> </ul>	S	Martina Jakara	1	
3.	<ul style="list-style-type: none"> <li>Intermodal transport system</li> <li>European transport policy / White Paper</li> <li>Factors in the development of intermodal transport</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Formation of intermodal cargo units</li> </ul>	AE	Martina Jakara	1	
4.	<ul style="list-style-type: none"> <li>Market conditions for the development of intermodal transport</li> <li>Resources in the intermodal transport system</li> <li>Cargo units and means of transport</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Consolidation of cargo and intermodal cargo unit in the transport process</li> </ul>	AE	Martina Jakara	1	
5.	<ul style="list-style-type: none"> <li>Characteristics of intermodal technologies in sea -land transport</li> </ul>	L	Jasmina P. Škrinjar	3	Quick test
	<ul style="list-style-type: none"> <li>Comparison of road and combined transport and calculation of breaking point</li> </ul>	AE	Martina Jakara	1	



6.	<ul style="list-style-type: none"> <li>Intermodal transport costs</li> <li>Intermodal transport and supply chains</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Analysis of elements of the intermodal transport chain</li> </ul>	AE	Martina Jakara	1	
7.	<ul style="list-style-type: none"> <li>TEN-T network and EU intermodal policies</li> </ul>	L	Jasmina P. Škrinjar	3	Preliminary Exam I
	<ul style="list-style-type: none"> <li>Calculation of capacity of the container terminal (static and dynamic capacity)</li> </ul>	AE	Martina Jakara	1	
8.	<ul style="list-style-type: none"> <li>The role of rail transport in integrated and intermodal transport</li> </ul>	L	Borna Abramović	3	
	<ul style="list-style-type: none"> <li>Showing the importance of TEN-T network</li> </ul>	S	Martina Jakara	1	
9.	<ul style="list-style-type: none"> <li>Intermodal transport technologies</li> </ul>	L	Borna Abramović	3	
	<ul style="list-style-type: none"> <li>Analysis of terminal in the Port of Rijeka</li> </ul>	S	Martina Jakara	1	
10.	<ul style="list-style-type: none"> <li>Innovative intermodal technologies</li> </ul>	L	Borna Abramović	3	
	<ul style="list-style-type: none"> <li>Analysis of terminal in the Port of Ploče</li> </ul>	S	Martina Jakara	1	
11.	<ul style="list-style-type: none"> <li>Intermodal terminals</li> <li>Logistics requirements for terminals</li> </ul>	L	Jasmina P. Škrinjar	3	



	<ul style="list-style-type: none"> <li>Network of existing intermodal terminals in the Republic of Croatia and the EU</li> </ul>				
	<ul style="list-style-type: none"> <li>Analysis of modal split in different countries</li> </ul>	S	Martina Jakara	1	
12.	<ul style="list-style-type: none"> <li>Planning and design of logistics intermodal centers</li> <li>Structure of goods and transport flows</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Intermodal transport chain flow</li> </ul>	S	Martina Jakara	1	
13.	<ul style="list-style-type: none"> <li>Intermodal Cargo Centres and free zone</li> <li>Structure of goods and transport flows</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Examples of analysis study and projections of intermodal flows</li> </ul>	S	Martina Jakara	1	
14.	<ul style="list-style-type: none"> <li>Risks in intermodal transport</li> </ul>	L	Jasmina P. Škrinjar	3	
	<ul style="list-style-type: none"> <li>Risk analysis in intermodal transport</li> </ul>	S	Martina Jakara	1	
15.	<ul style="list-style-type: none"> <li>Trends in intermodal transport</li> </ul>	L	Jasmina P. Škrinjar	3	Preliminary Exam II
	<ul style="list-style-type: none"> <li>Presentation of seminars</li> </ul>	S	Martina Jakara	1	

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





## STUDENT OBLIGATIONS AND EXAMS

### Requirements for completed course:

**Attendance:** a student should attend at least 50% of lectures and 50% of exercises.

### Written exam:

Students can take written exams in two ways:

1. In two parts through **preliminary exam**: the first preliminary exam is held in the middle of semester, and the second at the end of the semester. Maximum points that which a student can get in one preliminary exam is 10. Students who don't obtain at least 5 points at one preliminary exam didn't pass the preliminary exam, so those students will have to get points for the written exam in the final written part of the exam. Preliminary exams are available to all the students who take classes regularly (min 50%).

2. In one part through **written final exam**: On the written part of the exam a student can obtain 10 points. Students who obtain less than 50% of maximum points didn't pass the written part of the exam. All the students who don't have enough points on both preliminary exams, aren't satisfied with collected points, or didn't take the preliminary exams have to take the written part of the exam.

**Oral exam:** To attend the oral part of the exam it is necessary to obtain the minimum of 5 points through both preliminary exams or through the written final exam.

**Seminar works** (mandatory): The students independently prepare a seminar work, independently studying the recent professional and scientific literature, and finally present the seminar work in lecturer's consultations with the aim of achieving learning outcomes 1, 3, 4 and 6.





## LITERATURE

### a) Obligatory literature:

1. N. Brnjac: Intermodalni transportni sustavi, Sveučilište u Zagrebu, Fakultet prometnih znanosti, 2012.
2. Rodrigue, J.P: The Geography of transport systems, Routledge, New York, USA, 2020
3. Handbook on the Management and operation of dry ports, UN Conference on trade and development, Geneva 1991

### b) Recommended literature:

1. Kim K.H., Günther H.O.: Container Terminals and Cargo Systems: Design, Operations Management, and Logistics Control Issues, Springer 2007
2. Notteboom, T., A. Pallis and J-P Rodrigue (2021) Port Economics, Management and Policy, New York: Routledge.
3. Zimmer, R.N.: Designing intermodal terminals for efficiency, Transportation Research Circular, June 1996

## METHODOLOGY OF THE IMPLEMENTATION OF THE COURSE PLAN

### 1. LECTURES

The Lectures follow themes presented in authorized lectures given in compulsory literature, and are mostly presented to students by Power Point presentation and a board. For some units there are video presentations. Also during the lectures, discussions are encouraged on the issue which is being presented. On the seminars students are divided into groups and through debate they elaborate on the chosen essay subject.

### 2. AUDITORIAL EXERCISES

Exercises are performed by solving numerical tasks so that the students would be trained to plan, manage, control and analyze processes in the transport chains and intermodal transport systems. The Seminars follow the materials presented on lectures and they are performed on examples from the practice.

### 3. DOCUMENTATION

Records are kept of the attendance at the lectures, exercises, and seminars. As well as quick tests and exams together with the results of mid-term and end-term tests, and final exams.





#### 4. SCORING ACHIEVEMENTS

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

Activity /segment		ECTS points	
Lectures +seminar	+Exercises	1	
1st preliminary exam	= written exam	1	1,5
2nd preliminary exam		1	
Oral exam		1,5	
<b>Total</b>		<b>4</b>	

#### Assessment and evaluation of students during lectures and on final exam:

The final grade is formed on the basis of the sum of points obtained on the written and oral parts of the exam, and completed essay.

Total Sum of Points	Grade
10	5
8-9	4
7-8	3
5-6	2

#### Note: Individual and/or group viewing negative written test

Individual at the time of consultation or a designated period after each colloquium and / or written exam. If necessary and at the request of a group of students in the form post exam exercises in order to explain the most common mistakes typical, after discussion with the team responses to individual student issues.



**Information for students** (scoring system, implementation plan, learning outcomes, syllabus, literature, consulting teachers, announcement of results of examinations or colloquium, and all other information):

- <https://moodle.srce.hr/2024-2025/>
- <http://www.fpz.unizg.hr>

**Student assistants:** Additional individual work with the students through individual consultations for assignments from auditory exercises and / or research designs from laboratory exercises, for optional homework, as well as for insight into the negatively written part of the exam.

