



Course description

Generic information		
Head of Course	Dr.sc. Biserka Drašić Ban	
Course	Applied Mathematics	
Study Programme	Nautical Studies and Marine Transport Technology	
Type of Course	mandatory	
Year of Study	1.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30+30+0 (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

- | | |
|---|---|
| <input checked="" type="checkbox"/> Lectures | <input type="checkbox"/> Practical work |
| <input type="checkbox"/> Seminars and workshops | <input type="checkbox"/> Multimedia and Network |
| <input checked="" type="checkbox"/> Exercises | <input type="checkbox"/> Laboratory |
| <input type="checkbox"/> E-learning | <input type="checkbox"/> Mentorship |
| <input type="checkbox"/> Field work | <input type="checkbox"/> Other _____ |

1.6. Comments

1.7. Student Obligations



Regular attendance at classes and homework.

1.8. Assessment¹ of Learning Outcomes

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

¹ **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

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 $P(-1 < X < 6)$.
3. Determine the zero point of the function $f(x) = x^2 - 2/x$ 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.Marón: 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, 196

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	



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B. Draščić, T. Poganj, Primijenjena matematika, Pomorski fakultet u Rijeci, Sveučilište u Rijeci, Rijeka, 2010.	As needed	
1.13. <i>Quality Assurance</i>		



3.2. Course description

Generic information		
Head of Course	PhD Mirano Hess	
Course	Coastal Zone Management	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Optional course	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	45 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

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

1.4. Course Outline



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

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input type="checkbox"/> Field work		<input type="checkbox"/> Practical work <input checked="" type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____				
1.6. Comments							
1.7. Student Obligations							
Attendance in classes. Passing an in-course colloquium and a final exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	1.1	Oral exam		Essay		Research	
Project		Continuous Assessment	2.4	Presentation		Practical work	
Portfolio							

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

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

Examples of Learning Outcome Assessments:

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance



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



3.2. Course description

Generic information		
Head of Course	Edvard Tijan, PhD	
Course	Human Resource Management	
Study Programme	Nautical Studies and Maritime Transport Technology, graduate level	
Type of Course	elective	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able to:

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

1.4. Course Outline



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

1.5. Modes of Instruction



Lectures



Seminars and workshops



Exercises



E-learning



Field work



Practical work



Multimedia and Network



Laboratory



Mentorship



Other _____

1.6. Comments

1.7. Student Obligations

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

1.8. Assessment¹ of Learning Outcomes

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

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



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

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

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

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

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

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

Learning outcome 1: Explain the difference between human capital and human potential.

Learning outcome 2: What is the difference between job (work) analysis and position analysis?

Learning outcome 3: State the differences between regular and extraordinary termination of an employment contract.

Learning outcome 4: Select appropriate tests for different job positions and explain the methods of implementation.

Learning outcome 5: Develop a plan for onboarding new employees.

Learning outcome 6: Design a system for motivating and rewarding employees that consists of both material and non-material components.

Learning outcome 7: List and compare techniques for assessing work efficiency.

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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



1.13. Quality Assurance

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



3.2. Course description

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

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After learning, the student will be able to:

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

1.4. Course Outline

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

1.5. Modes of Instruction

- ☒ Lectures
- ☒ Seminars and workshops
- ☐ Exercises
- ☐ E-learning
- ☐ Field work

- ☒ Practical work
- ☐ Multimedia and Network
- ☐ Laboratory
- ☒ Mentorship
- ☐ Other _____



1.6. Comments		None					
1.7. Student Obligations							
<ul style="list-style-type: none">- 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: <ul style="list-style-type: none">- Presentation of the project assignment and research results: 50% of grade points- Final oral exam (all outcomes): 50% of the grade points.							
Examples of assessment of learning outcomes: <ul style="list-style-type: none">- Describe the rights and obligations of the coastal State when exploiting resources in the economic zone (1)- Explain pelagic fishing technologies (2)- Describe the principle of hydrocarbon exploration by seismic ships (3)- Compare the features of different types of hydrocarbon exploration platforms (3)- List and explain the principles of harnessing wave energy (4)- Judge which principle of using marine energy is applicable in the Adriatic Sea (4)- Explain the rights and obligations of anchorage users in nautical tourism in accordance with the regulations of the Republic of Croatia (5)- Compare the features of the different classes of ROV (6).							
1.10. Main Reading							
Teaching material available on the e-learning system - Merlin (https://moodle.srce.hr)							
1.11. Recommended Reading							
Selected entries of the Maritime Encyclopedia and a selection of articles and studies available on the Merlin e-learning system.							
1.12. Number of Main Reading Examples							
Title				Number of examples		Number of students	
Teaching material available on the e-learning system - Merlin (https://moodle.srce.hr)				Unlimited			
1.13. Quality Assurance							
The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the failure to pass are analysed and appropriate measures are adopted.							

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.



3.2. Course description

Generic information		
Head of Course	Doc.dr.sc. Juraj Bukša	
Course	Maritime Systems	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Compulsory	
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 + 1 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course Maritime Systems is to equip students with advanced theoretical and practical knowledge regarding the structure, function, and management of maritime systems, which form the backbone of the modern global economy. The curriculum provides students with analytical tools to examine complex maritime processes, including international regulations, logistics, economics, and the technologies shaping the global maritime industry.

Special attention will be devoted to contemporary challenges such as:

- *Climate change and its impact on maritime systems,*
- *Digitalization and the application of emerging technologies, including artificial intelligence and automation,*
- *Geopolitics and global trade networks,*
- *Sustainability and environmental concerns in maritime operations.*

The objective of the course is not only to provide students with a deep understanding of the fundamental components of maritime systems, but also to prepare them to make strategic decisions, anticipate trends, and develop innovative solutions within a dynamic and ever-changing global environment. In doing so, students will be well-prepared to manage complex challenges in the maritime sector and to contribute meaningfully to its continued advancement.



1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon successful completion of the course, students will be able to:

1. Analyze and interpret key concepts and classifications of maritime systems – Understand the fundamental structure and interconnection of core elements such as ports, vessels, logistics chains, and legal frameworks.
2. Evaluate the historical development and impact of maritime transport on global trade – Explain key historical events that have shaped the modern maritime system.
3. Apply knowledge of international regulations – Understand the role of institutions such as the IMO, EU legislation, and national regulators, and assess their influence on the operational aspects of the maritime sector.
4. Develop strategies to improve logistics and transport processes – Analyze maritime logistics chains, identify their weaknesses, and propose innovative solutions for optimization.
5. Develop sustainable models for managing maritime resources – Including reducing CO₂ emissions, improving ship energy efficiency, and integrating circular economy principles within the maritime sector.
6. Understand the impact of modern technologies – Analyze the application of automation, digitalization, artificial intelligence, and blockchain technology in maritime operations.
7. Identify key challenges and opportunities in port management – Propose measures to enhance port competitiveness in both regional and global contexts, with a focus on infrastructure, logistics, and environmental sustainability.
8. Analyze case studies – Evaluate real-world examples of maritime system modernization, such as LNG terminal projects, container terminal developments, or the implementation of smart technologies.



1.4. Course Outline

The course covers both theoretical and practical aspects of maritime systems, with an emphasis on an integrative approach and multidisciplinary analysis. Thematic units include:

1. Introduction to Maritime Systems

- Fundamental concepts, definitions, and classification of maritime systems
- Historical overview of maritime development, with a focus on technological innovations and key historical events

2. Structure of Maritime Systems

- Maritime infrastructure (ports, terminals, waterways)
- Economic, technical, and legal aspects of maritime systems
- International regulations and standards (IMO, SOLAS, MARPOL, ISM)

3. Maritime Transport and Logistics

- The role of maritime systems in global logistics chains
- Optimization of maritime transport and innovation in logistics processes
- Case studies – management of container terminals and LNG projects

4. Sustainable Development and Ecology

- Environmental impact of the maritime sector
- Application of sustainable technologies in maritime operations – alternative energy sources, ship energy efficiency, circular economy
- Analysis of international initiatives to reduce greenhouse gas emissions

5. Geopolitics and Maritime Economics

- The influence of maritime transport on global trade and economic integration
- Geopolitical challenges (Suez Canal, Strait of Hormuz, Bosphorus, Panama Canal)
- Market trends and development opportunities for the maritime sector in Croatia and globally

6. Port Management

- Strategies for improving port efficiency and competitiveness
- Implementation of smart technologies and digitalization in port systems
- Examples of port management in Croatia and worldwide – Port of Rijeka, Port of Gaženica, LNG terminal Omišalj

7. Contemporary Challenges in Maritime Affairs

- Climate change and its effects on the maritime sector
- The impact of pandemics and geopolitics on maritime transport
- Safety and cybersecurity in the maritime domain

8. Final Analysis and Future Perspectives

- Projections for the development of maritime systems in the 21st century
- Key challenges and opportunities for Croatia as a maritime nation
- Student discussion and integration of acquired knowledge into practical scenarios

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 lectures and practical sessions, pass the midterm exams (continuous assessment), and submit an independently written seminar paper in order to be eligible to take the final exam.

1.8. Assessment¹ of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam	1	Essay		Research	0.5
Project		Continuous Assessment	1.5	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

Student Obligations During the Course:

- **Regular Class Attendance:**

Students are expected to attend at least 75% of the total hours of lectures, seminars, and practical sessions. Regular attendance enhances students' understanding of the course material and enables active participation in discussions.

- **Final Examination (50% of final grade):**

The final exam consists of both theoretical and practical questions. Its purpose is to assess students' comprehension of key concepts and their ability to apply acquired knowledge to specific scenarios within maritime systems.

- **Project Assignment (50% of final grade):**

Throughout the semester, students are required to complete a project assignment as part of the seminars or practical sessions. The task involves the analysis of a specific aspect of a maritime system, critical evaluation of data, and presentation of results to their peers.

- **Prerequisites for Taking the Final Exam:**

Completion and submission of the project assignment during seminars or practical sessions.

Examples of Learning Outcome Assessment Aligned with Intended Learning Outcomes:

1. Define the concept of a maritime system and explain its importance in a nation's transport policy.
2. Analyze and evaluate individual components of the maritime system, as well as their interdependent interactions.
3. Classify and explain the economic aspects of the maritime system.
4. Interpret the impact of EU policies on the development of legal aspects of the maritime system in a specific EU member state.
5. Select and evaluate the impact of a specific regional event on the development of the global maritime system.
6. Identify various models of port coastal area management and interpret and compare the advantages and disadvantages of each management approach.

1.10. Main Reading

1. Bukša, J., *Maritime Systems*, Peer-reviewed lectures, Faculty of Maritime Studies, University of Rijeka, Rijeka, 2024.
2. Domijan-Arneri, I., *Business Operations in Sea Shipping*, Redak, Split, 2014.
3. Stopford, M., *Maritime Economics*, Routledge, London & New York, 2000 and later editions.



1.11. Recommended Reading

1. *Maritime Code* (Pomorski zakonik)
2. *Act on Maritime Domain and Seaports* (Zakon o pomorskom dobru i morskim lukama)
3. Academic Journals:
 - *Pomorstvo*
 - *Pomorski zbornik*
 - *Naše More*
 - *PROMET – Traffic & Transportation*
 - *Maritime Policy and Management*
 - *Journal of Transport Economics and Policy*

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Zelenika, R., <i>Transport Systems</i> , Faculty of Economics, University of Rijeka, Rijeka, 2001.	10	15
Dundović, Č., <i>Maritime System and Maritime Policy</i> , Faculty of Maritime Studies, University of Rijeka, Rijeka, 2003.	10	15
Kovačić, M., Komadina, P., <i>Coastal Area Management and Sustainable Development</i> , Faculty of Maritime Studies, University of Rijeka, Rijeka, 2011.	10	15
Vojković, G., <i>Maritime Domain and Concessions</i> , Croatian Hydrographic Institute (HHI), Split, 2003.	2	15

1.13. Quality Assurance

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



3.2 Course description

Generic information		
Head of Course	Sandra Tominac Coslovich, PhD, Full professor	
Course	Multiculturalism and Communication on Board	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Elective	
Year of Study	2nd	Graduate level
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours(L+E+S)	30+15+0 (2+1+0)

1.GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Developing and understanding the concepts of culture, the relationship between language and culture, and cultural dimensions according to Geert Hofstede, Fons Trompenaars, and Richard Lewis applied to the most numerous nationalities present on board (e.g., power distance, collectivist vs. individualist cultures, etc.). Understanding the role and place of multiculturalism in maritime industry (on board, in shipping agencies, shipping companies, ports, maritime administrations, etc.). Evaluating the role of language and culture in maritime business: national culture and language vs. international business relations, idiosyncratic features of language and culture in maritime industry. Understanding the concepts of multilingualism, multiethnicity, and multiculturalism in maritime industry. Developing methodology in the research of multilingualism and multiculturalism. Developing critical thinking skills in evaluating the place and role of language and culture on board.

1.2. Prerequisites for Course Registration

Completed undergraduate programme(s) in nautical studies, marine engineering or logistics and management in maritime transport

1.3. Expected Learning Outcomes

After taking the course, the students will be able to:

1. Explain and analyse the concept of culture.
2. Analyse different nationalities on board using cultural dimensions.
3. Evaluate the influence of multicultural crews on onboard work.
4. Analyse the advantages and disadvantages of quantitative and qualitative methods of research on multiculturalism.
5. Apply different cultural models in research on multiculturalism in the maritime industry.

1.4. Course Outline



Culture, language as a part of culture, culture as a determinant of language, culture as a way of life, “the culture onion”, model of “national culture” (Hofstede 2001, 2004), culture as “mental software” (Katunarić, 2004), language and culture in the process of globalization and localization, sociolinguistic aspects of multicultural communication in maritime industry (communication in stressful situations, crisis management), dimensions of culture and language: power distance, individualism and collectivism, long-term and short-term orientation, research methods in culture and sociolinguistics and their shortcomings, the danger of drawing absolute conclusions about national culture, a critique of Hofstede's postulates (Sweeney 2002), multinational crews: aspects of multilingualism and multiculturalism; problems in communication; research studies (Moreby, 1990), language and culture studies in the process of employing seafarers (Knudssen 2005, Horck 2005): culture and authority, “crewing”, cultural differences in the maritime industry, developing awareness of the importance of human factor and communication in maritime industry, the importance of continuous education on communication in multicultural environments, the relationship between English language and national languages and cultures in maritime industry.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Practical work					
	<input type="checkbox"/> Seminars and workshops	<input checked="" type="checkbox"/> Multimedia and Network					
	<input checked="" type="checkbox"/> Exercises	<input type="checkbox"/> Laboratory					
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship					
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Class attendance, passing written exam and assembling and presenting a seminar paper							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation	1,5	Seminar paper	1	Experiment	
Written exam		Oral exam		Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio		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.



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

Written test, preparation and presentation of a seminar paper, participation in class activities

Learning outcome 1.: Analyse the concept of culture and compare its various definitions

Learning outcomes 2., 3., 5.: Explain the impact of multicultural differences on ship's safety based on the text from the study entitled "If you are a good leader, I am a good follower"

Learning outcome 4.: Examine critically the advantages and limitations of the models of cultural dimensions according to Hofstede and Trompenaars.

Learning outcome 2., 4., 5.: Apply Hofstede's model of cultural dimensions in the analysis of one nationality on board according to your own choice and present the results and your own critical review in a seminar paper.

1.10. Main Reading

1. *Cross-Cultural Training* - course developed within the project KNOWME by Dorina Pörksen (author) and oncampus, e-learning department of Lübeck University of Applied Sciences, Germany – designed for developing intercultural competency in the maritime industry, <https://lernen.oncampus.de/blocks/ocproducts/product.php?id=08938638dd4ffc834b7d0d2482dd6f13>
2. *Cross Cultural Competency for Maritime Professionals through Education and Training* (CCUL.COMPET) (Phase II), IAMU 2011 Research Project No 2011-3 by James R. Parsons, Elaine Potoker & Maria Progoulaki, [http://archive.iamu-edu.org/download/final-report-of-research-project-fy2011/?ind=1633559032048&filename=2011-3%20Cross-CULTural%20Competence%20for%20Maritime%20Professionals%20through%20Education%20and%20Training%20\(CCUL.COMPET\)\(Part%202\).pdf&wpdmdl=6764&refresh=67865e1712a771736859159](http://archive.iamu-edu.org/download/final-report-of-research-project-fy2011/?ind=1633559032048&filename=2011-3%20Cross-CULTural%20Competence%20for%20Maritime%20Professionals%20through%20Education%20and%20Training%20(CCUL.COMPET)(Part%202).pdf&wpdmdl=6764&refresh=67865e1712a771736859159)
3. *Hofstede's Insights – Country Comparision*, <https://www.hofstede-insights.com/product/compare-countries/>

1.11. Recommended Reading



1. Hofstede, Geert (1997/2004) *Cultures and Organizations: Software of the Mind*
2. Horck, J. (2005) Can shipping people communicate? A human factor aspect on multicultural communication and ethnic stereotyping in Shipping. *Journal of Maritime Studies*. Vol. 2. World Maritime University
3. Jeknić, Ranka (2006) Individualističke i kolektivističke kulture u kontekstu globalizacije: Hofstedeov model i njegova kritika. *Revija za sociologiju*, Vol XXXVII (2006), No 3-4, 205-225.
4. Knudsen, F. (2005) *Seamanship –between techniques and practical wisdom*. Proceedings of NoFS6.
5. Lutsenko, O. & Stok, H. (2008) *Cultural awareness in Maritime English*. Proceedings of IMLA-IMEC Conference on Maritime English, Rotterdam
6. Andres, T. Q. D. (2006) *Understanding the Filipino Seaman: His Values, Attitudes and Behavior*, Our Lady of Manaoag Publishers, Manila, Philippines
7. Barnett, M.L (2005) Searching for the Root Causes of Maritime Casualties: Individual Competence or Organisational Culture? Maritime Research Centre, Warsash, Southampton, UK, *WMU Journal of Maritime Affairs*, 2005, Vol. 4, No.2, 131–145.
8. Benton, G. *Multicultural crews and the culture of globalization*, Department of Global and Maritime Studies, California Maritime Academy. [www.Multicultural crews and the culture of globalization.mht](http://www.Multicultural%20crews%20and%20the%20culture%20of%20globalization.mht)
9. Čulić-Viskota, A. & Bielić, T. (2008) Cultural and linguistic differences as factors of ineffective communication. Proceedings of IMLA-IMEC 20, Rotterdam
10. Froholdt, L.L. (2007) *Seamanship -Between Techniques And Practical Wisdom Imec 2007 The Human element in Maritime Accidents and disasters –a matter of communication*
11. Galešić, A.-Dž., Tominac Coslovich, S. (2019) Working with Multinational and Multicultural Crews: a Croatian Seafarers' Perspective, *Scientific Journal of Maritime Research* 33 2019, pp. 56-62, Faculty of Maritime Studies, University of Rijeka, <https://doi.org/10.31217/p.33.1.6>
12. Hofstede, G. *Culture's consequences: international differences in work-related values*, Abridged version, London: Sage, 1984/2001.
13. Hofstede Geert 1997 (1991) *Cultures and organizations Software of the mind*. Intercultural cooperation and its importance for survival. McGraw-Hill NY, London m.fl.
14. Horck, Jan (2005) Getting the best out of multi-cultural manning. BIMCO GA 2005 in Copenhagen
15. Horck, J. (2003) Cultural Diversity in Shipping. *The International Maritime Human Element Bulletin*, No. 18.
16. Katunarić, Vjeran (2004) Od distance prema srodnosti: model "nacionalne kulture" Geerta Hofstede. *Pedagoški istraživanja*, 1(1):25–39.
17. Knudsen F. (2004): "If you are a good leader I am a good follower". Working and leisure relations between Danes and Filipinos on board Danish vessels. *Arbejdsgog Maritimmedicinsk Publikationsserie*, rapport nr. 910.
18. Knudsen, F. (2007) *Are we really programmed by our culture? A critical approach to culture as software of the mind*. Syddansk Universitet
19. Knudsen, F. (2008) Conceptions of 'culture' in inter-national communication - Limits to cultural explanation. Proceedings of IMLA-IMEC Conference on Maritime English, Rotterdam
20. McSweeney, Brendan (2002): Hofstede's model of national cultural differences and their consequences: a triumph of faith—a failure of analysis. *Human Relations* 55 (1), pp. 89–118.
21. Pritchard (1998) Report on Current Approved Standards of Maritime English Communication and Recommendation – Deliverable No. 6 –In: *The Impact of Multicultural and Multinational Crews on MARITIME COMMUNICATION*, The MARCOM Project), European Union (1996-1998), Malmö: 1-6813.
22. Pritchard, B. (1998) 'Norma i jezične varijacije u pomorskim komunikacijama', *Zbornik HDPL-a*, ur. B. Pritchard, Badurina, D. Stolac, Zagreb, 457-470 14.
23. Pritchard, B. (2003) Maritime English syllabus for the modern seafarer: comprehensive or safety-related communication? *WMU Journal of Maritime Affairs*, 2003, Vol. 2, No. 2, Malmö: 149-16615.
24. Pritchard, B. (2000) 'Maritime VHF Communications: Standards versus Practice', In: *Proceedings of Workshop on Maritime English (WOME 2A)*, IMLA, Dalian Maritime University, Dalian, China, 44-5410.
25. Pritchard, B. (1998) On Some Cultural Issues in Translating Lexical Sets, *British Studies Conference -Cross-Cultural Challenges*, The British Council, 84-103 16.
26. Taylor. P. T. (2008) *The culture of safety onboard!*. Proceedings of IMLA-IMEC Conference on Maritime English, Rotterdam



1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
<i>Cross-Cultural Training</i> - course developed within the project KNOWME by Dorina Pörksen – designed for developing intercultural competency in the maritime industry	available online at https://lernen.uncamp.us.de/blocks/ocproducts/product.php?id=08938638dd4ffc834b7d0d2482dd6f13	20
<i>Cross Cultural Competency for Maritime Professionals through Education and Training (CCUL.COMPET) (Phase II)</i> by James R. Parsons, Elaine Potoker & Maria Progoulaki	Available online at http://archive.iamu.edu.org/download/final-report-of-research-project-fy2011/?ind=1633559032048&filename=2011-3%20Cross-CULtural%20Competence%20for%20Maritime%20Professionals%20through%20Education%20and%20Training%20(CUL.COMPET)(Part%202).pdf&wpdmdl=6764&refresh=67865e1712a771736859159	20
<i>Hofstede's Insights</i> – Country Comparision, https://www.hofstede-insights.com/product/compare-countries/	Available online at https://www.hofstede-insights.com/	20

1.13. Quality Assurance

The quality of the course is monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. Once a year the results of the course are analysed and a survey is conducted among the students once per semester.



Course description

Generic information			
Head of Course	Ana Perić Hadžić, PhD		
Course	Scientific Research Methodology		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	mandatory		
Year of Study	1	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 the course is to learn the basic knowledge about concepts of methodology and technology of scientific and professional research, and their training of students for the application of student works at the level of graduate studies.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After passing the exam from this course, students will be able to:

1. define and clearly distinguish between scientific concepts, scientific research work and scientific research activity
2. analyze fundamental and developmental characteristics of science and research focusing on contemporary social and technological processes
3. classify science fields in Republic of Croatia in accordance with the applicable legislative framework
4. define, understand and interpret fundamental scientific categories through specific examples in research process framework.
5. distinguish and classify types and structure of scientific, scientific research and professional papers and critically evaluate their relevance
6. describe, classify and compare key scientific methods, and analyze its purpose in specific research projects.
7. interpret and apply technology of scientific research by mastering the phases of research process.
8. apply methodological and technological scientific research principles in creation, writing, structuring students papers in higher education.

1.4. Course Outline

Science, scientific activity and research: Theory of Science, characteristics of contemporary science, Croatia in science, Croatian classification framework, scientific and technological policy of the Republic of Croatia, classification of science. Scientific, scientific and professional works: classification of written works, concept and types of scientific works, concept and types of scientific professional works, concept and types of professional parts, works on undergraduate and graduate studies, works on postgraduate studies. The concept and features of the scientific method. Scientific research methodology. Scientific research technology: recognition of scientific problems, placement of hypotheses, selection and analysis of topics (titles), development of research plan, drafting of work bibliography, collection and study of literature and



scientific information, solving the problem, formulating the results of research, applying the results of research, controlling of the application of research results. Writing text and technical processing of scientific and professional work: Documentation Base of the manuscript, reading of literature, referencing in the text, European quoting system, Harvard (American) quoting system, illustration showing.

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 be present for at least 70% of the total hours in lectures and tutorials and have passed continuous assessments and written an independent seminar paper to be admitted to the final exam.

1.8. Assessment¹ of Learning Outcomes

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

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:

- 1st assessment – it is necessary to achieve a minimum of 50% correct answers
- 2nd assessment – it is necessary to achieve a minimum of 50% correct answers
- Seminar paper – it is necessary to show the acquired knowledge and application of technology and methodology

Final exam:

- At the final exam it is necessary to achieve a minimum of 50% correct answers.

Examples of assessment of learning outcomes in relation to established learning outcomes are:

1. define the terms science and scientific research
2. explain the development characteristics of science
3. name the scientific fields in Croatia according to the latest qualification of science from 2009 (Regulation on Scientific and Artistic Fields, Areas and Branches, NN, 2009).
4. explain what the problem and the object of research is and give an example
5. explain what a journal is as a work and to which category the work belongs
6. define compilation methods and explain how we use them
7. name the stages of scientific research technique
8. prepare a seminar paper in which you apply the principles of methodology and technology of scientific research.



1.10. Main Reading		
1. Zelenika, R.: Metodologija i tehnologija izrade znanstvenog i stručnog djela, Pisana djela na stručnim i sveučilišnim studijima, knjiga peta, Ekonomski fakultet u Rijeci, Rijeka, 2011.		
2. Teaching material available on the e-learning platform – Merlin (https://moodle.srce.hr)		
3. Instructions for the preparation of the thesis, University of Rijeka, Faculty of Maritime Studies, 2020 (online materials)		
1.11. Recommended Reading		
1. Kulenović, Z.: Metodologija istraživačkog rada, Pomorski fakultet Sveučilišta u Splitu, Split 2005.		
2. Žugaj, M., Dumičić, K., Dušak, V.: Temelji znanstvenoistraživačkog rada : metodologija i metodika , 2. dop. izmijenjeno izdanje, Varaždin, Tiva , 2006		
1.12. Number of Main Reading Examples		
Title	Number of examples	Number of students
Zelenika, R.: Metodologija i tehnologija izrade znanstvenog i stručnog djela, Pisana djela na stručnim i sveučilišnim studijima, knjiga peta, Ekonomski fakultet u Rijeci, Rijeka, 2011.	6	50
Teaching material available on the e-learning platform – Merlin (https://moodle.srce.hr)	Unlimited	50
Instructions for the preparation of the thesis, University of Rijeka, Faculty of Maritime Studies, 2020 (online materials)	Unlimited	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.		



3.2. Course description

Generic information		
Head of Course	Borna Debelić, PhD	
Course	Shipping and Port Management	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Elective	
Year of Study	1.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

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

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

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

1.5. Modes of Instruction

☒ Lectures

☐ Seminars and workshops

☐ Exercises

☐ E-learning

☒ Field work

☒ Practical work

☒ Multimedia and Network

☐ Laboratory

☒ Mentorship

☐ Other _____

1.6. Comments

1.7. Student Obligations

Regular attendance at classes and completion of homework assignments.

1.8. Assessment¹ of Learning Outcomes

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

¹ **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

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

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	Renato Ivče full professor, Ph.D	
Course	Survey and maintenance planning of ship systems	
Study Programme	Nautical Studies and Maritime Transport Technology	
Optional	Optional	
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+1+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to acquaint students with the importance of maintenance and the necessity of its planning as a cornerstone of modern management of human and material resources in the maritime industry. The course emphasizes the significance of implementing maintenance strategies and introducing software tools that contribute to the optimization of ship system maintenance, with the goal of enhancing the efficiency of maritime transport operations and, more broadly, increasing the competitiveness of shipping companies in the maritime market.

1.2. Prerequisites for Course Registration

No prerequisites for Course Registration

1.3. Expected Learning Outcomes

1. Determine the importance of inspection and maintenance planning for ship systems
2. Assess the impact of maintenance on the efficiency and profitability of shipping companies
3. Evaluate the significance of maintenance management of individual ship systems
4. Identify the key factors for optimizing ship system maintenance
5. Master the use of software tools applied in ship system maintenance
6. Apply modern maintenance strategies to specific ship systems

1.4. Course Outline



Modern Trends in Maritime industry. Importance of inspection and maintenance planning of ship systems- Application of legal regulations to ship maintenance. Maintenance strategies for ship systems. Reliability of ship systems and maintenance. Ship maintenance in modern maritime company operations. Ship construction and interventions: repairs, replacement of major system components, modifications, or renewal of significant equipment from a maintenance perspective. Management and evaluation of ship system maintenance. Condition assessment of ship systems and maintenance planning based on database analysis. Optimization of ship system maintenance. Software tools in modern ship system maintenance, Inspection needs and condition assessment of the ship's hull and equipment-Importance of statutory ship surveys from a maintenance standpoint. Maintenance and inspection of cargo handling systems.

1.5. Modes of Instruction	X Lectures	X Practical work
	<input type="checkbox"/> Seminars and workshops	<input type="checkbox"/> Multimedia and Network
	X Exercises	<input type="checkbox"/> Laboratory
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____

1.6. Comments	
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1.7. Student Obligations

Active attendance in classes and at least 70% of completed classes are required for admission to the exam. Successfully passing the colloquiums and the final oral exam.

1.8. Assessment ¹ of Learning Outcomes

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

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

1st preliminary exam – learning outcomes 1-6 (1,0 ECTS (30%)) theory. In addition, the student must achieve a minimum of 52% of points for preliminary exam. To a seminar presentation, learning outcomes 1–6 (1,0 ECTS / 10%)

Final exam (1,0 ECTS (35%)) of the acquired learning outcomes (1-6), whereby the student must achieve a minimum of 52% of points to pass the final exam. To a seminar presentation, learning outcomes 1–5 (0,5 ECTS / 35%).

Examples of evaluation of individual learning outcomes during classes and at the final exam

1. Evaluate the importance of ship inspections conducted by classification societies from the perspective of required maintenance standards
2. Understand the role of ship system reliability in achieving commercial efficiency of the vessel
3. Assess the management of human and material resources in maintaining ship systems on container vessels in liner shipping
4. Identify key factors for optimizing maintenance of bulk carriers
5. Demonstrate proficiency in using the AMOS software tool

1.10. Main Reading

- 1 Ahuja, P. S.: Total Productive Maintenance, Chapter 17. u Handbook of Maintenance Management and Engineering, Springer-Verlag, London, 2009
2. Lovrić: Osnove brodske terotehnologije, Pomorski fakultet, Dubrovnik, 1989;
3. Siddiqui, A. W., Ben-Daya, M.: Reliability Centered Maintenance, Chapter 16. u Handbook of Maintenance Management and Engineering, Springer-Verlag, London, 2009.
4. Wintle J. B.; Kenzie, B. W.; Amphlett, G. J.; Smalley, S.: Best practice for risk based inspection as a part of plant integrity management, Contract research report 363/2001, HSE Books, **Sudbury/Suffolk, 20014.**
5. Ivče, R., teaching materials from the course Survey and maintenance ship systems on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka

1.11. Recommended Reading

- 1 Čekerevac, S.: Totalno produktivno održavanje, Tehnička dijagnostika, Br. 2, 2004
2. Irungu, S. C. : Total productive maintenance by cement companies in Kenya, Research project, University in Nairobi, 2015.
- 3 Idhammar, C.: Reliability and Maintenance Management Beliefs, Maintworld - maintenance & asset management, 4 (2016), Onipress Oy, Helsinki
- 4 Lycke L., Akersten, P. A.: Experiences of implementing TPM in Swedish industries International **Journal of Reliability and Application**
5. Kos S., Bukša J. : Feeder service of Lošinj'ska plovidba – Base of Multimodalism in the

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. Ahuja, P. S.: Total Productive Maintenance	web	
2. Lovrić: Osnove brodske terotehnologije	30	



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Idhammar, C.: Reliability and Maintenance Management Beliefs, Maintworld - maintenance &	web	
Teaching materials from the course	web	
<i>1.13. Quality Assurance</i>		
The quality of the study is monitored by the ISO 9001 system and by the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, exam passing results are analyzed and appropriate measures are adopted.		



3.2. Course description

Generic information		
Head of Course	Prof. dr. sc. Neven Grubišić	
Course	Designing and Planning of Ports and Terminals	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Optional	
Year of Study	1.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+0+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objectives of the course are getting knowledge about methods for strategic and tactical planning of port container and intermodal transport terminals, and about the methods for port operation and cargo handling process planning.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon completing the course, the student will be able to:

1. Apply the system analysis procedures and LCM methods in planning of ports and terminals.
2. Identify functional requirements to be used for strategic planning
3. Divide port area into zones and draw the port layout with the main infrastructure objects (zoning)
4. Calculate optimal number of berthing facilities, capacity needs and the port area for different type of terminals
5. Solve typical logistic tactical problems in Container terminals
6. Draw up operating plan for handling equipment job-schedule

1.4. Course Outline



Meaning of transport planning and categories of planning. Strategic and tactical planning. Dependency between spatial and transport facilities planning. Methodology of terminal development. Application of system engineering and LCM ("Life Cycle Management") approaches to port planning. Structure of port Master plan. Functional requirements for ports and terminals development. Berth requirements, terminal area and capacity computations. Layout design problems and space optimization. Tactical logistic problems on Container terminals. Berth and quay crane allocation, crane scheduling and transport process optimization.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input type="checkbox"/> Exercises <input checked="" type="checkbox"/> E-learning <input type="checkbox"/> Field work	<input type="checkbox"/> Practical work <input checked="" type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments	Lectures are held in a specialized classroom equipped with computer tools for technical drawing and programming.						
1.7. Student Obligations							
Students are required to regularly attend classes, actively participate in instructional activities, and complete a programming assignment on a computer.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project	1	Continuous Assessment	1	Presentation		Practical work	
Portfolio							

¹ **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 achieved learning outcomes is conducted in accordance with the Regulations on Study Programs of the University of Rijeka and the Study Regulations of the Faculty of Maritime Studies in Rijeka as follows:

Project/Programming Assignment:

Development of a layout plan (zoning) for land use in the port area - Learning Outcome 3: 30 points

Defense of the Programming Assignment - Learning Outcome 3: 10 points

Continuous Knowledge Assessment:

Test 1: Calculation of the number of berths and operational capacities - Learning Outcome 4: 10 points

Test 2: Preparation of a tactical berth allocation plan and an operational plan for cargo handling operations

Learning Outcomes 5–6: 20 points

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

Examples of assessment by individual learning outcomes:

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance



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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.

3.2. Course Description

Generic information		
Head of Course	Igor Vio, PhD.	
Course	Environmental Law	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Graduate degree programme	
Type of Course	Elective (Deactivated)	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS Coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0
1. GENERAL COURSE DESCRIPTION		
<i>1.1. Course Objectives</i>		
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.		
<i>1.2. Prerequisites for Course Registration</i>		
none		
<i>1.3. Expected Learning Outcomes</i>		
<p>After passing the exam, students will be able:</p> <ol style="list-style-type: none"> 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 <i>acquis communautaire</i> in the field of environmental law. 		
<i>1.4. Course Outline</i>		
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	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Practical work
	<input type="checkbox"/> Seminars and workshops	X Multimedia and Network
	X Exercises	<input type="checkbox"/> Laboratory
	X E-learning	<input type="checkbox"/> Mentorship
	<input type="checkbox"/> Field work	<input type="checkbox"/> 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. Assessment¹ of Learning Outcomes

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

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

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

Examples of Assessment of Learning Outcomes:

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

1.10. 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>)

1.11. Recommended Reading

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.

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	PhD Mirano Hess	
Course	Integrated and Multimodal Transport	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Compulsory course	
Year of Study	1	
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

To equip students with the application of methods and procedures for integrated and multimodal transport. Understanding influential factors and operational processes in managing integrated and multimodal transport. Identifying optimal business models and decision-making. Comprehending rights and responsibilities defined by international regulations and recommendations.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

1. Analyze elements of the transport process and evaluate freight forwarding tasks.
2. Assess operational freight forwarding services in cargo dispatch and transport, and explain the role of non-vessel operating carriers (NVOs).
3. Explain the concept of cargo consolidation, the role and tasks of ship operators in multimodal transport, and select optimal transport routes managed by multimodal transport operators.
4. Categorize key factors affecting the execution and quality of multimodal transport.
5. Explain the duties and responsibilities of multimodal transport operators and highlight the advantages of information technology in transport and logistics.

1.4. Course Outline



1. The role of freight forwarders in transport.
2. Special cargo operators.
3. Operational freight forwarding services.
4. Key factors in cargo dispatch and transport.
5. Non-vessel operating carriers (NVOCs) and their role.
6. Concept and practice of cargo consolidation.
7. Ship operators in integrated and multimodal transport.
8. Multimodal transport operators.
9. Key factors affecting the execution and quality of multimodal transport.
10. Types of multimodal transport corridors.
11. Duties and responsibilities of multimodal transport operators, scope and limitations of liability.
12. Technical and technological characteristics of integrated and multimodal systems in road, rail, maritime, and river transport.
13. Operational parameters in cargo and passenger transport for road and rail vehicles.
14. Productivity, energy efficiency, and profitability in integrated/multimodal transport.
15. Implementation of multimodal transport, advantages of information technology in transport and logistics.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input checked="" type="checkbox"/> Practical work					
	<input type="checkbox"/> Seminars and workshops	<input checked="" type="checkbox"/> Multimedia and Network					
	<input checked="" type="checkbox"/> Exercises	<input type="checkbox"/> Laboratory					
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship					
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Attendance in classes. Preparation of a presentation/seminar paper. Passing an in-course colloquium and a final exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	0.9	Oral exam	1.05	Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio		Presentation/ Seminar paper	1.05				

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

35% in-class assessment (colloquium), 35% presentation/seminar paper on a selected topic, and 30% final exam (according to the University of Rijeka Study Regulations and the Faculty of Maritime Studies of Rijeka Study Regulations). Continuous assessment: colloquium on course material, minimum 50% of grade points required (I1, I2, I3). Presentation/seminar paper on a selected topic agreed with the assistant during exercises (I1, I2, I3, I4, I5). Final exam: written exam on course material, minimum 50% of grade points required (I4, I5).

Examples of Learning Outcome Assessments:

1. Evaluate the responsibility of freight forwarders based on the Rotterdam Rules. (I1)
2. Explain to whom and why a non-vessel operating carrier (NVO) issues a cargo receipt notice. (I2)
3. Which transport route for an MTO (Multimodal Transport Operator) will be optimal—the fastest, the cheapest, or a third option—and what will determine the route's optimality? (I3)
4. Categorize factors affecting the execution and quality of multimodal transport from the perspective of the transport client. (I4)
5. Highlight the advantages of using blockchain in transport and logistics. (I5)

1.10. Main Reading

1. Hess, M.: Integralni i multimodalni transport, 2025, na Merlinu (<https://moodle.srce.hr>).
2. Kos, S.: Integralni i multimodalni transport (Predavanja), 2025, na Merlinu (<https://moodle.srce.hr>).

1.11. Recommended Reading

1. UIC FREIGHT DEPARTMENT, Report on Combined Transport in Europe, 2024
2. UNCTAD, Contracts for the carriage of goods by sea and multimodal transport, 2024
3. Hess, Svjetlana; Hess, Mirano; Novaselić, Marko; Grbić, Luka: Assessment of the Position of North Adriatic Terminals in Container Market Based on Different Indices // Logistics (Basel), 8 (2024)
4. Babeli, Karla ; Hess, Svjetlana ; Hess, Mirano: Capacity utilization of the container terminal as multiphase service system // European transport/trasporti europei, 86 (2022)
5. Ivanić, Katarina ; Hess, Mirano: Assessment of efficiency of the north Adriatic container terminals // Naše more : znanstveni časopis za more i pomorstvo, 66 (2019)
6. Kos, Serđo; Vukić, Luka; Brčić, David, Comparison of External Costs in Multimodal Container Transport Chain. // Promet - Traffic & Transportation. 29 (2017) , 2; 243-252 (članak, znanstveni),
7. Kos, Serđo; Vilke, Siniša; Brčić, David, Redirection of the World Traffic Flow Far East – Europe via the Adriatic Sea. // Athens Journal of Technology & Engineering. 4 (2017) , 3; 229-245
8. Kos S. , Zenzerović Z. : Modelling the Transport process in Marine Container Technology , Promet , Vol.15 , No.1, str. 13-17 , Zagreb , 2003.
9. Kos S. : Productivity of Full Container Ship and Energy-Economy of its Propulsion Plant , Promet , Vol. 15, No.2, str. 101-104 , Zagreb , 2003.
10. Kos S., Zenzerović Z. : Model of Optimal Cargo Transport structure by Full Container Ship on Predefined Sailing Route , Promet , Vol. 16 , No.1 , str. 15-20 , Zagreb , 2004.
11. Kos, Serđo; Šamija, Suzana; Brčić, David : Multimodal Transport in The Function of the Port System Containerization Development // ICTS 2012 ; Maritime, Transport and Logistic Science: Conference Proceedings / Zanne, Marina ; Bajec, Patricija (ur.). Portorož : Fakulteta za pomorstvo in promet Portorož, 2012. 1-14 .
12. Vilke, Siniša; Brčić, David; Kos, Serđo, Northern and Southern European traffic flow land segment analysis as part of the redirection justification. // The International Journal on Marine Navigation and Safety of Sea Transportation. 11 (2017) , 4; 673-679

1.12. Number of Main Reading Examples

Title

Number of examples

Number of students



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Hess, M.: Integralni I multimodalni transport, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	30
2. Kos, S.: Integralni I multimodalni transport (Predavanja), 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	30
<i>1.13. Quality Assurance</i>		
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.		



Course description

Generic information		
Head of Course	Vlado Frančić, Full Professor, Ph.D.	
Course	International Maritime Safety System	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Mandatory	
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 familiarize students with the fundamental characteristics, principles, and regularities of the International Maritime Safety System and marine pollution prevention, as well as its implementation in national legislation. The course provides a general overview of the international maritime safety system, based on international and national regulations, including industry standards. Furthermore, it explains the principles of ship surveys and the work of recognized organizations (ROs), certification procedures, and the procedures of port state control (PSC) inspections. Special emphasis is placed on the technology of decision-making and regulation at the political, technological, and implementation levels, as well as their impact on the business efficiency of shipping companies at both the international and national levels.

1.2. Prerequisites for Course Registration

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

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

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

1.4. Course Outline



Principles of implementation and management of safety of navigation. Marine environment protection and the navigation safety system. The safety of navigation and marine environment protection and its position in respect of the international legal framework. International Maritime Organization (IMO) structure and organizational activities, goals. IMO Convention - organization, principles and activities. Assembly, committees, and sub-committees. The most important maritime conventions: SOLAS, COLREG, MARPOL, STCW, MLC 2006, SAR, TONNAGE, LOADLINE, AFS, BWM. Recommendations and codes adopted by the IMO. Implementation of the international sources related to the safety of navigation on the national level and the ship operators' level. Privileges and obligations of the state to ships sailing under the national flag (Flag State Control – FSC). Privileges, obligations and the role of the Recognized organizations (ROs). Classification societies and IACS. Harmonized System of Survey and Certification (HSSC).

Rights and obligations of the coastal state related to ships sailing under a foreign flag (Port State Control – PSC). Port State Control Regime. Regional cooperation. Rights and obligations and procedures according Paris Memorandum of Understanding. Future development of the safety of navigation. Influence and limitations of modern technological solutions. Influence of the safety measures to the business efficiency of the ship operators and ship-owners.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input checked="" type="checkbox"/> Practical work					
	<input type="checkbox"/> Seminars and workshops	<input checked="" type="checkbox"/> Multimedia and Network					
	<input checked="" type="checkbox"/> Exercises	<input type="checkbox"/> Laboratory					
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship					
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Active participation in classes, with at least 70% attendance. Preparation of a research paper. Oral exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	2	Essay		Research	1,5
Project		Continuous Assessment		Presentation		Practical work	
Portfolio							

¹ **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

Through oral examination and seminar Paper (research article) students will achieve learning outcomes. On the final exam (oral exam) students need to present theoretical knowledge in the field of the international maritime safety system, where it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

Examples of Assessment of Learning Outcomes:

1. Explain certification process and port state control inspection procedures (Learning Outcomes 4,5,6)
2. Determine the ship risk profile of the specific ship type according the rules of the Paris MoU. (Learning Outcomes 7, 8)

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	Dr.sc. Jakov Karmelić	
Course	International Shipping Business	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Mandatory	
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 business in the international shipping markets (freight, new-building, sale and purchase, and demolition market) for different types of shipping (liner, dry bulk, tanker, passenger, and offshore).

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

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

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

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

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

1.4. Course Outline



Analysis of world overseas trade by cargo types and regions, structure of the world merchant fleet by ship types, age structure of ships, and structure of the world fleet by ownership (countries) and operators.
Overview of international maritime and trade organizations. Shipowners and operators in all types of shipping. Specifics of the work of shipbrokers and maritime agents.
Segmentation of the shipping market. Categorization of ships in the transport of bulk, liquid, gaseous, containerized cargo and the offshore industry. Freight indices by all types of shipping. Shipping market cycles. Supply and demand in the shipping market.
Regulations on market competition in the maritime industry. Organizational structure of shipping companies. Outsourcing jobs in the maritime industry: ship management, D/A Desk, C/P Desk, service sharing centers, planning centers, etc.
Basics of designing maritime liner services. Criteria for selecting the optimal maritime service and shipping company from the user's perspective.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Practical work
	<input checked="" type="checkbox"/> Seminars and workshops	<input type="checkbox"/> Multimedia and Network
	<input checked="" type="checkbox"/> Exercises	<input type="checkbox"/> Laboratory
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____

1.6. Comments	Email communication with the Head of course: jakov.karmelic@uniri.hr
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1.7. Student Obligations

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

1.8. Assessment ¹ of Learning Outcomes

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

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 oral exam:

- Active class attendance
- Preparation and presentation of seminar paper (40 points)

A. Prerequisite for passing the oral exam (60 points):

- At least 50% of complete theoretical knowledge of the course of International Shipping Business

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

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

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Domijan-Arneri, I.: Poslovanje u morskom brodarstvu, Redak, Split, 2014.	5	40
Hess, M., Kos, S.: Ugovaranje u pomorstvu, Pomorski fakultet u Rijeci, 2013	5	40
Review of Maritime Transport, UNCTAD, New York and Geneva, web edition	40	40
Shipping and Shipbuilding Markets, Annual Review Barry Rogliano Salles, web edition	40	40
Shipping Statistics and Market Review, ISL (Institute of	1	40



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Shipping Economics and Logistics), Bremen		
1.13. <i>Quality Assurance</i>		
The quality of studies is monitored in accordance with the ISO 9001 system and in accordance with European standards and guidelines for quality assurance, which is carried out at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the examination pass rate are analyzed, and appropriate measures are adopted.		



3.2. Course description

Generic information		
Head of Course	Dr. sc. Alen Jugović, full professor	
Course	Port economics	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Electoral	
Year of Study	1 st	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course aims to enable students to understand and apply knowledge in the field of seaport organization and management. Special attention is paid to familiarizing students with port management models in the world, the specifics of port management of national and county importance in the Republic of Croatia, and determining the gravitational zones and functions of ports. Students will develop skills in designing organizational structures, analyzing economic indicators, and assessing key factors that influence port operations.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

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

1. Explain the basic concepts of ports and port system
2. Explain port features as creators of multiplier effects
3. List the types of seaports
4. Analyze port development trends
5. Understand the importance and impact of particular phenomena (globalization, informatization etc.) on the development and competitiveness of ports
6. Analyze and apply basic economic settings to individual cases from port practice (calculation of travel costs, fares, etc.).

1.4. Course Outline



THE ROLE AND IMPORTANCE OF PORTS. Port definition, division of ports and port terminology.

HISTORICAL DEVELOPMENT OF PORTS. The development of ports from ancient times to the present.

INTERNATIONAL MARITIME TRAFFIC AND PORTS. Development of international maritime freight transport. Port development as a consequence of the incensement in maritime freight traffic.

FACTORS RELEVANT FOR THE DEVELOPMENT OF PORTS. Natural benefits of the ports. Technical benefits of the ports. Labor organization in the ports. Customs regime. Tariffs and tariff policy. Economic strength of the port hinterland. The role of the state in port development and port policy measures. Political relations.

GRAVITATION ZONES IN PORTS. The concept and significance of the gravitations zones in ports. Factors relevant for determining the size of the gravitational region. Methods for determining the size of the gravitational region.

PORT FUNCTIONS. Port traffic, trade and industrial function.

PARTICIPANTS IN THE PORT BUSINESS. Administration bodies and business entities.

ORGANIZATION OF PORT SYSTEM COMPONENTS. Zoning and specialization.

PORT AND PORT BUSINESS POLICY. Forms of management in ports.

PORT SYSTEM DEVELOPMENT PLANNING. Port development planning methodology. Port traffic forecast.

Financial and economic evaluation of the plan. Types of development plans. Long-term, mid-term and short-term plans.

BASIC ORGANIZATION OF PORT BUSINESS. The concept and types of freight in ports. Traffic and technological process in the ports. Documents in the port business. Daily operational planning. Improvement of the traffic-technological process and business system in the ports. Port jamming.

ECONOMIC INDICATORS OF BUSINESS PERFORMANCE. Determining the value of the port service. Port fees and tariffs, port revenues. Costs in the port business. Labor productivity. Business efficiency. Business profitability.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input checked="" type="checkbox"/> Field work	<input checked="" type="checkbox"/> Practical work <input checked="" type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
1. Attending classes 2. Attending exercises 3. Class activity 4. Taking quizzes and tests 5. Taking exams							
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 **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

Grading and evaluation of student work includes continuous assessment of knowledge through two midterm exams and two tests with calculation tasks during classes, and a final exam. Grading is carried out in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka, which means that a student can achieve 70% of the grade during classes, and the remaining 30% at the final exam.

Knowledge assessment in class is carried out continuously, and students can achieve a percentage of the grade as follows:

- 1st preliminary exam - 25% Learning outcomes: 1., 2., 3., 4.
- 2nd preliminary exam - 25% Learning outcomes: 2., 3., 4., 5., 5.
- Test 2 - 10% Learning outcomes: 1., 5.
- Test 1 - 10% Learning outcomes: 5.
- Final exam - 30% Learning outcomes: 1., 2., 3., 4., 5.

The final exam can be taken by students who have earned 35 points during class, or 50% of the total number of points that could be achieved during class evaluation. It is also a condition that students achieve at least 50% of the points in each preliminary exam. The final exam is in written form and includes 30% of the total grade. Students must pass 50% of the final exam in order to receive a passing grade for the course.

Some examples of learning outcome checks are:

1. What is a port system and what are the basic functions of a seaport within that system?
2. Explain how a seaport can generate multiplier effects in the local and national economy.
3. Explain how ports in the Republic of Croatia are divided according to size and importance.
4. What are the most important trends in the development of seaports in the last ten years, and how do they affect their infrastructure and superstructure?
5. How do phenomena such as liberalization and sustainable development affect the competitiveness of ports?

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (<https://moodle.srce.hr>)
2. Jugović, A.: Upravljanje morskom lukom, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2013. (knjiga dostupna u e-izdanju na sustavu za e - učenje – Merlin).
3. Jugović, A., Mudronja, G., Schiozzi, D.: Ekonomika luka – riješeni zadaci, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2020.
4. Kesić, B.: Ekonomika luka, Pomorski fakultet, Rijeka 2003. (izabrana poglavlja - dostupna u e-izdanju na sustavu za e - učenje – Merlin).

1.11. Recommended Reading



1. Kesić, B., Jugović, A.: Menadžment pomorskoputničkih luka, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2006.
2. Wayne, K. Talley: Port Economics, Routledge – Taylor and Francis Group, London and New York, 2009.
3. Notteboom, T., Pallis, A., Rodrigue, J.: Port Economics, Management and Policy, New York: Routledge, 2020
4. Mudronja G., Aksentijević D.: Framework for Planning the Implementation of Innovations in Seaport Operations: Case Study of the Seaport of Rijeka, 47th MIPRO ICT and Electronics Convention (MIPRO), Opatija, 2024.
5. Jugović A, Jardas Antonić J., Aksentijević D.: An Overview of Criteria and Scenarios Relevant for Development of Seaports of County and Local Importance in the Republic of Croatia, Transactions on Maritime Science, 2023.
6. Jugović, A., Sirotić, M., Žgaljić, D, Oblak, R.: Assessing the Possibilities of Integrating Ports into the Circular Economy, Tehnički vjesnik, 2022
7. Jugović, A., Sirotić, M., Peronja, I.: Sustainable Development of Port Cities from the Perspective of Transition Management, Transactions on Maritime Science, 10(02), str. 466-476., 2021
8. Mudronja, G., Jugović, A., Škalamera-Alilović, D.: Seaports and Economic Growth: Panel Data Analysis of EU Port Regions. J. Mar. Sci. Eng., 2020, 8, 1017.

1.12. *Number of Main Reading Examples*

<i>Title</i>	<i>Number of examples</i>	<i>Number of students</i>
Jugović, A.: Upravljanje morskom lukom, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2013.	30	40
Kesić, B.: Ekonomika luka, Pomorski fakultet, Rijeka 2003. (dio)	20	40
Wayne, K. Talley: Port economics, Routledge – Taylor and Francis Group, London and New York, 2009.	3	40

1.13. *Quality Assurance*

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



3.2. Course description

Generic information		
Head of Course	Associate professor David Brčić, PhD	
Course	Satellite navigation	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
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+15+15) (2+1+1)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objectives of the course are for students to acquire specific knowledge necessary for the understanding and proper use of GNSS systems, to competently interpret systematic errors in satellite-based user position determination, to understand the possibilities for mitigating undesired effects on system performance, and to apply various methods of positioning using satellite navigation systems.

One of the goals of the course is the analysis and processing of satellite and environmental data under different scenarios and satellite positioning methods.

Ultimately, the course aims to guide students in conducting independent research and preparing a project assignment by selecting one of the proposed topics/scenarios.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes



It is expected that the student will be able to:

1. Describe and explain fundamental and advanced concepts of satellite navigation, including basic characteristics, principles, operating modes, and applications of GNSS systems,
2. Define, analyse, and synthesize the fundamentals of user position determination procedures using satellite navigation systems, as well as advanced positioning methods with GNSS systems,
3. Identify, explain, and evaluate positioning algorithms of basic GNSS systems, considering the total environmental conditions,
4. Compare and assess the accuracy, reliability, and precision of GNSS services provided by various satellite navigation systems under natural and intentional effects,
5. Properly analyse and evaluate the total error budget of satellite-based user position determination, including the individual sources of error,
6. Explain, analyse, and evaluate tropospheric and ionospheric delays of satellite signals, as well as the geometric and user distribution of positioning accuracy,
7. Synthesize mitigation procedures for ionospheric signal delay effects, analyse and assess the impact of space weather phenomena,
8. Analyse and critically evaluate position errors caused by multipath effects, and properly apply computational methods to mitigate negative propagation influences on satellite navigation signals,
9. Calculate position deviations based on available satellite data from different GNSS systems, analyse positioning errors, and correlate them with individual potential contributing factors,
10. Create, analyse, and perform statistical and graphical processing of position records obtained from satellite data of global and regional reference networks, and investigate the results of processing/research through demonstration and discussion.

1.4. Course Outline

Fundamentals of satellite navigation. Satellite systems: classification, overview, and general applications. Fundamental characteristics of satellite navigation. Architecture of satellite navigation systems (GNSS, SNS, RNSS, SBAS). **Operating principles of GNSS systems.** Structure of satellite navigation signals. Basic procedure of satellite-based user position determination. Positioning algorithms in basic satellite systems. Advanced GNSS positioning methods. Corrections to satellite-determined position. Generation of position records. **Space segment.** Influential factors and environmental effects on satellite navigation systems. **Total positioning error budget of satellite-determined user position.** Fundamentals of error calculation and statistical analysis. Geometric distribution of user positioning accuracy. User error distribution. Total error budget of satellite-determined position. Mitigation procedures for individual influencing factors. Satellite, user, and transmission medium components of the total error budget. **User segment.** Microenvironmental characteristics. Computational methods for mitigating multipath effects and user clock errors. Control segment. Characteristics of the navigation message. Calculation of deviations in satellite-determined position. **Applications of basic GNSS services.** Use in daily life. Applications in transportation sectors and socio-economic systems. Use of GNSS systems in maritime domain and related fields.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input checked="" type="checkbox"/> Practical work
	<input checked="" type="checkbox"/> Seminars and workshops	<input checked="" type="checkbox"/> Multimedia and Network
	<input checked="" type="checkbox"/> Exercises (individualised)	<input type="checkbox"/> Laboratory
	<input type="checkbox"/> E-learning	<input checked="" type="checkbox"/> Mentorship
	<input type="checkbox"/> Field work	<input type="checkbox"/> Simulator exercises

1.6. Comments

1.7. Student Obligations

During the semester, students must fulfill the following obligations as prerequisites for taking the final exam: Presentation on a given topic, Thematic homework assignments, Continuous knowledge assessments, Project assignment (a seminar paper resulting from research).

1.8. Assessment¹ of Learning Outcomes

Course attendance	2	Class participation	0,25	Seminar paper	1	Experiment	
Written exam		Oral exam	0,5	Essay		Research	1
Project	0,5	Continuous Assessment	0,5	Presentation		Practical work	0,25
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

1. Presentation of Topic / Seminar Paper (Learning Outcomes 1, 2)

The presentation is conducted in teams of up to two students, while the seminar paper applies to part-time students, all based on a previously selected topic. This obligation is exclusively theoretical in nature. A total of 20 points can be earned through the presentation or seminar.

Example Topics:

GNSS PNT: GPS, GNSS PNT: GLONASS, GNSS PNT: Galileo, GNSS PNT: Beidou, GNSS SBAS: EGNOS, GNSS RNSS: QZSS, GNSS RNSS: IRNSS/NAVIC, GNSS SBAS: MSAS, GNSS SBAS: WAAS, classical and advanced satellite positioning and their comparison

Examples of Seminar Papers:

Application of GNSS in maritime, Critical applications of GNSS systems, Application of GNSS in transport systems, Galileo MEOSAR, Application of GNSS systems in everyday life.

2. Homework Assignments (Learning Outcomes 3, 4, 5, 6, 7, 8, 9)

Assignments include programming and calculations that reinforce exercises previously covered in lectures. Each homework task addresses one topic of the course and builds upon the previous one. This obligation is theoretical, practical, and research-oriented, including statistical, tabular, and graphical presentation of results, and serves as preparation for obligation #4. Each assignment can earn up to 4 points, totalling 20 points based on the expected number of assignments (5).

Examples of Homework Assignments:

Generation of positioning solutions; Calculation and analysis of position deviations; Analysis of positional accuracy due to relative satellite and receiver positions; Ionospheric delay of satellite navigation signals; Calculation of Total Electron Content and analysis of its impact on satellite positioning.

3. Colloquiums/written exams (Learning Outcomes 1–5, 6–10)

Two written exams consist of questions that assess knowledge, understanding, and application of material covered during lectures and exercises. The colloquia include theoretical and computational components, often involving generation of position displays. The total achievable points for the exam is 20.

Sample Questions:

- The figure (...) depicts (circle all correct answers, multiple may apply):
 - a) Radar interference;
 - b) Radar interference as displayed on the ECDIS screen;
 - c) Depiction of GPS satellite movement above the receiver recording the log;
 - d) Predicted GPS satellite movement above the receiver;
 - e) Current GPS satellite movement;
 - f) Azimuth and elevation of visible GPS satellites within a RINEX observation file.
- Name three mobile applications that utilize GNSS services.
- Determine the ionospheric delay on GPS L1 frequency given a measured total electron content of 28 TEC units. Show your calculations.
- Define and describe the following acronyms: UERE; UTC; CDMA; C/A; TEC; PNT.

4. Project Assignment (Learning Outcomes 1–10)

The project assignment represents the student's semester-long work. Its preparation relies on all researched and practical segments covered in class, along with the relevant theoretical background. The final form of the project assignment is a seminar paper, accompanied by mandatory documentation detailing the entire development process: acquired and used files, prepared and processed datasets, statistical tables, graphical presentations, generated and prepared program codes, and other files as necessary. The project assignment can earn up to 40 points.

Examples of Project Topics:



Analysis of the success of differential GPS services, Analysis of accuracy degradation due to relative satellite and receiver positions, Analysis of ionospheric delay model performance, Analysis of tropospheric delay model performance, Analysis of signal propagation medium impact.

5. Final Exam (Learning Outcomes 1–10)

A maximum of 100 points achievable from prior obligations translates into 70% of the total course success. The final exam consists of defending the project assignment (thematic segment) and an oral examination covering the entire course content. The maximum points available on the final exam is 30, with a minimum passing score of 15. Prior to sitting the final exam, all preceding obligations must be completed, with a minimum of 50% of points required in each individual obligation.

1.10. Main Reading

1. American Meteorological Society (AMS). (2011). *Satellite Navigation & Space Weather: Understanding the Vulnerability & Building Resilience*. Massachusetts, USA: AMS. Dostupno na: https://www.ametsoc.org/ams/assets/file/spacwx_gps_2010.pdf
2. Brčić, D. (2015). *Model nespecifičnoga dnevnog hoda ionosferskog kašnjenja signala za satelitsko određivanje položaja*. Doktorska disertacija. Rijeka, Hrvatska: Sveučilište u Rijeci, Pomorski fakultet. Dostupno na: <https://repository.pfri.uniri.hr/islandora/object/pfri:175>
3. Brčić, D. (2025). *Autorizirana predavanja iz kolegija Satelitska navigacija*. Dostupno na mrežnim stranicama kolegija.
4. Petrovski, I, Tsujii, T. (2012). *Digital Satellite Navigation and Geophysics: A Practical Guide with GNSS Signal Simulator and Receiver Laboratory*. Cambridge, UK: Cambridge University Press. Dostupno na: https://www.google.hr/books/edition/Digital_Satellite_Navigation_and_Geophys/fzZaxpoFekAC?hl=en&gbpv=1&prints_ec=frontcover
5. Subirana, J.S.; Zornoza, J.M.J.; Hernandez-Pajares, M. (2013). *GNSS Data Processing, Volume I: Fundamentals and Algorithms*. Noordwijk: ESA Communications. Dostupno na: https://gssc.esa.int/navipedia/GNSS_Book/ESA_GNSS-Book_TM-23_Vol_I.pdf

1.11. Recommended Reading

1. Bakota, M. (2022). *Prilog unaprjeđenju modeliranja zenitne komponente troposferskog kašnjenja satelitskih signala za određivanje korisničkog položaja sustava GLONASS*. Doktorska disertacija. Sveučilište u Rijeci, Pomorski fakultet.
2. Brčić D., Čelić J., Valčić S. (2020). Reconstruction of Geomagnetic Event as Observed in Northern Adriatic Region and Its Correlation with GPS Single-frequency Positioning Deviations. *TransNav, the International Journal on Marine Navigation & Safety of Sea Transportation*, 14(2), pp. 349-357. doi:10.12716/1001.14.02.11
3. Brčić, D., Filjar, R., Kos, S. & Valčić, M. (2019). On Global Ionospheric Maps based winter-time ionospheric delay with reference to the Klobuchar model: Case study of the Northern Adriatic. *Pomorstvo – Multidisciplinary Journal of Maritime Research*. ISSN: 1332-0718. 33 (2). str. 210-221.
4. Brčić, D., Kos, S. & Filjar, R. (2013). An assessment of geomagnetic activity-related technology failure risk based on patterns of Kp index dynamics in 2012. *Proceedings of the 7th Global Navigation Satellite Systems Vulnerabilities and Solutions Conference*. ISSN: 1849-7306. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 18-20. 4. 2013. str. 61-82. Dostupno na: https://www.pfri.uniri.hr/web/hr/zs_baska_rin_gnss.php
5. Brčić, D., Pongračić, B. & Kos, S. (2016). Vernal TEC behaviour in correlation with GPS coordinate deviations. *Proceedings of the 10th Annual Baška GNSS Conference*. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 8-10. 5. 2016. str. 63-78.
6. Dow, J.M., Neilan, R. E., i Rizos, C. (2009). The International GNSS Service in a changing landscape of Global Navigation Satellite Systems. *Journal of Geodesy*, 83, pp.191–198. DOI: 10.1007/s00190-008-0300-3
7. Filjar, R., Brčić, D. & Kos, S. (2013). Single-frequency Horizontal GPS Positioning Error response to a moderate ionospheric storm over Northern Adriatic. U: Weintrit, A. (ur). *Advances in Marine Navigation*. ISBN: 978-1-138-00106-0. London, UK: Taylor & Francis Group. str. 49-56.
8. Filjar, R., Kos, S. & Brčić, D. (2011). Single-frequency GPS positioning performance around the time of the Chilean 2010 earthquake. *Pomorstvo: Scientific journal of maritime research*. ISSN: 1332-0718. 25 (2). str. 287-306.
9. James, G. et al. (2013). *An introduction to Statistical Learning*. New York, United States: Springer Science+Business Media. Dostupno na: <https://www.casact.org/sites/default/files/2022-12/James-G.-et-al.-2nd-edition-Springer-2021.pdf>
10. Kaplan, E. D. i Hegarty, C.J. (ur.) (2006). *Understanding GPS: Principles and Application*. Second edition. Boston, USA: Artech House.
11. Kos, S., Barić, M. & Brčić, D. (2015). Discrepancies between predicted and final IGS ionospheric maps in the Northern Adriatic region. *Proceedings of the 9th Annual Baška GNSS Conference*. ISSN: 1849-7306. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 10-12. 5. 2015. str. 35-51. Dostupno na: https://www.pfri.uniri.hr/web/hr/zs_baska_rin_gnss.php
12. Kos, S., Brčić, D. & Musulin, I. (2013). Smartphone application GPS performance during various space weather conditions: A preliminary study. *Proceedings of the 21st International Symposium on Electronics in Transport (ISEP)*. ISBN: 978-961-6187-53-4. Electrotechnical Association of Slovenia & ITS Slovenia. Ljubljana, Slovenija, 25-26. 3. 2013.
13. Kos, S., Filjar, R. & Brčić, D. (2012). GPS Performance Degradation Caused by Single Satellite Outage: a GPS PRN24 Croatia Case Study. *Pomorstvo: Scientific journal of maritime research*. ISSN: 1332-0718. 26 (1). str. 165-179.
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15. Mendillo, M. (2006). Storms in the ionosphere: Patterns and processes for total electron content. *Rev. Geophys*, 44, RG4001, doi:10.1029/2005RG000193. Dostupno na: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2005RG000193>
16. Pongračić, B., Brčić, D. & Kos, S. (2018). Spatial assessment of GPS ionospheric delay model during St. Patrick's geomagnetic storm. *Proceedings of 11th Annual Baška GNSS Conference*. ISSN: 1849-7306. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 7-9. 5. 2018. str. 75-91. Dostupno na: https://www.pfri.uniri.hr/web/hr/zs_baska_rin_gnss.php
17. Pongračić, B., Wu, F., Fathollahi, L. & Brčić, D. (2019). Mid-latitude Klobuchar correction model based on the k-means clustering of ionospheric daily variations. *GPS Solutions*. ISSN: 1080-5370. 23(3). 13 str.
18. Sickles, J. V. (2015). *GPS for Land Surveyors*. Bosa Roca, United States: CRC Press/ Taylor & Francis Inc.
19. Parkinson, B. W., Spilker, Jr., J. J. (1996). *Global Positioning System: Theory and Applications (Vol. I.)*. AIAA. Washington, DC.
20. Thomas, M. et al. (2011). *Global Navigation Space Systems: reliance and vulnerabilities*. London, UK: RAENG.
21. Toman, I. (2022). Utjecaj vulkanske aktivnosti na raspršenje položaja određenog satelitskim navigacijskim sustavima. Doktorska disertacija. Rijeka, Hrvatska: Sveučilište u Rijeci, Pomorski fakultet.
22. Žic, A., Pongračić, B., Kos, S. & Brčić, D. (2020). On GPS L1 Positioning Errors' Estimation in the Adriatic Region. *Pomorski zbornik*, 58. (1), 169-184. doi: 10.18048/2020.58.11. Dostupno na: <https://repository.pfri.uniri.hr/islandora/object/pfri%3A2684>



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<i>Title</i>		<i>Number of examples</i>	<i>Number of students</i>
All main reading is freely available online			
1.13.	<i>Quality Assurance</i>		
The quality of study is monitored in accordance with the ISO 9001 system and in accordance with the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, exam passing results are analyzed and appropriate measures are adopted.			



3.2. Course description

Generic information		
Head of Course	Robert Mohović, PhD, Full professor	
Course	SHIP STABILITY	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
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)	45+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of the course is to familiarize students in detail with the factors that affect the ship stability, as well as the stability requirements for ships of different technologies. The static and dynamic stability of the ship in intact and damaged condition, as well as special cases of stability, are analyzed in detail. The impact of ship stability on the safety of the ship, cargo and persons is particularly emphasized. As part of analytical exercises, the students should master the methods of stability calculation. An understanding of the limitations of individual methods is required. The course provides a scientific basis for the optimization of calculation methods, which has a direct impact on performing the maritime transport process in a safe manner.

1.2. Prerequisites for Course Registration

There are no special requirements for enrolling in the course

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

- 1. Define, analyze and interpret the factors that affect the ship stability.*
- 2. Define, analyze and interpret the static and dynamic stability of the ship in intact and damaged condition, and special cases of stability.*
- 3. Evaluate the influence of individual parameters and significant factors on the ship stability and determine their mutual correlation.*
- 4. Define, analyze and interpret stability requirements for ships of different technologies.*
- 5. Apply and interpret analytical methods of stability calculation and their limitations.*
- 6. Define and explain the basics of optimization for individual calculation methods.*

1.4. Course Outline



Introduction to the course, concept and division of the science of stability. Transverse static stability, initial stability, initial and additional stability, influence of free surfaces. Transverse static stability, stability at greater angles of inclination, static stability curve analysis. Analysis of the influence of ship geometric features and position of the ship's systematic centre of gravity on stability. Dynamic stability and motion of a ship on waves, analysis of the dynamic stability curve (construction and characteristics). Transverse ship stability, influence of displacement and loading or unloading of masses on transverse stability, desired metacentric height. Torques, methods of determining and analysis of the impact on ship stability. Longitudinal stability of the ship, concepts and analysis of factors defining longitudinal stability. Longitudinal stability of the ship, the influence of shifting and loading or unloading of masses on the longitudinal stability, bringing the ship to the desired draft or the desired trim, the influence of water density on the longitudinal stability. Ship stability in damaged condition, flooding of ship spaces, analysis of the impact on ship stability, various types of flooding, ship division. Ship stability in special conditions (grounding stability, docking stability). Ship stability in operation, ship stability documentation, analysis of the ways of calculating stability and trim in operation. Stability requirements for ships of different technologies. Comparative analysis of the stability of ships of different technologies, analysis of the impact of technology and the degree of loading on ship stability. Possibilities and limitations of using electronic computers in stability calculations, optimization of calculation methods. Historical development of the science of stability, perspectives for future development and methods of application in exploitation. Requirements of the STCW Convention. Teaching methodology.

1.5. Modes of Instruction

- ☒ Lectures
- ☒ Seminars and workshops
- ☐ Exercises
- ☐ E-learning
- ☐ Field work

- ☒ Practical work
- ☐ Multimedia and Network
- ☐ Laboratory
- ☐ Mentorship
- ☐ Other _____

1.6. Comments

1.7. Student Obligations

Active class attendance and at least 70% of classes.

Completing homework, prepared and positively graded programme assignments, and passing the final exam.

1.8. Assessment¹ of Learning Outcomes

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

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



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

1. 70% of acquired learning outcomes are evaluated through continuous knowledge testing during the semester. The students must do their homework – learning outcomes 1 - 5 (30%), and make programme assignments – learning outcomes 1 - 5 (40%).

2. at the final exam (oral exam) the integrity of theoretical knowledge in the field of ship stability is checked – learning outcomes 1 - 6 (30%), through analysis of the developed programme assignments, a block of questions in the field of course content (from ship stability theory), presentation and analysis of a case of transverse stability, and presentation and analysis of a case of longitudinal stability. At the final exam it is necessary to achieve a minimum of 50% of the required theoretical knowledge..

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

1. Interpret the impact of different shapes of ship form on the transverse stability of a ship.
2. Define and interpret the concept of dynamic stability of a ship.
3. Evaluate the influence of wind moment on the stability of the ship and establish the correlation with other turning moments.
4. Interpret the requirements regarding the stability of ships in intact condition on the example of bulk carriers during the transport of grain.
5. Interpret analytical methods for calculating the longitudinal stability of a ship when loading or unloading a mass and point out their limitations.
6. Define possible ways of optimizing the method of calculating the ship trim by loading cargo into two cargo spaces, and explain them.

Homework includes the performance of tasks using calculation methods presented in the course in the field of transverse and longitudinal stability in intact condition, special cases of stability, and stability in damaged condition.

Programme assignments include the performance of the tasks and calculation methods in such a way that students themselves should set the task for a selected specific ship (using the necessary tables and other documentation), and solve the tasks.

1.10. Main Reading

1. R. Mohović, *Ships stability - teaching texts and attachments available on the e-learning system - Merlin* (<https://moodle.srce.hr>)
2. Mohović, R.: *Ships stability – theoretical foundations, teaching text on the website of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2020.*
3. Uršić, J.: *Stabilitet broda I dio, Sveučilište u Zagrebu, Zagreb, 1962.*
4. Uršić, J.: *Stabilitet broda II dio, Sveučilište u Zagrebu, Zagreb, 1964.*

1.11. Recommended Reading



- 1.) Uršić, J.: *Plovnost broda*, Sveučilište u Zagrebu, Zagreb, 1966.
- 2.) Fatur, J.: *Teorija broda*, Uredništvo časopisa „Brodogradnja“, Zagreb, 1954.
- 3.) *Vademecum Maritimus*, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2014.
- 4.) *Pravila za tehnički nadzor pomorskih brodova*, Dio 4. – *Stabilitet*, Hrvatski registar brodova, Split, *
- 5.) *Pravila za tehnički nadzor pomorskih brodova*, Dio 5. – *Pregrađivanje*, Hrvatski registar brodova, Split, *
- 6.) *Pravila za tehnički nadzor pomorskih brodova*, Dio 23. – *Prijevoz tereta*, Hrvatski registar brodova, Split, *
* važeća izdanja
- 7.) IMO Rezolucija A.749 (18), *Kodeks o stabilnosti u neoštećenom stanju za sve vrste brodova koji su u skladu sa IMO propisima*
- 8.) IMO Rezolucija A.562 (14) *Preporuka o utjecaju jakog vjetrova i valjanja (kriterij vremenskih prilika) za stabilnost u neoštećenom stanju putničkih i teretnih brodova duljine 24 m i više*

* valid editions

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
R. Mohović, <i>Ships stability - teaching texts and attachments available on the e-learning system - Merlin</i> (https://moodle.srce.hr)	available on web	10 - 15
Mohović, R.: <i>Ships stability – theoretical foundations, teaching text on the website of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka</i> , 2020.	available on web	
Uršić, J.: <i>Stabilitet broda I dio</i> , Sveučilište u Zagrebu, Zagreb, 1962.	Library 2	
Uršić, J.: <i>Stabilitet broda II dio</i> , Sveučilište u Zagrebu, Zagreb, 1964.	Library 2	

1.13. Quality Assurance

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



Course description

Generic information		
Head of Course	dr.sc. Biserka Drašić Ban	
Course	Statistics	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Graduate degree programme	
Type of Course	mandatory	
Year of Study	first	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	2+2

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main course objective is to teach the students how to apply statistical methods to determine the natural laws of the observed traffic phenomena.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

1. To recognize the meaning and the task of statistics and the phases of statistical analysis
2. To recognize and analyze different kinds of data sets and their characteristics
3. To explain the terms of random variables and probability distributions
4. To differ the theoretical probability distributions, and connect them with empirical ones
5. To describe the sampling method and, by using the estimation methods and statistical testing on a random sample, make some conclusions about the population
6. To recognize the Chi-Square Test
7. To interpret the terms of correlation and regression

1.4. Course Outline

The meaning and the task of statistics. Graphical methods in data analysis. Relative numbers. Numerical data analysis. Random variables. Theoretical distribution functions. Chi-Square Test. Sampling method. Time series analysis. Correlation and regression.

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							
Taking classes regularly and doing homework assignments.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	2	Class participation	0,5	Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	1,5	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

Assessment of learning outcomes is done by conducting three partial written tests and by final exam (oral exam).

Examples:

Written exam:

- 1) (outcome 2) In period from 2010. until 2017. a certain mass phenomenon has been investigated and the following data was collected:

Year	Y	
2010	5565	
2011	5334	
2012	4734	
2013	4690	
2014	4497	
2015	4356	
2016	4172	
2017	3359	

- a) Find the average number of occurrences per year?
b) Determine the curve of the linear trend (with the origin in the center of the time period) and by it calculate the number of occurrences that is expected in 2020.

- 2) (outcome 5) A statistical feature X has mean 9,72 and standard deviation 1,4. A sample of 36 statistical units gave the mean 8,93 . Is the difference between means statistically significant with the risk of 5%?

Oral exam questions:

- 1) (outcome 2) Make an example for attributive, numerical and time series, and for every one of them name the statistical indicators that can be calculated.
2) (outcomes 3 and 4) Say what is the probability of a certain, and of an impossible event. Name a few continuous probability distribution and a few discrete ones, and for every of them write down the DF.
3) (outcome 6) How (meaning by which statistical test) can we determine the correspondence of some empirical PD with a certain theoretical PD? Describe the procedure.
4) (outcome 7) Explain the meaning of the correlation and regression.

1.10. Main Reading

1. Z. Zenzerović, Statistički priručnik, Pomorski fakultet u Rijeci, Rijeka, 2004.
2. I. Šošić-V.Serdar, Uvod u statistiku, Školska knjiga, Zagreb, 2002.

1.11. Recommended Reading



1. Z. Zenzerović, Statističke metode u tehnologiji prometa, Fakultet za pomorstvo i saobraćaj, Rijeka, 1988.
2. T. Pogány-Z. Zenzerović, Statističke tablice s uputama za primjenu, Pomorski fakultet u Rijeci, Rijeka, 1993
3. J. Čaval, Statističke metode u privrednim i društvenim istraživanjima, Sveučilište u Rijeci, Rijeka, 1981.
4. I.Šošić, Zbirka zadataka iz statistike, Mikrorad, Ekonomski fakultet, Zagreb, 1998.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Z. Zenzerović, Statistički priručnik, Pomorski fakultet u Rijeci, Rijeka,	9	80
I. Šošić-V.Serdar, Uvod u statistiku, Školska knjiga, Zagreb, 2002.	5	80

1.13. Quality Assurance



3.2. Course description

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

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

After learning, the student will be able to:

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

1.4. Course Outline

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



1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input type="checkbox"/> Field work	<input checked="" type="checkbox"/> Practical work <input checked="" type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
<ol style="list-style-type: none">1. Class attendance2. Study, research, and problem-solving3. Taking midterm exams and tests4. Final exam							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1,5	Oral exam		Essay		Research	0,5
Project		Continuous Assessment	2	Presentation		Practical work	
Portfolio							

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

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

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

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

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

Examples of learning outcome evaluation:

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

1.10. Main Reading

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



1.11. *Recommended Reading*

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

1.12. *Number of Main Reading Examples*

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

1.13. *Quality Assurance*

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



3.2. Course description

Generic information		
Head of Course	Vlado Frančić, Associate Professor, Ph.D.	
Course	Marine Accident Investigation	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Elective	
Year of Study	1	Semester 3
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 0 + 15 (2 + 0 + 1)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course objectives are to provide students the basic skills and knowledge required to organize and conduct marine accident investigation in accordance with generally accepted practice in shipping and international as well national legislation. In addition, the course will explain student's basic methodology of marine safety investigation and define the difference between safety and administrative investigation. Also, student will acquire skills to prepare and organize accident investigation and prepare investigation report according to generally accepted methodologies required for marine safety investigation basically developed and accepted by the IMO.

1.2. Prerequisites for Course Registration

It is expected that students possess at least basic knowledge about work and role of International Maritime Organization (IMO) and associate requirements related to safety of navigation as well as to understand basic technical and technological characteristics of ships.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Unite and explain international and national regulations regarding marine accident investigation;
2. Elaborate and assess importance of safety investigation procedure;
3. Envisage the methodologies of a marine accident safety investigation;
4. Compare and envisage different investigation methods and different types of marine investigation (safety and administrative);
5. Elaborate and envisage procedures and tasks during performing marine safety investigation;
6. Explain the overall marine accident investigation process;
7. Explain process of collecting evidence and making an interview;
8. Prepare a marine safety investigation report.

1.4. Course Outline



Basic regulations on marine accident investigations. Definition of an accident and casualty. Review of international obligations regarding the investigation of marine accidents and incidents by national maritime administrations. Investigation methodology for different types of marine accidents. Investigators and tools needed to investigate maritime accidents. Legal status of investigators. Investigator's safety during the investigation. Basic interviewing techniques. Preliminary activities in the investigation. Collection of evidence (collection procedure). Witness interviewing. Evaluation of evidence. Sharing evidence with others involved in the investigation. Scope of the investigation. Content and method of writing a marine safety investigation report. Findings and recommendations of the investigation.

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. Assessment¹ of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1,5	Essay		Research	2
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 preparation of tasks (projects) and the final exam are evaluated. Continuous assessment includes:

- Preparation of Marine Safety Investigation Report.
- Active participation in classes - performing tasks in groups.

Through oral examination 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. Describe methodology use in the process of marine accident investigation (Learning Outcomes 3,5,6)
2. Define and explain interview technique (Learning outcome 6)
3. Prepare marine safety investigation report (Learning Outcomes 5 and 8)

1.10. Main Reading

1. Lecturer's notes published on official e-learning platform - Merlin (<https://moodle.srce.hr>)
2. Code of International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), IMO.
3. Guidelines to assist investigators in the implementation of the Casualty investigation code (IMO Resolution A.1075(28))
4. "Establishing the fundamental principles governing the investigation of accidents in the maritime transport sector" Directive 2009/18/EC.
5. Uredba o istraživanju pomorskih nezgoda, Narodne novine.

1.11. Recommended Reading

1. Marine Accident Investigators International Manual, MAAIF
2. IMO Resolution related to accident investigations.
3. Marine accident reports, various sources.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1-5	Web	15

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	Robert Mohović, PhD, Full professor	
Course	MARITIME ASPECT OF DESIGN OF PORTS AND WATERWAYS	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
Type of Course	Mandatory	
Year of Study	2.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	45+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of the course is to familiarize the students with the factors that affect the maritime aspect of planning and design of ports and waterways (especially access waterways in restricted areas). Special emphasis is given to defining the parameters of the port and waterways that directly or indirectly affect safety during manoeuvring and during the stay of ships at berths. Criteria for design are defined from the point of view of navigational safety and protection of the marine environment, and special emphasis is given to defining maritime safety measures. The goal of the course is to adopt analytical methods for defining project parameters. The course provides a scientific basis for a more detailed study of this area.

1.2. Prerequisites for Course Registration

There are no special requirements for enrolling in the course

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

- 1. Define, analyze and interpret the factors influencing the maritime aspect of the planning and design of ports and waterways (especially access waterways in restricted areas).*
- 2. Evaluate the impact of individual parameters of ports and waterways that directly or indirectly affect safety during manoeuvring and the ship stay at berths.*
- 3. Determine the correlation between the ship manoeuvring characteristics and the design elements of ports and waterways.*
- 4. Define, analyze and interpret design criteria from the point of view of navigation safety and protection of the marine environment.*
- 5. Define, analyze, interpret and evaluate maritime safety measures when manoeuvring and during the ship stay at berth.*
- 6. Apply and interpret analytical methods for defining design parameters.*
- 7. Investigate in more detail a particular topic in the field of planning and design of ports and waterways, and through this experience and assessment of the case study adopt a scientific basis for a more detailed study of this area.*

1.4. Course Outline



Introduction to maritime port and waterway design. Defining the correlation between the navigational safety requirements, the protection of the marine environment and design principles. Definition of maritime ship safety. Analysis of significant factors in the ship manoeuvring system. Analysis of the impact of geographical position, structure and technological characteristics of port systems. Analysis of oceanographic and meteorological characteristics of the port and access area. Analysis of navigational characteristics of the approach area and the structure of maritime traffic. Organizational and technological support for ship manoeuvring. Comparative analysis of the impact of the ship type (technology) and the manner of operation on manoeuvring characteristics. Analysis of the influence of technical and technological characteristics of ships and tugs on ship manoeuvring. Human factor and analysis of its influence on the ship manoeuvring system. Safety conditions and restrictions when manoeuvring the ship and during the ship stay at berth. The total impact of ship manoeuvring on the safety and protection of the marine environment. Methods for determining the elements of the port and waterways important for maritime design. Using analytical and simulation methods to define design parameters. Determining the required depth and width of the waterway. Determining the necessary characteristics of the waterway from the point of view of navigation safety. Measures to improve the level of safety on the waterway. Determining safety criteria in manoeuvring system. Determining of the permitted approach speed of the ship. Selection and definition of fender system characteristics. Measures to improve the level of safety in the ship manoeuvring system. Determining the characteristics of shore mooring equipment. Criteria for the safety and efficiency of transshipment operations during the ship stay at the berth. Measures to improve the level of safety during the ship stay at the berth. The impact of navigation safety measures and protection of the marine environment on the economic aspect of the design or construction of ports and waterways. Optimization of the ship manoeuvring system and the impact on the design of ports and waterways, especially on the economic aspect of construction.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input checked="" type="checkbox"/> Seminars and workshops <input type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input type="checkbox"/> Field work	<input checked="" type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Active class attendance and at least 70% of classes. <i>Performed and positively evaluated project assignments (case studies) and research seminar, passing the final exam</i>							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation		Seminar paper	0,5	Experiment	
Written exam		Oral exam	1	Essay		Research	1
Project		Continuous Assessment		Presentation		Practical work	1
Portfolio		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.

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



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

1. 70% of acquired learning outcomes are evaluated through continuous knowledge testing during the semester. The students must complete the project assignments (case studies) – learning outcome 6 (40%) and research seminar – learning outcome 7 (30%).
2. the final exam (oral exam) checks the integrity of theoretical knowledge in the field of maritime design of ports and waterways (30%) through analysis and evaluation of project tasks (case study) – learning outcome 6 and analysis of research seminar – learning outcome 7, and a block of questions from the area of course content – learning outcomes 1-5. At the final exam it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

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

1. Define external natural factors affecting the ship and interpret their impact on the maritime aspect of waterway width design.
2. Evaluate the impact of waterway depth on navigation safety.
3. Explain the correlation between the ship manoeuvring characteristics and the characteristics of the manoeuvring space.
4. Analyze the criteria for port design from the point of view of navigational safety and the protection of the marine environment.
5. Define and interpret the importance of making maritime studies in the design of ports and access waterways.
6. Apply and interpret analytical methods for defining project parameters – through the development of project tasks (case study).
7. Investigate in more detail a particular topic in the field of planning and design of ports and waterways – through the preparation of a research seminar.

1.10. Main Reading

1. R. Mohović, *Maritime aspect of planning and design of ports and waterways - teaching texts and attachments available on the e-learning system - Merlin* (<https://moodle.srce.hr>)
2. Mohović, R., Mohović, Đ., *Maritime aspect of planning and design of ports and waterways – theoretical foundations, teaching text on the website of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2020.*

1.11. Recommended Reading



- 1.) Mohović, Đ., Mohović R., *Upravljanje rizikom u pomorstvu – teaching text on the website of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2020.*
 - 2.) R.W. Rowe, *The Shiphandler's Guide, The Nautical Institute, London, 2000.*
 - 3.) H. Hensen, *Tug Use in Port, A practical guide, The Nautical Institute, London, 1997.*
 - 4.) *Mooring Equipment Guidelines, Oil Companies International Marine Forum, Witherby and Co. Ltd., London, 2018.*
 - 5.) *Squat, Interaction, Manoeuvring, The Nautical Institute, London, 1995.*
 - 6.) G.P. Tsinker, *Marine Structures Engineering, Specialized Applications, Chapman & Hall, ITP An International Thomson Publishing Company, New York, 1995.*
 - 7.) P. Bruun, *Port Engineering, Harbour Planning, Breakwaters and Marine Terminals, Volume 1 i 2, Gulf Publishing Company, Houston, 1989.*
 - 8.) P. Bruun, *Mooring and Fendering Rational Principles in Design, The International Harbour Congress, Antwerp, 1983.*
 - 9.) H. Agerschou i dr., *Planning and Design of Ports and Marine Terminals, John Wiley and Sons, Chichester, 1985.*
 - 10.) *Approach Channels, Preliminary Guidelines, First report of the joint Working Group PIANC and IAPH, in cooperation with IMPA and IALA, Supplement to Bulletin No. 87, Permanent International Association of Navigation Congresses - PIANC, Brussels, 1995.*
 - 11.) M. Chernjowski, *Mooring of Surface Vessels to Piers, Marine Technology, Vol. 17. No.1., 1980., str. 1.-7.*
 - 12.) I.W. Dand - P.R. Lyon, *The Element of Risk in Approach Channel Design, International Conference on Maritime Technology, Challenges in Safety and Environmental Protection, Singapore, 1993.*
 - 13.) I. Petković, *Prikaz numeričkih vrijednosti krivulja brzina i specifičnih pritisaka vjetra iznad mora na bok broda u novim mjernim jedinicama, Simpozij «Teorija i praksa brodogradnje», Split, str. 4.193 – 4.203.*
 - 14.) T. Tabain, *Standard Wind Wave Spectrum for the Adriatic Sea Revisited (1997 – 1997), Brodogradnja, 45, 1997, str. 303.– 313.*
 - 15.) *Underkeel Clearance for Large Ships in Maritime Fairways with Hard Bottom, Report of a Working Group of the Permanent Technical Committee II, Supplement to Bulletin No. 51, Permanent International Association of Navigation Congresses - PIANC, Brussels, 1985.*
 - 16.) R. Solem, *Probability Models of Grounding and Collision, Proceedings of Automation of Safety in Shipping and Offshore Petroleum Operations, 1980.*
- M. McBride, *Safety assessment for ships manoeuvring in ports, The Dock & Harbour Authority, Vol. 79., No. 889, 890, 891, 892.*

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. R. Mohović, <i>Maritime aspect of planning and design of ports and waterways - teaching texts and attachments available on the e-learning system - Merlin (https://moodle.srce.hr)</i>	available on web	30 - 40
Mohović, R., Mohović, Đ., <i>Maritime aspect of planning and design of ports and waterways – theoretical foundations, teaching text on the website of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2020.)</i>	available on web	

1.13. Quality Assurance

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



3.2. Course description

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

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

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

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

1.4. Course Outline



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

1.5. Modes of Instruction

☒ Lectures

☒ Seminars and workshops

☒ Exercises

☐ E-learning

☐ Field work

☒ Practical work

☒ Multimedia and Network

☐ Laboratory

☒ Mentorship

☐ Other _____

1.6. Comments

1.7. Student Obligations

Regular attendance at classes and completion of homework assignments.

1.8. Assessment¹ of Learning Outcomes

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

¹ **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

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

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

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance

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

3.2. Course Description

Generic information		
Head of Course	Igor Vio, PhD.	
Course	Maritime Labour Law	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Graduate degree programme	
Type of Course	Elective (Deactivated)	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS Coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0
1. GENERAL COURSE DESCRIPTION		
<i>1.1. Course Objectives</i>		
<p>The aim of the course is to introduce students to the characteristics of labour relations in general and the specifics of labour relations between seafarers, namely: sources of labour law, essential elements of employment contracts, protection of the life, health and dignity of workers, working hours, holidays and permits, wages and remuneration, compensation for damages, termination of employment contracts, protection of rights under employment relations, collective entities of labour relations, collective bargaining and collective agreements.</p>		
<i>1.2. Prerequisites for Course Registration</i>		
none		
<i>1.3. Expected Learning Outcomes</i>		
<p>After passing the exam, students will be able:</p> <ol style="list-style-type: none"> 1. Define and interpret fundamental concepts of labour law. 2. Explain the rights of seafarers from employment relationships. 3. Explain how the rights of seafarers from employment relationships are exercised. 4. Determine ways to protect the rights of seafarers from employment relationships. 5. Analyze the specifics of maritime employment relationships. 6. Analyze the rights and obligations of workers and employers with regard to occupational safety. 7. Explain the role of trade unions and employers' associations in contracting rights and obligations in employment relations. 		
<i>1.4. Course Outline</i>		
<p>The concept, legal sources, entities and basic characteristics of the employment contract. Features and elements of the employment contract. Protection of life, health and dignity of workers, working hours, holidays and permits, salaries and remuneration, compensation of special reference to compensation for damages due to an accident at work or occupational disease, termination of the employment</p>		

contract, protection of rights from employment relationships, collective entities of labour relations, collective bargaining and collective contracts.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Practical work
	<input type="checkbox"/> Seminars and workshops	X Multimedia and Network
	X Exercises	<input type="checkbox"/> Laboratory
	X E-learning	<input type="checkbox"/> Mentorship
	<input type="checkbox"/> Field work	<input type="checkbox"/> 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. Assessment¹ of Learning Outcomes

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

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

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

Examples of Assessment of Learning Outcomes:

1. Explain the application of labor law principles.
2. List the seafarer's rights related to their employment.
3. Analyze the extrajudicial and judicial exercise of rights related to their employment.
4. Analyze the specificity of employment and stay at the workplace.
5. Explain the employer's responsibility for occupational safety.
6. Determine the role of seafarers' unions in protecting seafarers' rights.

1.10. Main Reading

Učur, Marinko: Radnopravni status pomoraca, Pravni fakultet Sveučilišta u Rijeci, 2004

Course teaching material available on e-learning system - Merlin (<https://moodle.srce.hr>)

1.11. Recommended Reading

Convention of the International Labour Organization, www.ilo.org

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Učur, Marinko: Radnopravni status pomoraca, Pravni fakultet Sveučilišta u Rijeci, 2004	20	40

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 teaching material available on e-learning system - Merlin	Web	Web
1.13. Quality Assurance		
The quality of study is monitored in accordance with the ISO 9001 system and in accordance with European quality assurance implemented at the Faculty of Maritime Studies in Rijeka. Once a year, the results of the student pass rate and adopt appropriate measures.		



3.2. Course description

Generic information		
Head of Course	Assoc Prof Đani Šabalja, PhD	
Course	Maritime pilotage	
Study Programme	Nautical science and maritime transport technology	
Type of Course	elective	
Year of Study	2.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	2 + 1

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introducing the student to the techniques of piloting different types of ships, different maneuvering capabilities without and with the use of tugs in different meteorological conditions. Introducing the student to pilot organizations, their rights and duties, as well as the procedures for obtaining a pilot certificate.

1.2. Prerequisites for Course Registration

There isn't any

1.3. Expected Learning Outcomes

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

1. Define and explain the role of a pilot on a ship.
2. Define and distinguish between different types and techniques of pilotage,
3. Distinguish and explain the legal regulations related to maritime pilotage,
4. Compare and analyze pilotage on ships with different propulsion systems,
5. Distinguish and explain the use of vessels and equipment used in pilotage,
6. Explain the goals and activities of pilotage associations.

1.4. Course Outline

Pilotage in general, History of pilotage. Pilot duties on the bridge, Communication and exchange of information during pilotage on the bridge and with VTMIS. Use of tugboats from the pilot's perspective, pilotage communication with tugboats Pilotage allocation, Coastal pilotage, harbour pilotage, river pilotage, channel pilotage, deep water pilotage. Definition of pilotage boundaries. Maritime Pilotage Regulations, Pilotage Act 1987, pilotage legislation in several selected areas around the world. Pilotage society, requirements for establishing a pilotage society, pilotage society resources and equipment, pilotage logbook., pilotage card, 2. ISPO Code A International Standard for maritime Pilot Organizations pilotage associations (EMPA, IMPA, UKMPA) Refusal of pilotage by the ship's master, refusal of pilotage by the pilot,. Piloting exemptions, piloting error and piloting responsibility. Acquiring a marine pilot's certificate, training and training, methods of continuous pilot training IMO Resolution A.960 (23), Recommendations on Training & Certification and on operational procedures for maritime pilots other than deep-sea pilots, CERTIPILOT. Navigation in the Panama Canal (Regulation on Navigation in Panama Canal Waters), Navigation in the Suez Canal (Rules of navigation SCA), Navigation in the Kiel Canal (German Traffic Regulations for Navigable Maritime Waterways), navigation in deep water and ice areas. Piloting ships with different propulsion systems, piloting the entrance/exit of the ship to the dock (with propulsion without propulsion). The technique of blind pilotage. Remote sensing. Navigation using a portable navigation computer.



<div> <div>1.5. Modes of Instruction</div> <div> <input checked="" type="checkbox"/> Lectures <input checked="" type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input checked="" type="checkbox"/> Field work </div> <div> <input type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____ </div> </div>							
1.6. Comments							
1.7. Student Obligations							
Regular attendance, • Preparation and presentation of seminar papers, • Written • Oral exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam	1	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 assessment is carried out:

1. by checking knowledge through a written exam,
2. by checking knowledge with an oral exam.

Examples of evaluation of learning outcomes:

1. Define and explain the role of a pilot on a ship.
2. Define and explain different types and techniques of hunting,
3. State the legal regulations related to maritime navigation,
4. Compare steering on ships with different propulsion systems,
5. What vessels and equipment are used when sailing,
6. Explain the goals and activities of the pilot associations.

1.10. Main Reading

1. Marine Pilotage Lectures available on the Merlin e-learning system,
2. Theory and Practices of Marine Pilotage, Capt Santosha K Nayak (June 24, 2020),
3. Bow Tug Operations: Risks and Effectiveness, 3rd Edition 2016.

1.11. Recommended Reading

1. Marine Pilotage Code
2. ISPO Code A International Standard for maritime Pilot Organizations,
3. THE EMBARKATION & DISEMBARKATION OF PILOTS CODE OF SAFE PRACTICE,
4. 2021. Regulations for Transiting the Panama Canal,
5. Driving with special reference to liability for damage caused by driving.

1.12. Number of Main Reading Examples

<i>Title</i>	<i>Number of examples</i>	<i>Number of students</i>

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



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

1. GENERAL COURSE DESCRIPTION		
<i>1.1. Course Objectives</i>		
The objective of this course is to explain the importance of projects and international projects, as well as the role of project management in developing business systems. Emphasis is placed on strategic preparation, evaluation, initiation, and development of project management models at various management levels to enable students to manage projects in the context of modern economic development.		
<i>1.2. Prerequisites for Course Registration</i>		
None		
<i>1.3. Expected Learning Outcomes</i>		
<p>Upon completion of the course, students will be able to:</p> <ol style="list-style-type: none"> 1. Interpret fundamental theoretical and practical concepts of project management and apply them in the development of business systems. 2. Differentiate and explain key project management processes (strategic preparation, initiation, implementation, control). 3. Analyze and evaluate the impact of various stakeholders (interest and influence groups). 4. Apply advanced skills and competencies for effective project implementation and resolution of complex organizational and related project management issues. 5. Define and interpret concepts related to the structure of projects financed by EU funds and programs. 6. Develop, analyze, and formulate their own project idea and prepare a comprehensive project proposal. 		
<i>1.4. Course Outline</i>		
Theoretical-methodological definition of project management (definition of project, project management, project life cycle, stakeholders). Project management processes (project planning, organization, leadership, control). Strategic aspects of project management, enterprise development project management (development policy, investment policy, investment project evaluation). Management of international projects. EU organization and programs (with an emphasis on programs funding transport development), EU project planning, Logical Framework (Logframe), measuring goal achievement, managing work packages and project results, consortium agreements and intellectual property protection, communication and project team management, exploitation, dissemination, and sustainability of EU projects, quality planning, quality assurance and control, risk management. Case Studies: Business Plan for a Port, Feasibility Study for a Concession on Maritime Domain, EU Project.		
<i>1.5. Modes of</i>	x Lectures	x Practical Work



Instruction	<input type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-Learning <input type="checkbox"/> Field work	<input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Students must attend at least 70% of lectures and exercises, pass midterm exams (continuous assessment), and submit a project to qualify for the final exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1	Essay		Research	
Project	1	Continuous Assessment	1,5	Presentation		Practical work	
Portfolio							
1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam							
<p>The final grade for the course is the sum of the percentage achieved during the course (70% of the grade) and the percentage achieved on the final exam (30% of the grade), in accordance with the Regulations on Studies of the University of Rijeka and the Regulations on Study at the Faculty of Maritime Studies in Rijeka. Continuous Assessment of knowledge:</p> <ul style="list-style-type: none">- a minimum of 50% of the grading points must be achieved.- project - students must demonstrate acquired knowledge and the application of project methodology on a selected example <p>Final Exam:</p> <p>A minimum of 50% of the grading points must be achieved on the final exam.</p> <p>Examples of Evaluating Learning Outcomes in Relation to Set Learning Objectives:</p> <ol style="list-style-type: none">1. Draw the project life cycle and identify the key phases of the project life cycle.2. List the basic processes/functions of project management and explain their purpose.3. Explain who the primary and secondary stakeholders (interest groups) are and describe their role in the project.4. Using a given example, present the sequence of project activities using the Critical Path Method, identify the critical path of project activities, calculate the total project duration, and depict the sequence of project activities using a Gantt chart.5. Explain the role of structural funds and European Union programs in financing projects related to sustainable transport development.6. Formulate your own project proposal, independently or in a team, which includes a project description, the relevance of the project application, the implementation capacities of the applicant and partners (if applicable), project efficiency and feasibility, project budget, and project sustainability.							
1.10. Main reading							
<ol style="list-style-type: none">2. Authorized lectures on the e-learning platform (online materials).3. Ivica Veža et al., "Upravljanje projektima," University of Split, Faculty of Electrical Engineering, Mechanical Engineering, and Naval Architecture, 2011.4. Anton Hauc, "Projektni menadžment i projektno poslovanje," Business and Management College, Zagreb, 2007.5. Marčelo Dujanić, "Projektiranje organizacije i upravljanje projektima," Polytechnic of Rijeka, 2006.6. Mislav Ante Omazić, "Projektni menadžment," Synergy Publishing, Zagreb, 2005.							

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.



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

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

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

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

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

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



3.2. Course description

Generic information		
Head of Course	Đani Mohović, PhD, Full professor	
Course	Risk management in shipping	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
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)	45+0+15 (3+0+1)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to introduce students to the theoretical and practical basis for maritime risk analysis. Detailed introduction and analysis of specific factors that influence risk identification. Introduction to risk identification methods. Definition of acceptable risk and measures to reduce maritime risk. Ability to identify risks using specific examples.

1.2. Prerequisites for Course Registration

No special requirements for enrolling in the course.

1.3. Expected Learning Outcomes

It is expected that after passing the exam, students will be able to:

- 1. apply theoretical and practical foundations for maritime risk analysis*
- 2. identify and analyze specific factors that influence risk determination*
- 3. select and apply methods for risk determination*
- 4. select an appropriate method and assess acceptable risk*
- 5. select options and apply common measures for maritime risk reduction*
- 6. determine risk on specific examples*

1.4. Course Outline

The risk concept. What is an accident? Risk picture. Accident statistics. Preventive and ameliorating measures. Safety management – monitoring of the risk level. Risk objectives and data. Statistical analysis of safety oriented decision alternatives. Maritime traffic models. Probability of grounding and collision. Risk analysis methods: Hazard analysis, FTA, ETA, FMECA, HazOp. Formal safety assessment (FSA). Cost-benefit analysis of safety measures. Analysis and modelling of ships casualties. Cost-benefit analysis of controls. Analysis and modelling of ship accidents. Human reliability and error mechanisms. Catastrophe behaviour, evacuation and rescue. Training, drills and human-machine simulation. Regulation and official control of maritime safety. National and international control authorities. Safety and quality management. ISO standards. Auditing. Safety case.



1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input checked="" type="checkbox"/> Seminars and workshops <input type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input checked="" type="checkbox"/> Field work	<input type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Regular class attendance, continuous learning, active class participation, group work on risk analysis examples, preparing and writing seminars, presenting research in seminars, studying and taking the final exam (oral).							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1.5	Class participation		Seminar paper	2	Experiment	
Written exam		Oral exam	1.5	Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio		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.



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

During the course, the quality of the seminar paper, mastery of the material and the seminar presentation are assessed. After the course, the oral exam is assessed. The evaluation percentage is 70% in class and 30% in the final exam (according to the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka).

Knowledge assessment during the course:

Through mentoring work when writing the seminar paper and during the presentation of the seminar paper, where knowledge of the theoretical foundations and their application in the seminar paper are assessed.

Final exam:

The final exam (oral exam) tests the completeness of theoretical knowledge in the field of Maritime Risk Management - it is necessary to achieve at least 50% of the required theoretical knowledge.

1.10. Main Reading

1. Authorized lecture, Ph.D.sc. Đani Mohović, Ph.D. sc. Robert Mohović, Rijeka, 2011/2012..
2. "Manging risk in shipping"- The Nautical Institute, London, 1999.
3. "Safety Management and Risk Analysis" – Svein Kristiansen, Butterworth-Heinemann, 2004.

1.11. Recommended Reading

1. "Risk and reliability in marine technology"- COMETT Programme, Wegemt, 1993.
2. "Good practice in risk assessment and risk management 1"- Hazel Kemshall and Jacki Pritchard, Bristol, Jessica Kingsley Publ., 1996.
3. "Acceptable risk"- Baruch Fischhoff, Cambridge, Cambridge University Press, 1981.
4. "General Security Risk Assessment"- ASIS International Guidelines Commission, Alexandria, Virginia, 2003.
5. "Procjena opasnosti za opasne tvari", Janeš V., Čavrak B., ZIRS, Intergrafika, Zagreb 1999.
6. "Risk analysis and its applications"- David B. Hertz and Howard Thomas, Chichester: Wiley, 1983.
7. "Quantitative risk analysis: a guide to Monte Carlo simulation modelling" – David Vose, Chichester: John Wiley, 1996.
8. "The risk ranking technique in decision making"- John. C. Chicken and Michael R. Hayns, Oxford: Pergamon Press, 1989.
9. "Reliability, maintainability and risk", Smith J. David, 2001.
10. "Offshore Risk Assessment", Vinnem J. E., Trondheim, Kluwer Academic Publisher, 1999.
11. "Metode procjene i upravljanja rizikom u procesnoj industriji", Enconet International, Zagreb, 1999.
12. Mario Šikić, Andro Jančić, Mihovil Jureško, Đani Mohović, „Analysis of Risks Arising from the Use of Autonomous Vessels“, pregledni rad, Pomorski zbornik 63 (2023), 63-74

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. Authorized lecture, Ph.D.sc. Đani Mohović, Ph.D. sc. Robert Mohović, Rijeka, 2011/2012..	unlimited	20-30
2. Manging risk in shipping- The Nautical Institute, London, 1999.	1	
3. Safety Management and Risk Analysis – Svein Kristiansen, Butterworth-Heinemann, 2004.	2	
	2	

1.13. Quality Assurance



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



3.2. Course description

Generic information		
Head of Course	PhD Mirano Hess	
Course	Ship chartering	
Study Programme	Nautical studies and maritime transport technology	
Type of Course	Compulsory course	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	45 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To equip students with the understanding and application of ship contracting methods, primarily in the open maritime market, including the analysis of influential parameters in carrier decision-making for optimal contract selection, and comprehension of rights and responsibilities defined by contractual clauses.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

1. Interpret the impact of maritime market dynamics on ship valuation and freight rates.
2. Compare elements of maritime market dynamics and their correlation with carrier operations.
3. Explain the process of determining technological-market parameters and analyze their interactions.
4. Evaluate changes in ship operational modes and carrier business optimization processes.
5. Identify and analyze the effects of various contractual clauses on party behavior.

1.4. Course Outline



1. Maritime market dynamics: ship supply and demand.
2. Baltic Exchange Indices and Worldscales.
3. Influence of maritime market factors on ship valuation and freight rates.
4. Carrier operations in the open market.
5. Freight rate correlation and forecasting, market shifts, and maritime market efficiency.
6. Assessment of freight rate parameters and ship performance elements (technical-technological parameters).
7. Establishing optimal carrier business policies in the open market.
8. Optimization of time charter and voyage charter contracts, and route selection.
9. Understanding optimal carrier business strategies.
10. Contracts for maritime vessel employment.
11. Ship contracting from a maritime broker's perspective.
12. Voyage profit calculation.
13. Tanker contracting specifics, container transport agreements.
14. The shipmaster's role in charter party execution.
15. Forward freight agreements (FFAs).
16. Comparative analysis of contractual clauses and their impact on party behavior (carriers/charterers), including the shipmaster's contractual role.

1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures	<input type="checkbox"/> Practical work					
	<input type="checkbox"/> Seminars and workshops	<input checked="" type="checkbox"/> Multimedia and Network					
	<input type="checkbox"/> Exercises	<input type="checkbox"/> Laboratory					
	<input type="checkbox"/> E-learning	<input type="checkbox"/> Mentorship					
	<input type="checkbox"/> Field work	<input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Class attendance. Passing an in-course colloquium and final exam.							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	1.1	Oral exam		Essay		Research	
Project		Continuous Assessment	2.4	Presentation		Practical work	
Portfolio							

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

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

Examples of Learning Outcome Assessments:

1. Interpret how carrier/charterer consensus on freight index projections affects charter party formation. (I1)
2. Compare factors determining spot vs. long-term freight rates. (I2)
3. Explain risk premium increases on voyage charter operations. (I3)
4. Analyze decision-making criteria for voyage vs. time charters. (I4)
5. Extract obligations/rights from Graincon's loading/discharge cost clause. (I5)

1.10. Main Reading

1. Hess, M.: Ugovaranje u pomorstvu, 2025, na Merlinu (<https://moodle.srce.hr>).
2. Hess, M.: Ugovorni dokumenti, 2025, na Merlinu (<https://moodle.srce.hr>).

1.11. Recommended Reading

1. Hess, M.: Ugovorno dopisivanje, 2025, na Merlinu (<https://moodle.srce.hr>).
2. Hess, M.: Izrazi i definicije, 2025, na Merlinu (<https://moodle.srce.hr>).
3. Shipbroking and Chartering Practice, 8th Edition, Informa Law from Routledge, 2019.
1. 2. Legal Principles in Shipping Business, Institute of Chartered Shipbrokers, 2016.
2. The Shipmaster's Business Self-Examiner, 10th edition, The Nautical Institute, 2016.
3. Master's Handbook On Ship's Business, 3rd Edition, Schiffer, 2011.
4. Maclachlam M.: The Shipmaster's Business Companion, 4th edition, NI, 2004.
5. Pomorski zakonik RH
6. Hess, Svjetlana; Hess, Mirano; Novaselić, Marko; Grbić, Luka, Assessment of the Position of North Adriatic Terminals in Container Market Based on Different Indices // Logistics (Basel), 8 (2024).
7. Babeli, Karla ; Hess, Svjetlana ; Hess, Mirano, Capacity utilization of the container terminal as multiphase service system // European transport/trasporti europei, 86 (2022).
8. Hess, Mirano; Pavić, Ivan Filip ; Kos, Serđo ; Brčić, David, Global shipbuilding activities in the modern maritime market environment // Pomorstvo : scientific journal of maritime research, 34 (2020).

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Hess, M.: Ugovaranje u pomorstvu, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	30
Hess, M.: Ugovorni dokumenti, 2025, na Merlinu (https://moodle.srce.hr).	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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3.2. Course description

Generic information			
Head of Course	dr. sc. Dario Ogrizović		
Course	Simulation and Modelling		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Core		
Year of Study	2nd		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6	
	Number of Hours (L+E+S)	30 + 30 + 0	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After finishing the course, the students will be able:

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

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		<input checked="" type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input checked="" type="checkbox"/> E-learning <input type="checkbox"/> Field work		<input checked="" type="checkbox"/> Practical work <input checked="" type="checkbox"/> Multimedia and Network <input checked="" type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____	
1.6. Comments					
1.7. Student Obligations					
The student must attend at least 70% of the total hours of lectures and exercises, and must have passed the exams (continuous assessment) to take the final exam.					
1.8. Assessment ¹ of Learning Outcomes					
Course attendance	2	Class participation	1	Seminar paper	Experiment
Written exam	1	Oral exam		Essay	Research
Project	1	Continuous Assessment	1	Presentation	Practical work
Portfolio					

¹ **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 class activities (10%), preparation and presentation of a project (20%), 2 midterm exams - total 40%) and at the final part of the exam (30%). A minimum of 50% of points must be achieved in individual knowledge assessments.

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

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

1.10. Main Reading

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

1.11. Recommended Reading

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

1.12. Number of Main Reading Examples

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

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	Radoslav Radonja, Ph. D., associate professor	
Course	Ecology in Maritime Transport	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Graduate	
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 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main goal of the course is to acquire knowledge about the principles and laws of environmental protection, and to understand the theoretical, technical and legislative considerations of pollution.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

After passing the exam, it is expected that students will be able to:

1. Critically assess the diversity of coastal sea and open ocean ecosystems.
2. Identify sources of marine pollution (including noise pollution)
3. Argue the impact of the ship as a source of pollution and analyse the environmental impacts of different types of ships
4. Evaluate the causes of acidification and eutrophication of the sea
5. Assess the impact of climate change on maritime business
6. Review requirements and development of legislation and analyse their impact on maritime business
7. Suggest the sustainable development of maritime affairs from the ecological, bioethical and technological aspect
8. Select marine pollution prevention measures, pollution contingency plans and cooperation in the framework of integrated coastal zone management
9. Argue the impacts of seabed mining on its ecosystem
10. Assess the environmental impacts of autonomous vessels.



1.4. Course Outline

Basic concepts of sustainable development and sustainable maritime affairs. Differences in coastal sea and open ocean ecosystems. Ship as a source of environmental pollution. Acidification and eutrophication of the sea. Climate change and maritime business. Environmental legislative requirements in maritime affairs and their development. Sustainable development of maritime affairs from the ecological, bioethical and technological aspect. Integrated coastal zone management and marine pollution contingency plans. Seabed mining and its impact on its ecosystems. Ecological aspects of autonomous vessels.

1.5. Modes of Instruction

- ☒ Lectures
- ☒ Seminars and workshops
- ☒ Exercises
- ☐ E-learning
- ☐ Field work

- ☐ Practical work
- ☒ Multimedia and Network
- ☐ Laboratory
- ☐ Mentorship
- ☐ Other _____

1.6. Comments

1.7. Student Obligations

Active attendance at classes and exercises (at least 70%). Preparation of a seminar paper on an agreed topic and final oral exam.

1.8. Assessment¹ of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	1,5	Experiment	
Written exam		Oral exam	2,0	Essay		Research	
Project		Continuous Assessment		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 in accordance with University's and Faculty's normative acts as follows:

- preparation of a seminar paper on an agreed topic (70%)
- At the final part of the exam, 30% of the acquired learning outcomes are evaluated (1-10), whereby the student must realize a minimum of 50% of points in order to pass the final exam.

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

1. Explain the differences in the ecosystems of the coastal area and the open oceans ??
2. List and explain possible sources of marine pollution with special reference to noise pollution (what can be the reasons for their occurrence and impact)? What impact on the marine environment comes from submarine seismic survey vessels? ...
3. List and explain possible adverse environmental impacts coming from crude oil tankers / cruise ships / etc.? ...
4. Explain the possible sources of sea acidification? Explain the origin and reasons for the appearance of 'sea blooms'? ...
5. How can the 'opening of the northern route' affect maritime business and what impact can it have on the ecosystems there? ...
6. Compare the development of environmental legislation at the global level and the legislation of the European Union? How is this reflected at national levels? Can the state pass 'mild' or 'stringent' regulations? ...
7. Explain the impact of environmental technology development and maritime applications (SCR, EGR, scrubbers, ...)? ...
8. Explain interstate cooperation in the framework of action in cases of incidental marine pollution? ...
9. Analyze the causes and impacts of seabed mining? What are your personal views in the context of the possible development of seabed mining legislation?
10. State your personal thinking in the context of the development of autonomous vessels and explain their impact on the environment that you expect?

1.10. Main Reading

1. IMO, MARPOL 73/78., Consolidated Edition, London 2013.

1.11. Recommended Reading

2. Teacher lectures - available in electronic form
3. Botkin, D., Keller, E., Environmental science, J. Wiley & sons, Inc., New York, 1995.
4. Sarić, I., Radonja, R., Noise as a source of marine pollution, Pomorstvo – Scientific Journal of Maritime Research, Vol. 28 (2014), pgs. 31-39
5. Radonja, R., Koljatić, V., The marine ecosystem as a functional whole, Pomorstvo – Scientific Journal of Maritime Research, Vol. 24/1 (2010), pgs. 3-18.
6. Radonja, R., Jugović, A., Ship owners' business policy in the context of development in the environmental legislation, Pomorstvo – Scientific Journal of Maritime Research, Vol. 25/2 (2011), pgs. 319-341

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Teacher lectures - available in electronic form	-	30
IMO, MARPOL 73/78., Consolidated Edition, London 2013.	1	30

1.13. Quality Assurance



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Course quality review carried in accordance with ISO 9001 system and European standards and guidance for quality assurance carried through on Maritime faculty. Student Success is evaluated, and corrective measure implemented yearly.

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.



3.2. Course description

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

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

Upon passing the exam, students will be able to:

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

1.4. Course Outline

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

1.5. Modes of Instruction

- | | |
|--|--|
| <input checked="" type="checkbox"/> Lectures | <input checked="" type="checkbox"/> Practical work |
| <input checked="" type="checkbox"/> Seminars and workshops | <input checked="" type="checkbox"/> Multimedia and Network |
| <input checked="" type="checkbox"/> Exercises | <input type="checkbox"/> Laboratory |
| <input type="checkbox"/> E-learning | <input type="checkbox"/> Mentorship |
| <input type="checkbox"/> Field work | <input type="checkbox"/> Other _____ |

1.6. Comments

1.7. Student Obligations

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



1.8. Assessment¹ of Learning Outcomes

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

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

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

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

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

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

1.10. Main Reading

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

1.11. Recommended Reading

- Ćelić, J., Mandžuka, B., Tomas, V., Tadić, F. (2024.). Driver-centric urban route planning: Smart search for parking, Sustainability 16 (2), 856.
- Grupa autora. (2000.). Intelligent Transportation Primer, Institute of Transportation Engineers, Washington, USA.
- Chen, Y., Li, L. (2013.). Advances in Intelligent Vehicles, Elsevier, Academic Press.
- Zilouchian, A., Jamshidi, M. (2001.). Intelligent Control Systems Using Soft Computing Methodologies, 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*

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

1.13. *Quality Assurance*

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

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.



3.2. Course description

Generic information			
Head of Course	Assoc Prof Đani Šabalja, PhD		
Course	Marine pollution removal technology		
Study Programme	Nautical science and maritime transport technology		
Type of Course	elective		
Year of Study	2.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5	
	Number of Hours (L+E+S)	2 + 1	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introducing the student to the sources of sea pollution and techniques for removing and preventing the spread of sea pollution. To familiarize them with the procedures for the operation of prescribed services in the event of sudden marine pollution.

1.2. Prerequisites for Course Registration

There isn't any

1.3. Expected Learning Outcomes

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

1. Define, distinguish and explain possible marine pollution.
2. Define and distinguish sources of various marine pollution,
3. Distinguish and explain legal regulations for the protection of the sea from pollution,
4. Compare and analyze the application of various methods for removing marine pollution,
5. Distinguish and explain the use of equipment used to prevent the further spread of pollution,
6. Define and explain procedures for intervention in the event of a certain marine pollution.

1.4. Course Outline

Marine pollution in general. Oil pollution, chemical pollution, plastic pollution, sewage pollution, waste pollution, ballast water pollution, Marine protection legislation. Conventions and regulations. Taking responsibility for marine pollution Marine oil pollution Prevention and ways to slow down the spread of oil on the water surface. Dams, types of dams Methods of removing oil from the sea. Mechanical, physical, chemical and microbiological methods. Skimmers, types of skimmers, absorbents, gelling agents, dispersants. Marine plastic pollution. History of plastics, properties of plastics, impact of plastics on the balance in the ecosystem, impact of plastics on human health. Marine chemical pollution. Types of tankers for transporting chemicals, classification of toxic chemicals according to MARPOL. Implementation of intervention measures in emergency cases of marine pollution. Systems for monitoring and controlling marine oil pollution Computer programs used to simulate the movement of oil pollution. WebGNOME, Medslik, Pisces. The use of simulators in the simulation of oil pollution



1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input checked="" type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input checked="" type="checkbox"/> Field work	<input type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
<ul style="list-style-type: none"> • Regular attendance, • Preparation and presentation of seminar papers,, • Written • Oral exam 							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1,5	Class participation	0,5	Seminar paper		Experiment	
Written exam	1	Oral exam	1	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

Assessment is carried out:

1. by testing knowledge through a written exam,
2. by testing knowledge through an oral exam.

Examples of learning outcome evaluation:

1. Define and explain possible marine pollution.
2. Define the sources of various marine pollution.
3. List the legal regulations for protecting the sea from pollution.
4. Compare the application of different methods for removing marine pollution.
5. Explain the use of equipment used to prevent the further spread of pollution.
6. Define and explain the procedures for intervention in the event of certain marine pollution.

1.10. Main Reading

1. Course teaching materials available on the e-learning system - Merlin (<https://moodle.srce.hr>)
2. Oil Spills First Principles: Prevention and Best Response BY BARBARA E. ORNITZ MICHAEL A. CHAMP

1.11. Recommended Reading

1. ITOPF Handbook 2019.,
2. Oil Spill Statistic 2020, - 2024. ITOPF

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students

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 implemented at the Faculty of Maritime Studies in Rijeka. Once a year, the passing results are analyzed and appropriate measures are adopted.



3.2. Course description

Generic information		
Head of Course	Robert Mohović, PhD, Full professor	
Course	MARITIME AND NAVIGATION HISTORY	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
Type of Course	Elective	
Year of Study	2.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+0+15

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of the course is to familiarize students with the history of the development of their profession, the development of vessels and their technical and technological characteristics, sea waterways, the development of navigation and navigation science. Special emphasis is placed on introducing students to Croatian maritime heritage and methods of preserving and revitalizing traditional and historical vessels as well as traditional maritime skills. Students are also introduced to the development of maritime education. The course provides a scientific basis for a more detailed study of this area.

1.2. Prerequisites for Course Registration

There are no special requirements for enrolling in the course

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. analyze and interpret the historical development of vessels and their technical and technological characteristics,
2. analyze and interpret the historical development of navigation and navigation science,
3. analyze and interpret the discovery of maritime waterways and navigation methods,
4. analyze and interpret segments of Croatian maritime, fishing and shipbuilding heritage,
5. analyze and interpret the stages of development and specifics of maritime education,
6. define, analyze, interpret and assess the methods of evaluation, preservation and revitalization of traditional and historical vessels, and traditional maritime skills,
7. explore in more detail a topic in the field maritime and navigation history, and through this experience and evaluation of research results adopt a scientific basis for a more detailed study of this area.

1.4. Course Outline



Historical development of vessels and their technical-technological characteristics, and factors that have influenced and continue to influence the development of maritime and navigation. Maritime waterways and major historical discoveries related to seafaring. Historical development of Croatian seafaring. Historical development and specifics of vessels in the Adriatic. Croatian maritime heritage (maritime, fishing and shipbuilding). Methods of evaluation and preservation of maritime, fishing and shipbuilding heritage. Methods of revitalization of traditional and historical vessels and traditional maritime skills. Historical development of coastal navigation. Historical development of astronomical navigation. Historical development of electronic navigation and electronic navigation systems. Historical development of maritime education.

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*

In addition to lectures, the students have an organized tour of the Maritime Museum and other institutions related to sources important for research of maritime, fishing and shipbuilding heritage, as well as field work in ports and shipyards; they also have the possibility to learn traditional maritime skills, volunteer at traditional events and other.

1.7. *Student Obligations*

Active class attendance and at least 70% of classes.

Prepared and positively evaluated seminar paper in the field of navigation history, conducting research in the field of maritime history and presenting the results, passing the final exam.

1.8. *Assessment¹ of Learning Outcomes*

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



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

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

1. 70% of acquired learning outcomes are evaluated through continuous knowledge testing during the semester. Students must make a seminar from the area of navigation history – learning outcome 6 (40%) and a research seminar in the field of maritime history – learning outcome 7 (30%).
2. the final exam (oral exam) checks the integrity of theoretical knowledge in the field of maritime history and navigation (30%) by analyzing the seminar paper in the field of navigation history and the presentation of results and research in the field of maritime history – learning outcome, and a block of questions from the field of course content – learning outcomes 1-6. At the final exam it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

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

1. Analyze the typology of 19th century sailing ships with their technical and technological features.
2. Analyze and interpret the historical development of navigation instruments.
3. Analyze and interpret the way of sailing the Adriatic in the Middle Ages.
4. Analyze and interpret the construction characteristics of traditional boats on the Adriatic.
5. Analyze and interpret the stages of development and specifics of the development of Croatian maritime education.
6. Interpret possible ways of revitalizing traditional and historical vessels.
7. Investigate in more detail a particular topic in the field of maritime history and navigation – prepare a research seminar.

1.10. Main Reading

1. Mohović, R.: Maritime History and Navigation - teaching texts and attachments available on the e-learning system - Merlin (<https://moodle.srce.hr>)
2. Hekman, I.: Povijest pomorske navigacije I i II dio, Tankerska plovdba – Zadar i Pomorski fakultet – Rijeka, 1995.
3. Franušić, B.: Povijest hrvatskog pomorstva, Veleučilište u Dubrovniku, Dubrovnik, 1996.
4. Keber, L.: Traditional Boats of the Croatian Adriatic, Technical Museum, Zagreb, 2013.

1.11. Recommended Reading

- 1.) Kozličić, M.: Hrvatsko brodogradništvo – Croatian shipping – Le navi croate, Književni krug Split, 1993.
- 2.) Novak, G.: Jadransko more u sukobima i borbama kroz stoljeća, Marijan tisak, Split, 2004.
- 3.) Barbalić, F. R., Marendić, I.: Onput kad smo partili, Rijeka, Matica hrvatska - Rijeka, 2004.
- 4.) Mendeš, N.: Stari jedrenjaci, Brodarstvo i brodogradnja Rijeke i Hrvatskog primorja od 18. do 20. stoljeća, Katalog muzejskih zbirki III., Pomorski i povijesni muzej Hrvatskog primorja, Rijeka, 2000.
- 5.) Suzanić, J.: Kostrena pod jedrima, Kostrena, Općina Kostrena i Narodna čitaonica, 1995.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
R. Mohović, Maritime History and Navigation - teaching texts and attachments available on the e-learning system - Merlin (https://moodle.srce.hr)	available on web	10 - 15
Hekman, I.: Povijest pomorske navigacije I i II dio, Tankerska plovdba – Zadar i Pomorski fakultet – Rijeka, 1995.	Library 5	



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<i>Franušić, B.: Povijest hrvatskog pomorstva, Sveučilište u Dubrovniku, Dubrovnik, 1996.</i>	<i>Library 2</i>	
<i>Keber, L.: Traditional Boats of the Croatian Adriatic, Technical Museum, Zagreb, 2013.</i>	<i>Library 2</i>	
1.13. Quality Assurance		
<i>The quality of study is monitored in accordance with the ISO 9001 system and in accordance with the European standards and guidelines for quality assurance carried out at the Faculty of Maritime Studies in Rijeka. Once a year, exam passing results are analyzed and appropriate measures are adopted.</i>		



Course description

Generic information		
Head of Course	Head of Department - Vlado Frančić, Full Professor, Ph.D.	
Course	Master's Thesis	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Mandatory	
Year of Study	2	Semester 4
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 objective of this course is to enable the student to apply both theoretical and practical knowledge in the independent development of an assigned topic, to correctly apply the methodology and techniques of academic writing, and to present relevant conclusions and findings.

The preparation of the Master's thesis is based on continuous consultations with the assigned supervisor. The thesis must be defended orally, with the purpose of demonstrating the student's ability to:

- apply theoretical and practical knowledge acquired during the course of study,
- independently analyze current domestic and international literature in the research and written elaboration of the defined thesis topic,
- analyze relevant findings, viewpoints, and facts published in the consulted literature,
- define and interpret illustrations (tables, charts, photographs, drawings) in accordance with research methodology.

1.2. Prerequisites for Course Registration

The student enrolls in the course Master's Thesis upon enrollment in the fourth (summer) semester of the graduate study program.

1.3. Expected Learning Outcomes

It is expected that student will be able to:

- Evaluate and apply the theoretical and practical knowledge acquired during the study program.
- Research, prepare, interpret, and write a thesis on a given (selected) topic.
- Apply the methodology and techniques of master's thesis writing.
- Formulate and present conclusions and insights related to the topic and the conducted research within the master's thesis.

1.4. Course Outline



The master's thesis is an independent professional or scientific treatment of a defined topic. Through the thesis, the student demonstrates the attainment of competencies and learning outcomes in solving problems within the professional and scientific fields covered by the graduate study program in Nautical Science and Maritime Transport Technology, as well as the application of theoretical and practical knowledge acquired during the graduate studies.

During the thesis defense, the student must demonstrate theoretical and practical knowledge in the fields Nautical Studies and Maritime Transport Technology.

The master's thesis at the Faculty is assigned, written, and defended in the Croatian language. Exceptionally, the thesis may be written and defended in English. The defense of the thesis is conducted orally before the Master's Thesis Defense Committee.

1.5. Modes of Instruction	<input type="checkbox"/> Lectures <input type="checkbox"/> Seminars and workshops <input type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input type="checkbox"/> Field work	<input checked="" type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Mentorship <input checked="" type="checkbox"/> Other _____
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1.6. Comments	The master's thesis is defended before the mentor and the Master's Thesis Defense Committee.
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1.7. Student Obligations

The student, in consultation with the supervisor, is required to select a topic for the master's thesis and compose the thesis in accordance with the instructions provided on the Faculty's website:

<https://www.pfri.uniri.hr/web/hr/dokumenti/Upute.za.izradu.diplomskoga.rada.PFRI.26.3.2025.pdf>

as well as using the prescribed thesis template available online:

https://www.pfri.uniri.hr/web/hr/dokumenti/Predlozak_za_diplomski_rad_31.3.2025.docx

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

Following the initial consultative meeting between the student and the supervisor, the student is expected to review the assigned literature, study the subject matter, consult their own collected sources, and develop the content of the thesis in detail.

Once the supervisor has approved and accepted the final thesis, the student submits the final version to the Student Services Office.

The thesis must be written in accordance with the Regulations on the Final Thesis, as outlined on the Faculty's website:

https://www.pfri.uniri.hr/web/hr/dokumenti/pravni_akti/Pravilnik.o.diplomskom.radu.na.sveucilisnom.diplomskom.studiju.pdf

1.8. Assessment¹ of Learning Outcomes

Course attendance		Class participation		Seminar paper		Experiment	
Written exam		Oral exam		Essay		Research	8
Project	5	Continuous Assessment		Presentation		Mentorship	2
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 verification of learning outcomes is conducted before an expert committee comprising three members from the Department of Nautical Sciences, including the supervisor. An external associate may be included as a committee member if the thesis topic requires additional expertise and competencies.

The student is required to defend the master's thesis. Following the presentation and responses to the questions posed, the expert committee renders a decision regarding the defense and assesses the thesis, taking into account the quality and scope of the work, the student's answers to professional questions, and the student's proficiency in the selected subject matter. Committee members maintain a record in which all information about the student and the thesis, questions posed by the committee, and the candidate's performance during the defense are documented.

In accordance with the Guidelines on the Use of the Information System for Verifying the Originality of Student Work at the University of Rijeka, the supervisor checks the originality of the final thesis using the Turnitin service. Based on this analysis, the supervisor prepares a Report on the Conducted Originality Check of Student Work—Appendix C (University of Rijeka Form), which includes information about the student's work and provides an opinion and rationale as to whether the thesis meets the originality requirements. A positive opinion from the supervisor and a positive originality report are prerequisites for the acceptance of the final thesis and the organization of the defense.

Examples of learning outcome assessment in relation to the stated learning outcomes include:

1. Present your thesis and highlight the conclusions within a timeframe not exceeding 15 minutes (learning outcomes 1–4).
2. Explain the graphs on page x of your thesis (learning outcomes 1–4)

1.10. Main Reading

1. Required literature from the course in which the master's thesis is registered and written
2. Additional literature as agreed with the course instructor – supervisor
3. Instructions for Writing the Final Thesis, editors: Prof. Dr. Sc. I. Kolanović, Assoc. Prof. Dr. Sc. A. Perić Hadžić, Assoc. Prof. Dr. Sc. I. Jurdana, Assoc. Prof. Dr. Sc. I. Rudan, Faculty of Maritime Studies in Rijeka, University of Rijeka, Rijeka, 2024 – available at:
<https://www.pfri.uniri.hr/web/hr/dokumenti/Upute.za.izradu.diplomskoga.rada.PFRI.26.3.2024.pdf>

1.11. Recommended Reading

1. Supplementary literature from the course in which the final thesis is registered and written
2. Other supplementary literature as agreed with the course instructor – supervisor

1.12. Number of Main Reading Examples

Title

Number of examples

Number of students

1.13. Quality Assurance

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



3.2. Course description

Generic information		
Head of Course	Đani Mohović, PhD, Full professor	
Course	Nautical tourism	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University graduate study program	
Type of Course	Elective	
Year of Study	2.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+5+10 (2+0.33+0.67)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to introduce students to the theoretical and practical basis of nautical tourism issues. Introduction to the types and characteristics of nautical tourism craft and their use. Introduction to the technological features of nautical tourism ports. Introduction to the maintenance of ports and nautical tourism craft. Introduction to legal regulations relating to nautical tourism craft and ports with regard to navigation safety and environmental protection. Introduction to the organization of work and management in a nautical tourism port.

1.2. Prerequisites for Course Registration

No special requirements for enrolling in the course.

1.3. Expected Learning Outcomes

It is expected that after passing the exam, students will be able to:

- 1. recognize the theoretical and practical foundations of nautical tourism issues*
- 2. identify the types and characteristics of nautical tourism craft*
- 3. recognize and determine the technological characteristics of nautical tourism ports*
- 4. apply knowledge from the theory of maintenance of ports and nautical tourism craft*
- 5. apply regulations relating to nautical tourism craft and ports*
- 6. recognize the organization of work and management in nautical tourism ports*

1.4. Course Outline

Definition of nautical tourism. Forms of nautical tourism traffic. Types and characteristics of crafts in nautical tourism. Natural resources for the development of nautical tourism. Limitations to the development of nautical tourism. Characteristics of nautical tourism demand. Maritime domain and the development of nautical tourism. Legal regime for the transport of nautical tourism vessels. Ecological conditions for the development of nautical tourism. Characteristics and specificities of nautical tourism port management. Functioning of a nautical tourism port. Business operations of a nautical tourism port. Organization of a nautical tourism port.



1.5. Modes of Instruction	<input checked="" type="checkbox"/> Lectures <input checked="" type="checkbox"/> Seminars and workshops <input checked="" type="checkbox"/> Exercises <input type="checkbox"/> E-learning <input checked="" type="checkbox"/> Field work	<input type="checkbox"/> Practical work <input type="checkbox"/> Multimedia and Network <input type="checkbox"/> Laboratory <input checked="" type="checkbox"/> Mentorship <input type="checkbox"/> Other _____					
1.6. Comments							
1.7. Student Obligations							
Regular class attendance, continuous learning, active class participation, group work on risk analysis examples, preparing and writing seminars, presenting research in seminars, studying and taking the final exam (oral).							
1.8. Assessment ¹ of Learning Outcomes							
Course attendance	1.5	Class participation		Seminar paper	2	Experiment	
Written exam		Oral exam	1.5	Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	
Portfolio		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.



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

During the course, the quality of the seminar paper, mastery of the material and the seminar presentation are assessed. After the course, the oral exam is assessed. The evaluation percentage is 70% in class and 30% in the final exam (according to the Regulations on Studies of the University of Rijeka and the Regulations on Studies at the Faculty of Maritime Studies in Rijeka).

Knowledge assessment during the course:

Through mentoring work when writing the seminar paper and during the presentation of the seminar paper, where knowledge of the theoretical foundations and their application in the seminar paper are assessed.

Final exam:

The final exam (oral exam) tests the completeness of theoretical knowledge in the field of Nautical Tourism - it is necessary to achieve at least 50% of the required theoretical knowledge.

1.10. Main Reading

1. Authorized lecture, Ph.D.sc. Đani Mohović, Rijeka, 2009.
2. Dulčić A., Nautički turizam i upravljanje lukom nautičkog turizma", Ekokon, Split, 2002.
3. Šamanović J., Nautički turizam i management marina, Visoka pomorska škola u Splitu, 2002.

1.11. Recommended Reading

1. Favro S., Kovačić M., Nautički turizam i luke nautičkog turizma, Prostorna obilježja Hrvatskog Jadrana, Izbor lokacije luke nautičkog turizma, Ogranak Matice hrvatske Split, 2010.
2. Luković T., Gržetić Z., Nautičko turističko tržište u teoriji i praksi Hrvatske i europskog dijela Mediterana, HHI, Split, 2007.
3. Luković T., Šamanović J., Management i ekonomika nautičkog turizma, HHI, Split, 2007.
4. Komać, Ante; Mohović, Đani; Strabić, Marko, „Impact of High Speed of Vessels on Narrow and Shallow Waterways with Reference to the Adriatic Sea“, pregledni rad, Naše more, 69 (2022), 2; 84-91
5. Legac, Lora; Mohović, Đani, „Specific traits of communal berths in ports open to public transport in Primorje-Gorski Kotar County“, pregledni rad, Pomorstvo, 34 (2020), 2; 205-211
6. Toman, Ivan; Mohović, Đani; Barić, Mate; Mohović, Robert, „Correlation Between Strong Wind and Leisure Craft Grounding in Croatian Waters, Transactions on maritime science, 9 (2020), 2; 224-235
7. Iussich, Lovro; Mohović, Đani, „Comparison of Domestic and Foreign Skippers / Yachtmasters at Work in the Republic of Croatia“, Pomorski zbornik, 58 (2020), 1; 125-135

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
1. Authorized lecture, Ph.D.sc. Đani Mohović, Rijeka, 2009.	unlimited	15-20
2. Dulčić A., Nautički turizam i upravljanje lukom nautičkog turizma", Ekokon, Split, 2002.	5	
3. Šamanović J., Nautički turizam i management marina, Visoka pomorska škola u Splitu, 2002.	5	

1.13. Quality Assurance

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



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General information		
Course holder	Ph.D., Jasminka Bonato	
Course	Reliability and safety of technical systems	
Study program	Marine Electronic Engineering and Information Technology	
Course status	optional	
Year of study	2. graduate study	
Score value and method of teaching	ECTS credits	5
	Number of hours (L+E+S)	30+15+0 (2+1+0)

1. DESCRIPTION OF THE SUBJECT		
1.1. Course objectives		
Presents and approximates the basic ideas of reliability theory; determining the reliability of the component (system); mathematical modeling of technical systems reliability.		
1.2. Course enrollment requirements		
Passed the course Applied Mathematics.		
1.3. Expected learning outcomes for the course		
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 content		
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. Types of teaching	<div><div><div><div><input checked="" type="checkbox"/> lectures</div><div><input type="checkbox"/> seminars and workshops</div><div><input checked="" type="checkbox"/> exercises</div><div><input type="checkbox"/> distance education</div><div><input type="checkbox"/> field work</div></div></div><div><div><div><input checked="" type="checkbox"/> independent tasks</div><div><input checked="" type="checkbox"/> multimedia and network</div><div><input type="checkbox"/> laboratory</div><div><input type="checkbox"/> mentoring work</div></div></div></div>	
1.6. Comments		
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. Monitoring student work

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

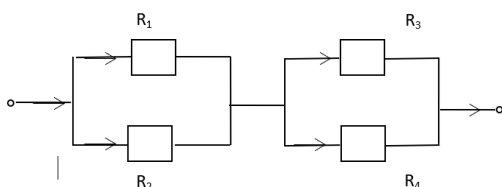
1.9. Procedure and examples of evaluation of learning outcomes during classes and at the final exam

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

Examples of evaluating learning outcomes in relation to set outcomes:

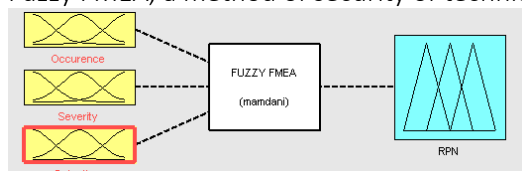
1 Outcomes 1,2 i 3

Let the system consist of four independent components as shown in the figure. Their reliability at time $t = 1000$ h are: $R_1 = 0.6$; $R_2 = 0.7$; $R_3 = 0.8$; $R_4 = 0.9$. What is the reliability of the system at time t ? Calculate the mean time to failure of this system! (picture)



2. Outcomes 4

Fuzzy FMEA, a method of security of technical systems



Final exam (outcomes 1,2,3 and 4)

1. Draw a statistical qualitative time diagram of the component failure frequency and write the name
2. What expression is used to determine the reliability of a component if the frequency of component failure when it is in operation is constant?
3. What is the process of failures in the operation of the technical system? Why?
4. What is true for a component with a constant refresh rate?
5. What expression is given to the reproducibility of a component with a constant renewal frequency?

1.10. Required literature (at the time of applying for the study program proposal)

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

1.11. Supplementary literature (at the time of application of the study program proposal)

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



1.12. Number of copies of required literature in relation to the number of students currently attending the course

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

1.13. Ways of monitoring quality that ensure the acquisition of output knowledge, skills and competencies

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.



3.2. Course description

Generic information		
Head of Course	Ph. D. Siniša Vilke, Associate Professor Ph. D. Ljudevit Krpan, Full Professor	
Course	Logistics in Land Transport	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Elective	
Year of Study	2	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

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

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

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

1.4. Course Outline

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

1.5. Modes of Instruction

☒ Lectures

☐ Seminars and workshops

☐ Exercises

☐ E-learning

☒ Practical work

☐ Multimedia and network

☐ Laboratory

☐ Mentorship



		<input type="checkbox"/> Field work		<input type="checkbox"/> 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					
<p>The procedure of assessment of acquired learning outcomes is carried out by the Study Regulations of the University of Rijeka and the Study Regulations at the Faculty Maritime Studies in Rijeka as follows:</p> <ul style="list-style-type: none">- through continuous assessment of knowledge during classes, 70% of the acquired learning outcomes are evaluated within the 1st exam (35%), and the 2nd exam (35%).- 30% of the acquired learning outcomes are evaluated in the final exam. <p>Examples of evaluation of learning outcomes in relation to the set learning outcomes are:</p> <ol style="list-style-type: none">1. Explain the characteristics and specificities of planning and organizing logistics services in road transport.2. Describe the method of implementing and controlling logistics activities in the road transport process.3. Explain the principles and specificities of planning and organizing logistics services in rail transport.4. Explain the principles and characteristics of implementing and controlling logistics activities in the rail transport process.5. Explain the integrated municipal waste collection system using the given example.6. Define the projection of daily trips and determine the number of means of transport for transporting municipal waste from transfer stations to the collection center according to the given example.					
1.10. Main Reading					
<ol style="list-style-type: none">1. Baričević, H., Vilke, S.: Logistika i sigurnost kopnenog prometa, Pomorski fakultet, Rijeka, 2016.2. Zelenika, R.: Logistički sustavi, Ekonomski fakultet, Rijeka, 2005.3. Segetlija, Z.: Distribucija, Ekonomski fakultet, Osijek, 2006.					
1.11. Recommended Reading					
<ol style="list-style-type: none">1. Bloomberg D., LeMay, J., Hanna, B.: Logistika, Mate d.o.o., Zagreb, 2006.2. Tilanus, B.: Information Systems in Logistics and Transportation, Emerald Group Publishing Limited, London, 1997.3. Šamanović, J.: Logistički i distribucijski sustavi, Ekonomski fakultet, Split, 1999.					
1.12. Number of Main Reading Examples					
Title				Nubmer of examples	Number of students
1. Baričević, H., Vilke, S.: Logistika i sigurnost kopnenog prometa, Pomorski fakultet, Rijeka, 2016.				5	30
2. Zelenika, R.: Logistički sustavi, Ekonomski fakultet, Rijeka,				5	30



2005.		
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.		