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3.2. Course description

Generic information		
Head of Course	Neven Grubišić, PhD	
Course	Methodology of Transportation Planning and Modelling	
Study Programme	Transport and Mobility	
Type of Course	Obligatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To gain knowledge about the methods in transportation planning and modelling, to develop skills in transport modelling, simulation techniques and analytic tools.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon completing the course, the student will be able to:
1. Construct objects within a transportation network, define their connections and attributes, and integrate new and existing elements into a transportation model using computer software.
2. Evaluate the effects of constructing an alternative transport route by applying methods for monetizing travel time (VOT) and determining vehicle operating costs (VOC).
3. Generate individual groups, activities, and strata of transport demand, as well as structural parameters for trip production and attraction by zones.
4. Calculate the spatial distribution of trips between zones by demand segments and transport modes.
5. Determine estimated traffic loads based on the assignment of transport demand to individual roads under static and dynamic conditions, using a digital traffic model.
6. Create procedures for launching a computer-simulated traffic model.
7. Analyze the accessibility of transport services based on isochrone analysis.
8. Present the results of the developed digital traffic model using a computer simulation tool.

1.4. Course Outline

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Concepts of traffic decision-making and planning. Methodology and planning process at the transport network level. Types of plans. Objectives, measures, and traffic performance indicators. Impacts of transport on mobility and the environment. Traffic analytics techniques. Graphical representation of movement in space and time. Elements of the transport network and traffic model. Travel time and generalized travel cost. Vehicle operating costs. Traffic modeling and the role of the traffic model in transport planning at the macro, meso, and micro levels. Process of developing a traffic model. Transport systems, modes, and demand segments. Demographic characteristics and demand strata. Trip production and attraction. Travel demand modeling: trip generation, distribution, and modal split. Gravity model. Logit model. Trip assignment to the transport network: Wardrop's equilibrium principles. Public transport planning: types of public transport services and accessibility indicators. Freight transport modeling methods. Regional transport planning. Negative impacts of transport and analytical methods for their assessment. Construction of a traffic model using computer simulation tools, management of attributes, procedures, and reports. Analysis of results and evaluation of planned and initial scenario states.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☒ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	Lectures and seminars are conducted in a specialized classroom equipped with computer tools for transport modeling and simulation.	

1.7. Student Obligations

Students are required to regularly attend classes and actively participate in collaborative forms of instruction, as well as complete a programming assignment on a computer. A minimum number of course credits, in accordance with the Study Regulations, is a prerequisite for taking the final exam.

1.8. Assessment [1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam	0,5	Oral exam	0,5	Essay		Research	0,5
Project	2	Continuous Assessment		Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The evaluation of achieved learning outcomes is conducted in accordance with the Regulations on Study Programs of the University of Rijeka and the Study Regulations of the Faculty of Maritime Studies in Rijeka as follows:

Project/Programming Assignment:

Component A: Development of a private and public transport network model – 30 points, learning outcomes 1–3
Component B: Development of a transport demand model – 30 points, learning outcomes 4–7
Project Assignment Defense: 10 points, learning outcomes 1–8

The project assignment must be completed and defended with at least 70% success (a prerequisite for taking the final exam). The project consists of two components, each evaluated separately. Defense of the project is mandatory and is graded based on the understanding of practical work and skills in using the software tool.

The final exam assesses 30% of the acquired learning outcomes, with students required to achieve at least 50% success to pass. A maximum of 70 points (70% of the grade) can be earned through coursework (lectures and seminars), and a maximum of 30 points (30% of the grade) on the final exam.

Examples of evaluation by individual learning outcomes:
1. Using an OpenStreetMap base, create nodes, links, zones, and connectors for the designated area; set attributes, geometry, and permitted directions of movement on key network elements for selected transport systems. (LO1)
2. Calculate the benefits of constructing a city bypass for an individual transport infrastructure user, as well as the total benefits of the project for all users, based on given values before and after project implementation. (LO2)
3. Propose structural parameters for calculating trip production and attraction by zones for the "HW-Emp" and "HE-Stu" demand strata. (LO3)
4. Distribute generated trips by origin-destination zones using the gravity method, and perform balancing with a constraint on the production side. (LO4)
5. Explain Wardrop's user equilibrium principle in static and dynamic conditions with reference to traffic load distribution results along routes. (LO5)
6. In the simulation software, create a procedure for demand assignment along routes between selected origin and destination zone pairs, and compare results and skim matrix values. (LO6)
7. Graphically present isochrones in the transport model and evaluate the availability of public transport lines in the selected area based on the obtained values. (LO7)
8. Interpret the results obtained from the developed transport model related to the distribution of traffic loads by routes, modal split of trips, and skim matrix values. (LO8)

1.10. Main Reading

1. Teodorović, D., Janić, M.: Transportation Engineering: Theory, Practice and Modeling, 2nd edition, BH, 2022.
2. PTV Visum Fundamentals, PTV Planung Transport Verkehr AG, Karlsruhe, 2012.
3. Grubišić, N.: Metodologija prometnog planiranja – recenzirani nastavni materijali, Sveučilište u Rijeci, Pomorski fakultet, 2023.

1.11. Recommended Reading

Oruzar, D. de J., Willumsen, L. G.: Modelling Transport, 4th ed., John Wiley & Sons, Ltd, Chichester, 2011.

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1.12.	*Number of Main Reading Examples*		
	Title	*Number of examples*	*Number of students*
	Teodorović, D., Janić, M.: Transportation Engineering: Theory, Practice and Modeling, 2nd edition, BH, 2022.	4	30
	PTV Visum Fundamentals, PTV Planung Transport Verkehr AG, Karlsruhe, 2012.	Available online	30
	Grubišić, N.: Metodologija prometnog planiranja – recenzirani nastavni materijali, Sveučilište u Rijeci, Pomorski fakultet, 2023.	Available online	30
1.13.	*Quality Assurance*		

The quality is monitored in accordance with ISO 9001 standard carried out at the Faculty of Maritime Studies. The results of passed exams are analyzed once a year and proper measures taken.

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3.2. Course description

Generic information		
Head of Course	Svjetlana Hess, PhD	
Course	Technological Processes in Transport	
Study Programme	Transport and Mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The primary objective of the course is to equip students with the ability to manage technological processes in transport by mastering the terminology, defining operational parameters, performing analytical calculations, and evaluating capacity utilization. This will lead to the acquisition of practical, applicable knowledge and skills as a foundation for planning and efficient organization of technological processes.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

Upon successful completion of the course, students will be able to:
1. Identify the basic phases of a selected technological process
2. State the operational indicators of transport vehicles in a specific transport mode
3. Explain the efficiency indicators of transport vehicles and the method of expressing the utilization of transport, transshipment, and infra-/superstructure capacities
4. Interpret the cargo distribution diagram for a given vehicle and calculate the axle load
5. Calculate transport output, distance, time, speed, static and dynamic load, and/or work shift norms, capacity, and time utilization for given examples
6. Present key efficiency indicators for a specific technological process in transport

1.4. Course Outline

Operational indicators of freight vehicles. Technical regulations and vehicle maintenance. Transport output, capacity utilization. Cargo distribution on a transport vehicle and axle load calculation. Planning development and utilization of port capacities, types and number of means. Standardization of port technological processes. Technological processes in rail transport. Wagon operation indicators by capacity and time. Technical capacity of railway lines. Freight air transport, means of transportation. KPIs. Congestion measurement and monitoring: mobility and reliability measures. Analytical calculations.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning		☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship

1.6. Comments	

1.7. Student Obligations

Student responsibilities include: attending at least 70% of classes, completing two mid-term tests, a seminar paper, and a final exam.

1.8. Assessment [1] of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper	0.5	Experiment	
Written exam	1.0	Oral exam		Essay		Research	
Project		Continuous Assessment	2.0	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Evaluation Procedure:

During the course, students may earn up to 70% of the total grade points via two mid-term tests and a seminar paper (learning outcomes: 1–6), and 30% from the final exam (learning outcomes: 1, 2, 3, and 6). The final exam evaluates comprehensive theoretical knowledge and understanding of specific knowledge in transport and logistics technological processes. A minimum of 35% of total points is required to take the final exam, and at least 50% is needed to pass it.

Examples of Evaluation by Learning Outcome:
1. Identify the basic phases of a selected technological process
2. State the operational indicators of transport vehicles in a selected transport mode
3. Explain the efficiency indicators of transport vehicles and the method of expressing the utilization of transport, transshipment, and infra-/superstructure capacities
4. Interpret the cargo distribution diagram for a given transport vehicle and calculate axle load
5. Calculate transport output, distance, time, speed, static and dynamic load, and/or work shift norms, capacity, and working time utilization for a given example
6. Present key efficiency indicators for a specific technological process in transport

1.10. Main Reading

Course materials available on the e-learning platform – Merlin (https://moodle.srce.hr)

1.11. Recommended Reading

1. Babeli, K., Hess, S., Hess, M., Capacity utilization of the container terminal as multiphase service system. European Transport \ Trasporti Europei, Issue 86, Paper n° 4, 2022.
2. Krljan, T., Grbčić, A., Hess, S., Grubišić, N., The Stochastic Frontier Model for Technical Efficiency Estimation of Interconnected Container Terminals, JMSE, 9(5): 1-20, 2021.
3. Baričević, H., Tehnologija kopnenog prometa, Pomorski fakultet u Rijeci, Rijeka, 2001.
4. Dundović, Č., Tehnološki procesi u prometu, Sveučilište u Rijeci, Odjel za pomorstvo, Rijeka, 2001.
5. Radačić, Ž., Suić, I., Škurla Babić, R., Tehnologija zračnog prometa I, Fakultet prometnih znanosti, Zagreb, 2008.
6. Pravilnik o tehničkim uvjetima vozila u prometu na cestama (Narodne novine 85/16, 16/20)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.12. Number of Main Reading Examples		
Title	*Number of examples*	*Number of students*
Course materials on e-learning platform – Merlin	web	15

1.13. Quality Assurance

The quality of education is monitored in accordance with the ISO 9001 system and aligned with European standards and guidelines for quality assurance, implemented at the Faculty of Maritime Studies in Rijeka. Exam pass rate analysis is conducted annually, and student surveys are carried out once per semester.

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3.2. Course description

Generic information		
Head of Course	Ines Kolanović, PhD	
Course	Research scientific methodology	
Study Programme	Transport and Mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of this course is that after completing the course, students will be able to write student and scientific papers using the technology and methodology of scientific and professional research.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Interpret the terms: science, technology and methodology of scientific research
2. Present the classification of science in the Republic of Croatia
3. Identify and distinguish the basic characteristics of certain types of scientific, scientific and professional works
4. Identify and use the rules of scientific research methodology in writing student papers
5. Identify and use the rules of scientific research technology in writing student papers

1.4. Course Outline

About science, scientific activity and research: theory of science, characteristics of modern science, Croatian Qualifications Framework, classification of science in the Republic of Croatia, scientific institutions. Scientific, scientific and professional works: classification of written works, concept, types and characteristics of scientific, scientific and professional works. Characteristics of works in the higher education system at graduate and postgraduate studies. Concept and characteristics of scientific methods. Methodology of scientific research. Technology of scientific research: identifying a scientific problem, setting a hypothesis, selecting and analyzing a topic (title), developing a research plan, compiling a working bibliography, collecting and studying literature and scientific information, solving the problem, formulating research results, applying research results. Writing a text and technical processing of a scientific and professional work: documentary basis of the manuscript, citing literature, referencing in the text, displaying illustrations.

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1.5. *Modes of Instruction*	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. *Comments*		

1.7. *Student Obligations*
Students are required to: attend classes, pass 1 preliminary exam (continuous knowledge assessment), write a seminar paper, and pass a final exam. Students must be present in class for at least 70% of the total number of hours of lectures and seminars.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	1	Experiment	
Written exam	0,75	Oral exam		Essay		Research	
Project		Continuous Assessment	0,75	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Procedure:
- The final grade in the course is the sum of the points earned by the student during the course (70% of the grade) and the points earned on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka.
- <u>Continuous knowledge assessment</u>:
    Midterm Exam – 30%; Learning outcomes: 1 to 5
    Research assignment (seminar paper) – 40%; Learning outcomes: 4 and 5
- <u>Final exam</u> – 30%; Learning outcomes: 1 to 5
A minimum of 50% of the points must be achieved on midterm exam.
A minimum of 50% of the points must be achieved on the research assignment (seminar paper)
A minimum of 50% of the points must be achieved on the final exam.

Examples of learning outcomes evaluation:
1. Define the terms science, technique, technology and methodology of scientific research work. (LO1)
2. Explain the classification of scientific fields. (LO2)
3. Using a specific example, highlight the basic characteristics of scientific works. (LO3)
4. State the characteristics of the methodology of scientific research when writing seminar papers at the graduate level. (LO4)
5. Analyze the rules of scientific research technology and their application in writing seminar papers at the graduate level. (LO5)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading
1. Kolanović, Ines: Teaching material on the e-learning platform (Merlin) 2. Instructions for writing a thesis, 3. Zelenika, Ratko: Metodologija i tehnologija izrade znanstvenog i stručnog djela, Pisana djela na stručnim i sveučilišnim studijima, knjiga peta, Ekonomski fakultet u Rijeci, Rijeka, 2011.

1.11. Recommended Reading
1. Zelenika, Ratko: Metodologija i tehnologija izrade znanstvenog i stručnog djela, Znanost-poluga održive egzistencije čovječanstva, knjiga treća, Ekonomski fakultet u Rijeci, Rijeka, 2011. 2. Žugaj, Miroslav; Dumičić, Ksenija; Dušak, Vesna: Temelji znanstvenoistraživačkog rada, Metodologija i metodika, Fakultet organizacije i informatike, Varaždin, 2006.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching material on platform Merlin	unlimited	15
Metodologija i tehnologija izrade znanstvenog i stručnog djela, Pisana djela na stručnim i sveučilišnim studijima, knjiga peta	6	15

1.13. Quality Assurance

The quality of studies is continuously monitored in accordance with the requirements of the ISO 9001 standard and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka. At the end of the semester, teachers and associates are evaluated by students, in accordance with the Manual for the Quality of Studies at the University of Rijeka.

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3.2. Course description

Generic information		
Head of Course	Dario Ogrizović, PhD	
Course	Simulation and Modelling	
Study Programme	Transport and mobility	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30 + 30 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course is intended to introduce students to simulation modelling and its application in the analysis and design of business processes. Simulation modelling enables the creation of dynamic business process models, execution of simulation experiments with the model and the evaluation of business process performance. Discrete event simulation allows the development of detailed queue system models.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After finishing the course, the students will be able:
1. Distinguish between types of systems, models and modelling
2. Analyse and compare types of simulations
3. Identify problems in the field of business systems that can be solved by different methods of simulation modelling
4. Apply simulation modelling to analyse and design business processes
5. Create simulation models using software tools that support simulation modelling methods and techniques and their verification
6. Create appropriate methods for conducting simulation experiments
7. Analyse and interpret solutions from conducted simulation experiments
8. Create business decision processes based on the results of simulation experiments

1.4. Course Outline

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Basic ideas of simulation. Simulation modelling. Modelling and computers. Simulation in decision making. Types of simulation models. Simulation models development. Basic concepts of discrete event simulation. Structure of computer tools for simulating discrete events. Conceptual simulation models. Activity cycle diagrams. Simulation performance strategies. Time shift mechanisms. Simulation strategies. FlexSim simulation software. Simulation software selection criteria. Basic concepts, method of modelling, execution of simulation experiments and their analysis. Modelling and simulation of several problems with FlexSim software. Computer model verification. Evaluation of the conceptual model. Input data analysis. Statistical distributions. Estimation of distribution parameters. Simulation experiments planning. Design of simulation experiments. Variance reduction techniques. Output data analysis of simulation experiments.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☒ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☒ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations
The student must attend at least 70% of the total hours of lectures and exercises, and must have passed the exams (continuous assessment) to take the final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The process of evaluation of the acquired learning outcomes takes place during continuous assessments (through class activities (10%), preparation and presentation of a project (20%), 2 midterm exams - total 40%) and at the final part of the exam (30%). A minimum of 50% of points must be achieved in individual knowledge assessments.

Examples of evaluating learning outcomes in relation to the learning outcomes that are set are:
1. Distinguish between types of systems, models and modelling
2. Analyse and compare types of simulations
3. Identify problems in the field of business systems that can be solved by different methods of simulation modelling
4. Apply simulation modelling to analyse and design business processes
5. Create simulation models using software tools that support simulation modelling methods and techniques and their verification
6. Create appropriate methods for conducting simulation experiments
7. Analyse and interpret solutions from conducted simulation experiments
8. Create business decision processes based on the results of simulation experiments

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading

1. Law, A.M. 2024. Simulation Modeling and Analysis, 6th Edition, McGraw-Hill Education.
2. Banks, J., Carson, J.S., Nelson, B. L., Nicol, D.M. 2013. Discrete-Event System Simulation: Pearson New International Edition, Pearson Higher Ed.

1.11. Recommended Reading

1. Robinson, S. 2014. Simulation: The Practice of Model Development and Use (2nd edition), Red Globe Press

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Law, A.M. 2024. Simulation Modeling and Analysis, 6th Edition, McGraw-Hill Education.	3	2
Banks, J., Carson, J.S., Nelson, B. L., Nicol, D.M. 2013. Discrete-Event System Simulation: Pearson New International Edition, Pearson Higher Ed.	2	2

1.13. Quality Assurance

Quality assurance is monitored in accordance with the ISO 9001 system and the European standards and guidelines for quality assurance, which are implemented at the Faculty of Maritime Studies in Rijeka. Yearly analysis of quantitative student examination data is conducted and appropriate measures are adopted accordingly.

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3.2. Course description

Generic information	
Head of Course	Edvard Tijan, PhD
Course	Human Resource Management
Study Programme	Transport and Mobility
Type of Course	Elective
Year of Study	1

Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to familiarize students with the importance and characteristics of human resource management. The principles, functions, and processes of managing human resources in business systems are studied. Through the course, students are introduced to the theoretical and practical foundations of human resource management, as well as strategies for staff recruitment personnel development and promotion.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able to:
1. Correctly interpret the role and significance of human capital
2. Analyze and describe job positions, tasks, and assignments
3. Identify the legal regulations applicable to employment relationships
4. Conduct tests and interviews related to candidate selection for hiring purposes
5. Describe the phases of employee onboarding
6. Determine the criteria and methods for motivating and rewarding employees
7. Compare and apply techniques for evaluating employee performance

1.4. Course Outline

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1. Theoretical perspectives of human resource management
2. Interdependence of personnel development and the company
3. Functions and objectives of human resource management
4. The importance and role of human resources within a company
5. Teamwork - managing processes and relationships
6. Job design and analysis
7. Planning, recruitment, and selection of personnel
8. Procedures for hiring employees and managers
9. Legal framework of employment
10. Conclusion and termination of employment contracts
11. Employment and onboarding policies
12. Employee motivation
13. Knowledge innovation in the business system
14. Evaluation of work efficiency and business excellence

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

1. Class attendance
2. Classroom activity
3. Taking the midterm exam
4. Taking the final exam

1.8. Assessment[1] of Learning Outcomes

Course attendance	1	Class participation	0,5	Seminar paper		Experiment	
Written exam		Oral exam	0,5	Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. *Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam*

Continuous assessment and grading include classroom activity and two midterm exams, followed by the final exam. Assessment is conducted in accordance with the current university and faculty regulations on studying. During continuous assessment, students can earn up to 70% of the total course points, and the remaining 30% can be earned on the final exam.

On each midterm exam, it is necessary to achieve at least 50% of the points possible on that exam.

Through continuous classroom assessment (midterm exams and classroom activity), students must cumulatively achieve at least 35% of the total course points (out of the possible 70%) in order to be eligible to take the final exam.

On the final exam, students can earn 30% of the total course points (with students required to achieve at least 50% of the points possible on the final exam to pass it).

Attendance at lectures is mandatory, and student attendance will be monitored. Students may miss a maximum of 50% of the classes.

Learning outcome 1: Explain the difference between human capital and human potential.
Learning outcome 2: What is the difference between job (work) analysis and position analysis?
Learning outcome 3: State the differences between regular and extraordinary termination of an employment contract.
Learning outcome 4: Select appropriate tests for different job positions and explain the methods of implementation.
Learning outcome 5: Develop a plan for onboarding new employees.
Learning outcome 6: Design a system for motivating and rewarding employees that consists of both material and non-material components.
Learning outcome 7: List and compare techniques for assessing work efficiency.

1.10. *Main Reading*

1. Edvard Tijan, Human Resource Management, on-line courses (Merlin)
2. Vujić, V.: Menadžment ljudskog kapitala – 3. izdanje, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija, 2008.

1.11. *Recommended Reading*

1. Hodžić, A., Aksentijević, S., Tijan, E.: Razvoj i upravljanje karijerama // Savremeni trendovi i kvalitet u upravljanju ljudskim resursima - Zbornik radova. Beograd: Visoka škola strukovnih studija za ekonomiju i upravu Centar za ekonomska istraživanja (CEIB) Beograd, 2015. str. 75-89
2. Aksentijević, S., Tijan, E., Marinković, B.: Strategija upravljanja ljudskim resursima u prometnim poduzećima // Pomorski zbornik, 49-50 (2015), 1; 281-303
3. Bahtijarević Šiber, F., Management ljudskih potencijala, Golden marketing, Zagreb, 1999.
4. Dessler, G., Human Resource Management, Prentice Hall, New Jersey, 2003.
5. Vujić, V. i drugi: Korporativno upravljanje – Hrvatsko udruženje menadžera i poduzetnika, Zagreb, 2008.

1.12. *Number of Main Reading Examples*

Title	Number of examples	Number of students
Edvard Tijan, Human Resource Management, on-line courses (Merlin)		
Vujić, V.: Menadžment ljudskog kapitala – 3. izdanje, Sveučilište u Rijeci, Fakultet za menadžment u turizmu i ugostiteljstvu, Opatija, 2008.	5	30

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1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in line with European standards and guidelines for quality assurance implemented at the University of Rijeka, Faculty of Maritime Studies. Once a year, the pass rates are analyzed and appropriate measures are taken (an anonymous survey is conducted in which students evaluate the quality of delivered teaching). An analysis of student performance on completed exams is also carried out.

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3.2. Course description

Generic information		
Head of Course	Lovro Maglić, Ph.D.	
Course	Marine technologies	
Study Programme	Transport and mobility	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to familiarize students with the basic characteristics, regulations and regularities of numerous activities in the field of exploration and exploitation of the sea and underwater (except maritime transport), which are based on modern technological solutions or are a consequence of technological development.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After learning, the student will be able to:
1. Distinguish between rights and obligations in the exploitation of the sea in the area of jurisdiction of coastal states and in international waters in accordance with the UN Convention on the Law of the Sea.
2. Explain technical and technological terms and distinguish methods of fishing and mariculture.
3. Interpret the methods of exploration and exploitation of hydrocarbons and ores from the seabed.
4. Interpret the conditions and efficiency of methods of using seawater and energy from the sea.
5. Analyze technologies and methods in the maritime industry related to the towing of objects, rescue of property at sea, shipbuilding and nautical tourism.
6. Explain technological concepts and underwater activities of divers and modern systems such as remotely operated and autonomous underwater vehicles.

1.4. Course Outline

The concept of marine technologies in general. The right to exploit the sea and the seabed. Marine fisheries and mariculture. Exploration and exploitation of hydrocarbons. Offshore mining and dredging. Harnessing the energy of the sea. Seawater treatment. Towing and salvage at sea. Nautical tourism. Shipbuilding. Underwater activities – divers and autonomous and remotely operated underwater vehicles.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☒ Mentorship ☐ Other _____

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1.6. Comments	None

1.7. Student Obligations

- Attendance at classes
- Conducting research and presenting the project assignment
- Final Oral Exam

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	1	Experiment	
Written exam		Oral exam	2,5	Essay		Research	1
Project		Continuous Assessment		Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Outcome evaluation procedure:
- Presentation of the project assignment and research results: 50% of grade points
- Final oral exam (all outcomes): 50% of the grade points.

Examples of assessment of learning outcomes:
- Describe the rights and obligations of the coastal State when exploiting resources in the economic zone (1)
- Explain pelagic fishing technologies (2)
- Describe the principle of hydrocarbon exploration by seismic ships (3)
- Compare the features of different types of hydrocarbon exploration platforms (3)
- List and explain the principles of harnessing wave energy (4)
- Judge which principle of using marine energy is applicable in the Adriatic Sea (4)
- Explain the rights and obligations of anchorage users in nautical tourism in accordance with the regulations of the Republic of Croatia (5)
- Compare the features of the different classes of ROV (6)

1.10. Main Reading

Teaching material available on the e-learning system - Merlin (https://moodle.srce.hr)

1.11. Recommended Reading

Selected entries of the Maritime Encyclopedia and a selection of articles and studies available on the Merlin e-learning system.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching material available on the e-learning system - Merlin (https://moodle.srce.hr)	Unlimited	

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the failure to pass are analysed and appropriate measures are adopted.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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3.2. Course description

Generic information		
Head of Course	**Borna Debelić, PhD**	
Course	**Public Management and Governance**	
Study Programme	**Transport and mobility**	
Type of Course	**Elective**	
Year of Study	**1**	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring knowledge in a specific area of public management is essential for persons responsible for the successful operations of economic entities in the public and private sectors.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing and passing the course, students will be able to:
1. Interpret and interpret basic concepts within public sector economics.
2. Typify and interpret basic economic types (categories) of goods and criteria for classification, and describe allocation mechanisms and their characteristics depending on the types of goods.
3. Classify the role of public authorities in economic flows, and describe and correctly interpret public authorities' actions in the context of making allocation decisions.
4. Argue the importance and impact of management in the public sector with regard to the economic and non-economic effects that arise through its activities.
5. Categorize the basic components of domestic product and the impact of the public sector on macroeconomic flows through the system of public finances and public policies.
6. Identify the postulates and significance of public choice theory and game theory.
7. Examine new tendencies in the management of common and public goods, and critically consider possibilities for further improvements.

1.4. Course Outline

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The role of the public sector and the role of public authorities in economic flows. Economic reasons for the existence of the public sector. Public choice theory. The influence of public choice theory and complementary theories on the development of the modern public sector. Typification of goods and classification criteria. Features and peculiarities of management in the public sector. Characteristics of private goods, public goods and common goods. Fundamental differences between types of goods. Allocative specificities of public and common goods, and significant differences in the allocation of public and common goods. Features of collective decision-making and the problem of aggregating preferences. Game theory and collective action. Deliberation and the public sector. Pluralism, participation and service provision. Policy and practice of budgeting and public expenditures. Public sector performance. Public sector limitations and self-regulatory governance.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☒ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Regular attendance at classes and completion of homework assignments.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	0,5	Oral exam		Essay		Research	
Project		Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Discussion in class (10% of learning outcomes) in which students analyze the role and significance of the public sector in contemporary economic systems and interpret public choice theory in the context of game theory and goods theory (I1 – I7) from the aspect of fundamental decision-making mechanisms in the public sector.

Written continuous knowledge assessment (2 colloquiums, each worth 25% of learning outcomes, which is a total of 50% of learning outcomes and a minimum of 50% of the points achieved per colloquium) in which the student demonstrates understanding of theoretical concepts and practical implications of categorization and types of goods and corresponding allocation mechanisms (I1 – I7), the principles of their operation and the effects on the decision-making system in the public sector.

Preparation and defense of a seminar paper (10% of learning outcomes) in which the student demonstrates understanding of the specifics of the functioning of the public sector (I1-I7).

Final written test (30% of learning outcomes and minimum 50% of achieved points) in which the student demonstrates understanding of public choice theory, goods theory and game theory and their practical implications for decision-making mechanisms in the public sector (I1 - I7).

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Ostrom, E.: Upravljanje zajedničkim dobrima: Evolucija institucija za kolektivno djelovanje, Naklada Jesenski i Turk, Zagreb, 2006.
3. McLean, I., (1997). Uvod u javni izbor. Zagreb: Fakultet političkih znanosti.
4. North, D. C.: Institucije, institucionalna promjena i ekonomska uspješnost, Masmedia, Zagreb, 2003.

1.11. Recommended Reading

1. Elster, J.: Uvod u društvene znanosti, Naklada Jesenski i Turk, Hrvatsko sociološko društvo, Zagreb, 2000.
2. Bailey, S. J.: Public Sector Economics: Theory, Policy and Practice, 2nd edition, Palgrave, 2002.
3. Geckil, I. K., Anderson, P. L.: Applied Game Theory and Strategic Behavior, Taylor & Francis Group, Boca Raton, 2010.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Ostrom, E.: Upravljanje zajedničkim dobrima: Evolucija institucija za kolektivno djelovanje, Naklada Jesenski i Turk, Zagreb, 2006.	20	75
McLean, I., (1997). Uvod u javni izbor. Zagreb: Fakultet političkih znanosti.	10	
North, D. C.: Institucije, institucionalna promjena i ekonomska uspješnost, Masmedia, Zagreb, 2003.	10	

1.13. Quality Assurance

The quality of studying is continuously monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies, University of Rijeka. An analysis of exam taking is prepared annually, and a survey among students is conducted every semester.

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3.2. Course description

Generic information		
Head of Course	Alen Jugović, PhD	
Course	Economics and organization of maritime passenger transport	
Study Programme	Transport and mobility	
Type of Course	Electortal	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 0 + 15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objective of the course is to train students to assess the key features and factors of maritime passenger transport that contribute to the development of transport infrastructure, superstructure, urban areas, island communities and their connection with the maritime and tourism system of the Republic of Croatia. Through project assignments, students will apply the acquired knowledge to concrete examples from practice, analyzing the operations of passenger ports, shipping companies and other participants in maritime passenger services, with an emphasis on the application of basic economic principles.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

1. Explain the basic concepts of maritime passenger transport.
2. Evaluate the characteristics of passenger ports, their connection with tourism and the economy, and especially their importance for the development of islands.
3. Determine the characteristics of liner maritime passenger transport.
4. Analyze the trends in the development of nautical tourism ports in the coastal area and on the islands, and determine their impact on the sustainable development of the destination.
5. Evaluate the significance and impact of management and organization on the development of maritime passenger services.
6. Examine the multiplicative effects of maritime passenger ports.

1.4. Course Outline

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RELEVANT FEATURES OF SEA PASSENGER PORTS. Concept, functions and development of ports. City-port interconnection. Business technology and active participants in sea passenger ports.

STATE AND SIGNIFICANCE OF SEA PASSENGER PORTS AND PASSENGER SHIPS IN THE WORLD AND EUROPE. Liner passenger transport. Business analysis, specific features of the privatization process. Features of sea passenger shipping.

MANAGEMENT OF SEA PASSENGER PORTS IN THE WORLD AND IN THE REPUBLIC OF CROATIA. Legal framework and principles of sea passenger port operations. Management of sea passenger ports. Management of ports of county and local importance for the Republic of Croatia. Management of nautical tourism ports.

LOGISTICS AND ECONOMIC FACTORS OF THE DEVELOPMENT OF SEA PASSENGER PORTS AND SHIPPING. Economic indicators and logistics of sea passenger ports development. Multiplicative effects of sea passenger ports. The role of tourism in the development of maritime passenger transport. Basics of cruise tourism. Cruise ships.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____

1.6. Comments	

1.7. Student Obligations

1) Attending classes
2) Attending seminars
3) Taking midterm exams
4) Creating a project assignment
5) Final exam

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Assessment and evaluation of student work includes class attendance, continuous assessment of knowledge through two midterm exams, preparation and presentation of a project assignment, and a final exam. Assessment is carried out in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka, which implies that a student can achieve 70% of the grade during classes, and the remaining 30% at the final exam.

Assessment of knowledge in classes is carried out continuously, and students can achieve the percentage of the grade as follows:

- 1st midterm exam - 25% Learning outcomes: 1.- 6.
- 2nd midterm exam - 25% Learning outcomes: 1.- 6.
- Project assignment - 20% Learning outcomes: 1.- 6.
- Final exam - 30% Learning outcomes: 1.- 6.

The final exam can be taken by students who have gained 35 grade points during classes, or 50% of the total number of points that could be achieved during the assessment in classes. It is also a requirement that students achieve at least 50% of the points on each preliminary exam. The final exam is in written form and comprises 30% of the total grade. Students must satisfy 50% of the final exam in order to achieve a positive grade in the course.

Some examples of learning outcome evaluation are:

1) What do we mean by the term maritime passenger transport and how does it differ from other types of maritime transport?
2) Explain the connection of a passenger port with tourism and the economy of a municipality/city.
3) List the basic characteristics of regular maritime passenger transport.
4) How can the development of marinas and ports of nautical tourism contribute to the sustainable development of a tourist destination? Provide a specific example.
5) Explain the importance of management and organization for the provision of maritime passenger services.
6) Identify and analyze the micro and macro multiplicative effects of a maritime passenger port.

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Kesić, B.; Jugović, A.: Menadžment pomorskoputničkih luka, Sveučilište u Rijeci, Pomorski fakultet Rijeka & Liber d.o.o., Rijeka, 2006.
3. Peručić, D.: Cruising-turizam – razvoj, strategije i ključni nositelji, Sveučilište u Dubrovniku, Dubrovnik, 2013.

1.11. Recommended Reading

1. Jugović, A., Zaninović P. A. i Aksentijević, D.: The Influence of Important Macroeconomic Factors on Tariff Trends and The Shipowners Business in Coastal Liner Passenger Transport in The Republic of Croatia. U: Naše more 2021 Conference Proceedings / Mišković, Darijo - Dubrovnik : University of Dubrovnik, Maritime Department, 2021.

2. Jugović, A., Šutalo, V. i Aksentijević, D.: Comparative analysis of tariff models in RO-RO transport in Croatia, Italy and Greece. U: Mišković, D. (ur.)Naše more 2021 Conference Proceedings, Dubrovnik : University of Dubrovnik, Maritime Department, 2021.

3. Gračan, D., Jugović, A., Aksentijević, D., Gračan, L. i Barkiđija Sotošek, M.: Analysis and trends of maritime passenger traffic in European Union. U: Economic and Social Development 88th International Scientific Conference on Economic and Social Development – "Roadmap to NetZero Economies and Businesses" Book of Proceedings, 2022.

4. Jugović, A., Aksentijević, D. i Zaninović, P.A.: The impact of economic policy on shipper businesses in coastal line maritime passenger transport in Croatia. Pomorstvo, 35 (1), 87-92., https://doi.org/10.31217/p.35.1.9, 2021.

5. Jugović, A.: Perspectives of cruise tourism in the City of Rijeka. Pomorstvo, 34 (2), 252-260., 2020.

6. Jugović, A. THEORETICAL MODEL OF DESTINATION DEVELOPMENT FOR CRUISING TOURISM IN THE ADRIATIC REGION. Ekonomska misao i praksa, 29 (1), 205-226., 2020.

7. Stopford, M.: Maritime Economics, Routledge, London & New York, 2000.

8. Mrnjavac, E.: Promet u turizmu, Fakultet za turistički i hotelski menadžment, Opatija, 2002.

9. Wayne K.Talley: Port Economics, Routledge – Taylor and Francis Group, London and New York, 2009. (i novija).

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Kesić, B., Jugović, A.: Menadžment pomorskoputničkih luka, Sveučilište u Rijeci Pomorski fakultet Rijeka & Liber d.o.o., Rijeka, 2006. – dostupno i online	30	10
Peručić, D.: Cruising-turizam – razvoj, strategije i ključni nositelji, Sveučilište u Dubrovniku, Dubrovnik, 2013.	10	10

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka.

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3.2. Course description

Generic information		
Head of Course	Dario Ogrizović, PhD	
Course	Big Data Analysis	
Study Programme	Transport and mobility	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Big data analysis includes structured, partially structured and unstructured data that are large and complex for processing and analysis in terms of scope, complexity, generation speed and different collection intervals.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

1. Explain the theoretical foundations of big data analysis.
2. Distinguish types of problems and categories of big data.
3. Indicate the sources and methods of data collection.
4. Application of big data analysis methodology.
5. Analyse and apply appropriate algorithms for processing data streams.
6. Design of a system for finding similar entities, frequent sets and groups in big data.
7. Compare storage systems and recommendation systems.
8. Critically assess privacy and ethics in big data analysis.

1.4. Course Outline

Historical development and theoretical foundations of big data analysis. Types of problems and categories of big data. Sources and methods of data collection. Data processing and formatting. Big data analysis methodology. Analysis of flows and links in data. Finding similar entities, frequent sets and groups in big data. Recommendation systems. Data visualization. Storage systems. Map-reduce/Hadoop, GFS/HDFS, Bigtable/HBASE and Spark software tools. Big data analysis in maritime and transport. Multicore and manycore processing systems. Computer clusters and cloud computing for big data analysis. Privacy and ethics in big data analysis.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☒ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☒ Laboratory ☐ Mentorship ☐ Other _____	

1.6. Comments	

1.7. Student Obligations

1. Attendance and activity in class
2. Attendance and activity in laboratory exercises
3. Project
4. Written exam (midterms and exam)

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The process of evaluation of the acquired learning outcomes takes place during continuous assessments (through class activities (10%), preparation and presentation of a project (20%), 2 midterm exams - total 40%) and at the final part of the exam (30%). A minimum of 50% of points must be achieved in individual knowledge assessments.

Examples of evaluating learning outcomes in relation to the learning outcomes that are set are:
1. Explain the theoretical foundations of big data analysis.
2. Distinguish types of problems and categories of big data.
3. Indicate the sources and methods of data collection.
4. Application of big data analysis methodology.
5. Analyse and apply appropriate algorithms for processing data streams.
6. Design of a system for finding similar entities, frequent sets and groups in big data.
7. Compare storage systems and recommendation systems.
8. Critically assess privacy and ethics in big data analysis.

1.10. Main Reading

1. Obembe, F., Engel, O. 2024. A Hands-on Introduction to Big Data Analytics, SAGE Publications
2. Kelleher, J.D., Tierney, B. 2021. Znanost o podacima, MIT Press, Mate d.o.o.
3. Leskovec, J., Rajaraman, A., Ullman, J. D. 2014. Mining of Massive Datasets, Cambridge University Press.
4. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

1. Buyya, R., Calheiros, R. N., Dastjerdi, A. V. 2016. *Big Data: Principles and Paradigms*, Elsevier.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Obembe, F., Engel, O. 2024. A Hands-on Introduction to Big Data Analytics, SAGE Publications	3	40
Leskovec, J., Rajaraman, A., Ullman, J. D. 2014. *Mining of Massive Datasets,* Cambridge University Press.	5	40

1.13. Quality Assurance

The quality of study is constantly monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of the exams is made annually and a student survey is conducted once a semester. All data, including exam, written work and assessment, are at all times public data for all students who have enrolled in the course (on the e-learning platform).

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Course description

Generic information		
Head of Course	Biserka Draščić Ban, PhD	
Course	Applied Mathematics	
Study Programme	Transport and Mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introduction to the elements of numerical mathematics and the basic concepts of probability theory.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Describe the space of elementary events
2. Explain and apply probability to specific problems in practice
3. Recognize and apply the Total probability and Bayesian formula
4. Describe random variables
5. Use and calculate numerical characteristics of random variables
6. State and apply the Poisson and Moivre - Laplace theorems in specific situations
7. Calculate the errors in the approximate calculation
8. Describe and apply interpolation polynomials, numerical methods for solving equations, and numerical integration

1.4. Course Outline

The space of elementary events. Probability. Total probability and Bayesian formulas. Random variables. Numerical characteristics of random variables. Binomial, Poisson, uniform, normal distribution. Poisson's and Moivre-Laplace theorems. Error analysis. Interpolation. Numerical solution of equations. Numerical integration

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		
1.7. Student Obligations		

Regular attendance at classes and homework.

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1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1,5	Essay		Research	
Project		Continuous Assessment	2,5	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Assesment of learning outcomes outcomes is done according to the Ordinance on Studies of the University of Rijeka and the Ordinance on Studying at the Faculty of Maritime Studies in Rijeka as follows:

- through continuous testing of knowledge during classes, 70% of acquired learning outcomes are evaluated through the 1st written exam - learning outcomes 1-6 (30%), the 2nd written exam - learning outcomes 6-8 (30%), and through regular class attendance (10 %)
- At the final part of the exam, 30% of the acquired learning outcomes are evaluated (1-8), where the student must realize a minimum of 50% of points to pass the final exam.

Examples of evaluating learning outcomes in relation to set learning outcomes are:

WRITTEN EXAM:
1. There are 1000 dice in the box, all of which are correct, except for one, which has a six on all sides. Fortunately, one dice was drawn and thrown four times. All four times it dropped to number 6. What is the probability that it is a faulty dice?

2. The random variable X has a normal distribution with expectation EX = 3 and is valid P (X <5) = 0: 6915. Calculate the probability of event P (-1 <X <6) .l

3. Determine the zero point of the function f (x) = x2-2 / x with an accuracy of 0.005.

4. The function is given in the table:

x	0	1	2	3
f(x)	0,1232	0,3687	0,4587	0,6899

Using Simpson's formula with 2n = 6, determine the integral of the function f (x) on the segment [0,3].

ORAL EXAM:
1. The Total probability theorem
2. Approximation of the Binomial Distribution by the Normal Distribution
3. Iterative method for solving equations

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading	

1.   . Poganj: Teorija vjerojatnosti. Metodička zbirka riješenih ispitnih zadataka, Pomorski fakultet u Rijeci, 1997.
2.   B. Draščić, T. Poganj, Primijenjena matematika, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2010. (e-izdanje)

1.11. Recommended Reading

1.   N.V.Kopchenova, I.A.Maron: Computational mathematics, MIR Publishers, Moscow, 1972.
2.   P. Vranjković: Zbirka zadataka iz vjerojatnosti i statistike, Školska knjiga, Zagreb, 1992.
3.   W. Feller: An Introduction to Probability Theory and its Applications, I,II, J. Wiley & Sons, New York, 1950, 1966

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
T. Poganj: Teorija vjerojatnosti. Metodička zbirka riješenih ispitnih zadataka, Pomorski fakultet u Rijeci, 1997.	35	
B. Draščić, T. Poganj, Primijenjena matematika, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2010.	As needed	

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka.

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3.2. Course description

Opće informacije		
Head of Course	Siniša Vilke, PhD	
Course	Urban traffic and environment	
Study Programme	Transport and mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 0 + 15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to provide fundamental knowledge of urban transport with the application of improvement aligned with modern requirements and criteria related to sustainability and environmental management.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

After completing and passing the course, students will be able to:

1. Assess and compare the requirements and specificities of public and individual urban transport.
2. Analyze the advantages, efficiency and development opportunities of public urban transport.
3. Classify conventional and innovative technologies in urban transport.
4. Analyze the relationship between urban transport, mobility and the environment.
5. Analyze the basic elements of the network of lines and the optimal structure of the network of lines of public urban transport.
6. Identify the consequences of applying a geographic information system (GIS) in urban transport.
7. Interpret the connection between public urban transport, mobility and transport sustainability.
8. Prepare and present a research task on a given transport technology or transport solution in an urban environment within the framework of independent research.

1.4. Course Outline

The influence of transport on the development of the urban environment. The history of public transport. Efficiency of public transport. Technology of urban passenger transport. Aggregate and de-aggregate models of passenger behavior. Urban transport and public transport and mobility. Conventional modes of public transport. Paratransit. Innovative technologies in urban transport. Urban expansion, telecommuting and transport. Urban transport in the cities of the Republic of Croatia. Sustainability of urban transport. Traffic and urban pollution. Urban transport and energy. Urban public transport planning, mobility and sustainability. Planning of public transport network. Geographic information system (GIS) in urban transport. Weather characteristics of public transport. Cost estimation and funding sources for public transport. Policy objectives for public transport.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ laboratory ☐ Mentorship ☐ Other _____

1.6. Comments	

1.7. Student Obligations

1.8. Assessment1 of Learning Outcomes

Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	0,5
Project		Continuous Assessment	1,5	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure of assessment of acquired learning outcomes is carried out by the Study Regulations of the University of Rijeka and the Study Regulations at the Faculty Maritime Studies in Rijeka as follows:

- 70% of the acquired learning outcomes are assessed through continuous assessment during classes within the 1st exam (25%), 2nd exam (25%), and through the preparation and presentation of a research task (20%);
- 30% of the acquired learning outcomes are assessed in the final part of the exam.

Examples of evaluating learning outcomes in relation to the set learning outcomes are:

1. Interpret and compare the characteristics and specificities of public and individual urban transport.

2. Explain the basic principles, advantages and efficiency of public urban transport.

3. Explain the application of conventional and innovative technologies in urban transport using a specific example of a European city.

4. Explain the possibility of developing public urban transport using a specific example of an urban environment.

5. Explain the impact of urban transport on the environment.

6. Explain the basic elements of the network of lines in the city of Rijeka

7. Interpret the optimal structure of the network of public urban transport lines of the company "Autotrolej".

1.10. Main Reading

1. Štefančić, G.: Tehnologija gradskog prometa I, Fakultet prometnih znanosti, Zagreb, 2008.
2. Štefančić, G.: Tehnologija gradskog prometa II, Fakultet prometnih znanosti, Zagreb, 2010.
3. Teaching material for the e-course available on the LMS Merlin *(https://moodle.srce.hr)*

1.11. Recommended Reading

1. Vilke, S.; Tadić, F.; Ćelić, J.; Debelić, B.: Decision support system in urban traffic management, ODS 2022 – International Conference on Optimization and Decision Sciences, 2022.
2. Vilke, S.; Mance, D.; Debelić, B.; Maslarić, M: Correlation between freight transport industry and economic growth – panel analysis of CEE countries, Promet–Traffic & Transportation, 33 (2021), 4, 517 – 526.

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3. Genevieve, G., Hanson, S.: The Geography of Urban Transportation, Fourth Edition, The Guilford Press, New York, 2017.

4. Vuchic, V., R.: Urban Transit: Operations, Planning and Economics, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.

5. Black, A.: Urban Mass Transportation Planning, McGraw-Hill College, New York, 1995.

6. Črnjar, M.: Ekonimika i politika zaštite okoliša, Ekonomski fakultet, Rijeka, 2002.

7. Golubić, J.: Promet i okoliš, Fakultet prometnih znanosti, Zagreb, 1999.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. Štefančić, G.: Tehnologija gradskog prometa I, Fakultet prometnih znanosti, Zagreb, 2008.	5	30
2. Štefančić, G.: Tehnologija gradskog prometa II, Fakultet prometnih znanosti, Zagreb, 2010.	5	30
3. Teaching material for the e-course available on the LMS Merlin (https://moodle.srce.hr)	-	30

1.13. Quality Assurance

The quality of studies is monitored according to the system ISO 9001 and according to the European standards and guidelines for quality assurance introduced at the Faculty Maritime Studies in Rijeka. Once a year the passage results are analyzed and appropriate measures are taken, and once a semester a survey is conducted among the students.

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Course description

Generic information		
Head of Course	Tanja Poletan Jugović, PhD	
Course	Passenger Transport Flows	
Study Programme	Transport and Mobility	
Type of Course	Compulsory	
Year of Study	1	
Estimated Student Workload and Methods of	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The primary objectives of the course are: understanding and analysing passenger transport flows in relation to their forms, elements, and specific patterns of formation; analysing geo-transport, socio-economic, logistical and other factors of sustainable mobility; acquiring key knowledge and skills for planning and optimizing passenger transport flows, developing methodologies for the quantitative analysis of relevant passenger flow indicators; drawing conclusions about the current state of intensity, structure, and dynamics of passenger transport flows at global, regional, national and local levels; identifying contemporary trends and challenges in the development of passenger transport (sustainable mobility, digitalization, impact of climate change, changes in passenger behaviour, etc.). A special objective of the course is the integration of theoretical and practical knowledge and the preparation of students for the labour market through the practical component of independent research (for example, case study analysis of cities with sustainable transport systems, simulation and planning of optimal routes, creation of passenger tourist routes, optimization of passenger transport structure, parking transport planning, infrastructure capacity analysis, etc.).

1.2. Prerequisites for Course Registration

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1.3. Expected Learning Outcomes

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After attending and passing the course, the student will be able to:

1. Differentiate and analyse relevant concepts, forms, and elements of the formation of passenger transport flows.
2. Assess the significance and current state of passenger flows in relation to transport modalities, travel motives (e.g., economic and tourism), sustainable mobility criteria, and other relevant factors.
3. Explain and critically analyse geo-transport, socio-economic, and logistical factors as well as the principles of formation, consolidation, and spatial distribution of passenger transport flows.
4. Apply the concept of sustainable mobility to evaluate passenger transport flows in the context of reducing environmental impact and improving the efficiency of the transport system.
5. Conduct an analysis of relevant indicators of passenger flow formation, including intensity, structure, dynamics, and temporal and spatial distribution, considering transport modalities, travel motives, and sustainability.
6. Develop methods and approaches for organizing and planning passenger transport flows, including creating tourist routes, parking traffic planning, and infrastructure optimization.
7. Prepare and present independent research on a specific practical example, using acquired knowledge and relevant analytical methods.

1.4. Course Outline

Basic principles, elements and significance of passenger transport flows. Types and peculiarities of certain types of passenger transport flows (considering different transport modalities, motives, ie economic and tourist purpose of travel and other criteria. Factors of formation, expansion and consolidation of passenger transport flows (geo-traffic, socio-economic and logistical factors). Relevant principles of organization and planning of passenger traffic flows in urban structures. Accompanying traffic flows in passenger transport flows (goods flows, information flows, stationary traffic, ...) Organization and planning of passenger traffic flows (planning and creation of passenger and tourist routers, intermediaries in the organization and planning of passenger flows, supply and demand in transport of passenger.) Monitoring statistics and quantitative analysis of relevant indicators of passenger transport flows (intensity, structure, dynamics, spatial distribution, emitting markets ...). Trends and conditionality of passenger transport development (considering different transport modalities, motives - purpose of travel and other criteria).

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		
1.7. Student Obligations		

- 1st exam (with a minimum achievement of 50% of points)
- 2nd exam (with a minimum achievement of 50% of points)
- Research paper – preparation and presentation of a research paper/seminar (the research is evaluated according to detailed criteria with a minimum achievement of 50% of points)

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1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	0,5	Experiment	
Written exam		Oral exam		Essay		Research	
Project		Continuous Assessment	1,5	Presentation		Practical work	0,5
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure for assessing the acquired learning outcomes is conducted in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka as follows:

- Continuous knowledge assessment during classes – evaluates 70% of the acquired learning outcomes (LO) : 1st exam – 35% (LO 1-4) and 2nd exam – 35% (LO 5-6), with the requirement that the student must achieve at least 50% of the points in each activity.
- Preparation and oral presentation of a seminar within the research work on a given topic – evaluates 30% of the acquired learning outcomes (LO 7), with the requirement that the student must achieve at least 50% of the points.

Examples of evaluating learning outcomes in relation to defined learning outcomes are:
1. Analyse and interpret the types of passenger transport flows in relation to travel motives, using specific examples of tourist and economic passenger flows.
2. Compare the significance of tourist and economic passenger flows for the economy at the global, regional, and local levels, using concrete quantitative data.
3. Explain and interpret the geo-transport factors that influence the spatial distribution of maritime passenger flows, using case studies or quantitative data.
4. Compare the basic prerequisites of sustainable mobility using examples of selected cities in the context of passenger transport flows.
5. Identify and analyse two navigable areas of the Republic of Croatia that dominate in the intensity of scheduled maritime passenger transport, using current statistical data.
6. Systematize and explain the basic phases of planning passenger transport flows in urban structures, applying sustainable transport strategies.
7. Prepare and present a research paper (seminar) based on acquired knowledge, using a specific practical example (for instance, analysis of passenger flows on a ferry line, planning a specific transport-passenger route, etc.)

1.10. Main Reading

1) teaching material for the e-course "Passenger Transport Flows" – accessible on the e-learning platform - Merlin (https://moodle.srce.hr) during the current academic year
2) Jean – Paul Rodrigue, The Geography of Transport Systems, -Fifth edition, New York: Routlege, 2020. (selected chapters)
3) Malić, A., Rendulić, I., Geoprometna obilježja svijeta, Dr. Feletar, Zagreb, 1995. (selected chapters)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.11. Recommended Reading

1) Đukić, A., Prometna geografija-geoprometne odrednice globalizacije u prometu i turizmu, Veleučilište u Dubrovniku, Dubrovnik, 2001. (selected chapters),

2) Current statistical sources with current data: Rewiew of Maritime transport – UNCTAD, Shipping Statistics and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen; Statistički ljetopis Republike Hrvatske, Državni zavod za statistiku RH i dr.

3) Scientific, professional papers published in foreign journals (Journal of Transportation Geografy, Transportation Research…) and domestic journals (Pomorstvo, Naše more, Suvremeni promet), projects and research work connected with passenger transport flows, such as:

- Poletan Jugović, T., Agatić, A., Gračan, D., Šekularac – Ivošević, S.: Sustainable activities in Croatian marinas – towards the "green port" concept, Multidisciplinary Scientific Journal Pomorstvo, Vol. 36, No. 2, Rijeka, 2022.

- Mateja Paulić, M., Poletan Jugović, T., Šutalo Šamanić, V.: Structural analysis of air passenger flow in the Republic of Croatia from the COVID–19 pandemic impact perspective, Multidisciplinary Scientific Journal Pomorstvo, Vol. 36, No. 2, Rijeka, 2022.

- Zoran Kovačević, Z., Šekularac-Ivošević, S., Poletan Jugović, T.: The Impact of Marketing Information on the Decisions of Nautical Tourists Visiting the Eastern Adriatic Region, Journal of the Faculty of Maritime Studies Kotor - Journal of Maritime Sciences, Vol. 24, No. 1/2023.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching material for the e-course "Passenger Transport Flows" – accessible on the e-learning platform - Merlin (https://moodle.srce.hr) during the current academic year	unlimited	20
Jean – Paul Rodrigue, The Geography of Transport Systems, - Fifth edition, New York: Routlege, 2020. (selected chapters)	3	20
Malić, A., Rendulić, I., Geoprometna obilježja svijeta, Dr. Feletar, Zagreb, 1995. (selected chapters)	5	20

1.13. Quality Assurance

The quality of studying is monitored in accordance with the ISO 9001 system and in line with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka. Once a year, pass rate results are analysed and appropriate measures are taken.

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3.2. Course description

Generic information		
Head of Course	Livia Maglić, PhD	
Course	Sustainable Marinas	
Study Programme	Transport and mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring knowledge of the principles of environmentally sustainable management, eco-labels, environmental and energy certificates, and innovative technologies used to achieve environmental sustainability in marinas.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students are expected to be able to:
1. Explain the principles of sustainable management in a marina
2. Interpret eco-labels for the quality of services in marinas
3. Distinguish and interpret quality certificates and energy certificates in marinas
4. Distinguish individual technological solutions in planning the ecological sustainability of marinas
5. Apply the concept of environmental sustainability in marina management
6. Critically assess the effect of the application of certain innovative technologies on the sustainability of marinas
7. Compare models of environmentally sustainable management with the given examples

1.4. Course Outline

Definition of sustainability and sustainable management of marinas. Categorisation of marinas. Principles of sustainable management in marinas. Legal framework in the field of sustainable environmental management. Strategy for environmentally sustainable management. Quality in marinas and eco-labels. Blue Flag Criteria. Blue Star Program. Clean Marinas Initiative. ADAC marina assessment. Golden anchor. ISO-energy certificates (EMS). Quality certificates (CMS). Information and communication protocols in marinas. Information technologies for sustainable berth management (link occupancy sensors, booking management, etc.). Innovative technologies for sustainable management of the marine environment in marinas (plastic trap bin device, etc.). Innovative technologies for sustainable energy management. Continuous control and minimisation of energy consumption in business with the application of energy efficiency principles (Remote water & electricity supply manager, etc.). Renewable energy planning sources (photovoltaic pavement, etc.). Quality management in marinas using sensors, cameras, and drones. Sustainable waste and wastewater management (promoting and implementing more efficient waste management and treatment). Examples of good practice in the world and the Republic of Croatia.

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1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☒ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____

1.6. Comments	

1.7. Student Obligations

1. Two colloquiums
2. Design and present a project assignment
3. Final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	0,5	Experiment	
Written exam		Oral exam	0,5	Essay		Research	0,5
Project		Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Evaluation procedure:
The procedure for evaluating the acquired learning outcomes is carried out according to the Regulations on Studies of the University of Rijeka and the Rulebook on Studies at the Faculty of Maritime Studies in Rijeka as follows:

- 70% of the acquired learning outcomes are evaluated through continuous knowledge assessment during the teaching process: through the 1st colloquium - learning outcomes 1-3 (25%), 2nd colloquium - 4-7 (25%), project assignment - learning outcomes 1-7 (20%);
- 30% of the acquired learning outcomes (1-7) are evaluated at the final part of the exam, with a minimum of 50% of available points necessary for passing the final exam.

Examples of evaluation:
1. Specify the basic principles of sustainable management.
2. Define and classify the differences between the criteria for the adoption of the Blue Flag and Golden Anchor eco-labels.
3. On the given example of a marina, single out certificates in the field of CMS and EMS.
4. Specify intelligent technologies used in marinas for the sustainable management of the marine environment and wastewater management.
5. Apply the concept of sustainable management to the default marina.
6. Analyse the effects of the introduction of information technology on berth booking.
7. Compare and evaluate the ecologically positive effects of using innovative technologies on a default marina.

1.10. Main Reading

- Course presentations available on the e-learning system Merlin
- EPA (2005.) Marina Environmental Management Plan

1.11. Recommended Reading

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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- Maglić, L. et al. (2024). Evaluation of an automated vessel recognition system: case study in Port of Cristo, IOP Conf. Ser.: Earth Environ. Sci. 1423 012001
- Maglić, L., Maglić, L., Grbčić, A., & Gulić, M. (2022). Composition of Floating Marine Litter in Port Areas of the Island of Mallorca. Journal of Marine Science and Engineering, 10(8), 1079. https://doi.org/10.3390/jmse10081079
- L. Maglić, A. Grbčić, L. Maglić and A. Blažina, "Evaluation of ultrasonic berth sensors in the port environment: case study Port of Cristo," 2022 International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME), Maldives, Maldives, 2022, pp. 1-5, doi: 10.1109/ICECCME55909.2022.9988615.
- Maglić, L., Maglić, L., Grbčić, A., Gulić. M. (2022). Marine Litter Composition in Port Areas on Mallorca Island. In: Simone Mancini and Luigi Vitiello, editors. Prime Archives in Marine Science. Hyderabad, India: Vide Leaf
- I. Ognjanović, L. Maglić and B. Tošić, (2021). IT Enhanced Process Management in ports: Comprehensive Evaluation Framework, 2021 10th Mediterranean Conference on Embedded Computing (MECO), Budva, Montenegro, 2021, pp. 1-4, doi: 10.1109/MECO52532.2021.9460144.
- Boljat, H.U., Vilke, S., Grubišić, N., Maglić, L. (2021). Application of multi-criteria analysis for the introduction of green port management practices: an evaluation of energy efficient mobility in nautical ports. Scientific Journals Maritime University of Szczecin, Zeszyty Naukowe Akademia Morska w Szczecinie, 65(137), http://dx.doi.org/10.17402/462
- Maglić,L., Varaždinac,P., Škiljan, I. (2019). Multi-Criterion decision model for marina location selection in the County of Primorje and Gorski Kotar - NAŠE MORE: znanstveni časopis za more i pomorstvo, 66(1), 28-36.
- Maglić, L., Maglić, L., Vilke, S. (2012). Ocjena postojećeg stanja i razvojni planovi luka nautičkog turizma Primorsko-goranske županije, Suvremeni promet, 32. (5-6), 395-399.
- Šantić, L., Vilke, S. i Grubišić, N. (2011). Čimbenici štetnog djelovanja cruising-turizma na brodski okoliš. Naše more: znanstveni časopis za more i pomorstvo, 58. (5-6), 229-243.
- PIANC: "Sustainable ports"- A guide for port authorities, The World Association for Waterborne Transport Infrastructure
- David S. Liebl (2002) Environmental Best Management Practices for Marinas and Boat Yards, University of Wisconsin

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Course presentations available on the e-learning system Merlin	Unlimited	
EPA (2005.) Marina Environmental Management Plan Unlimited	Unlimited	

1.13. Quality Assurance

The quality of education is monitored following the ISO 9001 system and the European Standards and Guidelines for Quality Assurance, as implemented at the Faculty of Maritime Studies in Rijeka. Each year, student pass rates are analysed, and appropriate measures are taken to improve academic outcomes.

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3.2. Course description

Generic information		
Head of Course	**Ines Kolanović, PhD**	
Course	**Quality in maritime industry**	
Study Programme	**Transport and mobility**	
Type of Course	**Mandatory**	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of this course is to familiarize students with the factors and the concept of service quality, the quality assessment, and the quality assurance and management system in the maritime sector.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. Recognize the specificity of service quality in the maritime sector (subjects, objectives, etc.)
2. Analyze and connect theoretical determinants and the concept of service quality in the maritime sector.
3. Assess the importance of service quality in the maritime sector
4. Measure and evaluate service quality in the maritime sector
5. Recognize the importance of the institution responsible for clarifying the concepts, principles and objectives of Croatian standardization
6. Analyze the elements, principles and specificity of the quality management system in the maritime sector based on the PDCA approach
7. Critically assess the role and responsibility of the organization's management in the quality management system
8. Examine the possibilities of improving, innovating and evaluating the quality management system in the maritime sector

1.4. Course Outline

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Definitions of service quality and explanation of relevant terms. Overview of the historical development of service quality. Quality models. Importance and significance of quality in the development of service activities. Quality as a factor of competitiveness in the maritime services market. Measuring service quality in the maritime sector. Quality standardization. Principles of service quality management. Service quality management systems. Tools and methods of quality management. Responsibility of the organization's management for service quality. Resource management. Service provision process. Improving the service quality management system. Evaluation of the service quality management system. Quality costs. Quality control. Specificities of the service quality management system in the maritime sector.

1.5. *Modes of Instruction*	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____

1.6. *Comments*	

1.7. *Student Obligations*

Students are required to: attend classes, pass two midterm exams (continuous knowledge assessment), complete a research assignment, and pass the final exam. Students must attend at least 70% of the total number of hours of lectures and seminars.

1.8. *Assessment[1] of Learning Outcomes*

Course attendance	1	Class participation		Seminar paper		Experiment	
Written exam	0,9	Oral exam		Essay		Research	0,3
Project		Continuous Assessment	1,8	Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Procedure:
- The final grade in the course is the sum of the points earned by the student during the course (70% of the grade) and the points earned on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka.
- Continuous knowledge assessment:

  Midterm Exam 1 – 30%; Learning outcomes: 1 to 5

  Midterm Exam 2 – 30%; Learning outcomes: 6 to 8

  Research assignment – 10%; Learning outcomes: 1 to 8

  - <u>Final exam</u> – 30%; Learning outcomes: 1 to 8

  A minimum of 50% of the points must be achieved on each midterm exam.

  A minimum of 50% of the points must be achieved on the research assignment.

  A minimum of 50% of the points must be achieved on the final exam.

Examples of learning outcome evaluation:
1. What are the specific characteristics of service quality compared to product quality? (LO1)
2. How would you explain the concept of port service quality? (LO2)
3. Highlight the importance of service quality from the perspective of customer satisfaction. (LO3)
4. Why is it important to measure the quality of port services? (LO4)
5. Which institutions represent the quality infrastructure in the Republic of Croatia? (LO5)
6. Using the example of port services, highlight the importance of the PDCA cycle. (LO6)
7. What is the role of management in the quality management system? (LO7)
8. Explain the quality system certification process with supporting arguments. (LO8)

1.10. Main Reading

1. Kolanović, Ines: Teaching material published on the e-learning platform (Merlin)
2. ISO standard 9001:2015

1.11. Recommended Reading

1. Žanić Mikuličić, Jelena; Kolanović, Ines; Jugović, Alen; Brnos, Dalibor: Evaluation of Service Quality in Passenger Transport with a Focus on Liner Maritime Passenger Transport - A Systematic Review // Sustainability, 16 (2024), 3; 1125, 15.
2. Agatić, Adrijana; Kolanović, Ines: Improving the seaport service quality by implementing digital technologies // Pomorstvo: scientific journal of maritime research, 34 (2020), 1; 93-101. doi: 10.31217/p.34.1.11
3. Kondić, Ž.: Kvaliteta i ISO 9000, Tiva, Varaždin, 2002.
4. Injac, N.: Mala enciklopedija kvalitete, Moderna povijest kvalitete, III. Dio, Oskar, Zagreb, 2001.
5. Skoko, H.: Upravljanje kvalitetom, Sinergija, 2000.
6. Juran, J.M., Gryna, F.M.: Planiranje i analiza kvalitete, Mate d.o.o. Zagreb, 1999.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching materials on Merlin	unlimited	10
ISO standard 9001:2015	unlimited	10

1.13. Quality Assurance

The quality of studies is continuously monitored in accordance with the requirements of the ISO 9001 standard and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka. At the end of the semester, teachers and associates are evaluated by students, in accordance with the Manual for the Quality of Studies at the University of Rijeka.

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Course description

Generic information		
Head of Course	Vlado Frančić, PhD	
Course	International Maritime Safety System	
Study Programme	Transport and mobility	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course objectives are to familiarize students with the fundamental characteristics, principles, and regularities of the International Maritime Safety System and marine pollution prevention, as well as its implementation in national legislation. The course provides a general overview of the international maritime safety system, based on international and national regulations, including industry standards. Furthermore, it explains the principles of ship surveys and the work of recognized organizations (ROs), certification procedures, and the procedures of port state control (PSC) inspections. Special emphasis is placed on the technology of decision-making and regulation at the political, technological, and implementation levels, as well as their impact on the business efficiency of shipping companies at both the international and national levels.

1.2. Prerequisites for Course Registration

It is expected that students possess at least basic knowledge about the International Maritime Organization (IMO) and associated requirements related to the safety of navigation.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. Discuss the principles of the international maritime safety system.
2. Determine the legal framework related to maritime safety and marine environmental protection.
3. Present and outline the structure and functioning of the IMO.
4. Compare the most significant conventions related to maritime safety.
5. Establish the rights and obligations of recognized organizations (ROs).
6. Elaborate on the role of port state control inspections (PSC inspections).
7. Compare the procedures of ship survey and ship inspection (PSC inspections).
8. Present the procedures for inspection of foreign ships under the provisions of the Paris Memorandum of Understanding.
9. Assess the impact of safety measures on the economic performance of shipowners and shipping companies.

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1.4. Course Outline
Principles of implementation and management of safety of navigation. Marine environment protection and the navigation safety system. The safety of navigation and marine environment protection and its position in respect of the international legal framework. International Maritime Organization (IMO) structure and organizational activities, goals. IMO Convention - organization, principles and activities. Assembly, committees, and sub-committees. The most important maritime conventions: SOLAS, COLREG, MARPOL, STCW, MLC 2006, SAR, TONNAGE, LOADLINE, AFS, BWM. Recommendations and codes adopted by the IMO. Implementation of the international sources related to the safety of navigation on the national level and the ship operators' level. Privileges and obligations of the state to ships sailing under the national flag (Flag State Control – FSC). Privileges, obligations and the role of the Recognized organizations (ROs). Classification societies and IACS. Harmonized System of Survey and Certification (HSSC).
Rights and obligations of the coastal state related to ships sailing under a foreign flag (Port State Control – PSC). Port State Control Regime. Regional cooperation. Rights and obligations and procedures according Paris Memorandum of Understanding. Future development of the safety of navigation. Influence and limitations of modern technological solutions. Influence of the safety measures to the business efficiency of the ship operators and ship-owners.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations
Active participation in classes, with at least 70% attendance. Preparation of a research paper. Oral exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	2	Essay		Research	1,5
Project		Continuous Assessment		Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Through oral examination and seminar Paper (research article) students will achieve learning outcomes.
On the final exam (oral exam) students need to present theoretical knowledge in the field of the international maritime safety system, where it is necessary to achieve a minimum of 50% of the required theoretical knowledge.
Examples of Assessment of Learning Outcomes:
  1. Explain certification process and port state control inspection procedures (Learning Outcomes 4,5,6)
  2. Determine the ship risk profile of the specific ship type according the rules of the Paris MoU. (Learning Outcomes 7, 8)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading	

1. Lecturer's notes published on official e-learning platform - Merlin (https://moodle.srce.hr)
2. Recognized Organizations Code, IMO.
3. Paris Memorandum of Understanding on Por State Control – latest annex.
4. Damir Zec, Sigurnost na moru, University textbook, Faculty of Maritime Studies Rijeka, 2001.

1.11. Recommended Reading

1. Relevant IMO Resolutions, Circular letters, recommendations, Codes and circular letters) of IMO in electronic and paper form.
2. Original texts of the basic International Maritime Organization's conventions: SOLAS, MARPOL, MLC 2006, STCW.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1-3	Web	30
4	5	5

1.13. Quality Assurance

The quality of studies is continuously monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of exam pass rates is conducted annually, and a student survey is carried out once per semester. For this course, all relevant data and information are available to all students via the course instructors' website/e-learning platform.

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3.2. Course description

Generic information		
Head of Course	Neven Grubišić, PhD	
Course	Designing and Planning of Ports and Terminals	
Study Programme	Transport and Mobility	
Type of Course	Optional	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+0+0

1. GENERAL COURSE DESCRIPTION
1.1. Course Objectives
The main objectives of the course are getting knowledge about methods for strategic and tactical planning of port container and intermodal transport terminals, and about the methods for port operation and cargo handling process planning.
1.2. Prerequisites for Course Registration
None
1.3. Expected Learning Outcomes
Upon completing the course, the student will be able to: 1. Apply the system analysis procedures and LCM methods in planning of ports and terminals. 2. Identify functional requirements to be used for strategic planning 3. Divide port area into zones and draw the port layout with the main infrastructure objects (zoning) 4. Calculate optimal number of berthing facilities, capacity needs and the port area for different type of terminals 5. Solve typical logistic tactical problems in Container terminals 6. Draw up operating plan for handling equipment job-schedule
1.4. Course Outline
Meaning of transport planning and categories of planning. Strategic and tactical planning. Dependency between spatial and transport facilities planning. Methodology of terminal development. Application of system engineering and LCM ("Life Cycle Management") approaches to port planning. Structure of port Master plan. Functional requirements for ports and terminals development. Berth requirements, terminal area and capacity computations. Layout design problems and space optimization. Tactical logistic problems on Container terminals. Berth and quay crane allocation, crane scheduling and transport process optimization.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☒ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	Lectures are held in a specialized classroom equipped with computer tools for technical drawing and programming.	

1.7. Student Obligations

Students are required to regularly attend classes, actively participate in instructional activities, and complete a programming assignment on a computer.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The evaluation of achieved learning outcomes is conducted in accordance with the Regulations on Study Programs of the University of Rijeka and the Study Regulations of the Faculty of Maritime Studies in Rijeka as follows:

Project/Programming Assignment:
Development of a layout plan (zoning) for land use in the port area - Learning Outcome 3: 30 points
Defense of the Programming Assignment - Learning Outcome 3: 10 points

Continuous Knowledge Assessment:
Test 1: Calculation of the number of berths and operational capacities - Learning Outcome 4: 10 points
Test 2: Preparation of a tactical berth allocation plan and an operational plan for cargo handling operations Learning Outcomes 5–6: 20 points

A maximum of 70 points (70% of the final grade) can be achieved during classes and through continuous knowledge assessment. The final exam accounts for a maximum of 30 points (30% of the final grade).

Examples of assessment by individual learning outcomes:
1. Draw and explain the relationships in a V-diagram related to the planning of construction or reconstruction of port facilities. (LO1)
2. Identify, according to a hierarchy of importance, the stakeholders and users, and their potential requirements in the process of developing a port master plan. (LO2)
3. Using a graphic technical drawing tool, construct a basic zoning layout of the port area highlighting key port facilities and their characteristics. (LO3)
4. Construct a terminal capacity diagram based on defined parameters. (LO4)
5. Interpret the relationships between dependent and independent parameters/variables in planning the allocation of berths/cranes at a port container terminal. (LO5)
6. Create an operational plan for the crane work sequence on a container ship, based on given input parameters, and present the solution in graphical form. (LO6)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading	

1. Ligteringen, H., Velsink, H.: Ports and Terminals, Vereniging voor Studie- en Studentenbelangen Delft, 2012.
2. Dundović, Č.: Lučki terminali – Tehnologija luka i terminala II, sveučilišni udžbenik, Rijeka, 2002.
3. Grubišić, N.: Planiranje i projektiranje luka i terminala – nastavni materijali, Sveučilište u Rijeci, Pomorski fakultet.

1.11. Recommended Reading

1. Grubišić, N., Dundović, Č.: Primjena sistemskog inženjeringa u planiranju lučkih terminala, Pomorstvo, vol.25, br.1, 2011.
2. Thomas, B.J.: Operations planning in ports, UNCTAD monographs on port management, UN, 1985.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Ligteringen, H., Velsink, H.: Ports and Terminals, Vereniging voor Studie- en Studentenbelangen Delft, 2012	6	15
Dundović, Č.: Lučki terminali – Tehnologija luka i terminala II, sveučilišni udžbenik, Rijeka, 2002.	30	15
Grubišić, N.: Planiranje i projektiranje luka i terminala – nastavni materijali, Sveučilište u Rijeci, Pomorski fakultet.	Available online	15

1.13. Quality Assurance

The quality is monitored in accordance with ISO 9001 standard carried out at the Faculty of Maritime Studies. The results of passed exams are analyzed once a year and proper measures taken.

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3.2. Course description

Generic information		
Head of Course	Saša Aksentijević, PhD Edvard Tijan, PhD	
Course	Business information systems	
Study Programme	Transport and Mobility	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to provide students with fundamental knowledge of information systems and business applications, including their development, implementation, integration, and maintenance within a business environment. Students will acquire basic methodologies for information system development, enabling them to analyze business problems and propose solutions based on information system concepts.

Special emphasis is placed on training students to define the information needs of organizations and to select relevant information and communication technologies. Students will also gain basic skills in modeling IT solutions, as well as in applying fundamental concepts of cybersecurity in the development of business information systems, thereby creating the prerequisites for solving practical problems in business organizations.

The course exercises focus on the practical modeling of business processes and information infrastructure using the ARIS Express software tool.

1.2. Prerequisites for Course Registration

Not required.

1.3. Expected Learning Outcomes

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Upon passing the exam, students will be able to:

1. Distinguish key terms and concepts of information systems and evaluate their role and interconnection within a business system.
2. Analyze business needs and requirements as a foundation for designing and developing information systems.
3. Identify fundamental risks and propose appropriate risk management methods throughout the information system lifecycle.
4. Apply principles and methods to ensure the security of business information systems.
5. Compare the functionalities and features of information systems used in maritime affairs and transport, and select the most suitable solutions for specific scenarios.
6. Model the components of an information system and their interdependencies using appropriate graphical models.
7. Create hierarchical (organizational) and process models using computer tools such as ARIS Express.

1.4. Course Outline

1. Introduction to the course: course mission, literature, grading system, methods of knowledge assessment
2. Information systems: definition, structure, tasks, functions, characteristics, with emphasis on managerial information
3. The role and operation of information systems in business system management, vertical and horizontal levels, support methods, and data integration
4. Planning, analysis, design, development, implementation, and maintenance of business information systems
5. Databases
6. Risks in the development of business information systems
7. Information systems security
8. Business continuity management and disaster recovery
9. Enterprise Resource Planning (ERP) systems
10. Maritime Single Window
11. Data exchange systems in port clusters (Port Community System)
12. Cybersecurity of business information systems
13. Graphical modeling of business processes using computer tools
14. Hierarchical (organizational) models, whiteboard models, ICT infrastructure models, process landscape models
15. Data models, process models, operand rules, branching rules, etc.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Attendance at lectures and laboratory exercises, work on the e-learning platform, and a final oral exam.

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1.8. Assessment[1] of Learning Outcomes

Course attendanc	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam		Oral exam	0,5	Essay		Research	
Project		Continuous Assessment	1,5	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Assessment and evaluation include class participation, two computer-based midterm exams, and a final oral examination. Evaluation is carried out in accordance with the valid University and Faculty Study Regulations. During the course, a student can earn up to 70% of the total grade, while the remaining 30% can be achieved through the final exam. In each knowledge assessment, the student must master at least 50% of the learning outcomes, i.e., obtain at least 50% of the possible grading points.

Examples of exam questions:

1. Learning outcome 1: List and explain the fundamental components of business information systems.
2. Learning outcome 2: Identify who participates in business process modeling and explain the required scope of their analysis.
3. Learning outcome 3: Enumerate categories and types of risks in the development and implementation of business information systems.
4. Learning outcome 4: Explain the basic principles of information system security and the most common security threats.
5. Learning outcome 5: Analyze and synthesize the similarities and differences between maritime single windows used in administrative (MSW) and commercial (PCS) segments of port operations.
6. Learning outcome 6: Draw a process model, hierarchy, process landscape, and BPMN 2.0 model using the ARIS Express software tool.
7. Learning outcome 7: Draw a process model according to a given task using the ARIS Express software tool.

1.10. Main Reading

Teaching materials are available on the e-learning platform.

M. Pavlić: Informacijski sustavi, Školska knjiga, Zagreb, 2011.

1.11. Recommended Reading

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[1]   **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1. Tijan, Edvard; Jović, Marija; Aksentijević, Saša; Pucihar, Andreja. "Digital transformation in the maritime transport sector." Technological Forecasting and Social Change, vol. 170, 2021, p. 120879, North-Holland.

2. Braidotti, Luca; Aksentijević, Saša; Tijan, Edvard; Balota, Adis. "The use of Bluetooth Beacons in Maritime Emergencies Mobile safety and security – DigLogs pilot project by University of Trieste." 2021 10th Mediterranean Conference on Embedded Computing (MECO), IEEE, 2021, pp. 1-4.

3. Marenković, Sven; Tijan, Edvard; Aksentijević, Saša. "Blockchain technology perspectives in maritime industry." 2021 44th International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2021, pp. 1414-1419.

4. Aksentijević, Saša; Tijan, Edvard; Panjako, Ana; Mrčela, Gordana. "Digitalization of port access control: Case study Port of Šibenik." 2021 44th International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2021, pp. 1294-1299.

5. Kapidani, Nexhat; Aksentijević, Saša; Tijan, Edvard; Kočan, Enis. "Establishing a National Maritime Single Window in small coastal countries." 2021 44th International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2021, pp. 1448-1453.

6. Jović, Marija; Aksentijević, Saša; Plentaj, Borna; Tijan, Edvard. "Port Community System Business Models," 2021.

7. Torlak, Ivan; Tijan, Edvard; Aksentijević, Saša; Oblak, Renato. "Analysis of port community system introduction in Croatian seaports – Case study Split." Transactions on Maritime Science, vol. 9, no. 2, 2020, pp. 331-341, Sveučilište u Splitu, Pomorski fakultet.

8. Jović, Marija; Tijan, Edvard; Žgaljić, Dražen; Aksentijević, Saša. "Improving maritime transport sustainability using blockchain-based information exchange." Sustainability, vol. 12, no. 21, 2020, p. 8866, MDPI.

9. Torlak, Ivan; Tijan, Edvard; Aksentijević, Saša; Jugović, Alen. "Port Community System feasibility analysis – Case study Split." 2020 43rd International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2020, pp. 1410-1415.

10. Tijan, Edvard; Jović, Marija; Aksentijević, Saša; Žgaljić, Dražen. "Electronic Transportation Management System Development in the Port of Rijeka." International Academic Institute (IAI) 2020 Virtual Conferences on Education & Social Science and Business & Economics, 2020, pp. 75-79.

11. Aksentijević, Saša; Tijan, Edvard; Jović, Marija; Munitić, Nataša. "Optimization of cargo container loading on railway wagons." 2020 43rd International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2020, pp. 1373-1378.

12. Jović, Marija; Tijan, Edvard; Aksentijević, Saša; Sotošek, Božidar. "The role of electronic transportation management systems in seaport digitalization," 2019.

13. Tijan, Edvard; Agatić, Adrijana; Jović, Marija; Aksentijević, Saša. "Maritime National Single Window – A prerequisite for sustainable seaport business." Sustainability, vol. 11, no. 17, 2019, p. 4570, MDPI.

14. Jović, Marija; Kavran, Natalija; Aksentijević, Saša; Tijan, Edvard. "The transition of Croatian seaports into smart ports." 2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), IEEE, 2019, pp. 1386-1390.

15. Tijan, Edvard; Aksentijević, Saša; Ivanić, Katarina; Jardas, Mladen. "Blockchain technology implementation in logistics." Sustainability, vol. 11, no. 4, 2019, p. 1185, MDPI.

16. Jović, Marija; Kavran, Natalija; Aksentijević, Saša; Tijan, Edvard. "Pametne luke," 2019.

17. Aksentijević, Saša; Marković, Dražen; Tijan, Edvard; Jardas, Mladen. "Application of social network analysis to port community systems." 2018 41st International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2018, pp. 1304-1310.

18. Tijan, Edvard; Jardas, Mladen; Aksentijević, Saša; Perić Hadžić, Ana. "Integrating maritime national single window with port community system – Case Study Croatia," 2018.

19. Aksentijević, Saša; Tijan, Edvard; Jugović, Alen. "Financial impact of forensic proceedings in ICT." 2017 40th International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2017, pp. 1454-1458.

20. Iskra, Ana; Tijan, Edvard; Aksentijević, Saša. "The modern approach to the analysis of logistics information systems." 2016 39th International Convention on Information, Communication and Electronic Technology (MIPRO), IEEE, 2016, pp. 1504-1508.

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1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
M. Pavlić: Informacijski sustavi, Školska knjiga, Zagreb, 2011.	4	25
Teaching materials are available on the e-learning platform, https://moodle.srce.hr/2023-2024/course/view.php?id=192891	unlimited	25

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in line with the European Standards and Guidelines for Quality Assurance, as implemented at the Faculty of Maritime Studies in Rijeka. Once a year, pass rate results are analyzed and appropriate measures are adopted accordingly.

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3.2. Course description

Generic information			
Head of Course	Mladen Jardas, Ph.D.		
Course	Supply Chain Management		
Study Programme	Transport and mobility		
Type of Course	Elective		
Year of Study	1		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		6
	Number of Hours (L+E+S)		30 + 30 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of this course is to provide a thorough understanding of an integrated approach to supply chain management. Through both theoretical and practical aspects, it will cover the identification and understanding of supply chain components, including supply systems, procurement, raw material handling, production, inventory management, ordering, and transportation. The interactions and dynamics among the components of the supply chain system will be analyzed, with a particular emphasis on process optimization and alignment. Additionally, methods and techniques for supply chain synthesis and analysis will be applied with the goal of improving the overall efficiency and sustainability of the system.

1.2. Prerequisites for Course Registration

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1.3. Expected Learning Outcomes

After learning, the student will be able to:
1. Interpret fundamental concepts of logistics and the supply chain.
2. Identify stakeholders in the overall supply process and explain their roles within the supply chain.
3. Analyze the importance of stakeholder integration and coordination in the supply chain and propose ways to improve business processes.
4. Apply statistical methods to forecast supply and demand within the supply chain.
5. Assess transportation and warehousing costs to ensure appropriate pricing of logistics services.
6. Evaluate procurement management and supplier selection, and make informed decisions regarding carrier selection based on the type of goods and specific requirements

1.4. Course Outline

The course covers theoretical concepts and models related to the management of logistics processes, distribution, and costs within supply chains. Students will be introduced to the fundamentals of logistics, cost management objectives, Porter's models of competitive strategies, and theoretical models of supply chain management. Additionally, the course will explore the role of information technologies, transaction costs, and sustainability in modern supply chains, as well as strategic approaches to resource optimization and risk reduction.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work		☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____	
1.6. Comments				

1.7. Student Obligations

1. Class attendance
2. Study, research, and problem-solving
3. Taking midterm exams and tests
4. Final exam

1.8. Assessment [1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1,5	Oral exam		Essay		Research	0,5
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The evaluation of achieved learning outcomes is carried out in accordance with the Regulations on Study Programs of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka, as follows:

Through continuous assessment during the classes, 70% of the learning outcomes are evaluated:

1. 1st midterm exam: 30%
2. 2nd midterm exam: 25%
3. Presentation of a research assignment: 15%

Students may take the final exam if they have obtained 35 grade points in continuous knowledge assessments, i.e., 50% of the total number of points that could be achieved during classroom evaluation. Also, a condition is that students achieve at least 50% of points on each colloquium. The final exam is in written form and comprises 30% of the total grade. Students must satisfy 50% of the final exam in order to achieve a positive grade in the course.

Examples of learning outcome evaluation:
1. List business activities within the supply chain.
2. Which models are used for product delivery in the supply chain?
3. What are the decision-making levels and time horizons in the supply chain?
4. What are the basic reasons for system inertia in the supply chain?
5. Using the Excel computer program, predict supply and demand.
6. Describe the functioning of total quality management

1.10. Main Reading

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1. Teaching material available on the e-learning system – Merlin (https://moodle.srce.hr)
2. Prester J., Upravljanje lancima dobave, Zagreb: Sinergija nakladništvo, 2012.
3. Jacobs, F. Robert, Upravljanje operacijama i lancem opskrbe / F. Robert Jacobs, Richard B. Chase, 13. izd, Zagreb : Mate, cop. 2018
4. Bloomberg, LeMay, Hanna Logistika Mate 2006
5. Fawcet , Ellram, Ogden Supply chain Implementation Pearson 2007

1.11. Recommended Reading

1. Ogrizović, Dario ; Perić Hadžić, Ana ; Jardas, Mladen, Fully Immersive Virtual Reality in Logistics Modelling and Simulation Education, Promet, 33 (2021), 6; 799-806. doi: 10.7307/ptt.v33i6.3941
2. Jardas, Mladen ; Dundović, Čedomir ; Gulić, Marko ; Ivanić, Katarina, The Role of Internet of Things on the, Development of Ports as a Holder in the Supply Chain, Pomorski zbornik, 54 (2018), 1; 61-73. doi: 10.18048/2018.54.05
3. Jardas, Mladen ; Dundović, Čedomir ; Tomić-Badurina, Paola, Supply chain - a key factor of the sustainable development of city centres, Pomorstvo : scientific journal of maritime research, 30 (2016), 1; 45-50. doi: 10.31217/p.30.1.6
4. G. Miscevic, E. Tijan, D. Žgaljić and M. Jardas, "Emerging trends in e-logistics," 2018 41st International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO), Opatija, Croatia, 2018, pp. 1353-1358, doi: 10.23919/MIPRO.2018.8400244.
5. Hugos. M.: Essentials of Supply Chain Management. J.Willey and sons 2003
6. Chorafas D.: Integrating ERP, CRM, Supply chain management and smart materials – CRC Press LLC 2001

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching material available on the e-learning system – Merlin (https://moodle.srce.hr)	Unlimited	50
Bloomberg, LeMay, Hanna Logistika Mate 2006	5	50
Fawcet , Ellram, Ogden Supply chain Implementation Pearson, 2007	1	50
Prester J., Upravljanje lancima dobave, Zagreb: Sinergija nakladništvo, 2012	5	50
Jacobs, F. Robert, Upravljanje operacijama i lancem opskrbe / F. Robert Jacobs, Richard B. Chase, 13. izd, Zagreb : Mate, cop. 2018	7	50

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the failure to pass are analysed and appropriate measures are adopted.

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3.2. Course description

Generic information		
Head of Course	Jakov Karmelić, PhD	
Course	International Shipping Business	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to provide students with a comprehensive insight and understanding of business in the international shipping markets (freight, new-building, sale and purchase, and demolition market) for different types of shipping (liner, dry bulk, tanker, passenger, and offshore).

Through this course, students will get acquainted with the goals and structure of the work of international maritime and trade organizations, the business of shipping companies and other entities in maritime trade, the structure of overseas trade, and the world fleet.

The course provides a scientific foundation for further specialized study in this multidisciplinary course.

During exercises, by studying specific cases, students will acquire basic knowledge of doing business in the international shipping industry.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

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1. Explain the basic characteristics of each segment of the international shipping market.
2. Distinguish the basic principles, objectives, and working methods of international maritime and trade organizations.
3. Analyze and interpret the structure of world overseas trade by cargo types and ship types.
4. Explain the importance and role of maritime transport service entities in all types of shipping, especially shipowners, shipbrokers, and agents.
5. Analyze and interpret freight indices in all types of shipping, interpret maritime market cycles, and analyze and interpret shipbrokers' reports.
6. Define and explain the basic procedures for designing maritime liner services.
7. Explain the reasons for cooperation and different types of shipowner cooperative agreements.
8. Analyze and demonstrate the connection between overseas commodity flows of individual types of goods, specific technologies and categorizations of ships for the transport of these types of goods, and methods of contracting for transport.
9. Analyze the connection of the freight market with the shipbuilding, secondhand, and demolition markets and the application of standardized contracts.

1.4.	Course Outline

Analysis of world overseas trade by cargo types and regions, structure of the world merchant fleet by ship types, age structure of ships, and structure of the world fleet by ownership (countries) and operators.

Overview of international maritime and trade organizations. Shipowners and operators in all types of shipping. Specifics of the work of shipbrokers and maritime agents.

Segmentation of the shipping market. Categorization of ships in the transport of bulk, liquid, gaseous, containerized cargo and the offshore industry. Freight indices by all types of shipping. Shipping market cycles. Supply and demand in the shipping market.

Regulations on market competition in the maritime industry. Organizational structure of shipping companies. Outsourcing jobs in the maritime industry: ship management, D/A Desk, C/P Desk, service sharing centers, planning centers, etc.

Basics of designing maritime liner services. Criteria for selecting the optimal maritime service and shipping company from the user's perspective.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	Email communication with the Head of course: jakov.karmelic@uniri.hr	

1.7.	Student Obligations

The student must be present at lectures and exercises for at least 70% of the total hours and prepare and present a written seminar paper on a given topic that should be positively assessed before taking the final oral exam.

1.8. Assessment [1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	1,5	Experiment	
Written exam		Oral exam	2	Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam	

The procedure for evaluating the acquired learning outcomes is performed according to the Ordinance on Studies of the University of Rijeka and the Ordinance on Studying at the Faculty of Maritime Studies in Rijeka, as follows:

   A) Requirements for taking the oral exam:
·   Active class attendance
·   Preparation and presentation of seminar paper (40 points)
   A. Prerequisite for passing the oral exam (60 points):
·   At least 50% of complete theoretical knowledge of the course of International Shipping Business

Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Explain the characteristics of each segment of maritime shipping markets.
2. Describe the principles, goals, and modes of operation of international maritime and trade organizations.
3. Interpret the structure of world overseas trade by types of cargo and types of ships.
4. Describe the role of maritime transport entities in all types of shipping, especially shipowners, operators, shipbrokers, and agents.
5. Interpret freight indices, shipping market cycles, and brokers' reports in all types of shipping.
6. Explain the basic procedures for designing maritime liner services.
7. Explain the reasons for the cooperation and the different types of shipping cooperation agreements among the shipowners and operators.
8. Demonstrate the connection between the overseas flows of certain types of goods, specific technology and segmentation of ships for the transport of these types of goods, and the ways of contracting sea transport.

During the preparation of the research seminar, individual topics from the field of international shipping business are researched in more detail.

1.10. Main Reading

1.)   Domijan-Arneri, I.: Poslovanje u morskom brodarstvu, Redak, Split, 2014.
2.)   Hess, M., Kos, S.: Ugovaranje u pomorstvu, Pomorski fakultet u Rijeci, 2013.
3.)   Review of Maritime Transport, UNCTAD, New York and Geneva, web edition
4.)   Shipping and Shipbuilding Markets, Annual Review Barry Rogliano Salles, web edition

1.11. Recommended Reading

1)   Stopford, M.: Maritime Economics, Routledge, 2009.
2)   Batalić, M., Mitrović, F.: Financiranje u pomorstvu, Pomorski fakultet u Splitu, Split, 2010.
3)   Karmelić, J.: Kooperacije među brodarima, Pomorstvo, god. 21, br. 2, 2007.
4)   Karmelić, J.: Sporazum o raspodjeli brodskog prostora, Pomorstvo, god. 24, br. 2, 2010.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Domijan-Arneri, I.: Poslovanje u morskom brodarstvu, Redak, Split, 2014.	5	40
Hess, M., Kos, S.: Ugovaranje u pomorstvu, Pomorski fakultet u Rijeci, 2013	5	40
Review of Maritime Transport, UNCTAD, New York and Geneva, web edition	40	40
Shipping and Shipbuilding Markets, Annual Review Barry Rogliano Salles, web edition	40	40

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Shipping Statistcs and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen	1	40

1.13. Quality Assurance

The quality of studies is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance, which is carried out at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the examination pass rate are analyzed, and appropriate measures are adopted.

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Course description

Generic information		
Head of Course	Dražen Žgaljić, PhD	
Course	Multimodal transport and Motorways of the Sea	
Study Programme	Transport and Mobility	
Type of Course	Mandatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 0 + 10

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Familiarizing students with various multimodal transport technologies, the technologies and organization of short sea shipping connections and maritime transport routes (Motorways of the Sea), legal and market conditions, and their environmental contributions.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After completing and passing the course, the student will be able to:

– Compare different methods and technologies for cargo and passenger transport in multimodal transportation
– Distinguish between management models for short sea shipping and maritime transport routes (Motorways of the Sea)
– Design various approaches to organizing the transport of goods and passengers in multimodal systems
– Explain internal and external factors influencing the success of short sea shipping and maritime transport routes
– Summarize the European Union's legal regulations related to short sea shipping and maritime transport routes
– Identify the environmental and social impacts of short sea shipping and maritime transport routes

1.4. Course Outline

Define, describe, and explain the elements of a multimodal transport system. Technical and technological characteristics of the intermodal transport system. Ownership of elements within the multimodal transport system. Development models of short sea shipping and maritime transport routes (Motorways of the Sea). Management models for short sea shipping and maritime transport routes. Criteria for evaluating the performance of specific elements of short sea shipping and maritime routes. Implementation of modern technologies/systems in the organization of short sea shipping and maritime transport routes. Public service in transport. Legal framework and efforts of the European Union in the functioning of short sea shipping and

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1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Student obligations include: regular class attendance, a seminar, midterm exams, and a final exam.
- 1st midterm exam – 25%
- 2nd midterm exam – 25%
- Seminar (individual assignment) – 20%
- Final exam – 30%

1.8. Assessment [1] of Learning Outcomes

Course attendance	1,3	Class participation		Seminar paper	0,7	Experiment	
Written exam	1	Oral exam		Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The evaluation of acquired learning outcomes is carried out in accordance with the Regulations on Study Programs of the University of Rijeka and the Study Regulations of the Faculty of Maritime Studies in Rijeka, as follows:

- Continuous assessment during classes accounts for 50% of the learning outcomes: 25% through the 1st midterm exam and 25% through the 2nd midterm exam. The student must achieve at least 50% of the available points on each midterm exam in order to pass.
- The seminar paper accounts for 20% of the learning outcomes.
- The final exam accounts for 30% of the learning outcomes, and to pass the final exam, the student must achieve at least 50% of the available points.

Examples of learning outcome assessments in relation to the defined learning outcomes include:

1. Describe the different methods of cargo transport using multimodal transport.
2. Describe and compare different ways of organizing short sea shipping connections.
3. Describe modern technologies/systems in the organization of short sea shipping and maritime transport routes.
4. Describe the European Union's efforts to promote the development of short sea shipping.
5. Propose a solution to encourage the development of maritime transport routes at the regional or corridor level.
6. Compare the impact of road and maritime transport on society and the environment.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The evaluation of acquired learning outcomes is carried out in accordance with the Regulations on Study Programs of the University of Rijeka and the Study Regulations of the Faculty of Maritime Studies in Rijeka, as follows:

- Continuous assessment during classes accounts for 50% of the learning outcomes: 25% through the 1st midterm exam and 25% through the 2nd midterm exam. The student must achieve at least 50% of the available points on each midterm exam in order to pass.
- The seminar paper accounts for 20% of the learning outcomes.
- The final exam accounts for 30% of the learning outcomes, and to pass the final exam, the student must achieve at least 50% of the available points.

Examples of learning outcome assessments in relation to the defined learning outcomes include:

7. Describe the different methods of cargo transport using multimodal transport.
8. Describe and compare different ways of organizing short sea shipping connections.
9. Describe modern technologies/systems in the organization of short sea shipping and maritime transport routes.
10. Describe the European Union's efforts to promote the development of short sea shipping.
11. Propose a solution to encourage the development of maritime transport routes at the regional or corridor level.
12. Compare the impact of road and maritime transport on society and the environment.

1.10. Main Reading

1. Bošnjak, I: Inteligentni transportni sustavi 1, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2006.
2. Zelenika, R.: Multimodalni prometni sustavi, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2006.
3. Zelenika, R.: Pravo multimodalnog prometa, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka,2006.
4. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

1) Papadimitriou, S. et al.: Dynamics of Short Sea Shipping
2) Santos, T. A., Guedes Soares, C.: Short Sea Shipping in the Age of Sustainable Development and Information Technology
3) Papadimitriou, S. et al.: Motorways of the Sea' (MoS) and Related European Policies
4) Bukljaš Skočibušić, M., Radačić, Ž., Jurčević, M.: Ekonomika prometa, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2011.
5) Miloš, I.: Tehnologija i organizacija intermodalnog prometa, Veleučilište u Rijeci, 2011.
6) Ortuzar, J de D., Willumsen, L. G.: Modelling Transport, 4th Edition, John Wiley and Sons, 2011.
7) Uredbe i direktive Europske komisije i Parlamenta vezane uz međuobalno prometno povezivanje i pomorske prometnice
8) Žgaljić, D., Tijan, E., Jugović, A., Poletan Jugović, T.:Implementation of sustainable Motorways of the Sea services - Multi-criteria analysis of Croatian port system // Sustainability, 11 (2019), 23; 6827, 21. doi: 10.3390/su11236827
9) Žgaljić, D., Oblak, R., Schiozzi, D.: Elaboration of Criteria for Development of Sustainable Motorways of the Sea Services // Pomorstvo : scientific journal of maritime research, 33 (2019), 2; 158-170. doi: 10.31217/p.33.2.5
10) Žgaljić, D., Perkušić, Z., Schiozzi, D.: Značenje multimodalnog, intermodalnog i kombiniranog prijevoza u razvoju pomorskih prometnica // Pomorski zbornik, 49-50 (2015), 265-278
11) Scientific and professional papers related to the topic of transport systems, Motorways of the Sea (MoS), and Short Sea Shipping (SSS) published in foreign and domestic journals.

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1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Bošnjak, I: Inteligentni transportni sustavi 1, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2006.	6	
Zelenika, R.: Multimodalni prometni sustavi, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2006.	2	
Zelenika, R.: Pravo multimodalnog prometa, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka,2006.	6	
Study materials available at e-learning platform (https://moodle.srce.hr)	unlimited	

1.13. Quality Assurance

The quality of studies is monitored in accordance with the ISO 9001 system and European standards and guidelines for quality assurance (ESG), which are implemented at the Faculty of Maritime Studies in Rijeka. Once a year, pass rates are analyzed, and appropriate measures are taken.

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3.2. Course description

Generic information		
Head of Course	**Svjetlana Hess, PhD**	
Course	**Optimization of the Transport Process**	
Study Programme	**Technology and Organization of Transport**	
Type of Course	**Mandatory**	
Year of Study	**2**	
Estimated Student Workload and Methods of	ECTS coefficient of Student Workload	**5**
	Number of Hours (L+E+S)	**30+0+10**

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The primary objective of the course is to equip students with the ability to apply selected methods for transport process optimization. This is achieved through mastering techniques, performing analytical calculations, and analyzing results, enabling students to gain practically applicable knowledge and skills necessary for optimal and efficient transport process planning and organization.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon successful completion of the course, students will be able to:
1. List the basic parameters and phases of the transport process and determine decision-making criteria for optimal organization
2. Formulate a model for organizing the movement of transport vehicles and determine the appropriate method for solving and finding the optimal solution for goods distribution
3. Compare types of itineraries and explain the differences between them
4. Plan travel routes, schematically present and solve an illustrative example of a transport process (itinerary) by calculating all necessary travel indicators
5. Solve a multi-phase transportation problem using dynamic programming and interpret the optimal solution with respect to the defined criteria and constraints
6. Identify possible changes and deviations under conditions of uncertainty

1.4. Course Outline

Analytical tools and techniques necessary for optimal organization of the transport process, types of itineraries, calculation of all transport process indicators for a given itinerary, operational planning problems, distribution network problems, dynamic programming in transportation problems, resource allocation and assignment (transport vehicles), organization of vehicle loading, solving selected examples with widely available software support (MS Excel Solver or WinQSB). Emphasis is placed on problem-solving techniques and applying analytical methods to concrete examples where quantification and optimization of the transport process are required.

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1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____

1.6. Comments	

1.7. Student Obligations

Students are required to attend at least 70% of the classes. They must complete assignments and a midterm exam during the course, and take a final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1.3	Class participation		Seminar paper	2.0	Experiment	
Written exam	1.0	Oral exam		Essay		Research	
Project		Continuous Assessment	0.7	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

During the course, students can earn up to 70% of the grade through a midterm and seminar paper (learning outcomes: 1, 2, 4, and 5), and 30% through the final exam (learning outcomes: 1, 3, and 6). The final exam evaluates comprehensive theoretical knowledge and understanding of specific knowledge in the organization and optimization of transport processes, with application to real-world cases in transport and logistics. Students must earn a minimum of 35% of total points to be eligible for the final exam and must score at least 50% to pass.
Examples of Assessment for Each Learning Outcome:

1. List the basic parameters and phases of the transport process and determine the decision-making criteria for optimal organization
2. Formulate a model for organizing the movement of transport vehicles and determine an appropriate solution method for goods distribution
3. Compare types of itineraries and explain the differences
4. Plan a travel route, schematically present and solve an illustrative example of a transport process (itinerary), calculating all relevant travel indicators
5. Use dynamic programming to solve a multi-phase transportation problem and explain the optimal solution based on the defined criteria and constraints
6. Identify potential changes and deviations under uncertainty

1.10. Main Reading

1. Course materials available on the e-learning platform – Merlin (https://moodle.srce.hr)
2. Backović, M., Vuleta, J., Popović, Z., Ekonomsko matematički metodi i modeli, Ekonomski fakultet Univerziteta u Beogradu, (udžbenik i zbirka zadataka), 2020.

1.11. Recommended Reading

1. Stanković, R., Pašagić Škrinjar, J., Logistika i transportni modeli, web edition, Fakultet prometnih znanosti, Zagreb, 2015.
2. Lindov, O., Džaferović, S., Tehnologija cestovnog transporta, workbook, Sarajevo, 2011.
3. Logistics Engineering Handbook, editor G. Don Taylor, CRC Press Taylor & Francis Group, 2008.
4. Pavlović, I., Kvantitativni modeli i metode u poslovnom odlučivanju, Mostar-Dubrovnik, 2015.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.12. *Number of Main Reading Examples*		
Title	*Number of examples*	*Number of students*
Course materials available on the e-learning platform – Merlin	web	20
Backović, M., Vuleta, J., Popović, Z., Ekonomsko matematički metodi i modeli, Ekonomski fakultet Univerziteta u Beogradu, (udžbenik i zbirka zadataka), 2020.	5	20

1.13. Quality Assurance

The quality of education is monitored in accordance with the ISO 9001 system and aligned with European standards and guidelines for quality assurance, implemented at the Faculty of Maritime Studies in Rijeka. Exam pass rate analysis is conducted annually, and student surveys are carried out once per semester.

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3.2. Course description

Generic information		
Head of Course	Siniša Vilke, PhD	
Course	Land Transportation System Planning	
Study Programme	Technology and Organization of Transport	
Type of Course	Mandatory	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the case is to provide fundamental knowledge of planning and design of transport infrastructure facilities for roads, railways and aviation.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

After completing and passing the course, students will be able to:

1. Analyze and connect the methodology, procedures and criteria of traffic planning and design of land infrastructure facilities.
2. Analyze the management of road and railway infrastructure.
3. Classify the chronology of land transport infrastructure design through the development of general, conceptual and main designs.
4. Analyze the procedures for preparing planning and project documentation for the construction of road transport infrastructure facilities.
5. Analyze the preparation of project documentation for the construction of railway transport infrastructure facilities.
6. Analyze and classify traffic elements in the construction design of airports.
7. Explain the regulations on the planning and construction of land transport infrastructure facilities.
8. Identify and connect traffic elements in the construction design of road roads.
9. Classify and compare traffic elements in the construction design of railway roads.
10. Develop and present a research task on a given road or rail traffic solution.

1.4. Course Outline

The basic characteristics of the elements of land infrastructure facilities. Transportation planning and design. Categorization of roads and road facilities, urban roads and intersections. Planning, design, execution and management of road infrastructure. Urban roads and intersections. Stationary traffic. Categorization of railways and railway facilities. Design elements of railway infrastructure. Planning and design of aviation infrastructure.

1.5. Modes of Instruction	☒ Lectures	☒ Practical work
	☐ Seminars and workshops	☐ Multimedia and Network

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	☒ Exercises ☐ E-learning ☐ Field work	☐ laboratory ☐ Mentorship ☐ other_____
1.6. Comments		

1.7. Student Obligations
Preparation of the study paper, presentation of the study paper, 1st colloquium, 2nd colloquium.

1.8. Assessment [1]of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	1
Project		Continuous Assessment	1,5	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure of assessment of acquired learning outcomes is carried out by the Study Regulations of the University of Rijeka and the Study Regulations at the Faculty Maritime Studies in Rijeka as follows:

- 70% of the acquired learning outcomes are assessed through continuous assessment during classes within the 1st exam (25%), 2nd exam (25%), and through the preparation and presentation of a research task (20%);

- 30% of the acquired learning outcomes are assessed in the final part of the exam.

Examples of learning outcome assessment in relation to the set learning outcomes are:

1. Explain the methodology, procedures and criteria for traffic planning and design of land infrastructure facilities.

2. Explain the basic principles and procedures for road infrastructure management.

3. Explain the activities of designing railway transport infrastructure using the example of the content of the general project.

4. Describe the preparation of planning and project documentation for the construction of road infrastructure facilities.

5. Explain the basic legal provisions on the planning and construction of land transport infrastructure facilities.

6. Identify traffic and construction elements in the given example of a road project.

7. Identify traffic and construction elements in a concrete example of a railway project.

8. Develop and present a solution for a selected road / railway junction.

1.10. Main Reading

1. Blašković Zavada, J.: Osnove prometne infrastrukture, Fakultet prometnih znanosti, Zagreb, 2019.
2. Legac.,I.: Cestovne prometnice I, Fakultet prometnih znanosti, Zagreb, 2006.
3. Stipetić, A.: Gornji ustroj željezničkoga kolosijeka, Fakultet prometnih znanosti, Zagreb, 2008.
4. Pavlin, S.: Aerodromi I, Prometni fakultet Zagreb, 2002.
5. Transport Development Strategy of the Republic of Croatia for the period 2017 to 2030 (Official

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[1]   **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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Gazette 84/17).

6. Teaching material for the e-course available on the LMS Merlin (https://moodle.srce.hr)

1.11. Recommended Reading

1. Vilke, S.; Tadić, F.; Ćelić, J.; Debelić, B.: Decision support system in urban traffic management, ODS 2022 – International Conference on Optimization and Decision Sciences, 2022.
2. Vilke, S.; Petrović, I.; Tadić, F.: Evaluation and Selection of the Railroad Route between Rijeka and Zagreb, Applied Sciences, 12, (2022), 3, 1306.
3. Vuchic, V., R.: Urban Transit Systems and Technology, John Wiley & Sons, Inc., Hoboken, New Jersey, 2007.
4. Physical Planning Act (Official Gazette 153/13, 65/17).
5. Building Act (Official Gazette 153/13, 20/17, 39/19).
6. Laws and implementing regulations in the field of transport infrastructure, Zagreb, Official Gazette, Republic of Croatia.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. Blašković Zavada, J.: Osnove prometne infrastrukture, Fakultet prometnih znanosti, Zagreb, 2019.	5	30
2. Cestovne prometnice I, Fakultet prometnih znanosti, Zagreb, 2006.	5	30
3. Stipetić, A.: Gornji ustroj željezničkoga kolosijeka, Fakultet prometnih znanosti, Zagreb, 2008.	5	30
4. Pavlin, S.: Aerodromi I, Prometni fakultet Zagreb, 2002.	3	30
5. Transport Development Strategy of the Republic of Croatia for the period 2017 to 2030 (Official Gazette 84/17).	online	30
6. Teaching material for the e-course available on the LMS Merlin (https://moodle.srce.hr)	-	30

1.13. Quality Assurance

The quality of studies is monitored according to the system ISO 9001 and according to the European standards and guidelines for quality assurance introduced at the Faculty Maritime Studies in Rijeka. Once a year the passage results are analyzed and appropriate measures are taken, and once a semester a survey is conducted among the students.

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3.2. Course description

Generic information		
Head of Course	Jasmin Ćelić, PhD	
Course	Intelligent Transportation Systems	
Study Programme	Technology and Organization of Transport	
Type of Course	Mandatory	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objectives of this course are to acquire fundamental knowledge in the field of Intelligent Transport Systems (ITS) and to understand the basic principles and techniques used in the design and operation of modern systems.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon passing the exam, students will be able to:
1. Identify the fundamental principles on which ITS is based.
2. Compare network-based control principles and choose the optimal solution.
3. Evaluate the development of ITS.
4. Assess and select appropriate procedures for ITS implementation in transport infrastructure.
5. Justify the relevance and benefits of ITS implementation.
6. Recommend telematics solutions for transport systems.
7. Compare the operating principles of electronic systems in transport entities.
8. Review prerequisites for development and provide recommendations for ITS service deployment.

1.4. Course Outline

Introduction to Intelligent Transport Systems. Standards and norms. Basics of systems theory and cybernetics. Physical and logical architecture of ITS. Traffic modelling. Communications in ITS. Expert systems and AI applications in transport. Intelligent navigation systems. ITS and control systems. Expert systems in maintenance. Diagnostics in ITS.

1.5. Modes of Instruction

- ☒ Lectures
- ☒ Seminars and workshops
- ☒ Exercises
- ☐ E-learning
- ☐ Field work
- ☒ Practical work
- ☒ Multimedia and Network
- ☐ Laboratory
- ☐ Mentorship
- ☐ Other _____

1.6. Comments

1.7. Student Obligations

1st preliminary exam, 2nd preliminary exam, research task and presentation, final exam

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1.8. Assessment[1] of Learning Outcomes

Course attendanc	1,5	Class participation	0,5	Seminar paper	1	Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	1	Presentation		Practical work	
Portfolio							

9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure for evaluating the acquired learning outcomes is carried out according to the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka in the following way:

- 70% of the acquired learning outcomes are evaluated through continuous knowledge assessment during classes:
  through the 1st preliminary exam – learning outcomes 1-4 (25%), 2nd preliminary exam – learning outcomes 5-8 (25%), presentation of the research task (seminar) – learning outcomes 1-8 (20%); in each preliminary exam, the student must achieve a minimum of 50% of the points, while the presentation of the research task is evaluated based on the developed assessment criteria;
- 30% of the acquired learning outcomes (1-8) are evaluated in the final part of the exam, and in order to pass the final exam, the student must achieve a minimum of 50% of the points;
- the final ECTS grade is defined based on the achieved total % of knowledge, skills and competences and the numerical grade after the final/remedial exam as follows:
  - excellent grade (5) corresponds to grade A on the ECTS scale and a success rate of 90 to 100%,
  - very good grade (4) corresponds to grade B on the ECTS scale and a success rate of 75 to 89.9%,
  - good grade (3) corresponds to grade C on the ECTS scale and a success rate of 60 to 74.9%,
  - satisfactory grade (2) corresponds to grade D on the ECTS scale and a success rate of 50 to 59.9%,
  - unsatisfactory grade (1) corresponds to grade F on the ECTS scale and a success rate of 0 to 49.9%.

Examples of learning outcome evaluations in relation to the set learning outcomes are:

1. List and explain the phases of the ITS lifecycle. (LO #1)
2. List and describe the four types of guidance. (LO #2)
3. What architecture includes the physical, logical and communication views? (LO #3)
4. What are the basic steps in the requirements discovery process? (LO #4)
5. How can the level of service (QoS) of intelligent roads be measured? (LO #5)
6. What does ITS vehicle adaptation involve? (LO #6)
7. List the types of sensors. (LO #7)
8. What are the visible benefits of ITS? Explain. (LO #8)

1.10. Main Reading

1. Teaching material available on the Merlin e-learning system (https://moodle.srce.hr)
2. Bošnjak, I. (2006). Intelligent Transport Systems 1, Faculty of Transport Sciences, Zagreb, Croatia
3. Williams, B. (2008.). Intelligent Transport Systems Standards, Artech House, Boston, USA.

1.11. Recommended Reading

- Ćelić, J., Mandžuka, B., Tomas, V., Tadić, F. (2024.). Driver-centric urban route planning: Smart search for parking, Sustainability 16 (2), 856.
- Grupa autora. (2000.). Intelligent Transportation Primer, Institute of Transportation Engineers, Washington, USA.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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- Chen, Y., Li, L. (2013.). Advances in Intelligent Vehicles, Elsevier, Academic Press.
- Zilouchian, A., Jamshidi, M. (2001.). Intelligent Control Systems Using Soft Computing Methodoligies, CRC Press, London, UK.
- Gupta, M., Sinha, N. K. (1995.). Intelligent Control Systems - Concept and Applications, IEEE Press, Piscataway NJ, USA.
- Internet:

http://local.iteris.com/arc-it/

http://its.dot.gov/

https://www.itsa.org/technology-scan-assessments

https://www.etsi.org/technologies/

https://www.pcb.its.dot.gov/eprimer/default.aspx

https://www.ieee-itss.org/its-transactions

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Bošnjak, I. (2006). Intelligent Transport Systems 1, Faculty of Transport Sciences, Zagreb, Croatia	10	40
Williams, B. (2008.). Intelligent Transport Systems Standards, Artech House, Boston, USA.	10	40

1.13. Quality Assurance

The quality of studies is constantly monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of exam taking is prepared annually, and a survey among students is conducted once a semester.

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3.2. Course description

Generic information		
Head of Course	Ines Kolanović, PhD	
Course	Maritime and transport policy	
Study Programme	Technology and Organization of Transport	
Type of Course	Mandatory	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 0 + 15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of this course is for students to analyze, evaluate and comment on the significance and content of maritime and transport policy, to identify the guidelines of the European maritime and transport policy and to critically connect them with the development strategies of maritime and transport in the Republic of Croatia.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. Recognize and interpret the characteristics of maritime and transport policies
2. Present and comment on the principles, objectives and measures of maritime and transport policies and classify the bearers of maritime and transport policies
3. Analyze and comment on the policy of support and subsidies in maritime and transport
4. Identify and comment on the characteristics of transport policy in relation to transport infrastructure and the Trans-European network
5. Present and connect the relationships between maritime activities and limitations in relation to the use of the sea as a resource
6. Critically assess the importance of maritime and transport policies for the sustainable development of maritime and transport
7. Evaluate the priorities of the maritime and transport policy of the Republic of Croatia in relation to strategic goals

1.4. Course Outline

The concept, significance and role of maritime and transport policy. Components and bearers of maritime and transport policy. The significance of transport policy in creating a sustainable transport system. Integrated maritime policy of the EU, interdependence of maritime activities, optimal use of the sea as a resource, monitoring and sustainability of coastal areas. Port policy, principles of European port policy, access to the port services market, charging and financing policy for port infrastructure. Maritime cabotage and market access. Subsidies and state aid in transport, specific characteristics of state aid in maritime transport. EU transport policy, strategic documents. Trans-European networks and policies in relation to transport infrastructure. Transport and sustainable development. External costs of transport. Maritime Development Strategy of the Republic of Croatia. Transport Development Strategy of the Republic of Croatia.

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1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work		☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____	

1.6. Comments	

1.7. Student Obligations

Students are required to: attend classes, pass two midterm exams (continuous knowledge assessment), complete and present an individual assignment, and pass the final exam. A student must attend at least 70% of the total number of lecture and seminar hours.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	0,7	Experiment	
Written exam	1,1	Oral exam		Essay		Research	
Project		Continuous Assessment	1,7	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Procedure:

-   The final grade in the course is the sum of the points earned by the student during the course (70% of the grade) and the points earned on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka.

Continuous knowledge assessment:

   Midterm Exam 1 – 25%; Learning outcomes: 1 to 3
   Midterm Exam 2 – 25%; Learning outcomes: 4 and 7
   Individual assignment – 20%; Learning outcomes: 1 to 7
-   Final exam – 30%; Learning outcomes: 1 to 7
A minimum of 50% of the points must be achieved on each midterm exam.
A minimum of 50% of the points must be achieved on the individual assignment.
A minimum of 50% of the points must be achieved on the final exam.

Examples of learning outcome evaluation:

   1. Explain the importance of maritime policy in the context of the development of seaports in the Republic of Croatia (LO1)
   2. Interpret the features of integral maritime policy (LO2)
   3. Explain the features of scheduled passenger traffic in the Republic of Croatia in the context of the sustainable development of islands in the Republic of Croatia (LO3)
   4. List the sources of financing for the construction of the transport TEN-T network (LO4)
   5. Interpret and argue the priorities of the European Maritime and Fisheries Fund (LO5)
   6. List the three basic components of external costs (LO6)
   7. Highlight and argue the priority goals of the EU transport policy in the context of the strategic guidelines for the development of maritime transport in the Republic of Croatia (LO7)

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[1] **NOTE**: Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Procedure:

- The final grade in the course is the sum of the points earned by the student during the course (70% of the grade) and the points earned on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka.

Continuous knowledge assessment:

  Midterm Exam 1 – 25%; Learning outcomes: 1 to 3
  Midterm Exam 2 – 25%; Learning outcomes: 4 and 7
  Individual assignment – 20%; Learning outcomes: 1 to 7
- Final exam – 30%; Learning outcomes: 1 to 7
  A minimum of 50% of the points must be achieved on each midterm exam.
  A minimum of 50% of the points must be achieved on the individual assignment.
  A minimum of 50% of the points must be achieved on the final exam.

Examples of learning outcome evaluation:

  1. Explain the importance of maritime policy in the context of the development of seaports in the Republic of Croatia (LO1)
  2. Interpret the features of integral maritime policy (LO2)
  3. Explain the features of scheduled passenger traffic in the Republic of Croatia in the context of the sustainable development of islands in the Republic of Croatia (LO3)
  4. List the sources of financing for the construction of the transport TEN-T network (LO4)
  5. Interpret and argue the priorities of the European Maritime and Fisheries Fund (LO5)
  6. List the three basic components of external costs (LO6)
  7. Highlight and argue the priority goals of the EU transport policy in the context of the strategic guidelines for the development of maritime transport in the Republic of Croatia (LO7)

1.10. Main Reading

1. Kolanović, Ines: Teaching materials on the e-learning platform (Merlin)
2. **Dundović, Čedomir, Grubišić, Neven:** Pomorska i prometna politika, Sveučilišni udžbenik, Pomorski fakultet u Rijeci, 2013.

1.11. Recommended Reading

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1. Kožić, Zlatka; Kolanović, Ines; Poletan Jugović, Tanja: Post-Covid European recovery plans in the context of sustainable development of maritime transport and seaports in the European Union and the Republic of Croatia // Proceedings of the 10th International Conference on Maritime Transport. Barcelona: Universitat Politècnica de Catalunya. Iniciativa Digital Politècnica, 2024. str. 1-15.
2. Lukin, Dorotea; Kolanović, Ines; Poletan Jugović, Tanja: The importance of Cohesion Policy for the Development of the Railway System of the Republic of Croatia // Pomorstvo: Scientific journal of maritime research, 35 (2021), 2; 402-410.
3. Bijela knjiga o budućnosti Europe, Razmatranja i scenariji za EU-27 do 2025., Bruxelles, Europska komisija, 2017.;https://eur-lex.europa.eu/resource.html?uri=cellar:b739b382-ff4f-11e6-8a35 01aa75ed71a1.0022.02/DOC_1&format=PDF
4. Prellezo, R., Villasante, S.: Economic and social impacts of the landing obligation of the European Common Fisheries Policy: A review, Marine Policy, Vol. 148, 2023.
5. Promet, Europska Komisija; https://ec.europa.eu/info/topics/transport_hr
6. Yap, W. Y., Hsieh, C. H., Lee, P. T. W: Shipping connectivity data analytics: Implications for maritime policy, Transport Policy, Vol. 132, 2023., p. 112 – 127.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teaching materials on Merlin	unlimited	9
Pomorska i prometna politika	11	9

1.13. Quality Assurance

The quality of studies is continuously monitored in accordance with the requirements of the ISO 9001 standard and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka. At the end of the semester, teachers and associates are evaluated by students, in accordance with the Manual for the Quality of Studies at the University of Rijeka.

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General Information		
Head of Course	Ana Perić Hadžić, Ph.D. Dražen Žgaljić, Ph.D.	
Course	Project Management	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of this course is to explain the importance of projects and international projects, as well as the role of project management in developing business systems. Emphasis is placed on strategic preparation, evaluation, initiation, and development of project management models at various management levels to enable students to manage projects in the context of modern economic development.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon completion of the course, students will be able to:
1. Interpret fundamental theoretical and practical concepts of project management and apply them in the development of business systems.
2. Differentiate and explain key project management processes (strategic preparation, initiation, implementation, control).
3. Analyze and evaluate the impact of various stakeholders (interest and influence groups).
4. Apply advanced skills and competencies for effective project implementation and resolution of complex organizational and related project management issues.
5. Define and interpret concepts related to the structure of projects financed by EU funds and programs.
6. Develop, analyze, and formulate their own project idea and prepare a comprehensive project proposal.

1.4. Course Outline

Theoretical-methodological definition of project management (definition of project, project management, project life cycle, stakeholders). Project management processes (project planning, organization, leadership, control). Strategic aspects of project management, enterprise development project management (development policy, investment policy, investment project evaluation). Management of international projects. EU organization and programs (with an emphasis on programs funding transport development), EU project planning, Logical Framework (Logframe), measuring goal achievement, managing work packages and project results, consortium agreements and intellectual property protection, communication and project team management, exploitation, dissemination, and sustainability of EU projects, quality planning, quality assurance and control, risk management. Case Studies: Business Plan for a Port, Feasibility Study for a Concession on Maritime Domain, EU Project.

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1.5. Modes of Instruction	x Lectures ☐ Seminars and workshops x Exercises ☐ E-Learning ☐ Field work	x Practical Work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Students must attend at least 70% of lectures and exercises, pass midterm exams (continuous assessment), and submit a project to qualify for the final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project	1	Continuous Assessment	1,5	Presentation		Practical work	
Portfolio							

1.9. *Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam*

The final grade for the course is the sum of the percentage achieved during the course (70% of the grade) and the percentage achieved on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Study at the Faculty of Maritime Studies in Rijeka. Continuous Assessment of knowledge:

- a minimum of 50% of the grading points must be achieved.
- project - students must demonstrate acquired knowledge and the application of project methodology on a selected example

Final Exam:
A minimum of 50% of the grading points must be achieved on the final exam.

Examples of Evaluating Learning Outcomes in Relation to Set Learning Objectives:
1. Draw the project life cycle and identify the key phases of the project life cycle.
2. List the basic processes/functions of project management and explain their purpose.
3. Explain who the primary and secondary stakeholders (interest groups) are and describe their role in the project.
4. Using a given example, present the sequence of project activities using the Critical Path Method, identify the critical path of project activities, calculate the total project duration, and depict the sequence of project activities using a Gantt chart.
5. Explain the role of structural funds and European Union programs in financing projects related to sustainable transport development.
6. Formulate your own project proposal, independently or in a team, which includes a project description, the relevance of the project application, the implementation capacities of the applicant and partners (if applicable), project efficiency and feasibility, project budget, and project sustainability.

1.10. Main Reading

1. Authorized lectures on the e-learning platform (online materials).
2. Ivica Veža et al., "Upravljanje projektima," University of Split, Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture, 2011.
3. Anton Hauc, "Projektni menadžment i projektno poslovanje," Business and Management College, Zagreb, 2007.
4. Marčelo Dujanić, "Projektiranje organizacije i upravljanje projektima," Polytechnic of Rijeka, 2006.
5. Mislav Ante Omazić, "Projektni menadžment," Synergy Publishing, Zagreb, 2005.

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[1] **NOTE**: Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.11. Supplementary Literature (at the time of study program proposal submission)

1. Online Manual on EU Projects, https://irmo.hr/prirucnik-o-eu-projektima/
2. Maletić, Ivana; Kosor, Kristina; Japunčić, Tea; Žagar, Davorka; Čakanić, Tomislav: A Guide to EU Programs and Funds 2021 – 2027, Funding Opportunities for Projects in Croatia.
3. Ana Odak, Marija Rajaković, Marko Žabojec: The Financial Perspective of the European Union 2021 – 2027, with a Focus on Cohesion Policy, 2021, Školska Knjiga.
4. Vajde Horvat, R., Smolčić Jurdana, D. (Eds.), EU Project Management – Challenges and Aspects, University of Rijeka, Rijeka 2009.
5. Project Management Institute, A Guide to the Project Management Body of Knowledge (PMBOK Guide), Fourth Edition, 2008.
6. Guidelines for Managing the Project Cycle, Volume 1, Support for Effective Implementation of the European Commission's External Aid, Central State Office for Development Strategy and Coordination of European Union Funds, Zagreb, October 2008 (translated into Croatian).

1.12. Number of Copies of Required Literature in Relation to the Number of Students Currently Enrolled in the Course

Title	Number of examples	Number of students
Authorized lectures on the e-learning platform (online materials).	-	15
Ivica Veža et al: Project Management, Split: University of Split, Faculty of Electrical Engineering, Mechanical Engineering and Naval Architecture, 2011.	2	15
Anton Hauc: Project Management and Project Business, College of Business and Management, Zagreb, 2007.	5	15
Omazić, Mislav Ante: Project Management, Zagreb, Sinergija Publishing, 2005.	5	15
Dujanić, Marčelo: Designing Organizations and Project Management, Textbooks of the Polytechnic of Rijeka = Manualia Collegium Politechnic Fluminensis, Rijeka: Polytechnic, 2006	1	15

1.13. The methods for monitoring quality that ensure the acquisition of learning outcomes, skills, and competencies include:

The quality of studies is monitored in accordance with the ISO 9001 system and European standards and guidelines for quality assurance (ESG), which are implemented at the Faculty of Maritime Studies in Rijeka. Once a year, pass rates are analyzed, and appropriate measures are taken.

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3.2. Course description

Generic information		
Head of Course	Biserka Rukavina, Ph.D.	
Course	EU Transport Law	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+ 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Students should become familiar with legal norms regulating transport activities at EU level covering all types of transport, access to the transport services market, social aspects of transport, transport safety and environmental protection.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able:
1. to define and interpret the basic principles of the EU common transport policy.
2. to categorize the basic principles of the development of EU transport systems.
3. to present the EU acquis in the fields of road, rail, transport and air Traffic.
4. to interpret the importance of the right of access to the transport services market and explain the social aspects of traffic.
5. to analyze new tendencies in the development of the European transport safety and environmental protection system.
6. to compare and argue the compliance of Croatian law with the acquis communnitaire in the field of transport policy.

1.4. Course Outline

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Basic principles of the EU's common transport policy; basic principles for the development of EU transport systems; "White Paper" on the Common Maritime Policy; EU road transport acquis, overview of conventions and agreements governing road activities (Customs Convention on the International Transport of Goods under the auspices of the TIR carnet, the Convention on international transport of goods by road (CMR), the Convention on the International Transport of Dangerous Goods (ADR), Convention on the Contract for the International Road Transport of Passengers and Luggage (CVR); Overview of EU transport policy documents in the field of railways - 'White Paper, 'Rail plan', pan-European corridors, secondary legal sources of European law relating to the area of rail traffic. Maritime transport policy basics - safety of navigation, improvement of surveillance and control systems responsible for pollution of the marine environment. Air transport policy basics, legal sources of EU aviation law; Air navigation services; air protection traffic; protection against aircraft noise; Aviation safety inspection. Compliance of Croatian law with *acquis communnitaire* in the field of transport policy.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Presentation
1.6. Comments		

1.7. Student Obligations

a) Students' main obligations are active course attendance and they are required to pass two tests as continuous assessment during the term.
b) As a prerequisite for the final exam, students must score at least 35 out of a possible 70 points (50%) during the classes.
c) Students must score at least 15 out of a possible 30 points on final exams (50%).

1.8. Assessment [1] of Learning Outcomes

Course attendance	1	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The process of evaluation of the acquired learning outcomes takes place during continuous assessments through 2 midterm examinations (70 %) and at the final part of the exam (30 %).

Examples of Assessment of Learning Outcomes:
1. Specify the basic principles of the EU Common Transport Policy.
2. What are the principles of development of EU transport systems?
3. Explain the EU acquis in the fields of road, rail, transport and air transport.
4. Specify the importance of access rights to the transport services market and explain the social aspects of transport.
5. Describe new tendencies in the development of the European transport safety and environmental protection system.
6. State the level of compliance of Croatian law with the acquis communnitaire in the field of transport policy.

1.10. Main Reading

1. Radionov, Nikoleta, i dr., Europsko prometno pravo, Pravni fakultet Sveučilišta u Zagrebu, Zagreb, 2011.

1.11. Recommended Reading

1. Treaty Establishing the European Community
2. Treaty on European Union, OJ C 191/92.,
3. Treaty of Amsterdam amending the Treaty on Europe

1.12. Number of Main Reading Examples		
Title	Number of examples	Number of students
Radionov, Nikoleta, i dr, Europsko prometno pravo, Pravni fakultet Sveučilišta u Zagrebu, Zagreb, 2011.		40

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, exam passing results are analyzed and appropriate measures are adopted.

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3.2. Course description

Generic information		
Head of Course	Borna Debelić, PhD	
Course	Shipping and Port Management	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring knowledge in the specific field of port and shipping company management, essential for persons responsible for the successful operation of major maritime economic activities.

1.2. Prerequisites for Course Registration

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1.3. Expected Learning Outcomes

After completing and passing the course, students will be able to:

1. Describe the characteristics of the market structure and parts of the business environment of maritime companies in the context of modern strategic and development planning of port systems.
2. Describe the principles, components and significance of financial and economic planning and the evaluation of port system development plans from the aspect of overall transport and economic development.
3. Analyse information on costs in ports collected from various sources and, based on the analysis conducted, identify possible business opportunities, predict cost levels and trends in costs and values of port services and port tariffs and fees that are important for effective management decision-making.
4. Analyse the impact of measures and instruments of development policy and agency relations in ports and understand the mechanisms of their action and effects on business operations as well as on the competitiveness of the transport route.
5. Explain the specifics of the management system of shipping companies, and indicators of business success as a basis for management decisions in shipping from the aspect of managing market and non-market risks.
6. Apply quantitative and qualitative methods of measuring and evaluating business results in shipping and describe the formation and dynamics of freight rates in shipping.
7. Determine the role and significance of ship cost optimization with regard to the specifics of technical and commercial management in shipping and in relation to indicators of business success.

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Contemporary strategic and development planning of port systems. Financial and economic evaluation of port system development plans. Long-term, medium-term and short-term planning of port system development in the context of overall transport development and development of local and regional economy with emphasis on the development of the port community. Cost dynamics in port operations and cost accounting in ports as a basis for managerial decision-making. Economic and financial indicators of port system business performance from the aspect of providing public services and commercial services of concessionaires. Determining the value of port services in the context of total transport costs. Port fees and tariffs as determinants of port business performance and competitiveness of the transport route within the framework of modern transport networks and competitiveness between ports. Agency relations in the port governance and management system. Specificities and management systems of shipping companies. Labor productivity, economy and profitability of operations as a basis for managerial decision-making in shipping companies. Measurement and evaluation of business results of shipping companies. Formation and dynamics of freight rates in maritime shipping, with an emphasis on the differences and processes of forming freight rates in individual types of maritime shipping activities. Optimization of ship voyage costs in the context of market dynamics. Specificities of technical and commercial management in shipping, and modern approaches to chartering ships and ship space. Indicators of business success in maritime shipping as a determinant of management success.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☒ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☒ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Regular attendance at classes and completion of homework assignments.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project		Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Written continuous knowledge assessment (2 colloquiums, each worth 35% of the learning outcomes, which is a total of 70% of the learning outcomes and a minimum of 50% of the points achieved per colloquium) in which the student demonstrates an understanding of the theoretical concepts and practical implications of specialist management in shipping and port systems and managerial planning (I1 - I7), the mechanisms of their operation and the effects on the operations of shipping and port companies as well as on economic trends, and parts of the business environment of entities in shipping and ports.

Final written exam (30% of the learning outcomes and a minimum of 50% of the points achieved) in which the student demonstrates an understanding of the application and techniques of managing business processes and transactions in shipping and port systems, in the function of quality reporting, and the possibility of applying managerial strategies for improving business processes and managing services (I1 - I7).

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Visvikis, I.D., Panayides, P.M.: Shipping Operations Management, Springer International Publishing, 2017.
3. Haralambides, H. E.: Port Management, Palgrave Macmillan, London, 2015.
4. Mitrović, F., Kesić, B., Jugović, A.: Menadžment u brodarstvu i lukama, Pomorski fakultet Split, 2010.
5. Debelić, B.: Agency Theory and a Concession Relation in Ports Open to Public Traffic in the Function of Empowerment of Entrepreneurial Initiatives, Pomorstvo: Scientific Journal of Maritime Research, 27 (1), 2013., p. 225-246.
6. Buble, M.: Management, Ekonomski fakultet, Split, 2000.

1.11. Recommended Reading

1. Alderton, P. M.: Port Management and Operations, Routledge, London, 2020.
2. Stuchery, R. W.: General Aspect of Port Management, Bremen, 1990.
3. Branch, A. E.: Elements of Port Operation and Managemnent, London, 1986.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Mitrović, F., Kesić, B., Jugović, A.: Menadžment u brodarstvu i lukama	30	75
Buble, M., Management	15	

1.13. Quality Assurance

The quality of studying is continuously monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies, University of Rijeka. An analysis of exam taking is prepared annually, and a survey among students is conducted every semester.

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3.2. Course description

Generic information	
Head of Course	**PhD Mirano Hess**
Course	**Coastal Zone Management**
Study Programme	**Technology and Organization of Transport**
Type of Course	**Optional course**
Year of Study	**2**

Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	45 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To equip students with the understanding of coastal zone management elements, recognizing tasks and challenges, planning, implementation, monitoring, and evaluation within international and national development frameworks, in accordance with modern technological solutions and the latest recommendations and regulations in the field.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:
1. Compare the characteristics of coastal zones in Croatia and worldwide.
2. Assess the importance and elements of sustainable coastal zone development in Croatia and globally.
3. Evaluate key challenges in coastal zone management processes in Croatia and identify recommendations.
4. Identify and highlight similarities and differences between key national and European documents, and describe Croatia's institutional framework.
5. Recognize the phases of coastal zone management and interpret the use of GIS for maritime assets.

1.4. Course Outline

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1. Instruments for integrated coastal zone management.
2. Key characteristics of coastal zones in Croatia.
3. Importance of sustainable coastal zone development in Croatia and globally.
4. Integrated coastal zone management in Croatia and worldwide.
5. Determinants of sustainable development and spatial planning.
6. Coastal zones in international and national development frameworks.
7. European documents for integrated coastal zone management and spatial planning, and their application in Croatia's spatial planning system.
8. Protocol on Integrated Coastal Zone Management.
9. Coastal zone management—institutional framework in Croatia.
10. Coordination and stakeholders in coastal zone management policies.
11. Analysis of planning solutions and processes in relation to integrated coastal zone management.
12. Maritime assets in Croatia's legal framework.
13. Valuation of maritime assets.
14. GIS for maritime assets as a support system for integrated management.
15. Planned development of the Adriatic region.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations

Attendance in classes. Passing an in-course colloquium and a final exam.

1.8. Assessment [1] of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	1.1	Oral exam		Essay		Research	
Project		Continuous Assessment	2.4	Presentation		Practical work	
Portfolio							

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

70% in-class assessment and 30% final exam (according to the University of Rijeka Study Regulations and the Faculty of Maritime Studies of Rijeka Study Regulations). Continuous assessment: colloquium on course material, minimum 50% of grade points required (I1, I2, I3). Final exam: written exam on course material, minimum 50% of grade points required (I4, I5).

Examples of Learning Outcome Assessments:

1. Compare EU principles for coastal zone management. (I1)
2. Evaluate three concepts underlying the philosophy of sustainable coastal zone development. (I2)
3. Identify significant challenges and explain the consequences of spatial planning issues in coastal zones. (I3)
4. Besides administrative bodies in counties, which other institutions are important for coastal zone management in Croatia, and highlight similarities in their functions. (I4)
5. Explain why and how GIS for maritime assets is used. (I5)

1.10. Main Reading

   1. Hess, M.: Upravljanje obalnim područjem, 2025, na Merlinu (https://moodle.srce.hr).

1.11. Recommended Reading

1. John R. Clark, Coastal Zone Management Handbook, CRC Press, 2019.
2. Frank Ahlhorn, Integrated Coastal Zone Management: Status, Challenges and Prospects, Springer Vieweg, 2018.
3. Kovačić, M., Komadina, P.: Upravljanje obalnim područjem i održivi razvoj, Pomorski fakultet u Rijeci, 2011.
4. David R. Green, Coastal Zone Management, Thomas Telford Publishing, 2009.
5. Protokol o integriranom upravljanju obalnim područjima sredozemlja, UNEP/MAP, 2008.
6. Prijedlog direktive o pomorskom prostornom planiranjui integriranom upravljanju obalnim područjem, 2013.
7. Marinović-Uzelac, A., Prostorno planiranje, Dom i svijet, Zagreb, 2021.
8. Schultz-Zehden, A., Gee, K., Scibior, K., HANDBOOK on Integrated Maritime Spatial Planning from the INTERREG III B CADSES PlanCoast Project, Berlin, 2022.
9. Jovanović, Filip ; Hess, Mirano: Reducing the catastrophe risk in coastal areas: risk management at fsru terminals // High technologies. Business. Society. Sofija: Scientific technical union of mechanical engineering Industry - 4.0, 2021.
10. Grbić, Luka ; Hess, Mirano: Tanker inspection regime in correlation with maritime accident risks and management decisions // High technologies. Business. Society. Sofija: Scientific technical union of mechanical engineering Industry - 4.0, 2021.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Hess, M.: Upravljanje obalnim područjem, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	25

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies University of Rijeka. Once a year, the results of the transience are analyzed and appropriate measures are adopted.

3.2. Course description

Generic information		
Head of Course	Borna Debelić, PhD	
Course	Maritime Financing	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring knowledge in the special field of financing maritime projects and maritime organizations, necessary for persons responsible for managing and leading business and technological processes in maritime projects and organizations.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing and passing the course, students will be able to:

1. Describe the system, market structures and elements of investment in the maritime sector, as well as sources, methods and models of financing.
2. Describe the principles, constituent elements and significance of financing the purchase of new and used ships, and describe the sources of possible financing.
3. Analyse the elements of a credit transaction in the purchase and sale of ships, and describe the calculation and repayment models and analyse the return via annuity in relation to instalments.
4. Analyse the impact of liquidity and solvency on debt servicing management from the aspect of the inflow of business funds.
5. Analyse and explain financial transactions and their basic principles in the purchase and sale of ships, and indicators of business success as a basis for financial decisions and risk management.
6. Apply quantitative and qualitative methods of analysing the inflow of business funds, operating costs, profit and loss account analysis, and approaches, methods and techniques of risk management from the aspect of financing.
7. Identify and analyse the specifics of financing infrastructure investments in the maritime sector and transport.

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1.4. Course Outline

General information about investments in the maritime sector. Sources, methods and models of financing in the maritime sector. Financing the construction of new ships from public sources and commercial banks. Financing the acquisition of used ships and sources of funds. Purchase of used ships and specific reasons for buying and selling. Basic elements of a credit transaction when buying and selling ships. Interest and principal, calculation and repayment models. Loan repayment by annuity and by instalments. Calculation of Euribor. Liquidity and solvency in the domain of debt servicing management and expected inflow of funds. Analysis of financial transactions when buying and selling ships and basic principles and conditions. Forecasting the inflow of business funds, operating costs, analysis of the profit and loss account, and risk management from the aspect of debt financing. Instruments of securing receivables. Specific financing of infrastructure investments in the maritime sector and transport. Documentation and execution of financial transactions.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☒ Mentorship ☐ Other _____
1.6. Comments		

1.7. Student Obligations
Regular attendance at classes and completion of homework assignments.

1.8. Assessment [1] of Learning Outcomes

Course attendance	1,5	Class participation	1	Seminar paper		Experiment	
Written exam	1,5	Oral exam		Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Seminar paper and presentation (discussion) in class (10% of learning outcomes) in which students analyse the financing system and sources of financing in the maritime sector and their characteristics as well as their impact on business, as well as the principles, components and significance of different sources and dynamics of financing (I1 - I7) from the aspect of contemporary maritime organizations and projects.

Written continuous knowledge assessment (2 colloquiums, each worth 30% of learning outcomes, which is a total of 60% of learning outcomes and a minimum of 50% of the points achieved per colloquium) in which the student demonstrates understanding of theoretical concepts and practical implications of specialist financing in the maritime sector (I1 - I7), mechanisms of action and effects on the operations of maritime companies and on the economy as a whole.

Final written examination (30% of learning outcomes and minimum 50% of points achieved) in which the student demonstrates understanding of the application and techniques of financial transactions and financial processes in maritime systems and projects, in the function of making quality management decisions on financing development and infrastructure processes and projects in the maritime sector (I1 - I7).

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[1]   **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.10. Main Reading	

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Batalić, M., Mitrović, F.: Financiranje u pomorstvu, Pomorski fakultet Split, Split, 2010.
3. Orsag, S.: Poslovne financije, Avantis, Zagreb, 2015.

1.11. Recommended Reading

1. Harwood, S.: Shipping finance, third edition, Euromoney books, 2006.
2. Bhimani, A., et al.: Upravljačko računovodstvo i računovodstvo troškova, Mate, Zagreb, 2018.
3. Paine, F.: The Financing of Ship Acquisitions, Coulsdon, 1989.
4. Stokes, P.: Ship finance, second edition, LLP, 1997

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Batalić, M., Mitrović, F.: Financiranje u pomorstvu, Pomorski fakultet Split, Split, 2010.	6	70

1.13. Quality Assurance

The quality of studying is continuously monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies, University of Rijeka. An analysis of exam taking is prepared annually, and a survey among students is conducted every semester.

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3.2. Course description

Generic information		
Head of Course	Dario Ogrizović, PhD	
Course	Artificial intelligence	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring basic theoretical and practical knowledge about artificial intelligence and the application of advanced algorithms.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

1. Explain the historical development and theoretical foundations of artificial intelligence.
2. Define and analyse problem-solving methodology and uncertainty modelling.
3. Analyse and classify machine learning.
4. Classify and evaluate artificial neural networks.
5. Define and analyse generative artificial intelligence.
6. Create basic artificial intelligence algorithms and apply them to simpler problems.
7. Create and apply artificial intelligence to optimization problems.
8. Critically evaluate the social aspects of artificial intelligence.

1.4. Course Outline

Historical development of artificial intelligence. Theoretical foundations of artificial intelligence. Problem solving methodology. Knowledge-based information system. Uncertainty modelling. Machine learning. Supervised, unsupervised and supported learning. Deep learning. Artificial neural networks. Generative artificial intelligence. Large language models. Nature-inspired optimization algorithms. Support vector method. Programming tools TensorFlow, H20.AI, Deeplearning4j, Google ML Kit, Apache Mahout, voice assistants (ALEXA, Google Assistant, Siri and Cogito). Application of artificial intelligence, optimization and planning of real problems in maritime and transport. Social aspects of artificial intelligence.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☒ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☒ Laboratory ☐ Mentorship ☐ Other _____

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1.6. Comments	

1.7. Student Obligations

1. Attendance and activity in class
2. Attendance and activity in laboratory exercises
3. Project
4. Written exam (midterms and exam)

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The process of evaluation of the acquired learning outcomes takes place during continuous assessments (through class activities (10%), preparation and presentation of a project (20%), 2 midterm exams - total 40%) and at the final part of the exam (30%). A minimum of 50% of points must be achieved in individual knowledge assessments.

Examples of evaluating learning outcomes in relation to the learning outcomes that are set are:
1. Explain the historical development and theoretical foundations of artificial intelligence.
2. Define and analyse problem-solving methodology and uncertainty modelling.
3. Analyse and classify machine learning.
4. Classify and evaluate artificial neural networks.
5. Define and analyse generative artificial intelligence.
6. Create basic artificial intelligence algorithms and apply them to simpler problems.
7. Create and apply artificial intelligence to optimization problems.
8. Critically evaluate the social aspects of artificial intelligence.

1.10. Main Reading

1. Norvig P. Artificial Intelligence: A Modern Approach, Pearson, 2021.
2. Alpaydin, E. 2021. Introduction to Machine Learning, fourth edition, MIT Press.
3. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

1. Chowdhary, K.R. 2020. Fundamentals of Artificial Intelligence, Springer-Nature.
2. Luger, G.F. 2005. Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Addison-Wesley

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.12. Number of Main Reading Examples		
Title	*Number of examples*	*Number of students*
Norvig P. Artificial Intelligence: A Modern Approach, Pearson, 2021.	3	40
Alpaydin, E. 2021. Introduction to Machine Learning, fourth edition, MIT Press.	5	40

1.13. Quality Assurance
The quality of study is constantly monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of the exams is made annually and a student survey is conducted once a semester. All data, including exam, written work and assessment, are at all times public data for all students who have enrolled in the course (on the e-learning platform).

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3.2. Course description

Generic information		
Head of Course	**Svjetlana Hess, PhD**	
Course	**Queueing Theory**	
Study Programme	**Technology and Organization of Transport**	
Type of Course	**Elective**	
Year of Study	**2**	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	**6**
	Number of Hours (L+E+S)	**30+0+10**

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objective is to equip students with the skills to apply queueing theory by mastering techniques and obtaining solutions—both manually and using computer support—and conducting comprehensive result analyses that lead to practical applications in planning real service processes in transport, service, and logistics sectors.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon successful completion of the course, the student will be able to:
1. State the basic principles and theoretical foundations of queueing theory.
2. Recognize specific problems in a given service activity and determine criteria and decision-making methods.
3. Collect data, define basic queue parameters, and identify the appropriate queue type.
4. Solve illustrative problems for various types of queues using the appropriate formulas.
5. Choose the optimal solution based on set criteria and interpret the results as well as the interdependencies of indicators.
6. Use computer support (QM for Windows) to obtain results

1.4. Course Outline

Definition and types of queues (mass service systems). Basic parameters and performance indicators of mass service systems. Analysis of indicator interdependencies. Impact of system parameters on service efficiency. Waiting cost models. Case studies of different queue types. Detection of bottlenecks and ensuring service flow to support sustainable transport with a focus on mobility. Emphasis on applying queueing theory methods to real-world problems in transport and logistics where queue optimization is required. Software: QM for Windows.

1.5. Modes of Instruction	☒ Lectures ☒ Seminars and workshops ☐ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____

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1.6. Comments	

1.7. Student Obligations

Attendance (minimum 70%), two midterm exams, seminar paper, and final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1.3	Class participation		Seminar paper	1.3	Experiment	
Written exam	0.7	Oral exam		Essay		Research	
Project		Continuous Assessment	2.7	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Evaluation Process

During the course, a maximum of 70% of grade points can be earned through midterm exam and seminar work (learning outcomes: 2–6), and 30% through the final exam (learning outcomes: 1, 2, and 5). The final exam assesses the comprehensiveness of theoretical knowledge and understanding of specific topics in queueing theory and their application in real transport and logistics scenarios. Students must earn at least 35% of total grade points to sit for the final exam and at least 50% to pass.

Examples of evaluation by learning outcome:

1. State theoretical foundations of a type of queue.
2. Choose and describe a hypothetical problem in a transport or service activity, and identify potential optimization criteria considering recognized bottlenecks.
3. For a practical problem, describe the data collection method, identify input parameters, and determine the appropriate queue type to find an optimal solution.
4. Solve a queueing problem using appropriate formulas for the queue type.
5. Interpret the solution based on the set criteria, analyze interdependencies of results, and explain the impact of input parameters on system efficiency.
6. Use QM for Windows to solve a queueing problem.

1.10. Main Reading

1. Course materials available on the e-learning platform Merlin (https://moodle.srce.hr)
2. Zenzerović, Z., Teorija redova čekanja, Stohastički procesi II. dio, autorizirana predavanja, Pomorski fakultet u Rijeci, Rijeka, 2003.

1.11. Recommended Reading

1. Babeli, K., Hess, S., Hess, M., "Capacity utilization of the container terminal as multiphase service system", *European Transport*, 86(4), 2022.
2. Hess, S., Grbčić, A., "The multiphase queuing system of the Rijeka airport", *Pomorstvo*, 33(2), 2019.
3. Barković, D., Operacijska istraživanja, Sveučilište u Osijeku Ekonomski fakultet, Osijek, 2001.
4. Queueing Theory Books Online (http://web2.uwindsor.ca/math/hlynka/qonline.html)
5. Sztrik, J., *Basic Queueing Theory: Foundations of System Performance Modeling*, 2016. https://irh.inf.unideb.hu/~jsztrik/education/16/SOR_Main_Angol.pdf or https://www.freetechbooks.com/basic-queueing-theory-foundations-of-system-performance-modeling-t1083.html

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Course materials on e-learning platform – Merlin	web	20
Zenzerović, Z., Teorija redova čekanja, Stohastički procesi II. dio, autorizirana predavanja, Pomorski fakultet u Rijeci, Rijeka, 2003.	10	20

1.13. Quality Assurance

The quality of education is monitored in accordance with the ISO 9001 system and aligned with European standards and guidelines for quality assurance, implemented at the Faculty of Maritime Studies in Rijeka. Exam pass rate analysis is conducted annually, and student surveys are carried out once per semester.

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3.2. Course Description

Generic information		
Head of Course	Igor Vio, PhD	
Course	Environmental Law	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective (Deactivated)	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS Coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Students should become familiar with international, regional and national rules and regulations regulating the environment. This course will provide an overview of major sources of law and address the variety of regulatory tools and concepts that can be used to prevent environmental harm, particularly to marine spaces. Course objectives are to evaluate the assumptions and justifications when choosing any regulatory approach such as environmental justice and public welfare.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

After passing the exam, students will be able:

1. Define and interpret the basic principles of environmental law.

2. Define and describe the basic principles of the development of international environmental law.

3. Define and explain the sources of environmental law in the legal order of the Republic of Croatia.

4. Describe and analyze new tendencies in the development of environmental protection and conservation rights.

5. Identify and analyze the most important international treaties dedicated to environmental protection and conservation.

6. Describe and argue the compliance of Croatian law with acquis communnitaire in the field of

environmental law.

1.4. Course Outline

Introductory and basic environmental law issues. The concept of environmental law and its place in the legal system. Basic principles of environmental law. Sources of environmental law in the legal order of the Republic of Croatia (Constitution of the Republic of Croatia, Declaration on environmental protection in the Republic of Croatia, environmental laws and other environmental regulations as sources of environmental

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law in the Republic of Croatia, bylaws as sources of environmental law). International legal aspects of protection and conservation environmental. Development of international environmental law. The most important international treaties dedicated to the protection and preservation of environment (environmental protection, protection of the marine environment, protection of international water flows, protection of biological diversity, cross-border traffic of hazardous waste).

1.5. Modes of Instruction	☒ Lectures	☐ Practical work	
	☐ Seminars and workshops	X Multimedia and Network	
	X Exercises	☐ Laboratory	
	X E-learning	☐ Mentorship	
	☐ Field work	☐ Other _____	

1.6. Comments	

1.7. Student Obligations

Students enrolled at the Faculty of Maritime Studies are expected to observe the code of conduct required by the academic institution, and regularly attend lectures and practical work sessions.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,0	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	2,0	Essay		Research	
Project		Continuous Assessment	1,0	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Through continues assessment student achieves up to 70% (Learning Outcomes from 1 to 6), while with the written Final Exam (Learning Outcomes from 1 to 6) up to 30% of total Score.

Examples of Assessment of Learning Outcomes:

1. Specify the basic principles of environmental law.
2. Describe the basic principles of the development of international environmental law.
3. Define sources of environmental law in the legal order of the Republic of Croatia.
4. Explain new tendencies in the development of environmental protection and conservation rights.
5. What are the most important international treaties dedicated to protecting and preserving the environment.
6. Indicate the degree of compliance of Croatian law with the acquis communnitaire in the field of environmental law

1.10. Main Reading

1. O. Lončarić-Horvat, L. Cvitanović, I. Gliha, T. Josipović, D. Medvedović, J. Omejec, M. Seršić, Pravo okoliša, Zagreb, 2003.
2. Course teaching material available on e-learning system - Merlin (https://moodle.srce.hr)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1.11.   Recommended Reading
Zakon o zaštiti okoliša, N.N. 80/13, 153/13, 75/15., 12/18., 118/18.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
O. Lončarić-Horvat, L. Cvitanović, I. Gliha, T. Josipović, D. Medvedović, J. Omejec, M. Seršić, Pravo okoliša, Zagreb, 2003.	20	40
Course teaching material available on e-learning system - Merlin	Web	40

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European quality assurance implemented at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the student pass rate and adopt appropriate measures.

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3.2. Course description

Generic information		
Head of Course	Siniša Vilke, PhD Ljudevit Krpan, PhD	
Course	Logistics in Land Transport	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to provide fundamental knowledge of logistics activities in land transport with an emphasis on improving the organization of the transport process in line with modern requirements for identifying and solving logistics problems.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Explain the planning and organisation of logistics services relevant to road transport.
2. Explain the implementation and control of logistics activities in the road transport process.
3. Justify the planning and organisation of logistics services in rail transport and combined transport.
4. Interpret the implementation and control of logistics activities in the transport process of rail and combined transport.
5. Determine and interpret the integral system of municipal waste collection on a given example.
6. Determine the number of means of transport for the transportation of municipal waste with an extrapolation of the necessary daily trips from transfer stations to the collection point on a given example.

1.4. Course Outline

The strategic importance of logistics. Logistics systems and logistics sectors. Elements of the logistics service. Transport and logistics chain. Optimization of logistics chains. Distribution channels. Interrelation between the logistics chain and the distribution chain. Information and electronic communication support for logistics. Land use and transport planning and logistics. Land transport planning and logistics. Defining transport routes to create a transport network. Organization of corporate logistics. The concept of supply chain. Transport network in the logistics system. Establishment and development of a logistic partnership. Organization of the land transport process. Logistics activities and procedures in the organization of land transportation.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning	☒ Practical work ☐ Multimedia and network ☐ Laboratory ☐ Mentorship

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	☐ Field work		☐ Other	
1.6. Comments				

1.7. Student Obligations				

1.8. Assessment [1] of Learning Outcomes

Course attendance	1	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure of assessment of acquired learning outcomes is carried out by the Study Regulations of the University of Rijeka and the Study Regulations at the Faculty Maritime Studies in Rijeka as follows:

- through continuous assessment of knowledge during classes, 70% of the acquired learning outcomes are evaluated within the 1st exam (35%), and the 2nd exam (35%).
- 30% of the acquired learning outcomes are evaluated in the final exam.

Examples of evaluation of learning outcomes in relation to the set learning outcomes are:

1. Explain the characteristics and specificities of planning and organizing logistics services in road transport.

2. Describe the method of implementing and controlling logistics activities in the road transport process.

3. Explain the principles and specificities of planning and organizing logistics services in rail transport.

4. Explain the principles and characteristics of implementing and controlling logistics activities in the rail transport process.

5. Explain the integrated municipal waste collection system using the given example.

6. Define the projection of daily trips and determine the number of means of transport for transporting municipal waste from transfer stations to the collection center according to the given example.

1.10. Main Reading

1. Baričević, H., Vilke, S.: Logistika i sigurnost kopnenog prometa, Pomorski fakultet, Rijeka, 2016.
2. Zelenika, R.: Logistički sustavi, Ekonomski fakultet, Rijeka, 2005.
3. Segetlija, Z.: Distribucija, Ekonomski fakultet, Osijek, 2006.

1.11. Recommended Reading

1. Bloomberg D., LeMay, J., Hanna, B.: Logistika, Mate d.o.o., Zagreb, 2006.
2. Tilanus, B.: Information Systems in Logistics and Transportation, Emerald Group Publishing Limited, London, 1997.
3. Šamanović, J.: Logistički i distribucijski sustavi, Ekonomski fakultet, Split, 1999.

1.12. Number of Main Reading Examples

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of   the course. Use empty fields for additional activities.

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Title	*Nubmer of examples*	*Number of students*
1. Baričević, H., Vilke, S.: Logistika i sigurnost kopnenog prometa, Pomorski fakultet, Rijeka, 2016.	5	30
2. Zelenika, R.: Logistički sustavi, Ekonomski fakultet, Rijeka, 2005.	5	30
3. Segetlija, Z.: Distribucija, Ekonomski fakultet, Osijek, 2006.	5	30
1.13. Quality Assurance		

The quality of studies is monitored according to the system ISO 9001 and according to the European standards and guidelines for quality assurance introduced at the Faculty Maritime Studies in Rijeka. Once a year the passage results are analyzed and appropriate measures are taken, and once a semester a survey is conducted among the students.

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General information	
	Jasminka Bonato, PhD
Course	**Reliability and safety of technical systems**
Study Programme	**Technology and Organization of Transport**
Type of Course	Optional
Year of Study	2
Estimated Student Workload and Methods of Instruction	

Estimated Student Workload and Methods of Instruction	ECTS credits	5
	Number of hours (L+E+S)	30+15+0

1. DESCRIPTION OF THE SUBJECT

1.1. Course objectives

Presents and approximates the basic ideas of reliability theory; determining the reliability of the component (system); mathematical modeling of technical systems reliability.

1.2. Prerequisites for Course Registration

Passed the course Applied Mathematics.

1.3. Expected Learning Outcomes

1.Describe the basic quantities of reliability theory.

2. Analyze different configurations of technical systems.

3. Application in solving problems from the theory of reliability and availability of different configurations of technical systems.

4. Describe the possibilities of applying reliability theory in engineering and technology.

1.4. Course Outline

Starting terms relevant to the area of reliability of technical systems. Component reliability (fault density, fault frequency. Reliability, mean time to failure). Reproducibility of the component (renewal density, renewal frequency, reproducibility, mean time to renewal). Reliability of non-renewable systems with mutually independent components. Reliability of serial and parallel configuration systems. Reliability of non-renewable systems of parallel-serial and serial-parallel configuration. System reliability of "k of m" configuration. Reliability of non-renewable systems with interdependent components. Reliability of the standby system. Reliability of a renewable parallel configuration system.
Reliability of a renewable reserve system. Availability of a renewable one-component system. Availability of a renewable parallel configuration system. Availability of a renewable reserve system. Reliable design of technical systems. FMEA. Design and safety of technical systems.

1.5. Modes of Instruction	x lectures ☐ seminars and workshops X exercises ☐ distance education ☐ field work	x independent tasks x multimedia and network ☐ laboratory ☐ mentoring work
1.6. Comments		
1.7. Student obligations		

Regular class attendance, taking colloquia, completing homework, as well as independent assignments through

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the merlin system, which students qualify for the final exam.

1.8. Assessment[1] of Learning Outcomes

| Class attendance	2	Teaching activity (homework)		Seminar paper		Experimental work	
Written exam		Oral exam		Essay		Research	0,5
Project		Continuous assessment	1,5	Report		Practical work	
Portfolio		Final exam	1				

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

During classes 70% (colloquia + seminar + dz) and final exam 30%.

Examples of evaluating learning outcomes in relation to set outcomes:

1 Outcomes **1,2 i 3**

Let the system consist of four independent components as shown in the figure. Their reliability at time t = 1000 h are: R1 = 0.6; R2 = 0.7; R3 = 0.8; R4 = 0.9. What is the reliability of the system at time t? Calculate the mean time to failure of this system! (picture)
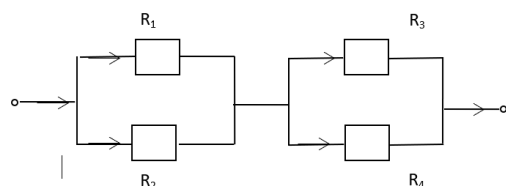
2. Outcomes **4**
Fuzzy FMEA, a method of security of technical systems
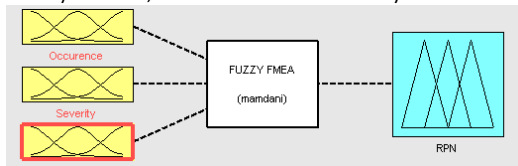
Final exam (outcomes 1,2,3 and 4)
1. Draw a statistical qualitative time diagram of the component failure frequency and write the name
2. What expression is used to determine the reliability of a component if the frequency of component failure when it is in operation is constant?
3. What is the process of failures in the operation of the technical system? Why?
4. What is true for a component with a constant refresh rate?
5. What expression is given to the reproducibility of a component with a constant renewal frequency?

1.10. Main Reading

1. Kraš, Antun; Bonato, Jasminka; Draščić Ban, Biserka: Reliability and availability of digital systems, Rijeka, 2017.
2. Notes from lectures and exercises.
3. V.Mikuličič, Z.Šimić: „Reliability, availability and risk models in the power system: Part 1 Analytical methods of reliability and availability calculatio", Kigen, Zagreb, svibanj, 2008.
4. N. Elezović: Fourier series and integral, Laplace transformation, Školska knjiga, Zagreb

1.11. Recommended Reading

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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J. Bonato:" Reliability and security of technical systems" Rijeka, 2020.		
1.12. Number of Main Reading Examples		

Title	*Number of copies*	Number of students
Kraš, Antun; Bonato, Jasminka; Draščić Ban, Biserka Reliability and availability of digital systems: , Rijeka,2017.	5	30

1.13. Quality Assurance
The quality of studies is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance, which is carried out at the Faculty of Maritime Studies in Rijeka. Student survey conducted at the end of the semester.

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3.2. Course description

Generic information		
Head of Course	**Jasmin Ćelić, PhD**	
Course	**Internet of Things**	
Study Programme	**Technology and Organization of Transport**	
Type of Course	**Elective**	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring knowledge about the principles of operation and design of smart devices, networking technologies, application development, security issues and principles of data processing within IoT networks. Training students for networking smart devices, implementing different platforms and intelligent environments, and working on developing solutions for different areas of application of IoT technology.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon passing the exam, students will be able to:
1. identify the basic concepts and features of the Internet of Things
2. select an appropriate Internet of Things architecture
3. differentiate approaches in implementing IoT solutions
4. differentiate between network and communication protocols
5. identify security threats and ways to compromise privacy
6. propose appropriate IoT solutions for different areas of application

1.4. Course Outline

Internet of Things (IoT) in general, different approaches and concepts. IoT architecture, hardware, components, devices and modules. Sensors and actuators. Cloud and fog computing, EDGE computing. Networking, communication models and methods, standards and protocols. Data collection, transmission, processing and storage. Development and embedded computer systems. Security and privacy in IoT systems. Real-time signal processing and analysis. IoT solutions for different application areas. Internet of Things in industry and maritime.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☒ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments		

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1.7. Student Obligations							

1st preliminary exam, 2nd preliminary exam, final exam

1.8. Assessment[1] of Learning Outcomes

Course attendanc	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	1	Presentation		Practical work	1
Portfolio							

9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

The procedure for evaluating the acquired learning outcomes is carried out according to the Regulations on Studies of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka in the following way:

- 60% of the acquired learning outcomes are evaluated through continuous knowledge assessment during classes:
  through the 1st preliminary exam – learning outcomes 1-3 (30%), 2nd preliminary exam – learning outcomes 4-6 (30%); in each preliminary exam, the student must achieve a minimum of 50% of the points;
  The preliminary exams are of written type, and since the passing threshold for the mandatory continuous evaluation has been established, the student is allowed one repeated access to such evaluation.
- 40% of the acquired learning outcomes (1-6) are evaluated in the final part of the exam, and in order to pass the final exam, the student must achieve a minimum of 50% of the points;
- the final ECTS grade is defined based on the achieved total % of knowledge, skills and competences and the numerical grade after the final/remedial exam as follows:
  - excellent grade (5) corresponds to grade A on the ECTS scale and a success rate of 90 to 100%,
  - very good grade (4) corresponds to grade B on the ECTS scale and a success rate of 75 to 89.9%,
  - good grade (3) corresponds to grade C on the ECTS scale and a success rate of 60 to 74.9%,
  - satisfactory grade (2) corresponds to grade D on the ECTS scale and a success rate of 50 to 59.9%,
  - unsatisfactory grade (1) corresponds to grade F on the ECTS scale and a success rate of 0 to 49.9%.

Examples of learning outcome evaluations in relation to the set learning outcomes are:

1. Name the technologies that enabled the development of the Internet of Things? (LO #1)
2. What is I2C and for what purpose is it used? (LO #2)
3. What is the difference between Cloud and EDGE IoT solutions? (LO #3)
4. What are the limitations of the IEEE 802.15.4 standard? (LO #4)
5. What security threats are recognized as the most significant in IoT solutions? (LO #5)
6. What classes of smart IoT objects are defined in the document RFC7228? (LO #6)

1.10. Main Reading

1. Teaching material available on the Merlin e-learning system (https://moodle.srce.hr)
2. Cirani, S., Ferrari, G., Picone, M., Veltri, L. (2019.). Internet of Things: Architectures, Protocols and Standards, 1st edition, Wiley, Hoboken, NJ, USA

1.11. Recommended Reading

- Elk, K. (2019). Embedded Software for the IoT, 3rd edition, De|G Press, Berlin, Germany
- Javed, A. (2016). Building Arduino Projects for the Internet of Things: Experiments with Real-World

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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Applications, 1st edition, A press, Illinois, USA

- Ćelić, J., Cuculic, A., Valcic, M. (2012.). Remote sensing for ship emissions monitoring in Adriatic ports: an approach, IEEE, Proceedings ELMAR-2012, 263-266., Zadar, Croatia
- Panić, I., Ćelić, J., Cuculić, A. (2018). Wireless condition monitoring of machinery and equipment in maritime industry: an overview, Pomorstvo 32 (2), 201-210., Rijeka, Croatia

1.12. Number of Main Reading Examples		
Title	*Number of examples*	*Number of students*
Cirani, S., Ferrari, G., Picone, M., Veltri, L. (2019.). Internet of Things: Architectures, Protocols and Standards, 1st edition, Wiley, Hoboken, NJ, USA	10	30

1.13. Quality Assurance
The quality of studies is constantly monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of exam taking is prepared annually, and a survey among students is conducted once a semester.

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3.2. Course description

Generic information		
Head of Course	Siniša Vilke, PhD	
Course	Professional Practice 2	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	0+60+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to enable the student to apply the acquired theoretical knowledge in the field of engineering, technology, organization and planning in performing professional tasks in maritime, port and inland transport, as well as to acquire the professional skills necessary for future work.

1.2. Prerequisites for Course Registration

The enrollment terms are determined by the holder of the study program by a special Decision in each academic year. Based on the Decision, a list of students who are qualified for enrollment is drawn up.

1.3. Expected Learning Outcomes

After passing the course, students will be able to:
1. Analyze the work organization of the employer with whom the student performed their professional internship.
2. Interpret and classify work processes and activities and job content of individual jobs within the company/institution in which the student performed their professional internship.
3. Identify and compare theoretical knowledge and practical skills for working on specific jobs in practice.
4. Present and independently perform a specific professional task based on practical knowledge and skills acquired during professional internship.

1.4. Course Outline

The professional practice is carried out in various maritime and transport companies in the public and private sectors where there are jobs related to the content of the curriculum of transport and mobility. As part of the professional practice, the student becomes acquainted with the appropriate jobs for which he / she is trained, along with the task of checking and updating his / her professional knowledge, with a complete overview of the work process.

1.5. Modes of Instruction	☐ Lectures ☐ Seminars and workshops ☐ Exercises ☐ E-learning ☒ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☒ Mentorship ☒ Other _____
1.6. Comments		
1.7. Student Obligations		

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Attending practice with an employer, keeping a Professional Practice Diary, designing a project assignment							

1.8. Assessment[1] of Learning Outcomes

Course attendance		Class participation		Seminar paper		Experiment	
Written exam		Oral exam		Essay		Research	
Project	2,0	Continuous Assessment		Presentation		Practical work	2,0
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Based on the evaluation of the professional practice diary, project assignments, and the mentor's assessment of the student's performance during the internship at the company or institution, the course instructor prepares an opinion and conclusion regarding the student's achievement of the defined learning outcomes and determines the final course grade.

1.10. Main Reading

1.11. Recommended Reading

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

1.13. Quality Assurance

The quality of study is continuously observed under the ISO 9001 system and following European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies, University of Rijeka. An analysis of the exams is given annually, and a survey among students is conducted by the semester.

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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3.2. Course description

Generic information		
Head of Course		
Course	UNDERGRADUATE FINAL THESIS	
Study Programme	Transport and mobility	
Type of Course	Mandatory	
Year of Study	3rd	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	10
	Number of Hours (L+E+S)	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to enable students to independently apply the theoretical and practical knowledge acquired during their studies in the treatment of a selected professional or scientific topic. Students are encouraged to critically analyze domestic and foreign literature, correctly apply research methodology, and structurally compose written work in accordance with academic standards and faculty regulations. Special attention is given to developing the ability to interpret and evaluate relevant data, theoretical approaches, and practical examples. Through the process of consultations with a mentor and a final defense, students acquire competencies to present the results and conclusions of their research before a professional committee, thereby demonstrating academic maturity and the ability to solve complex problems.

1.2. Prerequisites for Course Registration

The student enrolls in the course Final Thesis by registering for the sixth (summer) semester of the undergraduate study program.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. Analyse relevant domestic and foreign literature and identify key insights, viewpoints, and facts related to the research topic.
2. Apply research methodology in the planning, processing, and interpretation of collected data.
3. Synthesize data from various sources and compose a coherent final thesis text that includes illustrations (tables, graphs, diagrams) in accordance with research methodology.
4. Evaluate research results and formulate conclusions that reflect an understanding of the problem and the ability for critical thinking.
5. Present and defend the main results and conclusions of the final thesis before a mentor or professional committee.

1.4. Course Outline

The final thesis is an independent professional or scientific treatment of a selected topic. By completing it, the student demonstrates possession of the necessary competencies and learning outcomes, as well as the ability to apply theoretical and practical knowledge acquired during the studies. In the process of defending the final thesis, the student must demonstrate mastery of relevant scientific and professional knowledge related to the chosen topic. The thesis is written and defended in Croatian, though, exceptionally, it may also be written and defended in English. The oral defence is conducted before the mentor or a Committee for the Defence and Evaluation of the final thesis.

1.5. Modes of Instruction	☐ Lectures	☒ Practical work
	☐ Seminars and workshops	☐ Multimedia and Network

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	☐ Exercises ☐ E-learning ☐ Field work		☐ Laboratory ☒ Mentorship ☒ Other (research and collaboration with industry professionals, analysis and processing of practical examples and data, and so forth)		

1.6. Comments	

1.7. Student Obligations

The student, in agreement with the mentor, must choose the topic of the final thesis and write it according to the instructions found on the faculty website:
https://www.pfri.uniri.hr/web/hr/dokumenti/Upute.za.izradu.zavrsnog.rada.PFRI.26.3.2024.pdf

As assistance for the student, a template for preparing the final thesis is also available on the faculty pages:
https://www.pfri.uniri.hr/web/hr/dokumenti/Predlozak_za_zavrsni_rad_08.07.2024.docx

The paper must be grammatically, orthographically, and stylistically correct.

After the first consultative meeting between the student and mentor, the student consults the assigned literature, studies the subject matter, consults their own collected sources, and thoroughly develops the content of the thesis.

Once the mentor approves and accepts the final thesis, the student submits the final version to the student office.
The final thesis is written in accordance with the Regulations on the Final Thesis:
https://www.pfri.uniri.hr/web/hr/dokumenti/pravni_akti/Pravilnik.o.zavrsnom.radu.na.sveucilisnom.prijediplomskom.studiju.pdf

1.8. Assessment[1] of Learning Outcomes

Course attendance		Class participation		Seminar paper		Experiment	
Written exam		Oral exam		Essay		Research	3,5
Project		Continuous Assessment		Presentation		Practical work	
Portfolio		Mentorship work	1,5	Final thesis in written form	3,5	Oral defence of the final thesis	1,5

1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Verification of the achievement of learning outcomes is conducted before the mentor or a professional Committee composed of three members, including the mentor. An external associate can be a member of the Committee if the thesis topic requires additional specific knowledge and competencies. The student must defend the thesis with an oral presentation and by answering questions. The Committee evaluates the quality and coverage of the work, clarity and precision of the presentation, the ability to answer professional questions, and the level of mastery of the chosen topic. During the defence, a report is kept in which data about the work, questions posed, and the candidate's success grade are recorded.
The originality of the final thesis is checked using an appropriate IT system, and the mentor, based on the analysis, compiles a report on the conducted check. A positive opinion from the mentor and confirmation of the originality of the work are prerequisites for accepting the work and organizing the defense.

1.10. Mandatory literature (at the time of study program proposal submission)

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[1] **NOTE:** Name the proportion of ECTS credits for each activity so that the total number of ECTS credits is equal to the ECTS value of the course. Use empty fields for additional activities.

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1. Mandatory literature from the course for which the final thesis is registered and written
2. Additional literature in agreement with the course instructor – mentor
3. Instructions for writing the final thesis, editors: Prof. Dr. I. Kolanović, Associate Prof. Dr. A. Perić Hadžić, Associate Prof. Dr. I. Jurdana, Assistant Prof. Dr. M. Jardas, University of Rijeka, Faculty of Maritime Studies, Rijeka, 2024 – available at
https://www.pfri.uniri.hr/web/hr/dokumenti/Upute.za.izradu.zavrsnog.rada.PFRI.26.3.2024.pdf

1.11.   Recommended Reading (at the time of study program proposal submission)

1. Mandatory literature from the course for which the final thesis is registered and written
2. Additional literature in agreement with the course instructor – mentor

1.12.   Number of Main Reading Examples

Title	Reading examples	Number of students

1.13.   Quality Assurance

The quality of studying is continuously monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An annual analysis of exam pass rates is conducted, and student surveys are carried out once per semester. Additionally, pass rate results are analyzed annually, and appropriate measures are taken based on the findings.