Sveučilište u Rijeci • University of Rijeka
Trg braće Mažuranića 10 • 51 000 Rijeka • Croatia
T: (051) 406-500 • F: (051) 216-671; 216-091
W: www.uniri.hr • E: ured@uniri.hr

Generic information		
Head of Course	Neven Grubišić, Ph.D.	
Course	Methodology of Transportation Planning and Modelling	
Study Programme	Technology and Organization of Transport	
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

1. Design the transport network, links, and attributes of the objects and to integrate new and existing elements of the model in the software programme
2. Aggregate transport demand and calculate trip distribution between traffic zones
3. Discuss impacts of new infrastructure construction or new service operation
4. Compute travel time and vehicle operating cost based on a general cost function
5. Explain Waldrop's principle of traffic equilibrium, static and dynamic assignments
6. Create procedures for the traffic modelling using computer simulation
7. Test the accessibility of the transport service using isochrones
8. Compare the results of the existing and planning public transport network using simulation

1.4. Course Outline

Principles of transport planning and decision making. Methodology and planning process of the transport networks. Types of plans. Objectives, measures, and traffic performance indicators. Traffic impacts on the mobility and environment. Traffic analytics tools. Spatial and temporal traffic diagram. Elements of transport model network. Travel time and general transport cost function. Vehicle operating cost. Transport modelling, purpose of transport models, types of models: macroscopic, mesoscopic, and microscopic level. Process of transport model design. Trip generation, trip distribution, modal split and trip assignments, private and public transport demand modelling. Models for traffic equilibrium, Waldrop's principle of equilibrium. Freight transport models. Regional transport planning. Accessibility of transport services and measurement of accessibility. Negative impacts of traffic and analytic tools for measurement of the impacts.
Construction of traffic network using software simulation tools, work with attribute and procedures, creation of reports. Evaluation of results, comparation of the basic and alternative scenarios.

1.5. Modes of Instruction		
	☒ Lectures	☐ Practical work
	☒ Seminars and workshops	☒ Multimedia and Network
	☐ Exercises	☐ Laboratory
	☒ E-learning	☐ Mentorship
	☐ Field work	☐ Other _____
1.6. Comments	Lectures and assignments are performed in a specialized classroom	

1.7. Student Obligations

Students are required to attend classes regularly and actively participate in collaborative exercises; they are required to solve the project assignment.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	0.5
Project	1	Continuous Assessment		Presentation		Practical work	
Portfolio							

1.9. Assessment[1] of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam

Attending classes
Class attendance: Learning outcomes 1-8: 10 pts

Activity during seminars
Interactive participation in the computer model design: Learning outcomes 1-2: 20 pts

Collaborative work on the project
Learning outcomes 3-8: 40 pts

Maximum of 70 credits or 70% of total score during teaching process is available. Maximum of 30 credits or 30% of total score may be earned during final exam.

Examples of evaluation by individual learning outcome:

1. Design nodes, links, zones, and connectors using Open Street Map template for the marked area, set up attributes, traffic geometry and traffic directions (I1)
2. Using available demand data, create O-D demand matrix, calculate travel times based on general cost function (I2)
3. Analyze traffic volumes and traffic flows on the routes before and after construction of new infrastructure object, read the results from the simulation, and represent result graphically (I3)
4. Calculate vehicle operating cost using available data (I4)
5. Explain traffic behavior and route choice models in saturated traffic flow (I5)
6. Create simple simulation procedure for distribution of transport demand between selected origin and destination pairs, compare results and produce skim matrices (I6)
7. Calculate out-of-vehicle travel times in the public transport for the selected line route (I7)
8. Compare travel times before and after public stop changes and/or timetable changes using computer simulation (I8)

1.10. Main Reading

1. Teodorović, D., Janić, M.: Transportation Engineering – Theory, Practice, and Modeling, Elsevier, 2017.
2. PTV Visum Fundamentals, PTV Planung Transport Verkehr AG, Karlsruhe, 2012.

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1. PTV Visum Fundamentals, PTV Planung Transport Verkehr AG, Karlsruhe, 2012.	Accessible online	20

[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.

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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Generic information		
Head of Course	**Dr.sc. Biserka Draščić Ban**	
Course	Applied Mathematics	
Study Programme	Logistic and Management in Maritime Industry and Transport	
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 (2+2+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

none

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.

1.8. Assessment[1] of Learning Outcomes

[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.

Course attendanc	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

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

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

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W: www.uniri.hr • E: ured@uniri.hr

Generic information			
Head of Course	PhD Svjetlana Hess		
Course	Technological Processes in Transport		
Study Programme	Technology and Organization of Transport		
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 main objective of the course is to enable students to manage technological processes in transport through the adoption of terminology, defining operating parameters, their analytical calculations and capacity utilization. The above results in getting practically applicable knowledge and skills as a basis for planning and efficient organization of the technological process.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

1. establish and define the basic phases of a certain technological process (transport, loading, storage, transhipment, etc.)
2. define operational indicators of means of transport in road, rail, sea and air transport
3. explain the indicators of transport efficiency and the utilization of transport and transhipment capacities
4. interpret the load distribution diagram on the truck and calculate the axle loads
5. calculate transport performance, distance, time, speed, static and dynamic load, shift rate, utilization of capacity and of working time
6. independently analyze and interpret the results of key indicators of the technological process

1.4. Course Outline

Truck performance indicators. Technical regulations, vehicle maintenance. Transport performance, capacity utilization. Load distribution on a truck and calculation of axle load. Planning the development and utilization of capacities in the port, ie the type and number of means of transport and transhipment. Norm of the port technological processes. Technological processes in railway transport. Wagon operation indicators by capacity and time. The technical power of the railroad. Freight air transport, means of transport. KPI. Analytical calculations.

1.5. Modes of Instruction

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

1.6. Comments

1.7. Student Obligations

Colloquia and assignments, continuous assessment during classes and final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam		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

Evaluation procedure is following: 70% of the grade through exams for students' continuous assessment and 30% of the grade through final exam, ie:
- continuous assessment during classes through 2 exams and 1 assignment and
- with the final exam the understanding of total acquired knowledge in the field of technological processes is checked.

Valuation examples by individual learning outcomes:
1. explain the basic stages for the selected technological process
2. define the performance indicators of means of transport in each branch of traffic
3. explain the efficiency indicators of means of transport and explain how to express the utilization of transport, transhipment and infrastructure / suprastructural capacities
4. interpret the load distribution diagram for a specific truck and calculate the axle load solve the transport problem using the appropriate quantitative method
5. for given input data, calculate transport performance, path, time, speed, static and dynamic load, shift rate, utilization of capacity and working time
6. specify and present key performance indicators for a particular technological process in transport

1.10. Main Reading

- Lectures posted as teaching text on the website (Merlin)
- Baričević, H., Tehnologija kopnenog prometa, Pomorski fakultet u Rijeci, Rijeka, 2001.
- Dundović, Č., Tehnološki procesi u prometu, Sveučilište u Rijeci, Odjel za pomorstvo, Rijeka, 2001.

1.11. Recommended Reading

- Županović, I., Ribarić, B., Organizacija i praćenje učinka cestovnih prijevoznih sredstava, Fakultet prometnih znanosti, Zagreb, 1993.
- Bogović, B., Organizacija željezničkog prometa, Fakultet prometnih znanosti, Zagreb, 1987.
- Radačić, Ž., Suić, I., Škurla Babić, R., Tehnologija zračnog prometa I, Fakultet prometnih znanosti, Zagreb, 2008.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Dundović, Č., Tehnološki procesi u prometu, Sveučilište u Rijeci, Odjel za pomorstvo, Rijeka, 2001.	5	35
Baričević, H., Tehnologija kopnenog prometa, Pomorski fakultet u Rijeci, Rijeka, 2001.	5	35

1.13. Quality Assurance

The studying quality is monitored following the ISO 9001 system, as well as European standards and guidelines for quality assurance, carried out at the Faculty of Maritime Studies, University of Rijeka. Analysis of exam passing is done once a year, and once a semester a survey is conducted among students.

[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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Generic information			
Head of Course	Ines Kolanović, full professor		
Course	Scientific research methodology		
Study Programme	Technology and Organization of Transport		
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 aim of this course is that students after completing the course will be able to apply basic knowledge about the technology and methodology of scientific and professional research in writing student theses at graduate level.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

After passing the exam in this course, students will be able to:
1. correctly explain and interpret the basic terms: science, technology and methodology of scientific research
2. systematically analyze and explain the classification of science in the Republic of Croatia
3. recognize and single out the basic characteristics of certain types of scientific, scientific and professional works
4. explain and apply the rules of scientific research methodology in writing student papers
5. explain and apply the rules of scientific research technology in writing student papers

1.4. Course Outline

About science, scientific activity and research: theory of science, features of modern science, Croatian qualification 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 work in the system of higher education in graduate and postgraduate studies. The concept and features of scientific methods. Scientific research methodology. Technology of scientific research: observation of a scientific problem, setting a hypothesis, selection and analysis of a topic (title), making a research plan, compiling a working bibliography, collecting and studying literature and scientific information, solving a problem, formulating research results, applying research results. Writing a text and technical processing of a scientific and professional work: documentary basis of the manuscript, citation of literature, referencing in the text, presentation of illustrations.

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 obliged to: attend at least 70% of classes, 1 colluquia, seminar paper, final exam

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1,5	Class participation		Seminar paper	1	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

The final grade on the course is the sum of points earned by the student during classes (70% of the grade) and points earned in the final exam (30% of the grade) according to the Regulations on Studies of the University of Rijeka and the Regulations on studying at the Faculty of Maritime Studies in Rijeka.

Continuous assessment:
• 1 colloquia - it is necessary to achieve a minimum of 50% of the total number of points
• seminar paper - t is necessary to present the acquired knowledge and the application of the methodology and technology of scientific research

Final exam:
At the final exam, the integrity of theoretical knowledge in the field of Methodology of scientific research work is checked (minimum 50% of points)

Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Define the terms science, technique, technology and methodology of scientific research. (LO1)
2. Explain the classification of science in the Republic of Croatia. (LO2)
3. On a concrete example, single out the basic features of scientific works. (LO3)
4. Present the features 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 graduate level. (LO5)

1.10. Main Reading

1. 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.
2. Kolanović, I.: Teaching material published on Merlin

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*
Kolanović, I.: Teaching material published on Merlin	Unlimited (web)	
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.	6	13

[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.

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 passability are analyzed and appropriate measures are adopted.		

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Generic information		
Head of Course	Dario Ogrizović, PhD	
Course	Simulation and modelling	
Study Programme	Technology and Organization of Transport	
Type of Course	Elective	
Year of Study	1st	
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

1. Analyze and interpret solutions after simulation experiments
2. Identify problems in the field of business systems that can be solved by different methods of simulation modelling
3. Develop models for identified problems using simulation modelling methods
4. Apply appropriate methods to perform simulation experiments
5. Develop a business decision-making process based on the results of simulation experiments
6. Apply simulation modelling in business process analysis and design
7. Create simulation models using software tools that support methods and techniques of simulation modelling and their verification
8. Make an analysis of the output data of the simulation experiment

1.4. Course Outline

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 attendanc	2	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	1
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 2 midterm examinations - total 70%) and at the final part of the exam (30%).

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

1. Analyze and interpret solutions after conducting simulation experiments
2. Identify problems in the field of business systems that can be solved by different methods of simulation modelling
3. Create models for identified problems using simulation modelling methods
4. Apply appropriate methods to execute simulation experiments
5. Develop business decision-making processes based on the results of simulation experiments
6. Apply simulation modelling in business process analysis and design
7. Create simulation models using software tools that support simulation modelling methods and techniques and their verification
8. Perform a data analysis of the simulation experiment output

1.10. Main Reading

1. Čerić, V. 1993, *Simulacijsko modeliranje*, Školska knjiga, Zagreb.
2. FlexSim user manual, https://docs.flexsim.com
3. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

1. Law, A.M. 2014, *Simulation Modeling and Analysis*, 5th Edition, McGraw-Hill.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Čerić, V. 1993, *Simulacijsko modeliranje*, Školska knjiga, Zagreb.	5	75
FlexSim user manual, https://docs.flexsim.com	120	75

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).

[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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W: www.uniri.hr • E: ured@uniri.hr

Generic information		
Head of Course	**Edvard Tijan, PhD**	
Course	**Human Resource Management**	
Study Programme	**Technology and Organization of Transport**	
Level	graduate	
Type of Course	elective	
Year of Study	1st	
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 acquaint students with the importance and characteristics of human resource management. The principles, functions and processes of human resource management in business systems are studied. Through classes, students will be introduced to the theoretical and practical foundations of teamwork and strategies for staff recruitment, 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. Properly interpret the role and meaning of human capital
2. Analyze and describe jobs, job positions and tasks
3. Conduct tests and interviews related to the selection and employment of candidates
4. Identify sources and methods of recruitment and selection
5. Develop a work plan and program for innovating employee knowledge
6. Describe the stages of introducing workers to their jobs
7. Determine the criteria and methods of employee rewarding
8. Organize processes of human resource development
9. Compare and apply techniques for assessing employee achievements
10. Improve general individual competencies and communication skills

1.4. Course Outline

Theoretical perspectives of HRM. Interdependence of HR development and business systems. Functions and goals of HRM. Significance and role of HR in the company. Process and relationship management in teamwork. Job design and analysis. Planning, recruiting and selecting employees. Procedures for selecting managers. Legal regulations of labor. Conclusion and termination of employment contract. Employment induction policies. Employee motivation. Innovation of knowledge in the business system. Assessing 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

The student is required to attend and actively participate in lectures and be present in at least 70% of classes. All continuous assessments affect the grade, none of which should be satisfied with less than 50%.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	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

Assessment and evaluation include a teaching activity, two colloquia and a final oral exam. Assessment is carried out in accordance with the applicable university and faculty Regulations on study. The student can achieve up to 70% of the grade during classes, and the remaining 30% can be achieved at the final exam. At each knowledge test, the student must master at least 50% of the learning outcomes, ie achieve at least 50% of possible points.

Examples of exam questions:
Learning Outcome 3: Select appropriate tests for different job positions and explain how to implement them.
Learning Outcome 6: Create a plan to introduce a new employee to the job.
Learning Outcome 7: Design a system of employee motivation and reward consisting of tangible (financial) and intangible components

1.10. Main Reading

Teaching materials on the e-learning system.
Vujić, V .: Human Capital Management - 3rd Edition, University of Rijeka, Faculty of Hospitality Management, Opatija, 2008.

1.11. Recommended Reading

1. Bahtijarević Šiber, F., Management ljudskih potencijala, Golden marketing, Zagreb, 1999.
2. Dessler, G., Human Resource Management, Prentice Hall, New Jersey, 2003.
3. Vujić, V. et al: Korporativno upravljanje – Hrvatsko udruženje menadžera i poduzetnika, Zagreb, 2008.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Vujić, V .: Human Capital Management	5	30

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).

[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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Generic information		
Head of Course	**Lovro Maglić, Ph.D.**	
Course	**MARINE TECHNOLOGIES**	
Study Programme	**Technology and Organisation of Transport**	
Type of Course	**Optional**	
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

Objective of the course is to familiarize students with most important features, governing rules and regulations as well as principles of numerous activities for sea and seabed exploration and exploitation. The course deals only with those activities employing modern technologies or those which are caused by recent technological developments.

1.2. Prerequisites for Course Registration

There are no special requirements for enrolling in the course.

1.3. Expected Learning Outcomes

1. Define the content and concept of marine technologies.
2. Distinguish the 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.
3. Explain technological concepts and distinguish methods of fishing marine organisms.
4. Explain modern techniques of mariculture and compare their advantages and disadvantages.
5. Explain technological concepts and distinguish methods of exploration and exploitation of hydrocarbons and ores from the seabed.
6. Explain technological concepts and compare the conditions and efficiency of seawater exploitation methods
7. Explain technological concepts and analyze the applicability of certain methods of using sea energy.
8. Explain towing technological concepts, differentiate equipment and compare towing methods.
9. Distinguish rights and obligations in contracting and carrying out rescue of property at sea and describe specialized vessels for rescue of property.
10. Explain technological concepts and basic activities in the field of shipbuilding and nautical tourism.
11. Explain the technological concepts and underwater activities of divers and modern systems such as remotely controlled and autonomous vehicles.

1.4. Course Outline

The concept of marine technologies in general. The right to exploit the sea and the seabed. Marine fishing and mariculture. Hydrocarbon exploration and exploitation. Marine mining and dredging. Exploiting the energy of the sea. Seawater treatment. Towing and rescue at sea. Nautical tourism. Shipbuilding. Underwater activities - divers and autonomous and remotely controlled vehicles.

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

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 outcomes (Outcomes 1-11) - 50%
- Final oral exam (outcomes 1-11) - 50%

Examples of evaluating learning outcomes:
- Describe the rights and obligations of the coastal state in the exploitation of resources in the exclusive economic zone.
- Explain the technologies of fishing pelagic species.
- Describe the principle of hydrocarbon exploration by seismic ships.
- Compare the features of different types of platforms for hydrocarbon exploration.
- State and explain the principles of using wave energy.
- Assess which principle of sea energy use is applicable in the Adriatic Sea.
- Compare and explain different dredging methods with hydraulic dredgers.
- Explain the rights and obligations of users of anchorages in nautical tourism in accordance with the

1.10. Main Reading

Marine Technology lecture script available on the Merlin e-learning system

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*
Marine Technology lecture script available on the Merlin e-learning system	unlimited	30
selection of articles and studies available on the Merlin e-learning system	unlimited	30
Selected entries of the Maritime Encyclopedia	1	30

1.13. Quality Assurance

The quality of studies is monitored in accordance with the system ISO 9001 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 pass rate are analyzed and appropriate measures are adopted.

[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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W: www.uniri.hr • E: ured@uniri.hr

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

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The basic objective is to familiarize students with specificities of public sector management with emphasis on the subject matter and meaning of public sector economics while studying and understanding the issue of why public authorities (state, regional and/or local) appear as a market entity at all, and what tasks and functions it fills in the context of developed economies, and what and how much influence, place and role it plays in economic flows, especially regarding the categories of goods on which it makes allocative decisions.

1.2. Prerequisites for Course Registration

No additional prerequisites.

1.3. Expected Learning Outcomes

It is expected that students after passing the exam can:

1. Properly define and interpret fundamental concepts within public sector economics.
2. Classify and interpret basic categories of economic goods and classification criteria.
3. Explain the role of public authority in economic flows.
4. Understand and properly interpret public authorities' actions in the context of decision making on allocation.
5. Analyse, compare and demonstrate the specifics of the allocation depending on the types of goods.
6. Argument to the importance and impact of governance in the public sector in view of the economic and non-economic effects arising from its operation.
7. Understand the basic components of the domestic product and the impact of the public sector on macroeconomic flows through the system of public finances and public policies.
8. Explain the postulates and the importance of public choice theory and game theory.
9. Explain allocation mechanisms and their peculiarities.
10. Explain new tendencies in the management of common and public goods, and critically consider opportunities for further improvements.

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1.4. Course Outline

The role of the public sector and the role of public authority in economics. Economic reasons for the existence of the public sector. Public Choice Theory. The influence of public choice theory and complementary theories on development of the contemporary public sector. Types of economic goods and classification criteria. Features of Public Sector Governance. 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. Characteristics of collective decision-making and preference aggregation issues. Game theory and collective action. Deliberation and public sector. Pluralism, participation and service delivery. Budgeting and public expenditure policies and practices. Public sector performance. Public sector constraints and self-regulatory forms of governance.

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

1.6. Comments	

1.7. Student Obligations

1. Attending classes
2. Actively participate in classes
3. Development of project task
4. Study, research and solving tasks
5. Colloquiums
6. Final exam

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam	0,5	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

Through colloquiums, experiment and course attendance and participation students achieve up to 70% (Learning Outcomes from 1 to 10), while with the written Final Exam (Learning Outcomes from 1 to 10) up to 30% of total score.

Examples of Assessment of Learning Outcomes:

1. Specify the role of the public sector in economics and explain reasons for the existence of the public sector in the context of practice as well as Public Choice Theory. (Learning Outcomes 1, 2, 3, 4)
2. Explain the specifics of the allocation depending on the types of economic goods considering impact of governance in the public sector in view of the economic and non-economic effects arising. (Learning Outcomes 5, 6, 7)
3. Demonstrate allocation mechanisms and specify their peculiarities explaining new empirical tendencies in the management of common and public goods. (Learning Outcomes 8, 9, 10)

[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.

1.10. Main Reading

1. Ostrom, E.: Upravljanje zajedničkim dobrima: Evolucija institucija za kolektivno djelovanje, Naklada Jesenski i Turk, Zagreb, 2006.
2. McLean, I., (1997). Uvod u javni izbor. Zagreb: Fakultet političkih znanosti.
3. 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.
4. 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.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

1.13. Quality Assurance

Quality assurance system of educational process is in accordance with ISO 9001:2000 system as implemented on Faculty of Maritime Studies Rijeka. Analysis of exams is carried out annually. Students' evaluation is carried out each semester (more details provided in part describing organization of the Faculty).

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Generic information			
Head of Course	dr. sc. Alen Jugović, Full professor		
Course	Economics and organization of maritime passenger transport		
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 + 0 +15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main goal and task of the course is to enable students to valorize relevant features and factors of maritime passenger transport that are in the function of development of transport infrastructure, superstructure, city and its surroundings, island units and determine the importance of maritime transport for maritime and tourist system of Croatia. Through seminars, apply this knowledge to specific cases in practice by applying the basic economic laws to try to explain the business of passenger ports and shipping companies (and all entities) in the maritime passenger service.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After finishing this course students will be able to do the following:
1) Define the basic concepts of maritime passenger transport.
2) Valorize the characteristics of passenger ports, their connection with tourism and the economy, and especially their importance for the development of the island.
3) Determine the characteristics of liner shipping.
4) Analyze the trends in the development of nautical tourism ports on the coast and on the islands, and determine their impact on the sustainable development of the destination.
5) Evaluate the importance and influence of management and organization on the development of maritime passenger service.
6) Review the multiplicative effects of seaports.

1.4. Course Outline

RELEVANT CHARACTERISTICS OF PASSENGER SEAPORTS. Concept, functions and development of ports. Business technology and active participants in seaports. **STATE AND SIGNIFICANCE OF PASSENGER SEAPORTS AND PASSENGER SHIPS IN THE WORLD AND EUROPE.** Business analysis, specific quality of privatization process. Features of maritime passenger shipping. **MANAGEMENT OF MARITIME PORTS IN THE WORLD AND THE REPUBLIC OF CROATIA.** Legal framework and business principles of seaports. Management of seaports. Port management of county and local importance for the Republic of Croatia. Nautical tourism port management. **LOGISTICAL AND ECONOMICAL ELEMENTS OF DEVELOPMENT OF PASSENGER SEAPORTS AND SHIPPING.** Economic indicators and logistical elements of progress of development of seaports. Multiplicative effects of seaports. The role of tourism in the development of maritime passenger transport. Basics of cruising 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	None.	

1.7. Student Obligations

1) Class attendance
2) Attending seminars
3) Passing colloquiums
4) Seminar
5) Final exam

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1,5	Class participation		Seminar paper	1	Experiment	
Written exam	0,5	Oral exam		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.

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 testing of knowledge through two colloquia, preparation and presentation of seminars and the final exam. Grading is carried out in accordance with the Ordinance on Studies of the University of Rijeka and the Ordinance on Studying at the Faculty of Maritime Studies in Rijeka, which means that a student can achieve 70% of the grade during classes and the remaining 30% on the final exam.

Testing of knowledge in the classroom is carried out continuously, and students can achieve a percentage of grades in the following way:

1) Colloquium 25%
2) Colloquium 25%
3) Seminar 20%

The final exam is open to students who gained 35 points during classes, or 50% of the total number of points that could be achieved during the evaluation in class. Also, it is a condition that students achieve at least 50% of points in each colloquium. The final exam is in writing and covers 30% of the total grade. Students have to pass 50% of the final exam in order to achieve a positive grade from the course.

Some examples of evaluating learning outcomes are:

1) Define what maritime passenger transport involves.
2) Explain the connection of the passenger port with tourism and the economy of the municipality / city.
3) List the basic characteristics of liner shipping.
4) Analyze the development trend of nautical tourism ports.
5) Explain the importance of management and organization for the development of maritime passenger service.
6) Identify and analyze the micro and macro multiplicative effects of a seaport.

1.10. Main Reading

1) Nastavni materijal na sustavu za e-učenje – 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) Stopford, M.: Maritime Economics, Routledge, London & New York, 2000.
2) Mrnjavac, E.: Promet u turizmu, Fakultet za turistički i hotelski menadžment, Opatija, 2002.
3) Wayne K.Talley: Port Economics, Routledge – Taylor and Francis Group, London and New York, 2009.
4) 4) Notteboom, T., Pallis, A., Rodrigue, J.: Port Economics, Management and Policy, New York: Routledge, 2020.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1) Kesić, B., Jugović, A.: Menadžment pomorskoputničkih luka, Sveučilište u Rijeci Pomorski fakultet Rijeka & Liber d.o.o., Rijeka, 2006.*	30	46
2) Peručić, D.: Cruising-turizam – razvoj, strategije i ključni nositelji, Sveučilište u Dubrovniku, Dubrovnik, 2013.	10	46

1.13. Quality Assurance

Quality assurance system of educational process is in accordance with ISO 9001:2000 system as implemented on Faculty of Maritime Studies Rijeka. Analysis of exams is carried out annually. Students' evaluation is carried out each semester (more details provided in part describing organization of the Faculty).

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Generic information			
Head of Course	Dario Ogrizović, PhD		
Course	Big Data Analysis		
Study Programme	Technology and Organization of Transport		
Type of Course	Elective		
Year of Study	1st		
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

9. Explain the theoretical foundations of big data analysis.
10. Distinguish types of problems and categories of big data.
11. Indicate the sources and methods of data collection.
12. Describe data processing and formatting.
13. Indicate types of storage systems.
14. Design of a system for finding similar entities, frequent sets and groups in big data.
15. Design of a referral system.
16. Distinguish and systematize systems for big data processing and analysis and software tools.

1.4. Course Outline

Theoretical foundations of big data analysis. Types of problems and categories of big data. Sources and methods of data collection. Data processing and formatting. Storage systems. Analysis of flows and links in data. Finding similar entities, frequent sets and groups in big data. Referral 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.

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 attendanc	1,5	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	0,5
Project	0,5	Continuous Assessment	0,5	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 2 midterm examinations - total 70%) and at the final part of the exam (30%).

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

9. Explain the theoretical foundations of big data analysis.
10. Distinguish types of problems and categories of big data.
11. Indicate the sources and methods of data collection.
12. Describe data processing and formatting.
13. Indicate types of storage systems.
14. Design of a system for finding similar entities, frequent sets and groups in big data.
15. Design of a referral system.
16. Distinguish and systematize systems for big data processing and analysis and software tools.

1.10. Main Reading

4. Kelleher, J.D., Tierney, B. 2021. *Znanost o podacima*, MIT Press, Mate d.o.o.
5. Leskovec, J., Rajaraman, A., Ullman, J. D. 2014. *Mining of Massive Datasets*, Cambridge University Press.
6. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Kelleher, J.D., Tierney, B. 2021. *Znanost o podacima*, Mate d.o.o.	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).

[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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W: www.uniri.hr • E: ured@uniri.hr

Opće informacije		
Head of Course	**Siniša Vilke, Ph. D.**	
Course	**Urban traffic and environment**	
Study Programme	**Technology and Organisation of Transport**	
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

2. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to acquire basic knowledge of urban transport with the application of improvement according to modern requirements and criteria related to sustainability and environmental management.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Interpret the requirements and characteristics of public and individual urban transport.
2. Demonstrate the benefits, effectiveness, and opportunities for the development of public transportation.
3. Explain and discuss conventional and innovative technologies in urban transport.
4. Interpret and analyse the relationship between urban transportation and the environment.
5. Identify and interpret the basic elements of the route network and the optimal structure of the route network of urban public transport.
6. interpret the application of the geographical information system (GIS) in urban transport.
7. interpret the relationship between public transport planning and transport sustainability.
8. prepare and present a research brief on a particular transport technology or transport solution in an urban setting.

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 urban transport network planning. Conventional modes of public transport. Parathranzit. Innovative technologies in urban transport. Urban expansion, teleworking 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 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. 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 process of assessment of the acquired learning outcomes is carried out according to the study regulations of the University of Rijeka and the study regulations at the Faculty Maritime Studies in Rijeka as follows:

- through continuous review of knowledge during classes, 70% of the acquired learning outcomes in the 1st colloquium (25%), 2nd colloquium (25%) and through the elaboration and presentation of the research assignment (20%);
- in the final part of the examination 30% of the acquired learning outcomes are assessed.

1. Examples of assessment of learning outcomes in relation to the specified learning outcomes are:
2. Expand on the characteristics and features of public and individual urban transport.
3. Describe the basic principles, benefits and effectiveness of public transport and explain the possibility of its development.
4. Name and justify conventional and innovative technologies in urban transport.
5. Describe and explain the environmental impact of urban transport.
6. Describe the basic elements of the route network and the optimal structure of the route network of urban public transport with the help of an example.
7. Describe the application of geographical information system (GIS) in urban transport.
8. Explain the relationship between urban public transport planning and transport sustainability.

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.

1.11. Recommended Reading

1. Genevieve, G., Hanson, S.: The Geography of Urban Transportation, Fourth Edition, The Guilford Press, New York, 2017.
2. Vuchic, V., R.: Urban Transit: Operations, Planning and Economics, John Wiley & Sons, Inc., Hoboken, New Jersey, 2005.
3. Black, A.: Urban Mass Transportation Planning, McGraw-Hill College, New York, 1995.
4. Črnjar, M.: Ekonimika i politika zaštite okoliša, Ekonomski fakultet, Rijeka, 2002.
5. 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

[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.

1.13. 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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Generic information			
Head of Course	PhD Tanja Poletan Jugović, Full Professor		
Course	Passenger Transport Flows		
Study Programme	Technology and Organization of Transport		
Type of Course	Compulsory		
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 to analyse the basic types, elements and laws of formation of passenger transport flows, analysis of factors on which depends the formation, organization and planning of passenger traffic flows and to make conclusions about the current state and trends of sustainable passenger development.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

After passing the exam, students will be able to do the following:

1. Explain the basic laws of formation, elements and significance of passenger transport flows.
2. Analyse the specifics of passenger flows with regard to different transport modalities, motives (purpose) of travel and other criteria.
3. Interpret geo-traffic, socio-economic and logistical factors of formation, expansion, consolidation and spatial distribution of passenger transport flows.
4. Argue the specifics of individual needs and requirements of passengers as an "object" of transport.
5. Explain the peculiarities of the organization and planning of passenger transport flows in urban structures.
6. Analyse the relevant indicators of the formation of passenger flows - intensity, structure, dynamics and spatial distribution, …
7. Explain the specifics of the organization and planning of passenger traffic flows depending on certain types of passenger flows.
8. Argue the conditionality and tendencies of sustainable development of passenger transport on a global, regional and national level.

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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

Student obligations are following: 1st and 2nd exam through continuous monitoring and assessment and final exam / preparation and presentation of research project which is valuated according defined criterions within the final grade.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1	Class participation		Seminar paper	1	Experiment	
Written exam	0,5	Oral exam		Essay		Research	
Project		Continuous Assessment	2	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 evaluating the acquired learning outcomes takes place according to the Rule book of Studies at the University of Rijeka and Studying regulation at the Faculty of Maritime Studies in Rijeka as follows:

- 70% of the acquired learning outcomes within the 1st exam (35%), 2nd exam (35%) are evaluated through continuous monitoring and assessment during classes, and through the presentation of the research task - seminar (20%); the student must realize a minimum of 50% of points for each exam, and the presentation of the research task is evaluated on the basis of elaborated assessment criteria;
- at the final part of the exam/ research project, 30% of the acquired learning outcomes are evaluated, and the student must realize a minimum of 50% of points to pass the final exam.

[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.

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

1. Explain the manifestations of passenger travel in relation to travel motives.
2. Explain how competition between transport branches shapes the structure of passenger traffic.
3. Interpret geo-traffic factors that affect the spatial distribution of passenger flows.
4. Compare the requirements of passengers and cargo as an object of transport in the context of the quality of transport service.
5. Explain the time distribution of passenger flows in urban structures.
6. Determine 2 environments - navigable areas of the Republic of Croatia which, according to current statistical sources and data on the number of passengers, dominate in the total regular maritime passenger transport in the Republic of Croatia.
7. Give 2 examples of regulatory measures that can affect equal competition and liberalization in the (air) passenger transport market
8. Argue at least three factors for the sustainable development of passenger transport in the context of European transport policy.

1.10. Main Reading

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

1.11. Recommended Reading

- Đukić, A., Prometna geografija-geoprometne odrednice globalizacije u prometu i turizmu, Veleučilište u Dubrovniku, Dubrovnik, 2001. (selected chapters),
- Current statistical sources with current data: Shipping Statistics and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen; Statistički ljetopis Republike Hrvatske, Državni zavod za statistiku, RH, Zagreb;
- 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.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
teaching material available within the e-course Passenger Transport Flows - published on the e-learning system - Merlin (https://moodle.srce.hr) in 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 studying quality is monitored following the ISO 9001 system, as well as European standards and guidelines for quality assurance, carried out at the Faculty of Maritime Studies, University of Rijeka. Analysis of exam passing is given annually and a survey among students is conducted by the semester.

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Generic information		
Head of Course	**Assist. prof. Livia Maglić, phD**	
Course	**Sustainable marinas**	
Study Programme	**Technology and Organization of Transport**	
Type of Course	**Compulsory**	
Year of Study	**1st**	
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

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

1. Explain the principles of sustainable management in marinas
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 on given examples

1.4. Course Outline

Definition of sustainability and sustainable management of marinas. Categorization 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 minimization 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, drones). Sustainable waste and wastewater management (promoting and implementing more efficient waste management and treatment). Examples of good practice in the world and in the Republic of Croatia.

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 attendanc	1,5	Class participation		Seminar paper	0,5	Experiment	
Written exam		Oral exam	0,5	Essay		Research	0,5
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

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.

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 default marina, single out certificates in the field of CMS and EMS.
4. Specify the intelligent technologies used in marinas for sustainable management of the marine environment and wastewater management.
5. Apply the concept of sustainable management to the default marina.
6. Analyze the effects of the introduction of information technology on berths 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

- 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] 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*
EPA (2005.) Marina Environmental Management Plan	Unlimited	

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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Generic information		
Head of Course	Ines Kolanović, full professor	
Course	Quality in maritime industry	
Study Programme	Technology and Organization of Transport	
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 acquaint students with the factors and concept of service quality, quality measurement, quality assurance and management system in maritime affairs.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. To explain term and specificity of service quality in maritime and transport
2. To determine the theoretical determinants and the concept of service quality in maritime affairs
3. To assess and measure the quality of maritime service
4. To explain the concepts, principles and goals of Croatian standardization
5. To analyze the elements, principles and specifics of the maritime service quality management system
6. To recognize the role and responsibility of the organization's management in the quality management system
7. To explain the improvement, innovation and evaluation of the maritime quality management system

1.4. Course Outline

Definitions of service quality and explanation of relevant terms. An overview of the historical development of service quality. Quality models. The importance and significance of quality in the development of service industries. Quality as a factor of competitiveness in the maritime activities market. Measuring the quality of service in the maritime sector. Quality standardization. Principles of service quality management. Service quality management systems. Quality management tools and methods. Responsibility of the organization's management for service quality. Resource management. Service delivery process. Improving the service quality management system. Evaluation of service quality management system. Quality costs. Quality control. Specifics of the maritime service quality management system.

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 obliged to: attend at least 70% of classes, practical work (research task), 2 colluquia, final exam

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1	Class participation		Seminar paper		Experiment	
Written exam	1	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 final grade on the course is the sum of points earned by the student during classes (70% of the grade) and points earned in the final exam (30% of the grade) according to the Regulations on Studies of the University of Rijeka and the Regulations on studying at the Faculty of Maritime Studies in Rijeka.

Continuous assessment:
• 2 colloquia - it is necessary to achieve a minimum of 50% of the total number of points in each colloquium
• practical work (research task) - the verification of the adopted outcomes are checked by oral presentation
Final exam:
At the final exam, the material of the entire course is checked and it is necessary to achieve a minimum of 50% of the total number of points
Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. What are the specifics of service quality in relation to product quality? (I1)
2. How did you explain the concept of port service quality? (I2)
3. Why is it important to measure the quality of port service? (I3)
4. Which institutions represent the infrastructure for quality in the Republic of Croatia? (I4)
5. On the example of port service, emphasize the importance of the PDCA cycle. (I5)
6. What is the role of top management in the quality management system? (I6)
7. Explain the procedure of quality system certification with arguments. (I7)

1.10. Main Reading

1. Kolanović, I.: Teaching material published on Merlin
2. Injac, N.: Mala enciklopedija kvalitete, Moderna povijest kvalitete, III. Dio, Oskar, Zagreb, 2001.
3. Juran, J.M., Gryna, F.M.: Planiranje i analiza kvalitete, Mate d.o.o. Zagreb, 1999.
4. ISO 9001:2015 Quality Management System Requirements

1.11. Recommended Reading

1. Kondić, Ž.: Kvaliteta i ISO 9000, Tiva, Varaždin, 2002.
2. Skoko, H.: Upravljanje kvalitetom, Sinergija, 2000.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Kolanović, I.: Teaching material published on Merlin	Unlimited (web)	Elective course
Juran, J.M., Gryna, F.M.: Planiranje i analiza kvalitete, Mate d.o.o. Zagreb, 1999.	2	Elective course
Injac, N.: Mala enciklopedija kvalitete, Moderna povijest kvalitete, III. Dio, Oskar, Zagreb, 2001.	2	Elective course
ISO 9001:2015 Quality Management System Requirements	Unlimited (web)	Elective course

[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.

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 passability are analyzed and appropriate measures are adopted.

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Generic information			
Head of Course	**Vlado Frančić, Associate Professor, Ph.D.**		
Course	**International Maritime Safety System**		
Study Programme	**Technology and Organization of Transport**		
Type of Course	**Elective**		
Year of Study	**1**	Semester **2**	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		**30 + 15 + 0 (2 + 1 + 0)**

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course objectives are to explicate basic characteristics, laws and regulations related to the navigation safety and marine environment pollution prevention systems. The course describes International maritime safety system in general, based on international and national regulations including industry standards. Furthermore, principals of surveys, Certification procedures and Port State Inspection (PSC) are explained. Emphasis is given to the way of carrying out decisions and regulations on political, technological and implementation level as well as their influence to the business efficiency of the maritime companies on international and national level.

1.2. Prerequisites for Course Registration

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

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. **Determine and discuss the international legal framework and its principles related to safety of navigation and protection of the marine environment;**
2. **Explain and analyses the structure and organization activities of the International Maritime Organization (IMO);**
3. **Explain in detail important maritime conventions related to safety of navigation;**
4. **Determine and explain the role, rights and obligations of Recognized organizations (ROs);**
5. **Elaborate certification system;**
6. **Elaborate and discuss principles of Port State Inspection in shipping and related procedures;**
7. **Determine sand envisage the PSC procedure in accordance with Paris MoU requirements;**
8. **Compare surveys and port state inspection process.**
9. **Assess the implication of required safety measures on business efficiency of the shipowner and ship operator.**

1.4. Course Outline

Principles of implementation and managing 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 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 national level and 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 to ships sailing under foreign flag (Port State Control – PSC). Port State Control Regime. Regional cooperation. Rights and obligations and procedures according Paris Memorandum of Understandings. 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

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

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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) student will achieve learning outcomes. On the final exam (oral exam) student 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 ship risk profile of the specific ship type according the rules of the Paris MoU. (Learning Outcomes 7, 8)**

[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.

1.10. Main Reading

1. **Lecturer's notes published on official webpage**
2. **Damir Zec, Sigurnost na moru, University textbook, Faculty of Maritime Studies Rijeka, 2001.**
3. **Recognized Organizations Code, IMO.**
4. **Paris Memorandum of Understanding on Por State Control – latest annex.**

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 and 4	**Web**	**30**
2	**5**	**5**

1.13. Quality Assurance

Internal:
- **Student feedback (SET - Student evaluation of teaching) at the end of academic year.**
- **Course review by the head of course at the end of academic year.**

External:
Programme quality review carried by the QA Agency.

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Generic information		
Head of Course	Neven Grubišić, Ph.D.	
Course	Designing and Planning of Port and Terminals	
Study Programme	Technology and Organization of Transport	
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

3. 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

9. Apply the system analysis procedures and LCM methods in planning of ports and terminals.
10. Identify functional requirements to be used for strategic planning
11. Divide port area into zones and draw the port layout with the main infrastructure objects (zoning)
12. Calculate optimal number of berthing facilities and the port area for different type of terminals
13. Recommend capacity needs and terminal configuration for different development scenarios
14. Solve typical logistic tactical problems in Container terminals
15. 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.

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

1.6. Comments

1.7. Student Obligations

Students are required to attend classes regularly and actively participate in the learning process during the course.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1	Class participation	0.5	Seminar paper		Experiment	
Written exam		Oral exam	1	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

Attending classes
Class attendance: Learning outcomes 1-7: 10 pts

Continuous Assessment
Assignment 1: Port zooning plan. Learning outcomes 1-3: 20 pts
Assignment 2: Capacity calculation. Learning outcomes 4-5: 20 pts
Assignment 3: Berth and QC allocation plan and QC scheduling plan. Learning outcomes 6-7: 20 pts

Maximum of 70 credits or 70% of total score during teaching process is available. Maximum of 30 credits or 30% of total score may be earned during final exam.

Examples of evaluation by individual learning outcome:

9. Draw and explain relations in V-diagram considering a construction or reconstruction of the port facilities
10. Identify stakeholders, and positive/negative impacts of port infrastructure construction on them
11. Construct the simple zoning of the port area showing the main port infrastructure and their attributes.
12. Construct the capacity diagram based on cargo and normative workload data provided.
13. Define different alternatives of port development based on performance data
14. Explain the correlation between dependent and independent variables/parameters for the berth allocation and crane allocation plan on the port container terminal
15. Create the operation plan for crane deployment and present the graphical solution of the quay crane scheduling problem based on input dataset.

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., Dundović, Č.: Primjena sistemskog inženjeringa u planiranju lučkih terminala, Pomorstvo, vol.25, br.1, 2011.

1.11. Recommended Reading

1. 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*
1. Ligteringen, H., Velsink, H.: Ports and Terminals, Vereniging voor Studie- en Studentenbelangen Delft, 2012.	6	15
2. Dundović, Č.: Lučki terminali – Tehnologija luka i terminala II, sveučilišni udžbenik, Rijeka, 2002.	30	15
3. Grubišić, N., Dundović, Č.: Primjena sistemskog inženjeringa u planiranju lučkih terminala, Pomorstvo, vol.25, br.1, 2011.	Accessible online	15

[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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1.13. 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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Generic information			
Head of Course	Edvard Tijan, PhD		
Course	Business Information Systems		
Study Programme	Technology and Organization of Transport		
Level	graduate		
Type of Course	elective		
Year of Study	1	Semester	2
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		
	Number of Hours (L+E+S)		

4. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to acquaint students with the basics of information systems and business applications, including their development, design, implementation, integration and maintenance in business environment. Students will be introduced to the basic methodologies of building information systems to the extent that they can propose concepts of building information systems based on the analysis of business problems, which is a solid basis for students to work and solve practical problems in business organizations. By acquiring knowledge about the possibilities and functioning of information systems, students will be able to define information needs and relevant information and communication technologies. Also, the aim of the course is to enable students to some extent to model IT solutions themselves. The aim of the exercises is to introduce students to business process modeling and IT infrastructure modeling using the ARIS Express software solution.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able to:

1. Properly interpret terms and concepts related to information systems and the role of the information system within the business system.
2. Analyze the business needs in preparation for the design and development of the information system
3. Describe the underlying risks and ways of managing risks within the lifecycle of the business information system
4. Systematize the principles and methods by which the necessary level of security of business information systems is achieved.
5. Compare information systems used in maritime and transport sectors
6. Show the components of the information system and their interdependence using various graphical models.
7. Develop hierarchical (organizational) and process models using ICT tools

1.4. Course Outline

1. Introduction to the course, mission of the course, literature, grading system, testing
2. Information systems: definition, structure, tasks, functions, features, focus on managerial information
3. Significance and functioning of IS in business system management, vertical and horizontal levels, ways of support and data integration
4. Planning, analysis, design, construction, commissioning and maintenance of business information systems.
5. Databases
6. Risks in the development of business information systems
7. Information systems security
8. Maintaining business continuity and disaster recovery
9. Enterprise Resource Management Systems (ERP)

10. Maritime Single Windows
11. Port Community System data exchange systems
12. Graphic modelling of business processes using ICT tools
13. Hierarchy (organization) models, whiteboard models, ICT infrastructure models, process landscape models.
14. 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

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	0,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam	1	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

Assessment includes evaluation in class, two colloquia in the computer lab and a final oral exam. Assessment is carried out in accordance with the applicable university and faculty Regulations on study. The student can achieve up to 70% of the grade during classes, and the remaining 30% can be achieved at the final exam. At each knowledge test, the student must master at least 50% of the learning outcomes, ie achieve at least 50% of possible points.

Examples of exam questions:
Learning Outcome 4: Explain the basic principles of information systems security and the most common security threats.
Learning Outcome 5: Analyze and synthesize the similarities and differences between the unique maritime interfaces used in the administrative (MSW) and commercial (PCS) segments of the seaport business.
Learning Outcome 7: Draw a process model according to the given task using the ICT tool ARIS Express.

1.10. Main Reading

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

1.11. Recommended Reading

Aksentijević, Saša; Tijan, Edvard; Čišić, Dragan: Modeling of economically sustainable information security management systems in seaport clusters. // Pomorstvo: journal of maritime studies. 28 (2014) ; 56-64

Tijan, Edvard; Agatić, Adrijana; Hlača, Bojan: Port Community System Implementation in Croatian Seaports. // Promet-Traffic & Transportation. Vol 24, No 4 (2012); 305-315

Agatić, Adrijana; Čišić, Dragan; Tijan, Edvard: Information Management in Seaport Clusters. // Pomorstvo: journal of maritime studies. 25 (2011), 2; 371-386

Tijan, Edvard; Agatić, Adrijana; Hlača, Bojan: ICT EVOLUTION IN CONTAINER TERMINALS. // Pomorstvo: journal of maritime studies. 24/1 (2010) (2010); 27-40

Tijan, Edvard: Data Classification and Information Lifecycle Management in Port Community Systems. //

[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.

Pomorstvo - Journal of Maritime Studies. 2/2009 (2009); 557-568

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
M. Pavlić: Informacijski sustavi, Školska knjiga, Zagreb, 2011.	4	10

1.13. Quality Assurance

The quality of study is constantly monitored in accordance with the ISO 9001 system that is implemented in the Faculty of Maritime Studies. Annual evaluation is made also through surveys among students.

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Generic information			
Head of Course	Bojan Hlača, PhD		
Course	Supply chain management		
Study Programme	Technology and Organization of Transport		
Type of Course	elective		
Year of Study	1	graduate	
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 student is introduced to an integrated approach to the supply chain.

The goal of the course is a strategic approach. The student is required to understand:

- All components of the supply chain, such as supply systems, procurement, raw material handling, production, stocks, ordering and transportation.
- Interaction between system supply chain components
- Method and technique of synthesis and analysis of the supply chain

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

1. Understand the importance of supply chain management in a business environment
2. Identify different types of supply chains and identify stakeholders in the entire supply process
3. Explain the importance of integration and coordination of stakeholders in the supply chain and suggest ways to improve business processes
4. Identify carriers by type of goods
5. Use statistical methods to predict supply and demand in the supply chain.
6. Estimate transportation and storage costs to ensure an appropriate cost of logistics service

1.4. Course Outline

Abandonment of the classic functional approach to marketing, production, engineering, finance and personnel management and
increased importance of entrepreneurship on a project basis.
Logistics concept of physical distribution and information management, logistics goals, total cost management.
Porter's company models.
Supply chain management. Supply chain and information technology management organization.
Transaction costs. Supply chain models.

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 class attendance and solving tasks assigned to work at home.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	2	Class participation	1	Seminar paper		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 final grade for the student's success in the course is the sum of the percentage of success achieved by the student in class (70% of the grade) and the percentage of success achieved in the final exam (30% of the grade), according to the rules of University of Rijeka and the Faculty of Maritime Studies in Rijeka.
Continuous assessment:
Midterm exam - it is necessary to achieve at least 50% of correct answers from each exam.
Essay - it is necessary to present in writing the acquired knowledge and research on a given topic.
Final exam - at least 50% correct answers are required.

Examples of evaluating learning outcomes:

1. List the business activities within the supply chain.
2. What models are used to deliver products in the supply chain?
3. What are the decision levels and time horizons in the supply chain?
4. What are the main reasons for system sluggishness in the supply chain?
5. Using Excel, anticipate supply and demand.
6. Describe the functioning of total quality management.

1.10. Main Reading

1. Bloomberg, LeMay, Hanna Logistika Mate 2006
2. Fawcet , Ellram, Ogden Supply chain Implementation Pearson 2007

1.11. Recommended Reading

1. Hugos. M.: Essentials of Supply Chain Management. J.Willey and sons 2003
2. Chorafas D.: Integrating ERP, CRM, Supply chain management and smart materials –CRC Press LLC 2001
3. Ch., Cypress, H.: Integrated Distribution Management, Business, One Irwin, Homewood Illinois, 1993

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Bloomberg, LeMay, Hanna Logistika Mate 2006	5	50
Fawcet , Ellram, Ogden Supply chain Implementation Pearson	1	50

[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.

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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Generic information			
Head of Course	Dr.sc. Jakov Karmelić		
Course	International Shipping Business		
Study Programme	Technology and Organisation of Transport		
Type of Course	Elective		
Year of Study	1.	University graduate study program	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		30+15+0 (2+1+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 the international shipping markets (freight, shipbuilding, second hand and demolition) for different types of shipping (liner, tramp, passenger, off-shore).

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 world overseas trade and the world fleet.

The course provides a scientific basis for further specialist study of this multidisciplinary course.

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

1.2. Prerequisites for Course Registration

No

1.3. Expected Learning Outcomes

1. Explain the basic characteristics of each segment of the shipping market.
2. Distinguish the basic principles, goals and manner of work of the international maritime and trade organizations.
3. Analyze and interpret the structure of world overseas trade by types of cargo and types of ships.
4. Explain the importance and role of maritime transport entities in all types of shipping, especially: shipowners, operators, brokers and agents.
5. Analyze and interpret freight indices in all types of shipping, interpret shipping market cycles and analyze and interpret broker`s reports.
6. Define and explain the basic procedures for designing liner shipping services.
7. Explain the reasons for the business cooperation and the different types of cooperative agreements among the shipowners and operators.
8. Analyze and demonstrate the connection between overseas goods flows/trades 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.

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1.4. Course Outline

Analysis of world overseas trade by types of cargo and regions, structure of world trade fleet by types of ships, age structure of ships as well as structure of world fleet by ownership (countries) and operators.
An overview of the world's international maritime and trade organizations. Shipowners and operators in all types of shipping. Specifics of the work of brokers and shipping agents.
Shipping market segmentation. Categorization of ships in bulk, liquid, gaseous, containerized cargo transport and offshore industry. Freight indices in all types of shipping. Shipping market cycles. Supply and demand in the maritime shipping market.
Maritime competition regulations. Organizational structure of shipping companies. Ways of outsourcing in shipping: ship management, D / A Desk, C / P Desk, Service Sharing Centres, Planning Centres, etc.
Basics of liner service design. Criteria for selecting the optimal maritime shipping service and operator from the user's point of view.

1.5. Modes of Instruction	X☐Lectures X☐ Seminars and workshops X☐ Exercises X☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory X☐ 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 at least 70% of the total hours, 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 attendanc	2	Class participation		Seminar paper	1,5	Experiment	
Written exam		Oral exam	1,5	Essay		Research	
Project		Continuous Assessment		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.

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 exam:
· Active class attendance
· Preparation and presentation of seminar paper (40 points)
A. Prerequisite for passing the exam (60 points):
· At least 50% of complete theoretical knowledge in the field of International Shipping Business
Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Explain the characteristics of each type of maritime shipping market.
2. Describe the principles, goals and mode 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, brokers and agents.
5. Interpret freight indices, shipping market cycles and broker`s reports in all types of shipping.
6. Explain the basic procedures for designing 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, the 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 maritime business are investigated 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
5. Shipping Statistics and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen

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.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of*
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	unlimited	40
Shipping and Shipbuilding Markets, Annual Review Barry Rogliano Salles, web edition	unlimited	40
Shipping Statistics and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen	1	40

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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 examination pass rate are analyzed, and appropriate measures are adopted.

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Generic information		
Head of Course	**dr. sc. Dražen Žgaljić**	
Course	**Multimodal transport and Motorways of the Sea**	
Study Programme	**Logistics and management in maritime and transport**	
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

Introducing the students to different technologies of the multimodal transport, technologies, and organization of the Short Sea Shipping and Motorways of the Sea, legal and market conditions, as well as to its environmental contribution.

1.2. Prerequisites for Course Registration

n/a

1.3. Expected Learning Outcomes

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

- **explain different ways and technologies of freight and passenger transport in multimodal transport,**
- **explain the management models of Short Sea Shipping and Motorways of the Sea,**
- **explain different ways of organizing the transport of goods and passengers in multimodal transport,**
- **explain external and internal success factors of Short Sea Shipping and Motorways of the Sea,**
- **understand and explain EU legislation related to Short Sea Shipping and Motorways of the Sea,**
- **understand the characteristics of the Short Sea Shipping system,**
- **understand the characteristics of the Motorways of the Sea system,**
- **understand the success criteria for the Short Sea Shipping and Motorways of the Sea,**
- **understand the impact of transport on society and the environment,**
- **understand and explain the environmental and social effects of Short Sea Shipping and Motorways of the Sea.**

1.4. Course Outline

Define, describe, and explain the elements of a multimodal transport system. Technical-technological features of the intermodal transport system. Ownership of elements of a multimodal transport system. Models of development of Short Sea Shipping and Motorways of the Sea. Models of management of Short Sea Shipping and Motorways of the Sea. Criteria for evaluating the performance of individual elements of Short Sea Shipping and Motorways of the Sea. Introduction of modern technologies / systems in the organization of Short Sea Shipping and Motorways of the Sea. Public transport service. Legal basis and efforts of the European Union in the functioning of Short Sea Shipping and Motorways of the Sea. Market conditions of Short Sea Shipping and Motorways of the Sea. Impact and contribution of Short Sea Shipping and Motorways of the Sea on society and the environment.

1.5. Modes of Instruction

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

1.6. Comments	n/a

1.7. Student Obligations

1. Attending classes
2. Class participation
3. Written exam
4. Final exam

1.8. Assessment[1] of Learning Outcomes

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

[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.

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

The evaluation of acquired knowledge is carried out through:

1. *two written exams,*
2. *e-learning system during classes,*
3. *the final exam.*

Examples of evaluating learning outcomes:

1. *describe the different modes of freight transport by multimodal mode of transport,*
2. *analyze and describe the parts of the Short Sea Shipping system,*
3. *describe the different ways of organizing Short Sea Shipping system,*
4. *describe the impact of external success performance factors of Motorways of the Sea,*
5. *describe the European Union's efforts to promote the development of Short Sea Shipping,*
6. *describe the functioning of the Motorways of the Sea,*
7. *propose a solution to encourage the development of Motorways of the Sea at the regional level or transport corridor level,*
8. *describe modern technologies / systems in the organization of Short Sea Shipping and Motorways of the Sea,*
9. *compare the impact of road and maritime transport on society and the environment.*

1.10. Main Reading (at the time of applying the study program proposal)

1) **teaching material for the course available on the e - learning system - Merlin (https://moodle.srce.hr)**
2) **Bošnjak, I: Inteligentni transportni sustavi 1, Fakultet prometnih znanosti Sveučilišta u Zagrebu, Zagreb, 2006.**
3) **Zelenika, R.: Multimodalni prometni sustavi, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2006.**

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

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) **Regulations and directives of the European Commission and the Parliament related to Short Sea Shipping and Motorways of the Sea**
8) **Scientific papers related to the topic of transport systems, MoS, and SSS published in foreign and domestic journals**

1.12. Number of Main Reading Examples

Title	*Number of copies*	*Number of st*
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	

1.13. Quality Assurance

The quality of study is monitored in accordance with the ISO 9001 system and the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. The results on positive performance at studies are analyzed once a year and appropriate measures are adopted.

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Generic information			
Head of Course	PhD Svjetlana Hess		
Course	Transport Process Optimization		
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+10

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objective of the course is to enable students to apply selected methods of optimization of the transport process, through the adoption of techniques, analytical calculation and analysis of results. The above results in the adoption of practically applicable knowledge and skills as a basis for optimal and efficient planning and organization of the transport process.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

7. establish and define the basic parameters and phases of the transport process and determine the decision criteria for optimal organization
8. set up a model for the organization of the movement of means of transport and determine the appropriate method of solving and finding the optimal solution for the distribution of goods
9. define and compare types of itineraries and explain the differences between individual types
10. plan travel routes, schematically present and solve an illustrative example of a transport process (itinerary) by calculating all the necessary travel indicators
11. adopt a method of dynamic programming for optimal solution of a multi-phase process of transport problems and interpret the optimal solution with regard to the criterion and limitations
12. identify possible changes and deviations in conditions of uncertainty

1.4. Course Outline

Analytical tools and techniques needed for optimal organization of transport process, types of itineraries, calculation of all indicators of transport process for a particular itinerary, operational planning problem, distribution network problem, dynamic programming for transport problem, scheduling and allocation of transport vehicles and equipment, organization of vehicle loading, solving examples with widely available computer support (MS Excel Solver or WinQSB). The emphasis is on solving techniques and the application of analytical methods on real examples, where quantification and optimization of process is required.

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

Colloquia and assignments, continuous assessment during classes and final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1	Class participation		Seminar paper	1.5	Experiment	
Written exam	1	Oral exam		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

Evaluation procedure is following: 70% of the grade through exams for students' continuous assessment and 30% of the grade through final exam, ie:

- continuous assessment during classes through 2 exams and 1 assignment and
- the final exam checks the integrity of theoretical knowledge and understanding of specific knowledge in the field of organization and optimization of transport processes with application to specific cases in transport and logistics.

Valuation examples by individual learning outcomes:

1. define the basic parameters and phases of the transport process and determine possible optimization criteria
2. select and verbally formulate an arbitrary problem of freight transport and present the procedure of the transport process with the determination of a possible distribution of cargo
3. define the types of itineraries with a schematic representation of each and identify the differences
4. present the travel route (itinerary) for one problem from practice, collect data, and make a calculation of all indicators of the transport process
5. for a specific problem of freight transport set the model, interpret the function of criteria and constraints, calculate the solution by the method of dynamic programming and interpret the optimal solution with respect to the criteria and constraints
6. list possible changes and deviations from the plan in conditions of uncertainty and suggest solutions

1.10. Main Reading

- Lectures posted as teaching text on the website (Merlin)
- Stanković, R., Pašagić Škrinjar, J., Logistika i transportni modeli, autorizirana predavanja, web izdanje, Fakultet prometnih znanosti, Zagreb, 2015.

1.11. Recommended Reading

- Lindov, O., Džaferović, S., Tehnologija cestovnog transporta, zbirka zadataka, Sarajevo, 2011.
- Logistics Engineering Handbook, editor G. Don Taylor, CRC Press Taylor & Francis Group, 2008.
- Bather, J., Decision Theory: An Introduction to Dynamic Programming and Sequential Decisions, John Wiley and Sons, London, 2000.
- Vuleta, J., Backović, M., Ekonomsko matematički metodi i modeli, Ekonomski fakultet Univerziteta u Beogradu, 2015.
- Pavlović, I., Kvantitativni modeli i metode u poslovnom odlučivanju, Mostar-Dubrovnik, 2005.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Stanković, R., Pašagić Škrinjar, J., Logistika i transportni modeli, autorizirana predavanja, web izdanje, Fakultet prometnih znanosti, Zagreb, 2015.	web	35
Lectures posted as teaching text on the website (Merlin)	web	35

[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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1.13. Quality Assurance

The studying quality is monitored following the ISO 9001 system, as well as European standards and guidelines for quality assurance, carried out at the Faculty of Maritime Studies, University of Rijeka. Analysis of exam passing is done once a year, and once a semester a survey is conducted among students.

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Generic information		
Head of Course	**Siniša Vilke, Ph. D.**	
Course	**Land Transportation System Planning**	
Study Programme	**Technology and Organisation 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 acquire basic knowledge of the planning and design of transport infrastructure facilities for roads, railways and aviation.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Understand and interpret the methodology, procedures, and criteria of transportation planning and land infrastructure design.
2. Understand and compare the management of road and rail infrastructure.
3. Explain the chronology of land transport infrastructure design through the preparation of the general, conceptual and main project.
4. Interpret the procedures for preparing design and project documentation in the construction of road, rail and aviation infrastructure facilities.
5. Discuss regulations governing the design and construction of surface transportation infrastructure facilities.
6. Identify and interpret transportation elements in the construction planning of roads.
7. Interpret and compare elements in the construction planning of rail roads.
8. Prepare and present a research assignment on a given road or rail transportation 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
	☒ Exercises	☐ laboratory
	☐ E-learning	☐ Mentorship
	☐ Field work	☐ 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 process of assessment of the acquired learning outcomes is carried out according to the study regulations of the University of Rijeka and the study regulations at the Faculty Maritime Studies in Rijeka as follows:

- through the continuous review of knowledge during classes, 70% of the acquired learning outcomes in the 1st colloquium (25%), 2nd colloquium (25%), and through the development and presentation of the research assignment (20%);

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

Examples of assessment of learning outcomes in relation to the specified learning outcomes are:

1. develop the methodology, procedures and criteria of transport planning and land infrastructure design.

2. describe the basic principles and procedures for the management of road and rail infrastructure.

3. explain the procedures and activities of land transport infrastructure design, using the contents of the general, conceptual and main projects as examples.

4. explain and justify the development of design and project documentation for the construction of road infrastructure facilities.

5. explain the basic legal provisions for the design and construction of land transport infrastructure facilities.

6.Describe the traffic and civil engineering elements of the road construction project.

7) Describe the traffic and civil engineering elements in the rail road construction project.

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. Strategija prometnog razvoja Republike Hrvatske za razdoblje od 2017. do 2030. godine (NN 84/17).

1.11. Recommended Reading

3. Vuchic, V., R.: Urban Transit Systems and Technology, John Wiley & Sons, Inc., Hoboken, New Jersey, 2007.
4. Zakon o prostornom uređenju (NN 153/13, 65/17).
5. Zakon o gradnji (NN 153/13, 20/17, 39/19).
6. Zakoni i provedbeni propisi iz područja prometne infrastrukture, Zagreb, Narodne novine RH.

1.12. Number of Main Reading Examples

[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	*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. Strategija prometnog razvoja Republike Hrvatske za razdoblje od 2017. do 2030. godine (NN 84/17).	online	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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Generic information		
Head of Course	Ph. D. Jasmin Ćelić, associate professor	
Course	Intelligent transportation systems	
Study Programme	Technology and Organisation of Transport	
Level	Graduate degree programme	
Type of Course	Elective course	
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

The main objectives of this course are to acquire basic knowledge in the field of intelligent transportation systems, as well as to get acquainted with the basic principles and techniques in the design and operation of modern systems.

1.2. Prerequisites for Course Registration

There are no prerequisites.

1.3. Expected Learning Outcomes

After passing the exam, students will be able to do the following:

1. Define the basic laws on which the ITS functionality is based.
2. Explain and demonstrate the principles of network management.
3. Describe the development of ITS.
4. Present and explain the procedures for the implementation of ITS in transport infrastructure.
5. Demonstrate the justification and benefit of ITS implementation.
6. Describe telematic solutions of the transport system.
7. Describe and present the principles of operation of electronic systems of transport entities.
8. Define the prerequisites for the development and implementation of ITS services.

1.4. Course Outline

General information on intelligent transport systems. Standards and norms. Fundamentals of systems theory and cybernetics. Physical and logical architecture of ITS. Traffic modeling. Communications in intelligent transport systems. Expert systems for the application of artificial intelligence to transport systems. Intelligent navigation system. Intelligent transport systems and control systems. Expert maintenance systems. Diagnostics in intelligent transport systems.

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 colloquium, 2nd colloquium, development and presentation of a research task, final exam.

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1.8. Assessment[1] of Learning Outcomes

Course attendanc	2	Class participation	0.5	Seminar paper	1	Experiment	
Written exam	0.5	Oral exam	0.5	Essay		Research	
Project		Continuous Assessment	0.5	Presentation		Practical work	
Portfolio							

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 takes place 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:

- *70% of acquired learning outcomes are evaluated through continuous testing of knowledge during classes:*

  through the 1st colloquium - learning outcomes 1.-4. (25%), 2nd colloquium - learning outcomes 5.-8. (25%), research task – learning outcomes 1.-8. (20%); in doing so, the student must realize a minimum of 50% of points for each colloquium, while the presentation of the research task is evaluated on the basis of elaborated assessment criteria;
- *at the final part of the exam, 30% of the acquired learning outcomes are evaluated (1.-8.), whereby the student must realize a minimum of 50% of points to pass the final exam;*
- *final ECTS grade, is defined on the basis of the achieved total % of knowledge, skills and competencies and numerical grade after the final / remedial exam as follows:*
  - *the grade excellent (5) corresponds to the grade A in the ECTS scale and the success rate from 90 to 100%,*
  - *a grade of very good (4) corresponds to a grade of B on the ECTS scale and a success rate of 75 to 89.9%,*
  - *grade good (3) corresponds to grade C on the ECTS scale and a success rate of 60 to 74.9%,*
  - *a grade of sufficient (2) corresponds to a grade of D on the ECTS scale and a success rate of 50 to 59.9%,*
  - *the grade insufficient (1) corresponds to the grade F in the ECTS scale and the success rate from 0 to 49.9%.*

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

1. Part of the ITS life cycle may be:
   - A Physical analysis ☐
   - B Physical synthesis ☐
   - C Functional composition ☐
   - D Functional decomposition ☐ (IU #1)
2. Types of control include:
   - A Feedforward control ☐
   - B Adaptive control ☐
   - C Control on demand ☐
   - D Feedback control ☐ (IU #2)
3. Physical, logical and communication point of view includes:
   - A Service ITS architecture ☐
   - B ITS Framework architecture ☐
   - C National ITS architecture ☐
   - D Mandatory ITS architecture ☐ (IU #3)

[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.

4. The basic step in the request detection process can be:
   - A User specification and problem prevention ☐
   - B User classification and troubleshooting ☐
   - C User prediction and problem separation ☐
   - D User identification and problem definition ☐ (IU #4)

5. The level of service in intelligent roads is measured by:
   - A Driving safety ☐
   - B Freedom of maneuver ☐
   - C Sensors ☐
   - D Driving comfort ☐ (IU #5)

6. ITS vehicle adaptation includes:
   - A Vehicle starting devices ☐
   - B Vehicle controls ☐
   - C Vehicle stopping devices ☐
   - D Vehicle maintenance devices ☐ (IU #6)

7. Sensors can be:
   - A MENS sensors ☐
   - B Chemical sensors ☐
   - C Magnetic sensors ☐
   - D Neon sensors ☐ (IU #7)

8. The benefits of ITS are visible in:
   - A Increase in emissions of pollutants ☐
   - B Reducing the number of road signs ☐
   - C Increasing the number of foreign guests ☐
   - D Number of employees at gas stations ☐ (IU #8)

1.10. Main Reading

- Williams, B. (2008.). Intelligent Transport Systems Standards, Artech House, Boston, USA.

1.11. Recommended Reading

- Group of authors. (2000.). Intelligent Transportation Primer, Institute of Transportation Engineers, Washington, USA.
- 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*
Williams, B. (2008.). Intelligent Transport Systems Standards, Artech House, Boston, USA.	*10*	*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 exams is made annually, and once a semester a survey is conducted among students.

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Generic information		
Head of Course	Ines Kolanović, full professor	
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 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of this course is to get acquainted with the meaning and content of maritime and transport policy, guidelines of the European maritime and transport policy and with the strategies of maritime and transport development of the Republic of Croatia.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

After passing the exam in this course, students will be able to:
1. Explain the concepts of maritime and transport policy
2. Describe and identify the principles, objectives and measures of maritime and transport policy and classify the holders of maritime and transport policy
3. Explain the policy of support and subsidies in maritime and transport
4. Highlight the characteristics of transport policy in relation to the collection and use of transport infrastructure
5. Recognize the relationships between maritime activities and the constraints on the use of the sea as a resource
6. Identify the social and environmental impacts of transport by industry
7. Mark the priorities of maritime and transport policy in relation to strategic goals

1.4. Course Outline

The concept, significance and role of maritime and transport policy. Components and holders of maritime and transport policy. EU integrated maritime policy, 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 market of port services, policy of charging and financing of port infrastructure. Maritime cabotage and market access. Subsidies and state aid in transport, specific features of state aid in maritime transport. EU transport policy, strategic documents. Trans-European road networks and transport infrastructure policies. Transport and sustainable development, external transport costs. Maritime Development Strategy of the Republic of Croatia. Transport development strategy of the Republic of Croatia.

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 obliged to: attend at least 70% of classes, practical work (research task), 2 colluquia, final exam

1.8. Assessment[1] of Learning Outcomes

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

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

The final grade on the course is the sum of points earned by the student during classes (70% of the grade) and points earned in the final exam (30% of the grade) according to the Regulations on Studies of the University of Rijeka and the Regulations on studying at the Faculty of Maritime Studies in Rijeka.

Continuous assessment:
• 2 colloquia - it is necessary to achieve a minimum of 50% of the total number of points in each colloquium
• practical work (research task) - the verification of the adopted outcomes are checked by oral presentation
Final exam:
At the final exam, the material of the entire course is checked and it is necessary to achieve a minimum of 50% of the total number of points
Examples of evaluating learning outcomes in relation to set learning outcomes are:
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 an integrated maritime policy (LO2)
3. Explain the characteristics of regular passenger traffic in the Republic of Croatia in the context of sustainable development of islands in the Republic of Croatia (LO3)
4. List the sources of financing 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 EU transport policy in the context of strategic guidelines for the development of maritime transport in the Republic of Croatia (LO7)

1.10. Main Reading

5. Kolanović, I.: Teaching material published on Merlin
6. Dundović, Č., Grubišić, N.: Pomorska i prometna politika, Sveučilišni udžbenik, Pomorski fakultet u Rijeci, 2013.

1.11. Recommended Reading

https://ec.europa.eu/info/topics/transport_hr
http://europski-fondovi.eu/sektor/promet
https://ec.europa.eu/maritimeaffairs/policy_en

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Kolanović, I.: Teaching material published on Merlin	Unlimited (web)	21
Dundović, Č., Grubišić, N.: Pomorska i prometna politika	11	21

[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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1.13. 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 passability are analyzed and appropriate measures are adopted.

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Generic information			
Head of Course	Assoc Prof Ana Perić Hadžić, Assit. Prof. Dražen Žgaljić		
Course	PROJECT MANAGEMENT		
Study Programme	Technology and Organization of Transport		
Type of Course	Elective course		
Year of Study	2nd	Graduate degree programme	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours (L+E+S)		30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course aims to explain the importance of projects and international projects and the role of project management in the development of business systems. The emphasis is on strategic preparation, evaluation, initiation, and development of project management models at different management levels in order for students to be able to manage projects in the conditions of modern development of the economy.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After passing the exam in this course, students will be able to:
1. correctly interpret the basic theoretical and practical concepts of project management in the development of business systems,
2. distinguish project management processes (strategic preparation, initiation, implementation, control).
3. analyze different stakeholders
4. apply skills and competencies that contribute to more effective implementation and help solve complex organizational and other problems related to project management.
5. correctly define the terms related to the structure of EU-funded projects
6. design, analyze and formulate their own idea and make a project proposal.

1.4. Course Outline

Theoretical-Methodological determination of project management (defining project, project management, Project life cycle, Projects section-stakeholder), Processes of project management (project planning, organization, management, control). Strategic aspects of project management, project management of company development (development policy, investment policy, evaluation of investment projects). Management of international projects. Organization and programmes of the EU (focusing on programmes that finance the development of Transport), planning of EU projects, logical matrix (log frame), measuring the achievement of objectives, management of work packages and project results, consortium agreements and protection Intellectual property, communication and project management team, exploitation, dissemination and sustainability of EU projects, quality planning, quality assurance and control, risk management. Business case: Harbour Business Plan, the justification for the concession in the field of maritime domain, the EU project.

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. Assessment[1] of Learning Outcomes

Course attendanc	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 of the student's success in the course is the sum of the percentage of success achieved by the student during classes (70% of the grade) and the percentage of success achieved in the final exam (30% of the grade) according to the rules of the University of Rijeka and the Faculty of Maritime Studies in Rijeka.
Continuous assessment of knowledge:
- it is necessary to achieve at least 50% correct answers from continuous assessments
- project - it is necessary to show the acquired knowledge and application of project methodology for the selected example
Final exam:
- at the final exam it is necessary to achieve at least 50% correct answers

Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Draw the project life cycle and mark the basic stages in 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 are and explain their role in the project
4. On the given example, use the critical path method to show the sequence of project activities, print the critical path of project activities, calculate the total duration of the project and Gantt chart show the sequence of project activities
5. Explain the role of EU structural funds and programs in financing projects related to sustainable transport development
6. Formulate a project proposal individually or in a team that includes the project description, relevance of the project application, implementation capacities of applicants and partners (if you have a partner), project efficiency and feasibility, project budget, project sustainability.

1.10. Main Reading

1. Authorized lectures on the e-learning platform MERLIN (online materials)

1.11. Recommended Reading

1. European Funds for Croatian Projects, A Handbook of financial cooperation and European Union, Supported Programmes in Croatia, Središnji državni ured za razvojnu strategiju i koordinaciju fondova Europske Unije, Zagreb, 2009
2. Aid Delivery Methods, Volume 1. Project Cycle Management Guidelines, European Comission, Brusseles, 2004
3. Project Management Institute, A Guide to the Project management Body of Knowledge (PMBOK Guide), Fourth Edition, 2008.

[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*
1. Authorized lectures on the e-learning platform MERLIN (online materials)	50	50

1.13. Quality Assurance

The quality of studies is monitored in accordance with the system ISO 9001 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, the results of passability are analyzed and appropriate measures are taken.

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Generic information			
Head of Course	**Axel Luttenberger, Ph.D., Full Professor with tenure**		
Course	**European Union Transport Law**		
Study Programme	**Technology and Organization of Transport**		
Level	**Master**		
Type of Course	**Elective**		
Year of Study	**2**	Semester	**4**
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 standards governing transport activities at EU level covering all branches 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

1. Define and interpret the basic principles of the EU Common Transport Policy.
2. Define and describe the basic principles of the development of EU transport systems.
4. Define and explain the EU acquis in the fields of road, rail, transport and air
Traffic.
5. Describe and interpret the importance of the right of access to the transport services market and explain the social aspects of
Traffic.
6. Describe and analyze new tendencies in the development of the European transport safety and environmental protection system.
7. Describe and argue the compliance of Croatian law with the acquis communnitaire in the field of transport policy.

1.4. Course Outline

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	X Lectures ☐ Seminars and workshops	☐ Practical work X Multimedia and Network

	X Exercises X E-learning ☐ Field work	☐ Laboratory ☐ Mentorship ☐ 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	Class participation		Seminar paper	0	Experiment	
Written exam		Oral exam	2	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

Through continues assessment student achieves up to 70% (Learning Outcomes from 1 to 7), while with the written Final Exam (Learning Outcomes from 1 to 7) up to 30% of total Score.
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

1.1. Main Reading

Radionov, Nikoleta, i dr,. Europsko prometno pravo, Pravni fakultet Sveučilišta u Zagrebu, Zagreb, 2011
Course teaching material available on e-learning system - Merlin (https://moodle.srce.hr)

1.2. Recommended Reading

Treaty Establishing the European Community
Treaty on European Union, OJ C 191/92.,
Treaty of Amsterdam amending the Treaty on Europea

1.3. 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	20	40
Course teaching material available on e-learning system - Merlin	web	web

1.4. 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.

[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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W: www.uniri.hr • E: ured@uniri.hr

Generic information			
Head of Course	Assoc. Prof. Borna Debelić, PhD		
Course	Shipping and Port Management		
Study Programme	Technology and Organization of Transport		
Type of Course	Elective		
Year of Study	2nd	III	
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

Acquisition of knowledge from the specific field of port management and shipping companies, necessary for those responsible for the success of the main economic maritime activities.

1.2. Prerequisites for Course Registration

No additional prerequisites.

1.3. Expected Learning Outcomes

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 importance of financial and economic planning and evaluation of port system development plans in the context of general transportation and economic development.
3. Analyze information on port costs gathered from various sources and, based on the analysis, identify potential business opportunities, forecast cost levels, and trends in costs and values of port services and port rates and charges relevant to effective management decisions.
4. Analyze the impact of development policy and agency relations measures and instruments in ports and understand the mechanisms of their effect and the impact on business and on the competitiveness of the transportation mode.
5. Explain the features of the management system of shipping companies and business performance indicators as a basis for management decisions in shipping from the point of view of market and non-market risk management.
6. Apply quantitative and qualitative methods to measure and evaluate business performance in shipping and describe the origins and dynamics of freight rates in shipping.
7. Determine the role and importance of optimizing ship costs in terms of the specifics of technical and commercial management in shipping and in relation to business performance indicators.

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W: www.uniri.hr • E: ured@uniri.hr

1.4. Course Outline

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 for port system development in the context of overall transportation development and local and regional economic development, with emphasis on port community development. Cost dynamics in port operations and cost accounting in ports as a basis for management decision making. Economic and financial performance indicators of port systems from the perspective of the provision of public services and commercial services by concessionaires. Determining the value of port services in the context of total transportation costs. Port charges and tariffs as determinants of port business performance and competitiveness of transport routes within modern transport networks and competitiveness between ports. Agency relationships in the port management system. Characteristics and management systems of shipping companies. Labor productivity, profitability, and business viability as a basis for management decisions in shipping companies. Measurement and evaluation of business results of shipping companies. Formation and dynamics of freight rates in ocean shipping, with emphasis on the differences and processes of freight rate formation in specific types of ocean shipping activities. Optimization of shipping voyage costs in the context of market dynamics. Features of technical and commercial management in shipping and modern approaches to leasing of ships and shipping space. Business performance indicators 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 solving tasks assigned to work at home.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	
Project		Continuous Assessment	1	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.

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 management characteristics of port and shipping systems and their characteristics, and the impact on business performance, as well as the principles, components and importance of management reporting (I1 - I7) in terms of calculating modern business performance measures.

Written continuous knowledge test (2 colloquia, 30% of learning outcomes each, which is a total of 60% of learning outcomes and at least of 50% of the points achieved per colloquium) in which the student shows understanding of the theoretical concepts and practical implications of specific management in shipping and port systems and management planning (I1 - I7), the mechanisms of their impact and the implications for the operations of shipping and port companies as well as economic trends, and parts of the business environment of shipping and ports companies.
Final written test (30% of learning outcomes and at least 50% of the points obtained) in which the student shows understanding of the application and techniques of business processes and transactions in shipping and port systems, in the function of quality reporting, and the possibility of applying management strategies to improve business processes and management services (I1 - I7).

1.10. Main Reading

1. Visvikis, I.D., Panayides, P.M.: Shipping Operations Management, Springer International Publishing, 2017.
2. Haralambides, H. E.: Port Management, Palgrave Macmillan, London, 2015.
3. Mitrović, F., Kesić, B., Jugović, A.: Menadžment u brodarstvu i lukama, Pomorski fakultet Split, 2010.
4. Buble, M.: Management, Ekonomski fakultet, Split, 2000.

1.11. Recommended Reading

1. Alderton, P. M.: Port Management and Operations, London, 1999.
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*
1. Mitrović, F., Kesić, B., Jugović, A.: Menadžment u brodarstvu i lukama, Pomorski fakultet Split, 2010.	30	75
2. Buble, M.: Management, Ekonomski fakultet, Split, 2000.	15	75

1.13. Quality Assurance

Quality assurance system of educational process is in accordance with ISO 9001:2000 system as implemented on Faculty of Maritime Studies Rijeka. Analysis of exams is carried out annually. Students' evaluation is carried out each semester (more details provided in part describing organization of the Faculty).

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Generic information		
Head of Course	PhD Mirano Hess	
Course	Coastal zone management	
Study Programme	Technology and Organisation 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 train students to understand the elements of coastal zone management, identify tasks and problems, planning, implementation, monitoring and evaluation in international and national development domains and in accordance with modern technological solutions and the latest recommendations and rules in the field.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

1. Define, explain and distinguish the characteristics of the coastal zone in the Republic of Croatia (RC) and the world
2. List, explain and interpret the importance and elements of sustainable development of the coastal zone in the RH and the world
3. Describe, explain and compare the phases of coastal zone management and interpret the use of maritime domain GIS
4. List, define and distinguish key problems in the management process and recommendations in the RH and the world
5. Highlight and point out the similarities and differences of key national and European documents and describe the institutional framework in the RC

1.4. Course Outline

1. Instruments of integrated coastal zone management
2. Elements of sustainable development and characteristics of the coastal zone in the RC and the world
3. History and the need for integrated coastal zone management
4. Coastal area in international and national frameworks
5. Key European documents, development documents in the RC and the institutional framework in the RC
6. Analysis of planning solutions and processes
7. Key issues and recommendations and guidelines for improving spatial planning
8. Maritime domain within the legal framework of the RC and GIS of maritime domain
9. Planned development of coastal and coastal regions and the procedure for the introduction of maritime spatial planning
10. Examples and analysis of planned development and coastal zone management: Adriatic, Mediterranean and world

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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 ☒ Presentation
1.6. Comments		

1.7. Student Obligations

Active class attendance. Preparation of a seminar / work assignment. Passed a midterm exam and final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1.5	Class participation		Seminar paper		Experiment	
Written exam	1.1	Oral exam		Essay		Research	
Project		Continuous Assessment	1.7	Presentation/work assignment /sem.	0.7	Practical work	
Portfolio							

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

70% in classes and 30% in the final exam (according to the Ordinance on studies at the University of Rijeka and the Ordinance on studying at the Faculty of Maritime Studies in Rijeka). Continuous assessment of knowledge: colloquium from the material, it is necessary to achieve a minimum of 50% correct answers (I1, I2, I3). Students, in groups, make a seminar / work assignment / presentation of materials from the selected topic / materials, for which they can achieve a maximum of 20% of points in the course. Final exam: written exam from the material. It is necessary to achieve a minimum of 50% correct answers (I4, I5).
Examples of evaluating learning outcomes:

1. State and explain the EU principles for CZM. (I1)
2. List and explain the 3 concepts on which the philosophy of sustainable development of the coastal zone is based. (I2)
3. Explain for what reason and how the GIS of the maritime domain is used. (I3)
4. Highlight the most significant and explain the consequences of the problem of spatial planning of the coastal area. (I4)
5. In addition to the administrative bodies in the counties, which are still institutions of importance for CZM in the RC, and explain their functions. (I5)

1.10. Main Reading

Hess, M.: Coastal Zone Management, 2021, script on web pages of Faculty of Maritime Studies Univerity of Rijeka

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

[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.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Hess, M.: Coastal Zone Management, 2021, script on web pages of Faculty of Maritime Studies Univerity of Rijeka	unlimited	30

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.

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Generic information			
Head of Course	Assoc. Prof. Borna Debelić, PhD		
Course	Financing in Maritime Affairs		
Study Programme	Technology and Organization of Transport		
Type of Course	Elective		
Year of Study	2nd	III	
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 the management and management of business and technological processes in projects and organizations in maritime affairs.

1.2. Prerequisites for Course Registration

No additional prerequisites.

1.3. Expected Learning Outcomes

1. Describe the system, market structures and elements of maritime investment and the sources, methods and models of financing.
2. Describe the principles, constituent elements and importance of financing the purchase of new and used ships, and describe the sources of possible financing.
3. Analyze the elements of credit business in the purchase and sale of ships, and describe the models of calculation and repayment and analyze the return through annuities in relation to installments.
4. Analyze the impact of liquidity and solvency on debt service management in terms of inflows of operating funds.
5. Analyze and explain financial transactions and their basic principles in the purchase and sale of ships, as well as business performance indicators as a basis for financial decisions and risk management.
6. Apply quantitative and qualitative methods of analysis of inflows of operating funds, operating costs, analysis of profit and loss account, and approaches, methods and techniques of risk management from the aspect of financing.
7. Identify and analyze the specifics of financing infrastructure investments in maritime and transport.

1.4. Course Outline

Generally about maritime investments. Sources, methods and models of financing in maritime affairs. Financing the construction of new ships from public sources and commercial banks. Financing the procurement of used ships and sources of funds. Buying used boats and specific reasons for buying and selling. Basic elements of credit business in the purchase and sale of ships. Interest and principal, calculation and repayment models. Loan repayment through annuities and through installments. Calculation of Libor and Euribor. Liquidity and solvency in the domain of debt service management expected expected inflow of funds. Analysis of financial transactions in the purchase and sale of ships and basic principles and conditions. Forecasting of operating cash inflows, operating expenses, profit and loss account analysis, and risk management from the aspect of debt financing. Receivables security instruments. Specific financing of infrastructure investments in maritime 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 solving tasks assigned to work at home.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	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

Discussion in class (10% of learning outcomes) in which students analyze the system of financing and sources of financing in maritime affairs and their characteristics as well as the impact on business, and principles, components and importance of different sources and dynamics of financing (I1 - I7) from the aspect of modern maritime organization and projects.

Written continuous knowledge test (2nd colloquium, 30% of learning outcomes each, which is a total of 60% of learning outcomes and a minimum of 50% of points achieved per colloquium) in which the student shows understanding of theoretical concepts and practical implications of specialist funding in maritime (I1 - I7) , mechanisms of action and effects on the operations of maritime companies and on the overall economy.

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

1.10. Main Reading

1. Batalić, M., Mitrović, F.: Financiranje u pomorstvu, Pomorski fakultet Split, Split, 2010.

1.11. Recommended Reading

1. Harwood, S.: Shipping finance, third edition, Euromoney books, 2006.
2. Paine, F.: The Financing of Ship Acquisitions, Coulsdon, 1989.
3. Stokes, P.: Ship finance, second edition, LLP, 1997.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

[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.

1.13. Quality Assurance		
Quality assurance system of educational process is in accordance with ISO 9001:2000 system as implemented on Faculty of Maritime Studies Rijeka. Analysis of exams is carried out annually. Students' evaluation is carried out each semester (more details provided in part describing organization of the Faculty).		

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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	2nd		
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

Introduction to the basic theoretical and practical principles about artificial intelligence and application of advanced algorithms.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

17. Explain the theoretical foundations of artificial intelligence.
18. Analyse problem solving methodology and uncertainty modelling.
19. Define and analyse artificial neural networks.
20. Define and analyse nature-inspired optimization algorithms.
21. Define and analyse machine learning.
22. Define and analyse game theory.
23. Apply artificial intelligence to the optimization problem.
24. Summarize the social aspects of artificial intelligence.

1.4. Course Outline

Theoretical foundations of artificial intelligence. Problem solving methodology. Uncertainty modelling. Knowledge-based information system. Artificial neural networks. Nature-inspired optimization algorithms. Machine learning. Game theory. Software 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 road transport. Social aspects of artificial intelligence.

1.5. Modes of Instruction

☒ Lectures	☒ Practical work
☐ Seminars and workshops	☒ Multimedia and Network
☒ Exercises	☒ Laboratory
☒ E-learning	☐ Mentorship
☐ Field work	☐ 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 attendanc	1,5	Class participation	1	Seminar paper		Experiment	
Written exam	1	Oral exam		Essay		Research	0,5
Project	0,5	Continuous Assessment	0,5	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.

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 - total 70%) and at the final part of the exam (30%).

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

17. Explain the theoretical foundations of artificial intelligence.
18. Analyse problem solving methodology and uncertainty modelling.
19. Define and analyse artificial neural networks.
20. Define and analyse nature-inspired optimization algorithms.
21. Define and analyse machine learning.
22. Define and analyse game theory.
23. Apply artificial intelligence to the optimization problem.
24. Summarize the social aspects of artificial intelligence.

1.10. Main Reading

7. Luger, G.F. 2005. Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Addison-Wesley.
8. Alpaydin, E. 2021. Strojno učenje, MIT Press, Mate d.o.o.
9. Study materials available at e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

3. Chowdhary, K.R. 2020. Fundamentals of Artificial Intelligence, Springer-Nature.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Luger, G.F. 2005. Artificial Intelligence: Structures and Strategies for Complex Problem Solving, Addison-Wesley.	5	40
Alpaydin, E. 2021. Strojno učenje, MIT Press, Mate d.o.o.	3	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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Generic information			
Head of Course			
Course	Diploma Thesis		
Study Programme	Technology and Organization of Transport		
Type of Course	Core		
Year of Study	2nd year	4th semester	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		15
	Number of Hours (L+E+S)		

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The student's capacity to apply theoretical and practical knowledge obtained during graduate studies is demonstrated through the preparation of the diploma thesis, which includes ongoing consultations with the mentor and a successful oral defense of the diploma thesis:

- *the ability to examine contemporary foreign and domestic literature independently in the research and writing of the thesis's designated topic*
- *the ability to evaluate relevant other people's knowledge, attitudes, and facts as reported in the literature,*
- *the ability to define and analyze graphics (tables, graphs, pictures, and drawings) in line with research methods*

1.2. Prerequisites for Course Registration

The student enrolls in the course Diploma Thesis by enrolling in the fourth (summer) semester of graduate study, and the conditions for enrollment are: all courses taken from the third (winter) semester and the absence of a possible ban on taking courses from the third (winter) semester.

1.3. Expected Learning Outcomes

1. Analyze and apply the theoretical and practical knowledge acquired during the study.
2. Independently analyze, process and interpret a given (selected) topic.
3. Properly apply the methodology and technology of the thesis.
4. Present conclusions and insights related to the topic and research conducted within the thesis.

1.4. Course Outline

The diploma thesis is an independent professional or scientific processing of an established topic. With the diploma thesis the student proves the possession of competencies and learning outcomes in solving problems in professional and scientific areas that are the content of the graduate study Technology and Organization of Transport and the use of theoretical and practical knowledge acquired during graduate study. In the process of defending the thesis, the student must prove mastery of theoretical and practical knowledge in the field of technology and organization of transport.
Thesis at the Faculty is given, written and defended in the Croatian language. Exceptionally, the thesis can be written and defended in a foreign language. The defense of the thesis is conducted orally before the Commission for the defense of the thesis.

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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 (research and cooperation with businessmen, analysis and processing of examples and data from practice, ..)
1.6. Comments		

1.7. Student Obligations

The obligations of students relate to preparation of the thesis with continuous consultation with the mentor during the summer semester and the successful defense of the thesis before the Commission for the defense of the thesis. The manner of applying for, preparing and defending and grading the diploma thesis is prescribed by the Ordinance on the diploma thesis at the graduate university study of the Faculty of Maritime Studies in Rijeka.

1.8. Assessment[1] of Learning Outcomes

Course attendanc		Class participation		Seminar paper		Experiment	
Written exam		Oral exam	4	Essay		Research	4
Project	5	Continuous Assessment		Presentation		Practical work	
Portfolio		Mentorship	2				

[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.

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

In accordance with the Instructions on the application of the system for checking the authenticity of student work of the University of Rijeka, and using the Turnitin service (www.turnitin.com), the mentor checks the authenticity of the diploma thesis. Based on the above analysis, it compiles a Report on the conducted authenticity of student work - Appendix C (University of Rijeka Form) within which it provides data on student work and gives an opinion and explanation on whether the diploma thesis meets the requirements of original work. A positive opinion of the mentor and a positive report on the authenticity of the student work is a prerequisite for the acceptance of the thesis and the organization of the defense. The defense of the diploma thesis is held before the Commission for the defense of the diploma thesis, which consists of three members, including a mentor. The members of the Committee examine the candidate and a record is kept of the diploma defense procedure in which all information about the student and the diploma thesis, questions asked by the members of the Commission and the success of the candidate in the defense of the thesis are recorded.

Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Present your work in no more than 15 minutes and highlight the conclusions. (learning outcomes 1 - 4)
2. Interpret table x on the y page of the diploma thesis. (learning outcomes 1-4)
3. Explain the diagram x on the y page of your diploma thesis. (learning outcomes 1-4)
4. Analyze the results obtained from the last chapters of the diploma thesis. (learning outcomes 1-4)

1.10. Main Reading

1. compulsory literature from the course from which the diploma thesis is applied for and written
2. other required literature in agreement with the subject teacher – mentor
3. instructions for the preparation of the diploma thesis, editors: dr.sc. I. Kolanović, Ph.D. A. Perić Hadžić, Ph.D. No. Dundović, Ph.D. I. Jurdana, Ph.D. I. Rudan, Faculty of Maritime Studies in Rijeka, University of Rijeka, Rijeka, 2014 - available at https://www.pfri.uniri.hr/web/hr/studij BS.php

1.11. Recommended Reading

1. Supplementary literature from the course from which the diploma thesis is applied for and written from
2. Other supplementary literature in agreement with the subject teacher - mentor

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of*
Upute za izradu diplomskog rada, urednici: dr.sc. I. Kolanović, dr.sc. A. Perić Hadžić, dr.sc. Č. Dundović, dr.sc. I. Jurdana, dr.sc. I. Rudan, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2014.	Available at: *https://www.pfri.uniri.hr/web/hr/studij BS.php*	

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, exam passing results are analyzed and appropriate measures are adopted.

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Generic information		
Head of Course	PhD Svjetlana Hess	
Course	Queuing Theory	
Study Programme	Technology and Organization of Transport	
Type of Course	Optional	
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 of the course is to enable students to apply the theory of queues, through the adoption of techniques and obtaining solutions, manually and with computer support, as well as comprehensive analysis of results that will result in planning real service processes in transport, service and logistics activities.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

13. describe and interpret the basic principles and theoretical settings of the queueing theory
14. define a specific problem in a certain service activity and determine the criteria and manner of making a decision
15. collect data, define the basic parameters of the queue and determine the appropriate type of queue
16. solve illustrative problems for different types of queues applying appropriate formulas
17. choose the optimal solution with regard to the criteria, then interpret the solution and the interdependence of the obtained indicators
18. use computer support to get results

1.4. Course Outline

The concept and types of queues (mass service systems). Basic parameters and indicators of the functioning of the queuing system. Analysis of the interdependence of service system indicators. Influence of queuing system parameters on system operation efficiency. Waiting cost model. Case studies of different types of queues. The emphasis is on the application of the queuing theory to specific practical problems in transport and logistics, where queue optimization is required..

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

Colloquia and assignments, continuous assessment during classes and final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	1.5	Class participation		Seminar paper	2	Experiment	
Written exam	1	Oral exam		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

Evaluation procedure is following: 70% of the grade through exams for students' continuous assessment and 30% of the grade through final exam ie:
- continuous assessment through the preparation of seminar under mentorship and one colloquium,
- the final exam checks the integrity of theoretical knowledge and understanding of specific knowledge in the field of queuing theory with application to specific cases in transport and logistics.

Valuation examples by individual learning outcomes:
1. write the theoretical settings for one of the queue types
2. select and verbally formulate an arbitrary problem in a certain service or traffic activity with the determination of appropriate criteria
3. for a problem from practice, describe the method of data collection, define the input parameters and determine the appropriate type of queue for solving and finding the optimal solution
4. solve a particular queue problem by applying the appropriate formulas for that queue type
5. interpret the solution with respect to the set criteria, analyze the interdependence of the obtained indicators and explain the impact of input parameters on the efficiency of the service system
6. solve the practical queuing problem with computer support

1.10. Main Reading

- Lectures posted as teaching text on the website (Merlin)
- Zenzerović, Z., Teorija redova čekanja, Stohastički procesi II. dio, autorizirana predavanja, Pomorski fakultet u Rijeci, Rijeka, 2003.
- Barković, D., Operacijska istraživanja, Sveučilište u Osijeku Ekonomski fakultet Osijek, Osijek, 2001.

1.11. Recommended Reading

- Queueing Theory Books On Line (http://web2.uwindsor.ca/math/hlynka/qonline.html)
- Sztrik, J., Basic Queueing Theory: Foundations of System Performance Modeling, 2016, https://irh.inf.unideb.hu/~jsztrik/education/16/SOR_Main_Angol.pdf ili https://www.freetechbooks.com/basic-queueing-theory-foundations-of-system-performance-modeling-t1083.html

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Zenzerović, Z., Teorija redova čekanja, Stohastički procesi II. dio, autorizirana predavanja, Pomorski fakultet u Rijeci, Rijeka, 2003.	10	25
Lectures posted as teaching text on the website (Merlin)	web	25
Barković, D., Operacijska istraživanja, Ekonomski fakultet, Osijek, 2001.	5	25

[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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1.13. Quality Assurance
The studying quality is monitored following the ISO 9001 system, as well as European standards and guidelines for quality assurance, carried out at the Faculty of Maritime Studies, University of Rijeka. Analysis of exam passing is done once a year, and once a semester a survey is conducted among students.

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Generic information			
Head of Course	**Axel Luttenberger, Ph.D., Full Professor with tenure**		
Course	**Environmental Law**		
Study Programme	**Technology and Organization of Transport**		
Level	**Master**		
Type of Course	**Elective**		
Year of Study	**2**	Semester	**4**
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

None

1.3. Expected Learning Outcomes

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 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	X Lectures ☐ Seminars and workshops X Exercises X E-learning	☐ Practical work X Multimedia and Network ☐ Laboratory ☐ 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	Class participation		Seminar paper	0	Experiment	
Written exam		Oral exam	2	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

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

1.1. Main Reading

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

1.2. Recommended Reading

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

1.3. 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	web

1.4. 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.

[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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Generic information		
Head of Course	**Siniša Vilke, Ph. D.** **Ljudevit Krpan, Ph. D.**	
Course	**Logistics in land transport**	
Study Programme	**Technology and Organisation of Transport**	
Type of Course	Optional	
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 case is to acquire basic knowledge of logistic activities in land transport with the application of improving the organization of the transport process in accordance with modern requirements for identifying and solving logistic problems.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Explain the planning and organisation of logistical services relevant to road transport.
2. Explain the implementation and control of logistical activities in the road transport process.
3. Justify the planning and organisation of logistical services in rail transport and combined transport.
4. Interpret the implementation and control of logistic 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 logistic 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. Logistical activities and procedures in the organization of land transportation.

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. 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 process of assessment of the acquired learning outcomes is carried out according to the study regulations of the University of Rijeka and the study regulations at the Faculty Maritime Studies in Rijeka as follows:

- Through continuous review of knowledge during classes, 70% of acquired learning outcomes in the 1st colloquium (35%) and in the 2nd colloquium (35%).
- Colloquium (35%). The final exam assesses 30% of the acquired learning outcomes.

Examples of assessment of learning outcomes in relation to the specified learning outcomes are:

1. Recognize the characteristics and features of planning and organizing logistics services in road transport.
2. Describe how to implement and control logistics activities in the road transport process.
3. Explore the principles and peculiarities of planning and organizing logistic services in rail transport.
4. Explain the principles and peculiarities of implementation and control of logistic activities in the transport process by rail.
5. Explain the integral system of municipal waste collection on a given example.
6. Define the projection of daily trips and determine the number of means of transport for the transport of municipal waste from transfer stations to the collection center by default.

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

Title	*Nubmer of examples*	*Number of students*
1. Baričević, H., Vilke, S.: Logistika i sigurnost kopnenog prometa, Pomorski fakultet, Rijeka, 2016.	5	30

[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.

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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Generic information			
Head of Course	Jasminka Bonato		
Course	Reliability and safety of technical systems		
Study Programme	Technology and Organization of Transport		
Type of Course	optional		
Year of Study	2. graduate study		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5	
	Number of Hours (L+E+S)	30+15+0 (2+1+0)	

1. GENERAL COURSE DESCRIPTION

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 X E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship X Homework _____
1.6. Comments		

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1.7. Student Obligations

Regular class attendance, taking colloquia, completing homework, as well as independent assignments through the merlin system, which students qualify for the final exam.

1.8. Assessment[1] of Learning Outcomes

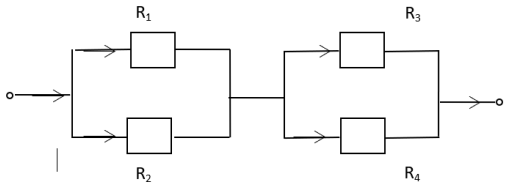
Course attendance		Class participation	0,5	Seminar paper		Experiment	
Written exam	2,5	Oral exam		Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio				Final exam	1	Homework	1

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

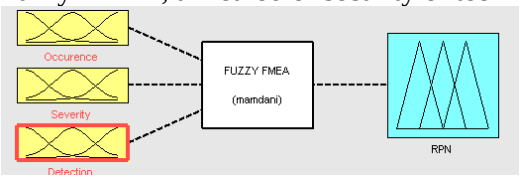
During classes 70% (colloquia + seminar + dz) and final exam 30%.

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] 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.

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

J. Bonato:“ Reliability and security of technical systems” Rijeka, 2020.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Kraš, Antun; Bonato, Jasminka; Draščić Ban, Biserka Reliability and availability of digital systems: , Rijeka,2017.	5	23

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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Generic information		
Head of Course	Ph.D. Jasmin Ćelić, assistant professor	
Course	Internet of Things	
Study Programme	Technology and Organisation of Transport	
Type of Course	Elective course	
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, technologies for their networking, application development, security issues and principles of data processing within IoT networks. Enabling students to network smart devices, implement different platforms and intelligent environments and work on developing solutions for different areas of application of IoT technology.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

After passing the exam, students will be able to do the following:

1. Identify the basic concepts and features of the Internet of Things
2. Choose the appropriate Internet of Things architecture
3. Distinguish approaches in the implementation of IoT solutions
4. Distinguish 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, models and ways of communication, 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 areas of application. The Internet of Things in industry and shipping.

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

1.6. Comments	

1.7. Student Obligations

1st colloquium, 2nd colloquium, final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam	0.5	Essay		Research	
Project		Continuous Assessment	1	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 evaluating the acquired learning outcomes is carried out according to the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka as follows:

- 70% of acquired learning outcomes are evaluated through continuous testing of knowledge during classes:
  through the 1st colloquium - learning outcomes 1.-3. (30%), 2nd colloquium - learning outcomes 4.-6. (30%); while a student after each colloquium must realize a minimum of 50% of points;
- at the final part of the exam, 40% of the acquired learning outcomes are evaluated (1-6), whereby the student must realize a minimum of 50% of points to pass the final exam;
- final ECTS grade, is defined on the basis of the achieved total% of knowledge, skills and competencies and numerical grade after the final / remedial exam as follows:
  - grade excellent (5) corresponds to grade A in the ECTS scale and a success rate of 90 to 100%,
  - a grade of very good (4) corresponds to a grade of B on the ECTS scale and a success rate of 75 to 89.9%,
  - grade good (3) corresponds to grade C in the ECTS scale and a success rate of 60 to 74.9%,
  - a grade of sufficient (2) corresponds to a grade of D on the ECTS scale and a success rate of 50 to 59.9%,
  - the grade insufficient (1) corresponds to the grade F in the ECTS scale and the success rate from 0 to 49.9%.

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

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

[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.

1.10. Main Reading

- Cirani, S., Ferrari, G., Picone, M., Veltri, L. (2019.). Internet of Things: Architectures, Protocols and Standards, 1st edition, Wiley, Hoboken, NJ, USA
- Ćelić, J. (2021.). Internet of Things, authorized lectures, Faculty of Maritime Studies, University of Rijeka, Rijeka, Croatia

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

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 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.

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Trg braće Mažuranića 10 • 51 000 Rijeka • Croatia
T: (051) 406-500 • F: (051) 216-671; 216-091
W: www.uniri.hr • E: ured@uniri.hr

Generic information		
Head of Course	**Siniša Vilke, Ph.D.**	
Course	**Professional Practice**	
Study Programme	**Technology and Organization of Transport**	
Type of Course	**Optional**	
Year of Study	**2**	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	**5**
	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 and inland transport, as well as to acquire the working 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 of each academic year. Based on the Decision, a list of students who are qualified for enrollment is drawn up.

1.3. Expected Learning Outcomes

1. Describe the organization of work of the employer in which the student was engaged in professional practice.
2. Explain and analyze work processes and activities and job content from one or more workplaces within the company/institution where the student practice was performed.
3. Correlate theoretical knowledge and practical skills to work on specific jobs in practice.
4. Adapt to the work environment.
5. Demonstrate and independently perform a specific professional task based on the practical knowledge gained during the professional practice.

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 technology and organization of traffic. As part of the traineeship, 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.

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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

The student performs a professional practice with an employer who, as part of his or her core activity, performs professional tasks that are consistent with the professional profile of his or her studies.
- Attending a practice with an employer
- Keeping a Log of Professional Practice
- 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 assessment of practice logs, project assignment and success in the practice by a mentor at the institution where the student took the practical work, head of the course concludes the student's success in achieving the defined learning outcomes and defines the final grade of the course.

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.

[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.