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3.2. Course description

Generic information			
Head of Course	Dr. sc. Marko Gulić, Ivan Tudor, mag.educ.		
Course	Application of Electronic Computers		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Mandatory		
Year of Study	1st year		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4	
	Number of Hours (L+E+S)	30+30+0	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To acquire knowledge about the structure and operating principles of computers as well as skills in using computers for word processing and spreadsheet applications. To train students to solve problems using computers by developing algorithms and implementing them using programming packages.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

Upon completing the course, students will be able to:
1. Identify the basic components of digital computers and their functions, including input/output units, working memory, hardware, and CPU.
2. Describe the operation of digital computers using number systems, logical expressions, and mathematical-logical fundamentals.
3. Apply basic principles of algorithms for problem-solving, including defining control structures (sequence, branching, looping).
4. Demonstrate the use of the MS Windows operating system for file management, data retrieval, and file compression.
5. Customize text documents in MS Word by formatting characters, paragraphs, headers, and tables, and prepare documents for printing.
6. Analyze data in MS Excel using formulas, functions (IF, COUNTIF), conditional formatting, and charts.
7. Develop basic computer programs using Just Basic, implementing conditional structures and loops.
8. Compare different types of computer software and evaluate their use in real-world scenarios.

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1.4. Course Outline

Mathematical-logical foundations of computer operations. Problem-solving using computers. Algorithms and programs (Just Basic). Elements of algorithms. Description of algorithms. Algorithm commands. Algorithm control structures. Computer hardware. Input/output devices. Memory. Processor. Computer software. System software. Operating system (MS Windows). Programming software. Utility programs. Application software. Word processing software (MS Word). Spreadsheet software (MS Excel).

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

1.7. Student Obligations

Students are required to actively attend lectures and exercises. All continuous assessments contribute to the final grade, none of which can be passed with less than 50% of the grading points.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1	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

Three knowledge tests are conducted during classes using computers, covering 70% of learning outcomes:
- Just Basic programming: 20% (Outcomes 2, 3, 7)
- MS Word: 25% (Outcomes 4, 5)
- MS Excel: 25% (Outcome 6)

The remaining 30% is assessed in the final exam (theory – Outcomes 1 and 8).

Examples of evaluation:
1. List technologies used for data recording in storage memory (Outcome 1).
2. Convert number 756 from octal to hexadecimal (Outcome 2).
3. Define algorithm steps that check whether a student meets exam requirements (Outcome 3).
4. Compress all newly created documents into one and create a file named nameSurname.zip (Outcome 4).
5. Format text using MS Word according to given specifications (Outcome 5).
6. Create a chart in MS Excel based on provided data (Outcome 6).
7. Write a Just Basic program that reads 20 numbers and prints the largest (Outcome 7).
8. Describe various types of application software (Outcome 8).

1.10. Main Reading

· Tudor, M. Application of Electronic Computers, University of Rijeka, Faculty of Maritime Studies, Rijeka, 2010.
· Course materials available on the e-learning system – Merlin (https://moodle.srce.hr)

1.11. Recommended Reading

· Vukšić et al., Basics of Business Informatics, University of Zagreb, Faculty of Economics, 2020.
· Grundler et al., ECDL 5.0 (WINDOWS 7, OFFICE 2010): Basic Program – 7 Modules, PRO-MIL, Varaždin, 2012.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Tudor, M. Application of Electronic Computers, University of Rijeka, Faculty of Maritime Studies, Rijeka, 2010	Library: 10 copies Script Office: 150 copies	50
Teaching materials on the Merlin e-learning system	unlimited	50

1.13. Quality Assurance

The quality of study is monitored according to the ISO 9001 system and in line with European standards and guidelines for quality assurance implemented at the Faculty of Maritime Studies in Rijeka. Annually, the pass rates are analyzed and appropriate measures are taken.

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3.2. Course description

Generic information			
Head of Course	Renato Ivče full professor, Ph. D		
Course	Cargoes in maritime transport		
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	3	
	Number of Hours (L+E+S)	(30 + 0 +0)	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The College aims to introduce students to the characteristics of maritime cargo transportation, the types of cargoes, the procedures when cargoes are transported by sea, and the possible dangers while certain cargoes are transported by sea

1.2. Prerequisites for Course Registration

No prerequisite for this course

1.3. Expected Learning Outcomes

1. Compare the characteristics of the most important types of cargo in maritime transport.
2. Identify the influential factors that are important in maritime transport.
3. Apply procedures for the transport of cargo by sea to ensure its safe preservation and delivery in the same condition as it was accepted for loading.
4. Compare the type and importance of packaging in maritime transport.
5. Assess the possible risks of damage to cargo during loading, unloading, and transport by sea and define procedures in the event of a harmful event.

1.4. Course Outline

Introductory considerations. Types of cargo in maritime transport. Characteristic and division of dangerous goods. Packaging and mode of packing of cargo. Stowage and broken stowage factors. Basic risks of goods damage during transport, port handling, and stowage. Fuels, characteristics, and division. Cargoes are transported in refrigerated and frozen conditions. Iron and products of iron in maritime transport. Grain and seeds in maritime transport. Other significant dry and liquid cargoes are transported by sea. Cargo units of modern general cargo technologies.

1.5. Modes of Instruction	X ☐ 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 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	1,0	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1,0	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

Student obligations are: regular attendance, 1st and 2nd colloquium, oral examination
The evaluation procedure for 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:
A. Through continuous knowledge assessment during classes, 70% of acquired learning outcomes are evaluated through • 1st colloquium – learning outcomes 1-3 (0.50 ECTS (35%)), while the student must achieve a minimum of 52% of points for passing colloquium • 2nd preliminary exam – learning outcomes 3-5 (0.50 ECTS (35%)), while the student must achieve a minimum of 52% of points for passing colloquium

B. Condition for passing the final oral exam: In the final part of the exam, (1.0 ECTS (30%)) of acquired learning outcomes (1-5) are evaluated, while to pass the final exam, the student must achieve a minimum of 52% of points. • Attendance at lectures is mandatory, and students' attendance will be monitored. • A student can miss a maximum of 25% of classes.

Examples of evaluation of individual learning outcomes during classes and at the final exam
1. List the basic divisions of dry cargo.
2. Identify significant characteristics of general cargo in sea transport.
3. Define and explain the procedures for loading fishmeal onto a ship.
4. Define and compare packaging for transporting wheat as general cargo.
5. Possible risks of cargo damage during loading, unloading, and sea transport, and define procedures in the event of wood bundles shifting on deck.

1.10. Main Reading

1.Vranić, D., Kos, S., Morska kontejnerska transportna tehnologija
2.D.J. House, Cargo Work, Butterworth-Heinemann
3. Vranić, D., Kos, S., Morska kontejnerska transportna tehnologija, Rijeka 2003
4. Ivče, R.., teaching materials from the course Cargoes in maritime transport on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka

1.11. Recommended Reading

1. Biblioteka pomorskog časnika, sv. 1,
2. Biblioteka pomorskog časnika sv. 2,
3. Biblioteka pomorskog časnika sv. 3,
4. Biblioteka pomorskog časnika sv. 4.
5. Međunarodni pravilnici i kodeksi koji se odnose na rukovanje i prijevoz tereta morem

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Tereti u pomorskom prometu	30	

Nastavni materijal za e-kolegij dostupan na sustavu za e- učenje – Merlin	web	
Cargo Work	web	
Morska kontejnerska transportna tehnologija	10	

1.13. Quality Assurance

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.

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3.2. Course description

Generic information			
Head of Course	Prof. Goran Vukelić, PhD.		
Course	Engineering Mechanics		
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		4
	Number of Hours (L+E+S)		30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring theoretical knowledge that is the basis for problem solving in the field of solid mechanics (statics, kinematics, dynamics) and fluid mechanics.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, the student will be able to:
1. Describe the axioms of statics and laws of mechanics.
2. Apply the laws of mechanics to solve the problems of determining the reactions of rigid bodies on friction(less) surfaces.
3. Dimension loaded beams.
4. Analyze the strength of a loaded beam.
5. Apply the laws of mechanics to the fluid mechanics problems.
6. Analyze the fluid flow.

1.4. Course Outline

Colinear, concurrent, parallel and general planar system of forces. Resultant of a forces and equilibrium of a body. Moment of a system of forces. Force couple. Analysis of a system of forces. Friction. Pappus-Guldin theorems. Beams and trusses.
Normal and tangential stress. Stress and strain dependence. Allowed stress. Axial load, shear stress, torsion, bending, buckling. Dimensioning of beams and shafts.
Coordinate system and position of a body within. Motion. Degrees of freedom. Kinematics of a particle: rectilinear and curvilinear motion.
Dynamics of a particle: inertia, inertia force, D'Alembert principle. Work, energy and power.
Fluid mechanics: general physical values and parameters. Fluid statics. Pressure and change of pressure. Measuring the pressure. Pressure force. Buoyancy. Stability of a floating body. Pascal law. Hydraulic press. Fluid motion. Laws of fluid motion. Euler and Bernoulli equation. Fluid flow. Fluid circulation. Cavitation.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	-	
1.7. Student Obligations		
Attending the lectures and exercises (min. 70%), attending the assessment and exams, submitting results of assignments.		
1.8. Assessment[1] of Learning Outcomes		

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

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

According to the study rulebooks of University of Rijeka and Faculty of Maritime Studies:

- through continuous assessment during the semester (70% of learning outcomes)
  - 1. colloquium - learning outcomes 1-2 (25%),
  - 2. colloquium - learning outcomes 3-4 (25%),
  - homework assignments - learning outcomes 1-6 (20%),
- through final exam (30% of learning outcomes (5-6)) with passing rate set at min. 50% of final exam points.

Examples of evaluation in correlation to learning outcomes:

1. Determine the equilibrium of a body exposed to a system of forces.
2. Determine the free-body diagram of a rigid body.
3. Determine the free-body diagram of a beam and determine the distribution of forces and moments.
4. Determining stress, strain, and stability of a beam.
5. Calculate pressure, change of pressure, pressure force, and buoyancy.
6. Calculate fluid motion between two points.

1.10. Main Reading

J. Brnić: Mehanika i elementi konstrukcija, Školska knjiga, Zagreb, 1996.
M. Pečornik: Tehnička mehanika fluida, Školska knjiga, Zagreb, 1985.

1.11. Recommended Reading

Video lectures on Merlin.
J. Brnić: Statika, Tehnički fakultet, Rijeka, 2004.
R. Žigulić, S. Braut: Kinematika, Sveučilište u Rijeci, Tehnički fakultet, Rijeka, 2012.
M. Krpan et al..: Dinamika, Tehnički fakultet, Rijeka, 2001.
G. Vizentin, G. Vukelić, L. Murawski, N. Recho, J. Orović: Marine propulsion system failures - A review, Journal of marine science and engineering, 2020.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
J. Brnić: Mehanika i elementi konstrukcija	6	80
M. Pečornik: Tehnička mehanika fluida	5	80

1.13. Quality Assurance

According to the ISO 9001 system set at the Faculty of Maritime Studies, Rijeka. Once a year, an analysis of the passing exam rate is conducted. Once a semester, an anonymous online survey of students is conducted.

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3.2. Course description

Generic information			
Head of Course	Lovro Maglić, Ph.D.		
Course	Marine environmental protection		
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		3
	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 principles, regulations and measures of environmental protection, especially the part related to the protection of the marine environment from pollution from ships. Therefore, the course contains material relating to the theoretical principles of the relationship between organisms and sources of pollution and technical and legislative solutions for the protection of the marine environment in accordance with the requirements of the STCW Convention.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

After learning the students will be able to:

1. describe and interpret the basic concepts of ecology;
2. explain and interpret the adverse impact of individual pollutants on biocenosis and the environment
3. analyze individual Annexes of the MARPOL 73/78 Convention
4. distinguish the documentation from the Appendices of individual MARPOL 73/78 Convention Annexes.
5. explain the procedures and measures in case of pollution of the sea from ships by various pollutants.

1.4. Course Outline

The content of the course includes the following topics: Ecology, Ecosystem, Protection of the marine environment, Marine ecosystem factors, Harmful pollutants, Ship as a source of pollution, MARPOL 73/78 Convention, Annex I (Prevention of pollution by oils), II (Prevention of pollution by bulk chemicals), III (Prevention of marine pollution by harmful substances in packaged form), IV (Prevention of marine pollution by sewage), V (Prevention of pollution by ship waste), VI (Prevention of air pollution from ships), Ballast water, Underwater antivegetative paints, Onshore reception facilities, Ship as a source of pollution.

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 condition for taking the final oral exam is a successfully passed written exam.
The final exam tests the completeness of theoretical knowledge in the field of marine environmental protection. The method of student assessment is:
- Passing the written exam: 50% of the grade points
- Final oral exam: 50% of Grade Points

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	1	Presentation		Practical work	
Portfolio							

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

1. Written exam in the field of protection of the sea and marine environment, international system of marine protection and cleaning from ships (it is necessary to achieve a minimum of 50% correct answers, all learning outcomes)
2. Oral exam - the completeness of theoretical knowledge in the field of marine environment protection is verified (it is necessary to achieve a minimum of 50% of the required theoretical knowledge)

Examples of evaluation of learning outcomes in relation to set learning outcomes are:
- Explain the basic concepts of environmental protection (1)
- Interpret the types and impacts of marine pollution from ships (2)
- Explain the ways of protecting the sea from working pollution of the sea by oils (3)
- Describe the report on the delivery of waste from ships to shore facilities (4)
- Describe the procedures in case of severe marine pollution by harmful substances (5)

1.10. Main Reading

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

1.11. Recommended Reading

- IMO, MARPOL 73/78., Consolidated Edition, London 2022.

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.

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3.2. Course description

Generic information		
Head of Course	**Assist. Prof. Jasmina Jelčić Čolakovac, PhD**	
Course	**Maritime English 1**	
Study Programme	**Nautical Studies and Maritime Transport Technology**	
Type of Course	Compulsory	
Year of Study	1st	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the English language course is for students to acquire fundamental and specialist linguistic knowledge and skills that will enable them to use English as the official language of communication in maritime communication.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

Upon completion of the course, students will be able to:
1. recognize present, past, and future verb tenses in a sentence.
2. apply English grammar rules in solving language exercises.
3. explain basic concepts in the field of ship classification, navigation, and shipbuilding in English.
4. summarize the main ideas of a generic text or a text from the prescribed literature and interpret unknown words within the context in which they are presented.
5. apply the rules for forming conditional sentences in authentic maritime contexts.

1.4. Course Outline

The course connects English for Specific Purposes (ESP) relevant to the future profession and General English (the ability to communicate in everyday life and at work). The basics of English grammar are covered: verb tenses (*Simple Present, Present Continuous, Simple Past, Past Continuous, Present Perfect, Present Perfect Continuous, Past Perfect, Future Tenses*), conditionals, and passive voice. Grammar rules are applied in professional texts. Maritime English vocabulary is introduced (types of vessels, ship parts and dimensions, basic navigation terminology). Vocabulary is practiced through targeted professional topics (*Types of Vessels, General Arrangement Plan, Shipbuilding, Ship's Movement & Position, Crew & Watchkeeping, Navigating Bridge and Navigation Marks*).

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

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1.7. Student Obligations

Active class participation and at least 70% attendance.

1.8. Assessment[1] of Learning Outcomes

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

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

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

1. Continuous assessment during classes evaluates 70% of the acquired learning outcomes. The student must achieve a minimum of 50% of points (at least 35/70) through three continuous assessments:
   - ✓ 1st midterm test – learning outcomes 1-3 (1.0 ECTS (25%)),
   - ✓ 2nd midterm test – learning outcomes 2-3 (1.0 ECTS (25%)),
   - ✓ 3rd midterm test – learning outcomes 2-5 (0.5 ECTS (20%)).

2. The final written exam (1.0 ECTS (30%)) evaluates learning outcomes 1-5. The student must achieve at least 50% of points to pass.

Examples of assessment for each learning outcome during classes and in the final exam:
1. Recognize Present Simple and Present Simple Continuous in a sentence.
2. Apply the rules for using time adverbials and the Present Simple tense.
3. Explain dead reckoning and running fix in English.
4. Summarize a text about the crew and the role of the chief mate and interpret unknown English words in the text (e.g. *obligation*, *dog watch*, etc.).
5. Apply the correct present tense form in zero and first conditional sentences (e.g. *If you go outside, the waves will get you wet*.)

1.10. Main Reading

1. Grice, Tony. 2012. *English for the Maritime Industry*. Units 1, 2, 4, 5, & 8. Idris Education: London.
2. Pritchard, Boris. 1995. *Maritime English 1*. Units 1-17, 24, 25, & 32. Zagreb: Školska knjiga.
3. van Kluijven, Peter C. 2003. *The International Maritime Language Programme*. Unit Two (Types of Vessels, General Arrangement Plan, Ship's Measurement, Shipbuilding), Unit Four (Navigation), Unit Five (Tides, Weather, Ship's motions). Alkmaar: Alk & Heijnen Publishers.
4. Jelčić Čolakovac, Jasmina & Irena Bogunović. 2021. *Grammar for mariners: Grammar coursebook for students of maritime courses*. Units 1,2, & 3. Rijeka: University of Rijeka, Faculty of Maritime Studies.

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

1. Powell, Debra with Elaine Walker & Steve Elsworth. 2008. *Grammar Practice for Upper Intermediate Students* (with key). 3rd Edition. Harlow. Essex: Pearson-Longman.
2. Carter, Ronald & Michael McCarthy. 2006. *Cambridge Grammar of English. A Comprehensive Guide. Spoken and Written English Grammar and Usage*. Cambridge: Cambridge University Press.
3. Hewings, Martin. 2005. *Advanced Grammar in Use. A self-study reference and practice book for advanced students of English.* Second edition. Cambridge: Cambridge University Press.
4.Swan, Michael. 2005. *Practical English Usage*. Third edition. Oxford: Oxford University Press. (Intermediate to Advance).

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Grice, Tony. 2012. *English for the Maritime Industry*	10	113
Pritchard, Boris. 1995. *Maritime English 1*	Chapters can be accessed at: https://www.pfri.uniri.hr/bopri/marengl1.html	
van Kluijven, Peter C. 2003. *The International Maritime Language Programme*	10	
Jelčić Čolakovac, Jasmina & Irena Bogunović, Irena. *Grammar for mariners: Grammar coursebook for students of maritime courses*	10	

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 Faculty of Maritime Studies in Rijeka. Pass rates are analysed annually and appropriate measures are taken.

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3.2. Course description

Generic information			
Head of Course	dr. sc. Biserka Draščić Ban, Martina Žuškin, mag. educ.		
Course	Mathematics 1		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Mandatory		
Year of Study	1.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		30 + 30 + 0 (2 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of the course is to master selected chapters of mathematics related to linear algebra and mathematical analysis.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

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

1. Recognize the basic concepts of linear algebra, functions of one variable, and differential calculus of functions of one variable.
2. Perform basic calculation operations with matrices, vectors, determinants.
3. Express and analyze basic results from linear algebra.
4. Interpret solutions to the derivative of a function of one variable, and limit values.
5. Analyze the course of a real function of one variable.

1.4. Course Outline

Number sets. Mathematical induction. Spherical trigonometry: definitions of trigonometric functions and spherical triangle. Complex numbers. Matrices and determinants. Systems of linear algebraic equations. Fundamentals of vector calculus in three-dimensional space. Sequences and limit values. Functions: domain, limit and continuity. Second-order curves: circle, ellipse, parabola, hyperbola. Derivative and differential

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

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1.7. Student Obligations

Active participation in classes. Attendance at least 70% of lectures and exercises. Completed independent assignments, passed preliminary exams and final oral exam.

1.8. Assessment[1] of Learning Outcomes

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

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

The process of evaluating the acquired learning outcomes is carried out according to the Regulations on student conduct and academic affairs of the University of Rijeka and the Regulations on studies at the Faculty of Maritime Studies in the following way:

- 1st Preliminary exam – 30 points Learning outcome: *1., 2., 3.*
- 2nd Preliminary exam – 30 points Learning outcome: *4., 5.*
- Attending classes and completing assignments – 10 points Learning outcome: *1. – 5.*
- Final Exam – 30 points Learning outcome: *1. – 5.*

- Student must achieve a minimum of 35 points to take the final exam.
- To pass the final exam, a student must achieve a minimum of 50% of points.
- Attendance at exercises and lectures is mandatory and student attendance will be monitored.
- Student may miss a maximum of 30% of exercises and 30% of lectures
- Student who does not participate in the work and does not achieve 35 points in class must re-enroll in the course.

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

1. Given the function f(x)=x^2+4x+3. Determine the domain of the function.
   Determine the zeros of the function.
2. Calculate the product of two matrices.
3. Explain what it means to solve a system of linear equations and what solutions can be?
4. Determine the extrema of the following function f(x)=x^3-4x
5. Examine the function f(x)=x/(1+x^2)

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Grupa autora, Matematika I, Pomorski fakultet Rijeka, 2001.
3. Grupa autora, Matematika – zbirka zadataka, Pomorski fakultet Rijeka, 1999.
4. Demidovič, Zadaci i riješeni primjeri iz matematičke analize za tehničke fakultete, Danjar, d.o.o, Zagreb 2003.

1.11. Recommended Reading

1. Kurepa, S., Matematička analiza I, Tehnička knjiga Zagreb, 1970.
2. Skenderović, J., Matejčić-Ružička, V., Vježbe na računalu, Pomorski fakultet, Rijeka 2000.
3. Štambuk, Lj., Matematika I, Tehnički fakultet Rijeka, 2002.
4. https://maremathics.pfst.hr/ (e – učenje)

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

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)	Online	65
Grupa autora, Matematika I, Pomorski fakultet Rijeka , 2001.	20	65
Grupa autora, Matematika – zbirka zadataka, Pomorski fakultet Rijeka , 1999.	20	65
Demidovič, Zadaci i riješeni primjeri iz matematičke analize za tehničke fakultete, Danjar,d.o.o, Zagreb 2003.	20	65

1.13. Quality Assurance

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

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3.2. Course description

Generic information			
Head of Course	Maja Skendžić, mag.cin.		
Course	Physical and Health Education 1		
Study Programme	Nautical Studies and Marine Transport Technology		
Type of Course	Core		
Year of Study	1		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		1
	Number of Hours (L+E+S)		0+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goals of physical and health education are: understanding the principles of the biopsychosocial characteristics of the human being, acquiring knowledge about the factors that cause diseases and injuries, gaining a set of motor skills and information necessary for more meaningful use of free time,fulfilling the human biopsychosocial need for movement, developing humane interpersonal relationships, increasing creative abilities and adapting to modern living and working conditions, and through appropriate programs, enabling individuals to independently and responsibly take care of preserving and promoting their personal health, work capacity and other abilities.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

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

1. Positively influence anthropological characteristics (anthropometric traits)
2. Improve the acquisition of general and specific motor abilities, knowledge, skills and habits
3. Apply and utilize methods for maintaining and promoting health
4. Preserve health status through the application of physical exercise

1.4. Course Outline

Course Content Overview introducing students to the curriculum, class locations, and specific equipment. Assessing students' health status and levels of (in)activity. Measuring heart rate in various starting positions: lying down, sitting, standing. Running with changes in direction. Volleyball technique elements (V). Running; cyclic running up to 6 minutes. Running technique: coordination of breathing, arm and leg movement. Elective activity. Stretching exercises, including sport-specific flexibility routines. Loosening and relaxation exercises. Basic kinesiological transformations on board (ship). Movement coordination. Kinesiotherapeutic exercises for spine preservation in seafarers. Overhead passing and rebounding, underhand passing with forearms (V). Stretching – F. Climbing up and down ship ladders and ropes – M. Catching, passing, and shooting a basketball; ball handling (B). Development of general motor abilities (speed, precision). *Field work. Incorrect posture – physical exercise and prevention. Dance structures (English waltz) – F. Ball handling and play (N) – M. Player positions – playing with multiple players over the net (V). Evaluation of students' individual attendance status, based on presence or absence and participation in class activities. Elective game.

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	Seminar paper is written by part-time students. Field work will be conducted if conditions and weather permit.	

1.7. Student Obligations

Active attendance and participation in at least 70% of classes is required.

1.8. Assessment[1] of Learning Outcomes

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

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

The course is not graded.
Students' motor activity is positively evaluated during classes. Each lesson, student attendance and participation are carefully monitored and recorded in a dedicated semester-long Physical and Health Education Attendance Sheet. The course *Physical and Health Education* is assessed for the respective semester by entering "PASSED" in the ISVU system.

1.10. Main Reading

1.11. Recommended Reading

1.Redžić A., Redžić M.: Križobolja i tjelesno vježbanje, HSSR Sport za sve. Godina XXXVI, broj 93.,2018
2. Findak V.: Metodika tjelesne i zdravstvene kulture, Školska knjiga Zagreb, 1999.
3. Anderson B.: Stretching, Vježbe istezanja za svakodnevni fitness: trčanje, plivanje, tenis, biciklizam, skijanje, košarka, nogomet i ostale sportove, Gopal, d.o.o., Zagreb, 1997
4. Anderson B., Burke E., Pearl B.: Fitnes za sve, Gopal, d.o.o., Zagreb, 1997.
5. Janković V. , N. Marelić.: Odbojka, Fakultet za fizičku kulturu Sveučilišta u Zagrebu, Zagreb 1995.
6. Kosinac, Z.: Kineziterapija, tjelesno vježbanje i sport kod djece i omladine oštećena zdravlja, Split, 1989.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

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, as implemented at the Faculty of Maritime Studies in Rijeka.
Once a year, pass rate results are analyzed and appropriate measures are taken.

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3.2. Course description

Generic information		
Head of Course	Igor Rudan, PhD	
Course	Ship design and construction 1	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Undergraduate degree programme	
Type of Course	Mandatory	
Year of Study	1st	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 30 + 0 (2 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to acquaint students with the basic ship's dimensions and measures, transversal and longitudinal constructional elements, elementary conception of ship's strength and constructional features of different type of ships.

1.2. Prerequisites for Course Registration

No prerequisites

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Parse and appAnalyze the historical development of the double hull system.
2. Classify and describe the transverse structural elements that support the ship’s deck.
3. Explain the concept of ship draft and illustrate a draft range between 8 and 10 meters.
4. Evaluate the characteristics of liner shipping and identify the types of vessels operating in liner services.
5. Identify and assess the characteristics of ice class ships designed for navigation in polar regions.
6. Compare and contrast the technical and technological features of container ships with those of general cargo vessels.

1.4. Course Outline

International rules for ship construction and historical development. Construction materials, welding, bulkheads, watertight bulkhead, watertight door. Type of ships. Structural elements of longitudinal and transversal ship's strength. Strength and stress of ship structure. Ship compartments, cargo compartments, navigation bridge and engine room. Ship's cargo handling equipment for different type of ships. Ship’s operational equipment.

Type of rudders, remarks for different kind of rudders, propeller execution with main particularities. Geometrical ship's dimensions and measures. Ship drawings and design. General plan of ship with different system technology. Wind surface and under water area. Ship's division toward purpose, type of cargo, navigational water categories, construction material, nature of shipping service, etc. Technical and technological characteristics for General Cargo ships, Container Ships, Ro-Ro vessels, Bulk Carriers, Oil/Oil products and Chemical Tankers, Gas takers, Passenger liner and cruise ships and offshore vessels with different purpose and service.

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 of classes over 70 %. Longitudinal and transversal ship drawing – student task. Passed two written exams. Final oral exams.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1,25	Essay		Research	
Project		Continuous Assessment	1,75	Presentation		Practical work	
Portfolio							

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

70 % of the course grade is based through 2 written exams in class and 30 % of the course grade is based in the oral 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.

Continuous assessment: Each written exam must have at least 70 % score.
Final oral exam (learning outcomes 1- 7) checks the competences of theoretical knowledge where it is necessary to achieve a minimum of 50 % of the required theoretical knowledge.
Examples of learning outcome assessments in relation to the defined learning outcomes:

1. Describe the historical development of the double hull system.
2. Classify and describe the transverse structural elements that support the ship's deck.
3. Explain the concept of ship draft and illustrate a draft range between 8 and 10 meters.
4. Comment on the characteristics of liner shipping and present the types of vessels operating in liner service.
5. List and comment on the characteristics of ice class ships designed for navigation in polar regions.
6. Highlight the technical and technological features of container ships and compare them with those of general cargo vessels.

1.10. Main 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.

1. Rudan, I., teaching materials from the course *Ship design and construction* on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka
2. Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions
3. Komadina, P., Brodovi multimodalne prijevozne tehnologije, Pomorski fakultet u Rijeci, Rijeka, 2001.
4. Komadina, P., Ro-Ro brodovi, Pomorski fakultet u Rijeci, Rijeka, 2001.
5. Komadina, P., Tankeri, Pomorski fakultet u Rijeci, Rijeka, 1994.
6. Buljan, I., Stabilnost brodova, Priručnik za pomorce, Školska knjiga Zagreb, Zagreb, 1982.
7. Milošević, M., i Š., Osnove teorije broda 1, Sveučilište u Zagrebu, Zagreb, 1981

1.11. Recommended Reading

1. Eyres, D. J., Ship Construction, Butterworth-Heinemann, London, 2007
2. K.J. Rawson, E.C. Tupper, Basic Ship Theory, Longman Scientific & Technical, Essex, 1984.
3. Biblioteka pomorskog časnika, sv. 1, sv. 2, sv. 3, sv. 4
4. Biblioteka Sigurnost na moru
5. Jovanović, Filip; Rudan, Igor; Žuškin, Srđan; Sumner, Matthew Comparative analysis of natural gas imports by pipelines and FSRU terminals. // Pomorstvo, 33 (2019), 1; 110-116 doi:10.31217/p.33.1.12
6. Sumner, Matthew; Rudan, Igor A Hybrid MCDM Approach to Transshipment Port Selection. // Pomorstvo, 32 (2018), 2; 258-267 doi:10.31217/p.32.2.11
7. Ivče, Renato; Rudan Igor; Rudan Mateo: Management and Usage of Nitrogen Systems on Liquefied Natural Gas (LNG) Carriers.// Pomorski zbornik, 55(2018), 219-227
8. Ivče, Renato; Jurdana, Irena; Rudan, Igor: Doprinos učinkovitosti Ro-Ro putničkog prometa primjenom usluga pokretne telekomunikacijske mreže na području Primorsko-goranske županije. // Pomorstvo : journal of maritime studies, 25 (2011), 2; 445-460
9. Vuskovic, B.; Rudan, I.;Sumner, M. Fostering Sustainable LNG Bunkering Operations: Development of Regulatory Framework. Sustainability 2023, 15, 7358. https://doi.org/10.3390/su15097358
10. Sirotic, M.; Žuškin, S.; Rudan, I.; Stocchetti, A. Methodology for the Sustainable Development of the Italy-Croatia Cross-Border Area: Sustainable and Multimodal/Cross-Border Passenger Services. Sustainability 2021, 13, 11895. https://doi.org/10.3390/su132111895
11. Dan Martinčević,, Igor Rudan, Davor Šakan; The Panama Canal drought crisis and its impact on the tanker market; Book of Abstracts, 8th My First Conference, 19 September 2024, Rijeka
12. Leopold Mandić, Alen Jugović, Josip Orović, Igor Rudan; Analysis of port infrastructure on the Croatian coast of Adriatic sea for berthing ships powered by alternative fuels; 3rd International Conference of Maritime Science & Technology; Dubrovnik, 14 – 16 September 2023
13. Šakan, D., Žuškin, S., Rudan, I., Brčić, D., Container ship fleet route evaluation and similarity measure-ment between two shipping line ports // Journal of marine science and engineering, 11 (2023), 2; 1-16. doi: 10.3390/ jmse11020400

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials from the course Ship design and construction	MERLIN – online	60
Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions	-	
Brodovi multimodalne prijevozne tehnologije	10	
Ro-Ro brodovi	10	
Tankeri	10	
Osnove teorije broda 1 i 2	5	
Brodovi multimodalne prijevozne tehnologije	10	

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 analysed and appropriate measures are adopted.

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3.2. Course Description

Generic information		
Head of Course	Igor Vio, PhD	
Course	Maritime Administrative Law	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Undergraduate degree programme	
Type of Course	Core (compulsory course)	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS Coefficient of Student Workload	3
	Number of Hours (L+E+S)	30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Students should become familiar with international and national legal framework regulating the boundaries of national jurisdiction at sea, rights and duties of states at sea, their mutual relations related to exploration and exploitation of marine and submarine resources and their protection, their relations concerning war and neutrality in armed conflicts at sea, as well as safety of navigation and protection of the marine environment, organization of maritime administration, labour relations of seafarers, flag state and port state control, maintenance of order in ports and harbours, and regime of maritime domain.

1.2. Prerequisites for Course Registration

none

1.3. Expected Learning Outcomes

After passing the exam, students will be able:

1. To list and compare the international conventions and other sources of the international law of the sea, to describe its basic principles and to explain their influence on the regimes of navigation of ships in various parts of the sea, as well as on the regime of the exploitation of the resources of the sea and the seabed.
2. To explain the regime of entry and navigation of various foreign ships (merchant, government, military, fishing or scientific) and foreign yachts and boats in internal waters, territorial sea and protected ecological and fishery zone of the Republic of Croatia.
3. To enumerate and interpret rules and regulations of international maritime law governing the safety of navigation and the protection of the marine environment.
4. To explain the structure and describe the activities of the International Maritime Organization (IMO) and the European Maritime Safety Agency (EMSA).
5. To list the laws and regulations of the Republic of Croatia in the area of maritime administrative law and explain their application to ships and other maritime vessels and crafts, maritime navigation, sea lanes, pilotage and order in ports.
6. To describe the organization of the maritime administration in the Republic of Croatia, explain the role and organization of harbour master's offices, to enumerate their functions, highlight the features of the certificate of registration and other ship documents and books, indicate the principles and procedures of inspection, explain the technical control and list other activities of the Croatian Register of Shipping.

7. To explicate the legal regulation of the maritime domain and seaports in the Republic of Croatia, describe the concept of the maritime domain and highlight the features of its concession, interpret the notion and list the types of seaports, and to describe the structure of the port authority and indicate its activities.
1.4. Course Outline
Part I: International Law of the Sea: definition and codification: UNCLOS I, II and III - Geneva Conventions (1958) and UN Convention on the Law of the Sea (1982); internal waters, ports, bays, historic bays and historic waters, archipelagic waters, regime of islands, territorial sea, contiguous zone, straits used for international navigation, canals, continental shelf, exclusive economic zone, maritime boundary delimitation, area, high seas, land-locked states, geographically disadvantaged states, enclosed and semi-enclosed seas, marine scientific research, marine pollution, marine and submarine areas of the Republic of Croatia, status of foreign ships in Croatian internal waters and territorial sea. International Law of Armed Conflicts at Sea: rights and duties of neutral and belligerent states, war zones at sea, status of neutral ships in convoy, status of military and merchant ships in armed conflicts, naval blockade, contraband of war. Part II: International Maritime Organization (IMO) – structure, goals and functions. International conventions on safety of navigation and protection of the marine environment: SOLAS, COLREG, LOADLINES, TONNAGE, INTERVENTION, LDC, MARPOL, OPRC, AFS and BWC. Principles of ISM and ISPS Code, Paris Memorandum of Understanding on Port State Control, problems of flags of convenience. European Maritime Safety Agency (EMSA) - structure and functions. Master and crew, STCW Convention, Maritime Labour Convention and other Conventions and Resolutions of the International Labour Organization (ILO). Croatian maritime legislation, Maritime Code, harbour master's offices and inspection of safety of navigation, categories of navigation, sea lanes, pilotage, ships – legal regime, ownership, nationality, registration, classification, name and call sign, ship registers, ship's documents, log book. Croatian Register of Shipping, technical supervision of ships, jurisdiction – flag state, coastal state and port state jurisdiction. Maritime Domain and Seaports Act, concept of maritime domain, concessions, definitions and characteristics of ports and harbours, concessions for port activities, port fees.

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

1.7. Student Obligations

a) Students' main obligations are active course attendance with the preparation and presentation of seminar paper and they are required to pass two mid-term exams.

b) As a prerequisite for the final exam, students must score at least 35 out of a possible 70 points (50%) during the classes.

c) Students must score at least 15 out of a possible 30 points on final exams (50%).

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,0	Class participation		Seminar paper	0,2	Experiment	
Written exam	1,0	Oral exam		Essay		Research	

[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.

Project		Continuous Assessment	0,8	Presentation		Practical work	
Portfolio							

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

The evaluation procedure consists of continuous examination of knowledge in the form of two tests and a final exam. Examples of evaluating learning outcomes during classes and on the final exam:

1. Compare the concept and legal regime of the contiguous zone according to the Convention on the Territorial Sea and Contiguous Zone (1958) and the UN Convention on the Law of the Sea (1982).
2. Indicate and explain conditions for entry and navigation of ships, yachts and boats of foreign nationality in internal waters of the Republic of Croatia, including their stay in seaports and shipyards.
3. List and discuss international acts regulating the protection of the marine environment from pollution.
4. Describe the structure of the International Maritime Organization (IMO) and highlight the role and functions of each body (Assembly, Council, Secretariat, Committees and Subcommittees).
5. Interpret the term and types of pilotage according to the provisions of the Maritime Code of the Republic of Croatia, specify the rights and duties of the pilot, and explain potential responsibility and liability of the pilot and of the pilot company.
6. Describe the structure of the maritime administration in the Republic of Croatia, highlight the most important powers of harbour master's office, and in particular explain and describe the rules of procedure for maritime offenses.
7. Explain the legal concept of maritime domain and indicate which parts of land and sea have this status.

1.10. Main Reading

Luttenberger, Axel, Pomorsko upravno pravo, Pomorski fakultet, Rijeka, 2005.
Luttenberger, Axel, Osnove međunarodnog prava mora, Pomorski fakultet, Rijeka, 2006.
Luttenberger, Axel, Pomorsko ratno pravo, Pomorski fakultet, Rijeka, 2008.
Pavić, Drago, Pomorsko imovinsko pravo, Književni krug, Split, 2006.

1.11. Recommended Reading

Capar, Rudolf, Međunarodno pravo mora, Pomorski fakultet, Rijeka, 1994.
Capar, Rudolf, Međunarodno pomorsko ratno pravo, Školska knjiga, Zagreb, 1989.
Grabovac, Ivo, Pomorsko pravo, Knjiga I: Pomorsko javno i upravno pravo,VPŠ Split, 2001
Grabovac, Ivo – Petrinović, Ranka, Pomorsko javno, upravno i radno pravo, Pomorski fakultet, Split, 2006.
Ibler, Vladimir, Međunarodno pravo mora i Hrvatska, Barbat, Zagreb, 2001.
Rudolf, Davorin, Međunarodno pravo mora, JAZU, Zagreb, 1985.
Pomorski zakonik, N.N. 181/04. (s kasnijim izmjenama i dopunama)
Zakon o pomorskom dobru i morskim lukama, N.N. 158/03. (s kasnijim izmjenama i dopunama)

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Osnove međunarodnog prava mora	Sufficient (in library and book shop)	139
Pomorsko ratno pravo	Sufficient (in library and book shop)	139
Pomorsko upravno pravo	Sufficient (in library and book shop)	139

1.13. Quality Assurance

Quality assurance of the course performance is continuously monitored according to ISO 9001 system applied at the University of Rijeka Faculty of Maritime Studies. An analysis of results of the final exams and a student survey are conducted and appropriate measures are adopted for each academic year.

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3.2. Course description

Generic information			
Head of Course	**Assist. Prof. Jasmina Jelčić Čolakovac, PhD**		
Course	**Maritime English 2**		
Study Programme	**Nautical Studies and Maritime Transport Technology**		
Type of Course	Compulsory		
Year of Study	1st		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		30+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the English language course is to enable students to communicate in English as the official language of communication in international maritime transport, by developing the four basic language skills: speaking, reading, writing, and listening.

1.2. Prerequisites for Course Registration

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1.3. Expected Learning Outcomes

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

1. identify different categories of words in a sentence (adjectives, adverbs, nouns, articles, prepositions).
2. apply English grammar rules when solving language exercises.
3. explain basic concepts in the fields of ship cargo, cargo handling equipment, port terminology, safety at sea, and marine environmental protection in English.
4. summarize the main ideas of a generic text or a text from the prescribed literature and interpret unknown words within the given context.
5. apply word formation rules to the vocabulary of Maritime English.
6. use basic terminology related to ship cargo, ports and terminals, and safety at sea when giving oral presentations on selected topics.

1.4. Course Outline

The course integrates English for Specific Purposes (content relevant to future professional careers) and General English (ability to communicate in everyday life and at work). It covers the basics of English grammar: nouns (singular and plural), formation of adjectives and adverbs, sentence structure, and the use of prepositions and articles. Grammar rules are applied in texts from the maritime domain. Vocabulary from Maritime English is introduced (ship cargo, cargo handling equipment, port terminology, safety at sea, marine environment protection). Targeted professional topics are covered in English (*Cargo & Cargo Handling Equipment, Ports & Harbours, Safety at Sea & Medicine on Board, Marine Conservation*).

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 participation and at least 70% attendance.

1.8. Assessment[1] of Learning Outcomes

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

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

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

1. Through continuous assessment during classes, 70% of the acquired learning outcomes are evaluated. The student must achieve a minimum total of 50% of the points (35/70) through two continuous assessments and one oral presentation:
   - ✓ 1st midterm test – learning outcomes 1-3 (0.75 ECTS (25%)),
   - ✓ 2nd midterm test – learning outcomes 1-3 (0.75 ECTS (25%)),
   - ✓ student presentation – learning outcomes 1-6 (0.5 ECTS (20%)).

2. Through the final written exam (1.0 ECTS (30%)), which evaluates learning outcomes 1-5, the student must achieve a minimum of 50% of the points in order to pass the final exam.

Examples of assessment of individual learning outcomes during classes and in the final exam:
1. Identify adjectives and adverbs in a sentence based on distinguishing suffixes/prefixes.
2. Apply the rules of adjective formation when converting a noun into an adjective.
3. Explain the difference between handling bulk and liquid cargo in English.
4. Summarize a text on the safe handling of dangerous cargo and interpret unknown English words in the text (e.g., *hazardous*, *contamination*, etc.).
5. Apply suffixes used to form adjectives when converting nouns from the field of cargo (e.g., converting the noun *hazard* to the adjective *hazardous*, etc.).
6. Use the terms *port, harbour, terminal, mooring*, or *berthing* when giving an oral presentation on the topic *The Port of Rotterdam*.

1.10. Main 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

1. Grice, Tony. 2012. *English for the Maritime Industry*. Units 10 & 15. Idris Education: London.
2. Pritchard, Boris. 1995. *Maritime English 1*. Units 1-17, 24, 25, & 32. Zagreb: Školska knjiga.
3. van Kluijven, Peter C. 2003. *The International Maritime Language Programme*. Unit Two (Types of Vessels, General Arrangement Plan, Ship's Measurement, Shipbuilding), Unit Four (Navigation), Unit Five (Tides, Weather, Ship's motions). Alkmaar: Alk & Heijnen Publishers.
4. Jelčić Čolakovac, Jasmina & Irena Bogunović. 2021. *Grammar for mariners: Grammar coursebook for students of maritime courses*. Units 4,5, & 6. Rijeka: University of Rijeka, Faculty of Maritime Studies.

1.11. Recommended Reading

1.Powell, Debra with Elaine Walker & Steve Elsworth. 2008. *Grammar Practice for Upper Intermediate Students* (with key). 3rd Edition. Harlow. Essex: Pearson-Longman.
2.Carter, Ronald & Michael McCarthy. 2006. *Cambridge Grammar of English. A Comprehensive Guide. Spoken and Written English Grammar and Usage*. Cambridge: Cambridge University Press.
3.Hewings, Martin. 2005. *Advanced Grammar in Use. A self-study reference and practice book for advanced students of English*. Second edition. Cambridge: Cambridge University Press.
4.Swan, Michael. 2005. *Practical English Usage*. Third edition. Oxford: Oxford University Press. (Intermediate to Advance).
5.Murphy, Raymond. 2004. *English Grammar in Use*. 3rd edition. Cambridge: Cambridge University Press.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Grice, Tony. 2012. *English for the Maritime Industry*	10	113
Pritchard, Boris. 1995. *Maritime English 1*	Chapters can be accessed at: https://www.pfri.uniri.hr/bopri/mareng1.html	
van Kluijven, Peter C. 2003. *The International Maritime Language Programme*	10	
Jelčić Čolakovac, Jasmina & Irena Bogunović, Irena. *Grammar for mariners: Grammar coursebook for students of maritime courses*	10	

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 Faculty of Maritime Studies in Rijeka. Pass rates are analysed annually and appropriate measures are taken.

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Course description

Generic information			
Head of Course	Tatjana Ivošević, PhD		
Course	Maritime Meteorology and Oceanology		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	obligation		
Year of Study	1	II semester	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours (L+E+S)		45+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aims of marine meteorology and oceanology are:
- to familiarise students with the purpose and importance of meteorological observations and measurements for the safety of navigation;
- to train students to carry out meteorological measurements and observations on the ship;
- to introduce students to the conduct of appropriate meteorological and oceanographic shipboard documentation;
-introduce students to the appropriate use of the products of meteorological services for navigation planning
- introduction to the understanding of the scientific basis of meteorological and oceanographic processes and phenomena in navigation.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

At the end of the course, students should be able to:
1. Observe, measure and code meteorological and oceanological factors on the ship to produce a SHIP report;
2. Decode meteorological and oceanological factors from a SHIP report and a “station model”;
3. Explain the consequences of changes in meteorological and oceanological factors during navigation;
4. Explain the surface analysis of weather charts;
5. Apply meteorological services to navigation planning;
6. Recognise and interpret weather and oceanographic conditions and local conditions useful for navigational safety;
7. Analyse the effects of meteorological and oceanographic phenomena that are important for the safety of navigation;
8. Describe and understand the synoptic surface chart and weather forecast for navigation planning.

1.4. Course Outline

Meteorology and oceanology and their historical development.
The position of the earth in space, the atmosphere and the meteorological processes in it. Meteorological factors: air temperature, air pressure and relative humidity, air currents, clouds, precipitation, fog and visibility, meteors. Application of the concepts in navigation
Weather analysis and forecasting: basic principles of the synoptic method, general atmospheric circulation, air masses, atmospheric fronts, cyclones and anticyclones, air movement in the atmosphere, storms. Applications and examples related to the sea and oceans
Weather in tropical areas, tropical cyclones.
Weather in the polar regions. The influence of polar meteorological conditions on navigation
Equipment and methods for testing meteorological parameters of the atmosphere.
Maritime meteorological navigation safety.
Water surfaces of the earth and the seabed. Properties of seawater. General conditions at sea. Ocean currents and waves at sea. Navigation in ice
Equipment and methods for testing physical parameters of the sea.
Oceanographic safety of maritime navigation.

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

In order to take part in the oral examination, students must achieve at least 50% of the points in class, which corresponds to 30 points. They must pass two preliminary examinations and a practical task and successfully pass the final oral examination.

1.8. Assessment[1] of Learning Outcomes

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

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

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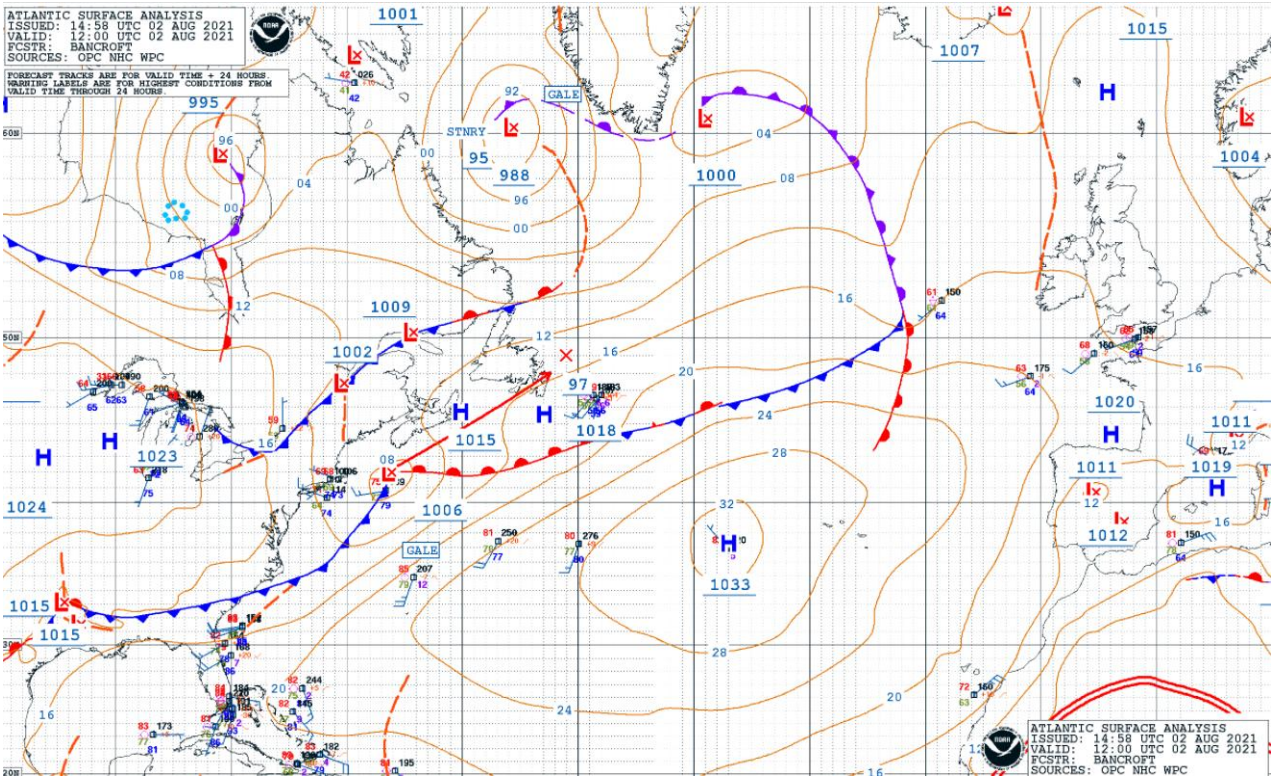
1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and at the Final Exam



Explain the surface map. Explain the movements of air masses and cyclones. Explain a station model. Analyse the pressure in cyclones and anticyclones. Are the weather conditions the same on all sides of the anticyclone? What is navigational safety?How does an extratropical cyclone develop? Explain whether it is dangerous.

1.10. Main (Compulsory) Reading

1. C. Donald Ahrens and Robert Henson, Essential of Meteorology, An invitation to the Atmosphere, Cengage Learning, Boston, 2019.
2. Maurice M Cornish and Elaine E Ives, Reed Maritime Meteorology, Adlard Coles Nautical, London, 2009.
3. Tom Garrison and Robert Ellis, Oceanography, An invitation to Marine Science, Cengage Learning, Boston 2016.
4. Marine Surface Weather Observations Observing Handbook No. 1, National Oceanic and Atmospheric Administration, 2010.
5. Manual on Codes, International Codes, Volume I.1 Annex II to the WMO Technical Regulations, Part A – Alphanumeric Codes, World Meteorological Organization WMO-N.306, 2019.

1.11. Recommended Reading

1. Frank R Spellman, The Handbook of Meteorology, Scarecrow Press, Inc., 2013.
2. Larry Lawrence, MARINE METEOROLOGY Supplementary Notes, WestOne Services, 2003.
3. Paul Webb, Introduction to Oceanography, http://rwu.pressbooks.pub/webboceanography
3. Matthias Tomczak, Lecture Notes in Oceanography, http://www.es.flinders.edu.au/~mattom/IntroOc/index.html
4. Picard, G.L., Emery, W.J.: Descriptive Physical Oceanography. Pergamon Press, Oxford, 1990.
5. Guide to Surface Weather Observations, Antigua and Barbuda Meteorological Services, 2018.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Essential (The essentials of/The basics of) of Meteorology	100 %	
Reed Maritime Meteorology	100 %	
Oceanography	100 %	
Marine Surface Weather Observations Observing Handbook No. 1	100 %	
Manual on Codes, International Codes, Volume I.1 Annex II to the WMO Technical Regulations, Part A – Alphanumeric Codes	100 %	

1.13. Quality Assurance

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3.2. Course description

Generic information		
Head of Course	dr. sc. Biserka Draščić Ban, Martina Žuškin, mag. educ.	
Course	Mathematics 2	
Study Programme	Nautical Studies and Maritime Transport Technology	
Type of Course	Mandatory	
Year of Study	1.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30 + 30 + 0 (2 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goal of the course is to enable students to utilize mathematical tools from integral calculus, ordinary differential equations, and multivariable functions in modeling and solving engineering-related problems.

1.2. Prerequisites for Course Registration

Passed Mathematics 1

1.3. Expected Learning Outcomes

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

1. Apply differential calculus to analyze the behavior of functions
2. Recognize and interpret the basic concepts of integral calculus of functions of one variable.
3. Recognize integrals that are elementary solvable and calculate them.
4. Calculate basic arithmetic operations with definite integrals.
5. Apply definite integrals in solving concrete problems.
6. Interpret basic arithmetic operations with functions of two variables, and methods for solving differential equations.

1.4. Course Outline

Application of the differential calculus to the examination of the flow of a function. Curvature, evolute, involute. Indefinite integral, tabular integrals. Methods for integration. Integrals of rational, trigonometric and irrational functions. The definite integral. Newton - Leibniz formula. Application of the definite integral. Improper integrals. Numerical integration. Basic ordinary differential equations. Functions of several variables: basic concepts, partial derivatives, extrema. Total differential.

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

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1.7. Student Obligations

Active participation in classes. Attendance at least 70% of lectures and exercises. Completed independent assignments, passed preliminary exams and final oral exam.

1.8. Assessment[1] of Learning Outcomes

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

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

The process of evaluating the acquired learning outcomes is carried out according to the Regulations on student conduct and academic affairs of the University of Rijeka and the Regulations on studies at the Faculty of Maritime Studies in the following way:

- 1st Preliminary exam – 30 points Learning outcome: *1., 2., 3., 4.*
- 2nd Preliminary exam – 30 points Learning outcome: *5., 6.,*
- Attending classes and completing assignments – 10 points Learning outcome: *1. – 6.*
- Final Exam – 30 points Learning outcome: *1. – 6.*

- Student must achieve a minimum of 35 points to take the final exam.
- To pass the final exam, a student must achieve a minimum of 50% of points.
- Attendance at exercises and lectures is mandatory and student attendance will be monitored.
- Student may miss a maximum of 30% of exercises and 30% of lectures
- Student who does not participate in the work and does not achieve 35 points in class must re-enroll in the course.

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

1. Examine the concavity/convexity of the function f(x)=x^2*ln(x)
2. Explain Newton-Leibnitz's formula
3. Calculate the integral of the function f(x)=(2x-1)/(x^2+x+1)
4. Calculate the integral of the function f(x)=x^2 sin(x) on the segment from x=1 to x=3
5. Calculate the area between the curve y=-3x^2-2x+1 and the x-axis
6. Solve the differential equation y'(y^3 +1)(1+ x^2)=xy

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Grupa autora, Matematika II, Pomorski fakultet Rijeka, 1993.
3. Demidovič, Zadaci i riješeni primjeri iz matematičke analize za tehničke fakultete, Danjar, d.o.o, Zagreb 2003.

1.11. Recommended Reading

1. Kurepa, S., Matematička analiza I, Tehnička knjiga Zagreb, 1970.
2. Skenderović, J., Matejčić-Ružička, V., Vježbe na računalu, Pomorski fakultet, Rijeka 2000.
3. https://maremathics.pfst.hr/ (e – učenje)

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

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1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)	Online	65
Grupa autora, Matematika II, Pomorski fakultet Rijeka, 1993.	20	65
Demidovič, Zadaci i riješeni primjeri iz matematičke analize za tehničke fakultete, Danjar,d.o.o, Zagreb 2003.	20	65

1.13. Quality Assurance

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

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3.2. Course description

Generic information			
Head of Course	Maja Skendžić, mag.cin.		
Course	Physical and Health Education 2		
Study Programme	Nautical Studies and Marine Transport Technology		
Type of Course	Core		
Year of Study	1		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		1
	Number of Hours (L+E+S)		0+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The goals of Physical and Health Education are: to understand the principles of the biopsychosocial characteristics of the human being, to acquire knowledge about the factors that cause illnesses and injuries, to adopt a set of motor skills and information necessary for more meaningful use of free time, to satisfy the human biopsychosocial need for physical activity, to develop humane interpersonal relationships, to enhance creativity, to adapt to modern living and working conditions, and through appropriate programs, to equip individuals for independent and responsible care for the preservation and promotion of personal health, as well as work and other abilities.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

Upon completion of the course, the student will be able to:

1. Demonstrate a positive impact on functional abilities.
2. Develop more meaningful use of leisure time.
3. Assess and improve the ability to solve everyday motor tasks.
4. Choose appropriate ways to perform motor tasks in urgent situations.

1.4. Course Outline

Measuring resting heart rate, measuring heart rate after 6 minutes of physical effort (M) and measuring heart rate after a 2-minute run (F). Optional activity. Volleyball skills – underhand and overhand serves, blocking, setting, spiking and playing the third hit. Volleyball rules and their application in the game (O). Catching, passing and dribbling in basketball. Basketball rules and their application in the game (K). Weightlifting and other strength exercises aimed at preserving spinal health (mariners). Polystructural complex movements: soccer (M), volleyball (F). Rope exercises in place and in motion. A new basketball game involving three teams. Adapted dodgeball with a large Pilates ball. Tug of war. Elective polystructural complex movements. Volleyball rules and their application in the game (O). Development of general motor skills (coordination, flexibility). *Field work. Situational passing and setting in volleyball (O). Dance structures (Viennese waltz) – (F). Football technique, playing in groups of three (N). Group work to develop basketball motor skills (K).
Low and high starts (technique refinement), cyclic movements at various tempos. Assessment of individual student status based on attendance and participation in class activities.
Elective kinesiology activity.

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	Seminar paper is written by part-time students. Field work will be conducted if conditions and weather permit.	

1.7. Student Obligations

Active attendance and participation in at least 70% of classes is required.

1.8. Assessment[1] of Learning Outcomes

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

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

The course is not graded.
A prerequisite for attending and completing this course is passing the course Physical and Health Education 1.
During the course, students' motor activities are positively evaluated.
Each student's attendance and participation are carefully recorded in a dedicated semester-long Physical and Health Education Attendance Sheet during every class.
The course is recorded in the ISVU system as "PASSED" (POLOŽIO) for the respective semester.

1.10. Main Reading

1.11. Recommended Reading

1.Redžić A., Redžić M.: Križobolja i tjelesno vježbanje, HSSR Sport za sve. Godina XXXVI, broj 93.,2018
2. Findak V.: Metodika tjelesne i zdravstvene kulture, Školska knjiga Zagreb, 1999.
3. Anderson B.: Stretching, Vježbe istezanja za svakodnevni fitness: trčanje, plivanje, tenis, biciklizam, skijanje, košarka, nogomet i ostale sportove, Gopal, d.o.o., Zagreb, 1997
4. Anderson B., Burke E., Pearl B.: Fitnes za sve, Gopal, d.o.o., Zagreb, 1997.
5. Janković V. , N. Marelić.: Odbojka, Fakultet za fizičku kulturu Sveučilišta u Zagrebu, Zagreb 1995.
6. Kosinac, Z.: Kineziterapija, tjelesno vježbanje i sport kod djece i omladine oštećena zdravlja, Split, 1989.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

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, as implemented at the Faculty of Maritime Studies in Rijeka.
Once a year, pass rate results are analyzed and appropriate measures are taken.

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3.2. Course description

Generic information		
Head of Course	Igor Rudan, PhD	
Course	Ship design and construction 2	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Undergraduate degree programme	
Type of Course	Mandatory	
Year of Study	1st	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	6
	Number of Hours (L+E+S)	30 + 30 + 0 (2 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to acquaint students with the basic characteristics of ship stability and the division of stability according to different criteria. In addition to numerical tasks, students should correctly interpret the criteria of initial transverse stability and transverse stability at higher tilt angles and longitudinal stability of the ship. Detailed introduction and analysis of transverse and longitudinal stability due to vertical and horizontal displacements of masses and transhipment. A thorough introduction and interpretation of the dynamic stability of the ship and the influence of the dimensions and technology of the ship on stability.

1.2. Prerequisites for Course Registration

No prerequisites

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Describe and interpret the classification of ship stability according to various criteria.
2. Break down and analyze the transverse stability of a ship.
3. Analyze and calculate the impact of different weight shifts/loadings/unloadings on the elements of transverse ship stability.
4. Interpret and evaluate the effects of free surfaces on ship stability.
5. Deconstruct and analyze the longitudinal stability of a ship.
6. Analyze and calculate the influence of various weight shifts/loadings/unloadings on the elements of longitudinal ship stability.

1.4. Course Outline

Ship stability definition and division. Basic ship hydrostatics. Statical initial transverse metacentric high. Transverse statical stability change in vertical and horizontal mass shifting. Transverse statical stability change in mass transshipment (loading/unloading). Transverse statical stability change in hanging loads. Influence of *Free Surface Correction* (FSC) on transverse statical stability. Statical transverse stability at large angles of heel. *GZ curve* construction with Intact stability regulations analyses. *KG* calculation in transverse

Ship stability definition and division. Basic ship hydrostatics. Statical initial transverse metacentric high. Transverse statical stability change in vertical and horizontal mass shifting. Transverse statical stability change in mass transshipment (loading/unloading). Transverse statical stability change in hanging loads. Influence of *Free Surface Correction* (FSC) on transverse statical stability. Statical transverse stability at large angles of heel. *GZ curve* construction with Intact stability regulations analyses. *KG* calculation in transverse stability. Statical longitudinal stability. Longitudinal stability change in mass shifting or mass transshipment (loading/unloading). *XG* calculation in longitudinal stability. Dynamical stability analyses. Damage stability. Ship's trim and stability book.

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 of classes over 70 %. Longitudinal and transversal ship drawing – student task. Passed two written exams. Final oral exams.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1	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

70 % of the course grade is based through 2 written exams in class and 30 % of the course grade is based in the oral 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.

Continuous assessment: Each written exam must have at least 70 % score.

Final exam:

Written (numerical) exam – ship transfers/longitudinal stability, loading / unloading / shifting of cargo, … - student must have 100 % score, and then

oral exam (learning outcomes 1- 9) checks the competences of theoretical knowledge where it is necessary to achieve a minimum of 50 % of the required theoretical knowledge.

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

1. Classify ship stability based on the axes around which it acts.
2. Categorize transverse stability with respect to the range of acting angles and analyze the influence of the ship's center of gravity position on the metacentric height.
3. Analyze the effect of ballast loading in the double bottom tank on the initial transverse stability of the ship.
4. Evaluate the influence of longitudinal bulkheads in tanks on the free surface effect.
5. Interpret and explain why a ship is significantly more stable longitudinally than transversely.
6. Interpret the influence of longitudinal cargo shift on forward and aft draft when the center of flotation (F) is not located at the midship section.

1.10. Main 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.

1. Rudan, I., teaching materials from the course Ship design and construction on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka (webinars, PPT, theory self-evaluation tests, practical (numerical) self-evaluation tests, …)
2. Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions
3. Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2002.
4. Buljan, I., Stabilnost broda, Priručnik za pomorce, Školska knjiga Zagreb, Zagreb, 1982.
5. Uršić, J., Stabilitet broda I. dio, Sveučilište u Zagrebu, Zagreb, 1968.
6. Uršić, J., Stabilitet broda II. dio, Sveučilište u Zagrebu, Zagreb, 1968.

1.11. Recommended Reading

1. C.B. Barrass; D.R. Derrett; Ship Stability for Masters and Mates; Butterworth-Heinemann, 2022.
2. Wärtsilä Encyclopedia of Ship Technology; Jan Babicz; Wärtsilä Corporation, 2015.
3. Dokkum, K., Katen, H.T., Koomen K., Pinkster J., Ship Stability, London, 2001.
4. Jovanović, Filip; Rudan, Igor; Žuškin, Srđan; Sumner, Matthew Comparative analysis of natural gas imports by pipelines and FSRU terminals. // Pomorstvo, 33 (2019), 1; 110-116 doi:10.31217/p.33.1.12
5. Sumner, Matthew; Rudan, Igor A Hybrid MCDM Approach to Transshipment Port Selection. // Pomorstvo, 32 (2018), 2; 258-267 doi:10.31217/p.32.2.11
6. Vuskovic, B.; Rudan, I.;Sumner, M. Fostering Sustainable LNG Bunkering Operations: Development of Regulatory Framework. Sustainability 2023, 15, 7358. https://doi.org/10.3390/su15097358
7. Šakan, D., Žuškin, S., Rudan, I., Brčić, D., Container ship fleet route evaluation and similarity measure-ment between two shipping line ports // Journal of marine science and engineering, 11 (2023), 2; 1-16. doi: 10.3390/ jmse11020400

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials from the course Ship design and construction	MERLIN – online	60
Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions.	-	
Buljan, I., Stabilnost broda, Priručnik za pomorce, Školska knjiga Zagreb, Zagreb, 1982.	10	
Uršić, J., Stabilitet broda I. dio, Sveučilište u Zagrebu, Zagreb, 1968.	10	
Uršić, J., Stabilitet broda II. dio, Sveučilište u Zagrebu, Zagreb, 1968.	10	
Uršić, J., Stabilitet broda II. dio, Sveučilište u Zagrebu, Zagreb, 1968.	10	

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 analysed and appropriate measures are adopted.

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3.2. Course description

Generic information		
Head of Course	Predrag Kralj, Associate Professor, Ph.D., MS.ME., BS.ME.	
Course	Ship Power Plant Systems	
Study Programme	Nautical Studies and Marine Transport Technology	
Type of Course	STCW - obligatory	
Year of Study	1	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to give the students basic knowledge on ship power plant, main engines but also auxiliary systems and other systems that are important for the safety of sea transport in accordance with contents that STCW convention defines for authorized deck officers.

1.2. Prerequisites for Course Registration

Knowledge gained through Technical mechanics course.

1.3. Expected Learning Outcomes

It is expected that the student will be able:

1. to recognize the type of propulsion systems and their main characteristics and to manage the ship accordingly
2. to explain the function and characteristics of auxiliary marine equipment or system
3. to apply knowledge to manage propulsion engine and other auxiliary systems as responsible deck officer on operating and managing level
4. to analyze, as a deck officer on duty, the indicated values of the power plant altogether
5. to evaluate the importance of detected irregularities in power plant operation and to be able to make corrections
6. to analyze classification societies schemes of safety systems and to plan periodical checks and crew exercises

1.4. Course Outline

Operating basics of ship power plants (diesel-engine, steam-turbine, gas-turbine and combined propulsion plants, ship's screw and driving shaft, power plant's remote operation from bridge). Marine auxiliary equipment (steam generators, fresh water generators, pumps and systems, steering gears, ventilation and air conditioning and corresponding refrigerating systems and elements, sewage treatment plants, stabilizers, bilge systems and equipment, incinerators, deck equipment, hydraulic systems). General knowledge on ship technical systems (basic engineering terms and fuel consumption, prerequisites for duty schedule to achieve respective power plant safety in normal circumstances and in case of unattended machinery space).

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

1.6. Comments	The exercises are performed od engine room simulator exclusively, they start with cold ship situation and finishes with operation of main engine and every important auxiliary system during voyage on open sea.

1.7. Student Obligations

Active participation on classes and at least 70% of presence on lessons.
Passed partial exams and successful demonstration of power plant managing skills on the engine room simulator through group type practical exams, preparing the students for their future working environment.
Passed final exam.

1.8. Assessment[1] of Learning Outcomes

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

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

70% during classes (learning outcomes 1 – 6) and 30% on final exam (learning outcomes 1 – 6) in accordance with the University's and Faculty's normative acts. Continuous assessment:

1. Two theoretical partial exams on marine engineering (diesel-engine power plants, steam generators and turbines, auxiliary equipment, piping) (46%) – outcomes 1 – 6
2. Two partial exams on engine room simulator where skill of marine engines and equipment operations is assessed (14%) – outcomes 1, 3, 4, 5, 6

Two numerical home works 10% - outcomes 1, 4, 5
On written final exam complete field of marine engineering is assessed.
Examples of assessment for outcome:

3. On the engine's scheme recognize main construction elements (outcomes 1, 3, 4)
4. On the engine room simulator operate propulsion engine in accordance with its characteristics (outcomes 2 – 5)
5. Demonstrate the importance of measured physical values for propulsion engine normal operation evaluation (outcomes 4, 5)

Students with exceptional results during the semester (i. e. at least 63 point out of possible 70, are freed of final exam and final mark is calculated proportionally [Example for 65 out of 70 – FP=65/70*100=92,86% - excellent (5), A].
Students have possibility to write seminar paper. The sum of points achieved through respected partial exam is increased by the points calculated in accordance with =seminar paper mark*5% but the sum of points for the partial exam could not be exceeded. The theme is determined at the beginning of the semester and it must be delivered before the end of it.
Students have possibility to write scientific paper with the teacher. The paper may or may not be a part of undergraduate thesis. In accordance with the paper and the publication accepting the paper classification, the student could be awarded with the final mark. The paper should be accepted for publication until the end of semester.

1.10. Main Reading

1. Kralj Predrag, Marine energy systems, web publication
2. Kralj Predrag, Learning materials published on the lecturer's web page and on the e-learning system Merlin

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.

1. Dragan Martinović: Strojarski priručnik za časnike palube, Graftrade, Rijeka, 2005.
2. Matković Milan, Protupožarna zaštita na brodovima, Pomorski fakultet, Rijeka, 1995.
3. Ozretić Velimir, Brodski pomoćni strojevi i uređaji, Ship management, Split, 1996.
4. Knak Christen, Diesel Motor Ships – Engines and Machinery, G-E-C GAD Publishers, Copenhagen, 1979.
5. Glujić, D., Kralj, P., Dujmović, J., *Considerations on the Effect of Slow-Steaming to Reduce Carbon Dioxide Emissions from Ships*, , Journal of Marine Science and Engineering (MDPI) – 10, doi.org/10.3390/jmse10091277
6. Glujić, D., Kralj, P., Bernečić, D., *SCR and Fuel-Water Emulsion Equipment Influence on the Two-stroke Ship Engine Fuel Oil Consumption and Harmful Gasses Emission Analysis*, 4th International Conference on Smart & Green Technology for Shipping and Offshore Decommissioning (SMATECH 2023), 24-25 April 2023, ONLINE
7. Kralj, P., Martinović, D., Tudor, M., Lenac, D., *Optimized Marine Fresh Water Generator Control System. // Naše more : znanstveni časopis za more i pomorstvo, 68 (2021), 1; 28-34* doi:10.17818/NM/2021/1.3

2.1. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Kralj, P., Brodski energetski sustavi (Marine Energy Systems)	web	100
Kralj, P., Lecturer's Learning materials published on official web page and e-learning system Merlin	web	
Martinović, Dragan, Strojarski priručnik za časnike palube	Bibliothek 6	
Matković, Milan, Protupožarna zaštita na brodovima	Bibliothek 6 Faculty Book Store 500	

2.2. Quality Assurance

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.

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3.2. Course description

Generic information			
Head of Course	Dr. sc. Alen Jugović, full professor		
Course	Shipping Economics		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Core		
Year of Study	1st		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		2
	Number of Hours (L+E+S)		30 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introduction to the theoretical foundations and understanding of practical aspects of shipping business, with an emphasis on economic principles and key business processes. By analyzing concrete examples from practice, students will develop skills in applying basic economic principles in the business of shipping companies and other participants in the maritime transport system, which will enable them to better understand the significance of maritime transport within the overall transport system.

1.2. Prerequisites for Course Registration

None

1.3. Expected Learning Outcomes

1. Explain the basic concepts and main characteristics of maritime shipping.
2. Distinguish between types of maritime shipping and their transport technologies.
3. List and interpret specific types of maritime shipping activities.
4. Describe the specifics of the maritime market and use practical examples to connect market structures with individual types of maritime shipping.
5. Analyze the factors that influence changes in freight rates and tariffs in shipping.
6. Calculate the key operating costs of shipping companies.

1.4. Course Outline

General information on the economics of maritime shipping - an introduction to the concept and significance of the economics of maritime shipping
Merchant shipping: global and national, special types of maritime shipping activities
Special types of maritime shipping activities: charter, liner and tanker - passenger shipping: national and global
Maritime transport: passenger and cargo
Maritime market in shipping: general, division and market structure - economic specificities of charter, liner and tanker shipping
Free shipping space market, liner shipping space market, tanker shipping space market
Indicator of maritime market dynamics, freight rate indices and market typology
Ship acquisition through loan financing - repayment of loan for ship acquisition
Freight rates in maritime shipping: general information on freight rates, principles, types and determination and formation of freight rates
Freight rates in charter shipping, liner shipping rates
Tariffs: general, division, calculation
Freight rates in tanker shipping, freight rates in passenger shipping
Maritime transport costs: general information on costs in maritime shipping and costs in general - fixed and variable costs in maritime shipping
Cost types: by location and by carrier
Optimization of ship voyage costs
Depreciation in maritime shipping: types, depreciation calculations and depreciation calculation
Model of total ship voyage costs; fixed, variable and marginal costs
Indicators of business success in maritime shipping: economy, profitability and productivity

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

1.7. Student Obligations

Student obligations include regular attendance at classes, 1st and 2nd midterm exams, and a final exam.
The evaluation process of 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 as follows:

- 1st midterm exam - 35% Learning outcome: 1, 2, 3, 4, 6
- 2nd midterm exam - 35% Learning outcome: 1, 2, 3, 4, 5, 6
- Final exam - 30% Learning outcome: 1, 2, 3, 4, 5

A minimum of 50% of grade points must be achieved in each midterm exam. Access to the final exam is only possible with a minimum of 35 points achieved. The final exam evaluates 30% of the acquired learning outcomes, and in order to pass the final exam, the student must achieve a minimum of 50% of the grade points.
Attendance at lectures is mandatory, with regular attendance checks. Students have the right to miss up to 50% of

1.8. Assessment[1] of Learning Outcomes

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

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 implies that a student can achieve 70% of the grade during classes, and the remaining 30% at the final exam.

The procedure for evaluating the acquired learning outcomes is carried out as follows:

- *1st preliminary exam - 35% Learning outcome: 1., 2., 3., 4., 6.*
- *2nd preliminary exam - 35% Learning outcome: 1., 2., 3., 4., 5., 6.*
- *Final exam - 30% Learning outcome: 1., 2., 3., 4., 5.*

The final exam can be taken by students who have obtained 35 grade points in continuous knowledge assessments, or 50% of the total number of points that could be achieved during the evaluation in class. 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 achieve a positive grade for the course.

Examples of learning outcome evaluation:
1. What is meant by the term "maritime navigation" and what are the basic principles of business in liner shipping?
2. What are the main differences between liquid cargo transportation technologies (e.g. oil tankers) and container transportation technologies?
3. What are off-shore operations in maritime shipping and how do they differ from traditional cargo transportation?
4. How does the oligopoly market structure affect the functioning of container shipping? Relate your answer to an example of a specific shipping company.
5. What are the key macroeconomic factors that cause fluctuations in freight rates in the dry bulk market?
6. If a ship with a carrying capacity of 50,000 DWT consumes 30 tons of fuel per day at a price of 600 USD per ton, what are the total fuel costs for a 20-day voyage?

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. Jugović, A., Zanne, M., Bukša, J.: Ekonomika brodarstva, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2024.
3. Stopford, M.: Maritime Economics, Routledge, London & New York, 2000. or new.
4. Kesić, B; Jugović, A.; Debelić, B.: Ekonomika brodarstva riješeni zadaci, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2013.

1.11. Recommended Reading

1. Jugović, A., Aksentijević, D., Zaninović, P.A.: The impact of economic policy on shipper businesses in coastal line maritime passenger transport in Croatia. Pomorstvo, 35 (1), 87-92., https://doi.org/10.31217/p.35.1.9, 2021.
2. Jugović, A., Komadina, N., Perić Hadžić, A.: Factors influencing the formation of freight rates on maritime shipping markets. Pomorstvo, 29 (1), 23-29., 2015.
3. Radonja, R. i Jugović, A.: Shipowners' business policy in the context of development in the environmental legislation. Pomorstvo, 25 (2), 319-341., 2011.
4. Kesić, B., Jugović, A.: Menadžment pomorskoputničkih luka, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2006.
5. Cullinane, K.: Shipping Economics – Research in transportation Economics, Elsevier, 2005.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Jugović, A., Zanne, M., Bukša, J.: Ekonomika brodarstva, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2024.	20	60
Stopford, M.: Maritime Economics, Routledge, London & New York, 2000. or new.	5	60
Kesić, B; Jugović, A.; Debelić, B.: Ekonomika brodarstva riješeni zadaci, Pomorski fakultet Sveučilišta u Rijeci, Rijeka, 2013.	30	60

1.13. Quality Assurance

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

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3.2. Course description

Generic information			
Head of Course	Assoc Prof Đani Šabalja, PhD		
Course	Astronomical navigation		
Study Programme	Nautical science and maritime transport technology		
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)		2 + 2

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introducing the student to instruments for measuring the height of celestial bodies as well as publications used in astronomical navigation. To introduce students to determining the position of a ship using methods of astronomical navigation

1.2. Prerequisites for Course Registration

Nil

1.3. Expected Learning Outcomes

After passing the course, the student will be able to:
1. show the position of celestial bodies using different coordinate systems of astronomical navigation.
2. Perform time conversion,
3. Determine the beginning and end of nautical twilight/scroll as well as the time of true sunrise/sunset
4. Perform corrections on the sextant and measure the height of a celestial body,
5. Determine the latitude of a ship's position using the Sun and Polaris,
6. Determine the ship's position using the direct method,
7. Determine the ship's position using the altitude method,
8. Control the deviation of a magnetic compass.

1.4. Course Outline

Definition of the celestial sphere. Coordinate systems: horizontal, local equatorial, celestial equatorial, ecliptic. Apparent daily rotations of celestial bodies, First astronomical spherical triangle. Second astronomical spherical triangle, Bodies of the Solar System. Geocentric and heliocentric systems. Mutual relationship between terrestrial and celestial coordinates. True motion of stars, Time in astronomical navigation Phenomena that apparently change the position of celestial bodies on the celestial sphere. Astronomical refraction. Parallax. Aberration. Precession and nutation, Time in astronomical navigation Phenomena that apparently change the position of celestial bodies on the celestial sphere. Astronomical refraction. Parallax. Aberration. Precession and nutation, Instruments for measuring heights. Historical overview (quadrant, astrolabe, back staff,). Ship's sextant. Optical principle of the sextant. Sextant errors and their correction. Correction of measured heights. Corrections, types, method and order of application, Twilight. Determining the ship's position using astronomical navigation methods. Determining the ship's position using astronomical navigation methods. Indirect method - Altitude method Determining the position of the ship using methods of astronomical navigation. Direct method Determining the ship's position using astronomical navigation methods. By observation in a time gap. Control of deviation of the magnetic compass. Use of computer programs to obtain the ship's position by astronomical navigation

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

1.7. Student Obligations

- Regular class attendance,
- Preparation and presentation of seminar papers,
- Homework,
- Preliminary exam,
- Final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation	0,5	Seminar paper		Experiment	
Written exam	1,5	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.

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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 three written tests,
2. by testing knowledge through an oral exam.

Examples of learning outcome evaluation:
1. Show the position of a celestial body on the celestial sphere at given values of the coordinate systems.
2. Describe the conversion of time from local true to local mean time.
3. Determine the beginning and end of nautical twilight/scroll as well as the time of true sunrise/sunset.
4. Make corrections to the sextant and measure the height of a celestial body,
5. Determine the latitude of the ship's position using the Sun and Polaris,
6. Determine the ship's position using the direct method,
7. Determine the ship's position using the altitude method

1.10. Main Reading

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

1.11. Recommended Reading

1. Lipovac M., Astronomical Navigation
Hydrographic Institute JRM Split
2. Astronomical Navigation 2/ Maks Klarin,
3. „A Short Guide to Celestial Navigation“

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*

1.13. Quality Assurance

Quality monitoring methods that ensure the acquisition of exit knowledge, skills and competences. 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. The results of passing are analyzed once a year and appropriate measures are adopted.

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3.2. Course description

Generic information		
Head of Course	**Robert Mohović, PhD, Full professor**	
Course	**Cargo Handling 1**	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University undergraduate study program	
Type of Course	Mandatory	
Year of Study	2.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	**7**
	Number of Hours (L+E+S)	30+30+0 (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Introduce students to International regulations, recommendations and standards related to handling, stowing, securing and transporting cargo. Introduce students to ship's tables and other ship's documentation related to cargo handling and cargo transportation. Introduce students to calculation of ship's stability and ship's strength in exploitation. Introduce students to loading calculation and problems in waters of different densities, stowing, securing and transportation of dangerous goods by sea. Introduce students to methods of draft survey.

1.2. Prerequisites for Course Registration

Ship design and construction 1 and Cargo carried by sea - passed the subject

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. analyse and properly interpret the basics of cargo handling and influencing factors for cargo stowage
2. correctly interpret International regulations, recommendations and standards related to technology of cargo transportation
3. use of tables and other ship's documentation related to cargo handling and transportation of cargo by sea
4. solve problems related to ship's stability and stress in exploitation
5. solve problems related to loading cargo in waters of different densities
6. know how to use methods of draft survey
7. solve problems related to stowing and securing of cargo
8. know the technology of transporting of dangerous goods and stowing and segregation of dangerous goods

1.4. Course Outline

Introduction to the subject. International regulations, recommendations and standards related to cargo handling. Capacity plan and Deadweight of the vessel. Use of ship's tables. Basic principles of stowage plans. Ship's stress in exploitation. Influence of cargo and cargo operations on the transverse and longitudinal stability of the vessel. Characteristics of the equipment for dunnaging, lashing and securing cargo, Methods to assess the efficiency of securing arrangements. Loading in salt, brackish and fresh water. Determining the weight of loaded/discharged cargo with draft survey methods. Transportation of dangerous goods by sea.

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*	*Practically use of various ship's tables and other ship's documentation related to cargo handling and solving various problems in the field of planning and transportation of cargo by sea.*	

1.7. *Student Obligations*

Active attendance of classes and at least 70% of completed classes.
Completed homework, pass colloquia in which to solve tasks with practical examples of calculating planning and carriage of goods by sea, and the final exam passed.

1.8. *Assessment[1] of Learning Outcomes*

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

1. through continuous testing of knowledge during the semester, 70% of the acquired learning outcomes are evaluated. Students must do homework - learning outcomes 3 - 7 (20%), and pass 2 colloquia - learning outcomes 3 - 7 (50%).

2. at the final exam (oral exam) the integrity of theoretical knowledge in the field of cargo handling is checked - learning outcomes 1 - 8 (30%), through questions from the field of course content (from the theory of cargo handling). At the final exam it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

Homework includes the preparation of tasks using calculation methods that are processed in the course in the field of transverse and longitudinal stability of the ship in operation.

The colloquium solve various problem tasks in the field of planning and transport of cargo by sea - it is necessary to solve all tasks.

1.10. *Main Reading*

1. R. Mohović, Cargo handling 1 - teaching texts and attachments available on the e-learning system - Merlin (https://moodle.srce.hr)
2. D. Vranić, R. Ivče, Cargo in maritime transport, Faculty of Maritime Studies Rijeka, Rijeka, 2010.
3. Naval Officer's Library, Vol. 1, vol. 2, vol. 3, vol., Vol. 4

1.11. Recommended Reading

1. *Thomas Stowage 8th edition, Brown Son & Ferguson Ltd., London 2018.*
2. *Buljan, I.: Krcanje i slaganje tereta, Ognjen prica, Zagreb, 1980.*
3. *House, D.J.: Cargo Work 8th edition, Butterworth-Heinemann, UK, 2016.*
4. *Uršić, J.: Stabilitet broda I dio, Sveučilište u Zagrebu, Zagreb, 1962.*
5. *Derrett, D.R., Barrass, C.B.: Ship Stability for the Masters and Mates, Butterworth-Heinemann, Oxford, 2011.*
6. *Clark, I.C.: The Management of Merchant Ship Stability, Trim and Strenght 6th edition, The Nautical Institute, London, 2006.*
7. *Milošević, M.: Nauka o brodu III dio, Pomorska škola Kotor, Kotor, 1961.*
8. *Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2014.*
9. *Pravila za tehnički nadzor pomorskih brodova, Dio 4. – Stabilitet, Hrvatski registar brodova, Split*.*
10. *Pravila za tehnički nadzor pomorskih brodova, Dio 23. – Prijevoz tereta, Hrvatski registar brodova, Split*.*
11. *Code of Safe Practice for Cargo Stowage and Securing, IMO, 2011 with amendments**
12. *SOLAS, Consolidated, IMO**
13. *International Maritime Solid Bulk Cargoes Code (IMSBC)* with Amendments*, IMO, London*.*
14. *IMDG Code, IMO, London**
15. *Code of Safe Practice for Ships Carrying Timber Deck Cargoes, IMO, London**

* valid editions

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Robert Mohović, Cargo Handling 1, teaching texts and attachments available on the e - learning system - Merlin (https://moodle.srce.hr)	*web*	*85*
D. Vranić, R. Ivče, Cargo in maritime transport, Faculty of Maritime Studies Rijeka, Rijeka, 2010.	*Library 10*	
Naval Officer's Library, Vol. 1, vol. 2, vol. 3, vol. 4, Faculty of Maritime Studies, Rijeka	*Library 10*	

1.13. Quality Assurance

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

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3.2. Course description

Generic information			
Head of Course	**Ivan Panic, PhD**		
Course	**Marine electrical systems**		
Study Programme	**Nautical Studies and Maritime Transport Technology**		
Type of Course	**Compulsory**		
Year of Study	**2.**		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours (L+E+S)		45+0+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of this course is to provide students with fundamental knowledge of electrical engineering, the structure of shipboard electrical systems, automation systems, and the safe handling of electrical equipment within the scope of responsibility of deck officers, in accordance with the requirements of the STCW Convention.

1.2. Prerequisites for Course Registration

Completed courses: Electronic Devices and Circuits

1.3. Expected Learning Outcomes

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

1. Sketch and define basic concepts in electrical engineering and relate them to the fundamentals of shipboard electrical systems.
2. Identify shipboard electrical devices and machines, determine their function, and relate their operation to fundamental physical phenomena in electrical engineering.
3. Identify key components of ship electrical power systems and verify relevant classification society rules related to their operation.
4. Classify the most commonly used ship electric motor drives, describe their electrical characteristics, and relate them to classification society regulations.
5. Categorize the basic characteristics of ship electric propulsion and explain its role within shipboard electrical systems.
6. Distinguish and identify basic safety and protection measures for shipboard electrical devices and systems, with emphasis on the protection of ship equipment and human life.
7. Present basic concepts of ship automation and compare types of automation used in the management of ship systems.

1.4. Course Outline

Electrostatics, electrodynamics, and electromagnetism. Storage batteries. Operating principles of generators, electric motors, and transformers. Rectifiers and frequency converters. Electrical power generation on board. Emergency power supply systems. Power distribution and switching devices. Electric motor drives for ship equipment. Ship lighting and navigational lights. Electric ship propulsion. Explosion protection. Safe handling and safety measures. Basics of automation. Ship automation systems. Safety and maintenance of electrical systems.

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

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	☐ Field work	☐ Other _____
1.6. Comments		
1.7. Student Obligations		
Regular class attendance, continuous assessment, final exam.		

1.8. Assessment[1] of Learning Outcomes

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

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

1. Through continuous assessment during the course, where the student can earn up to 70% of the total grade points:
   - 1st midterm exam – 35% of grade points
   - 2nd midterm exam – 35% of grade points

The midterm exams in given in written format. For each midterm exam, student must achieve at least 50% of the points. As the passing threshold for continuous assessment of learning outcomes is determined to be 50%, student is allowed one retake of each midterm exam.

2. Through the final exam, which the student may attend upon earning a sufficient number of grade points during the course:
   - Final exam – 30% of grade points

The student must achieve at least 50% of the points available on the final exam.

Examples of learning outcome assessment in relation to learning outcomes 1–7:

1. Sketch the magnetic field of a flat permanent magnet. (Learning outcome 1)
2. Which type of electric motor is most commonly used on board? What fundamental physical principle does this type of motor operate on? (Learning outcome 2)
3. Which electrical machine can be used as an auxiliary propulsion system on a ship? What classification society rules must such propulsion comply with? (Learning outcome 3)
4. Which types of ship winches use electric motor drives? Which type of winch is among the most heavily loaded drives on board? (Learning outcome 4)
5. How does electric propulsion improve the availability of ship propulsion? (Learning outcome 5)
6. Describe the basic characteristics of the ExD design of electrical equipment and give an example of its application. (Learning outcome 6)
7. On a basic block diagram, indicate the difference between automatic control and regulation. (Learning outcome 7)

1.10. Main Reading

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

1.11. Recommended Reading

1. Vučetić D., Brodski električni sustavi, Pomorski fakultet, Rijeka, 2018.
2. Skalicki B., Grilec J.; Brodski električni uređaji, Fakultet strojarstva i brodogradnje, Zagreb, 2000.
3. Skalicki B., Grilec J.; Električni strojevi I pogoni, Fakultet strojarstva i brodogradnje, Zagreb, 2005.
4. Pinter V.; Osnove elektrotehnike, Tehnička knjiga, Zagreb, 1994.
5. Patel, Mukund R.; Shipboard electrical power systems. Crc Press, 2021.
6. Borstlap R., Katen, H.; Ships' Electrical Systems, Dokmar Maritime Publishers B.V., 2021.

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1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials available on the e-learning platform Merlin	web	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 transience are analyzed and appropriate measures are adopted.

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3.2. Course description

Generic information			
Head of Course	Sandra Tominac Coslovich, PhD, Full Professor		
Course	Maritime English 3		
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		4
	Number of Hours(L+E+S)		15+30+0 (1+2+0)

1.GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to master the basic and specialized linguistic knowledge and skills required for education and training for certification under the provisions of IMO STCW Convention 1995, as amended, for a watch-keeping officer on ships of 500 GT or more, Chief Mate and Master of ships of 3000 GT or more, as well as to acquire communicative competence in English for the purpose of ensuring safety of navigation and marine environment protection in radio communication and marine meteorology. Furthermore, the goal is to develop the level of knowledge of maritime and general English language, as well as to master the linguistic knowledge and skills to enable students to learn, gain knowledge and adapt to the technological advances in the global maritime industry and to further develop the four language skills: reading, listening, writing and speaking and team work abilities

1.2. Prerequisites for Course Registration

Completing the course Maritime English 2

1.3. Expected Learning Outcomes

After taking the course, the students will be able to:
1. distinguish and define the terms and speech acts used in Maritime VHF radio communication in English
2. interpret and compose routine VHF radio messages in English
3. interpret and compose distress VHF radio messages in English
4. interpret and compose urgency VHF radio messages in English
5. interpret safety VHF radio messages (navigational and meteorological message) in English
6. distinguish and define the basic terms in marine meteorology and interpret and translate a weather report in English

1.4. Course Outline

The course content meets the requirements of the IMO STCW Convention

The communicative approach to learning is a dominant characteristic of learning since it focuses on student-centered language learning, group work and the development of cognitive language learning abilities.
The course focuses on the following:

- professional maritime lexis/terms used within a specific register of Maritime English (simple lexical forms, compounds, collocations, lexical sets), i.e., maritime VHF communcation

- maritime VHF communication in English (in accordance with the ITU Radio Regulations and IMO SMCP 2001) – routine radio messages, distress messages, SAR messages, urgency and safety messages

- marine meteorology – basic terms, marine weather reports

- application of Standard Marine Communication Phrases (SMCP 2001) within selected topics

- speech acts and linguistic functions (orders, requests, instructions, information, advice, intention, warning, prohibition, etc.) in maritime VHF communication (discourse)

- grammar: pronunciation and intonation; syntax (dominant grammatical structures in a maritime text/discourse)

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

Class attendance, activities, continuous assessment and final exam

1.8.Assessment[1] of Learning Outcomes

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

Learning outcomes are assessed in class through two written exams (midterm exams) (70 %) and the final written exam (30%)
1st midterm exam for the outcomes 1,2 (35%)
2nd midterm exam for the outcomes 3, 4, 5 (35%)
Final exam for the outcomes 1-6 (30%)

Examples of assessment for individual outcomes in midterm exams and the final exam:

1. Compose the conversation between two ships in English taking into consideration the speech acts and the standard marine communication phrases - SMCP (outcomes 1 and 2)
2. Write a distress message in English (outcome 3)
3. Write an urgency message in English (outcome 4)
4. Interpret a safety message in English (outcome 5)
5. Translate a weather report from English into Croatian (outcome 6)

1.10. Main Reading

- Pritchard, B. (1995) Maritime English 1, Školska knjiga, Zagreb:Units: 11 (Marine Meteorology), Unit 20 (Meeting Heavy Weather), Units36-38 (Maritime Communications) – accessible on Merlin (moodle.srce.hr)

- Pritchard, B. Maritime Communications & IMO SMCP 2001 (Sections I-IV) - accessible on Merlin (moodle.srce.hr)

- Standard Marine Communication Phrases (IMO SMCP 2001). Pomorski fakultet u Rijeci, 2006.

- MarEng, Web-based Maritime English Learning Tool, EU Leonardo Project - http://mkkdok.utu.fi/mat/marengplus_learning_tool/index.html

- Activities and materials on e-learning platform Merlin (moodle.srce.hr)

1.11. Recommended Reading

- Kluijven, P. van (2003) International Maritime English Programme. Alk&Heijnen, Alkmaar

- Luzer-Spinčić: Gramatička vježbenica za pomorce, Pomorski fakultet, Rijeka 2001.

- Search and Rescue - SAR Seamanship Reference Manual - Chapter 11: http://www.dfo-mpo.gc.ca/Library/253768.pdf

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pritchard, B. (1995) Maritime English 1, Školska knjiga, Zagreb:Units: 11 (Marine Meteorology), 20 (Meeting Heavy Weather), 36-38 (Maritime Communications).	accessible on Merlin (moodle.srce.hr)	50
Pritchard, B. MaritimeCommunications & IMO SMCP 2001 (Sections I-IV)	accessible on Merlin (moodle.srce.hr)	50
Standard Marine Communication Phrases (IMO SMCP 2001). Pomorski fakultet u Rijeci, 2006.	10	50
MarEng, Web-basedMaritime English Learning Tool, EU Leonardo Project	Accessible online http://mkkdok.utu.fi/mat/marengplus_learning_tool/index.html	50
Authorized activities and materials available on e-learning platform Merlin	accessible on Merlin (moodle.srce.hr)	50

1.13. Quality Assurance

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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 analyzed and a survey is conducted among the students once per semester.

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3.2. Course description

Generic information			
Head of Course	Assoc. Prof. Tatjana Čulina, MD, PhD		
Course	Maritime Medicine		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Mandatory		
Year of Study	2nd Year		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	3	
	Number of Hours (L+E+S)	**(L+E+S):** 30 + 15 + 0	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To train students in independently providing urgent medical assistance and, using manuals and telemedical consultation, to stabilize and care for a patient until optimal health is restored or higher-level medical care becomes available, in accordance with the STCW Convention.

1.2. Prerequisites for Course Registration

Enrollment prerequisite: Bridging Training Program: Competence in providing medical first aid.

1.3. Expected Learning Outcomes

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

1. Describe the duties and responsibilities of a certified ship officer during open-sea navigation and explain their application in various situations.
2. Apply appropriate medical aid procedures and perform procedures related to health and life safety at sea.
3. Demonstrate general competencies in providing first aid and carry out emergency medical procedures under maritime navigation conditions.
4. Interpret telemedical advice from shore and plan activities in accordance with the given instructions.

1.4. Course Outline

Recognizing emergencies. Assessment of the injured and ill. Application of appropriate procedures in life-threatening situations. Stabilizing and maintaining a critically ill patient. Exchange of medical information (Radio Medico). Primary healthcare of a patient aimed at stabilizing their condition or restoring optimal health using telemedical procedures and appropriate manuals. Use of maritime medical manuals.

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

1.7. Student Obligations

Active participation in classes and at least 70% attendance.
Demonstrate a minimum of 60% of required knowledge during continuous assessment through mid-term exams. Two mid-terms will be conducted. A maximum of 50 points can be achieved in the mid-terms, with a minimum of 30 points required to pass. In the final exam, during assessment of theoretical knowledge and practical skills by demonstrating a medical technique, at least 50% of knowledge must be demonstrated.

1.8. Assessment[1] of Learning Outcomes

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

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

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

70% during classes and 30% in the final exam (according to the University of Rijeka Study Regulations and the Maritime Faculty Study Regulations).
Continuous assessment: Mid-term exams covering practical knowledge from course content — a minimum of 60% knowledge is required. Two mid-terms will be conducted. A maximum of 50 points can be achieved, with a minimum of 30 points required to pass.
Final exam:
The final exam tests the comprehensiveness of theoretical knowledge, both in the theoretical part and practical skills — a minimum of 50% knowledge is required.

1.10. Main Reading

- Mulić R., Ropac D.: *Medicina za pomorce (Medicine for Seafarers)*, Medicinska naklada, Zagreb, 2002.
- Soldo I., Sesar Ž.: *Zdravstveni savjeti za pomorce (Health Advice for Seafarers)*, Naklada Zadro, Zagreb, 1999.
- Teaching materials available via the Merlin e-learning platform (https://moodle.srce.hr)

1.11. Recommended Reading

Vuksanović P.: *Zdravstvena zaštita na brodu (Healthcare on Board)*, Medical Institute Kotor, 1996.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Medicine for Seafarers	20	80
Competence in Providing Medical Care on Board (authorized lectures)	20	
Health Advice for Seafarers	20	

1.13. Quality Assurance

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The quality of study is monitored in accordance with the ISO 9001 system and in compliance with European standards and guidelines for quality assurance, which are implemented at the Maritime Faculty in Rijeka. Pass rates are analyzed annually and appropriate measures are adopted.

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3.2. Course description

Generic information			
Head of Course	Lovro Maglić, Ph.D.		
Course	Safety at sea		
Study Programme	Nautical Studies and Maritime Transport Technology		
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+15+0	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to familiarize students with the international navigation safety system, including the most important maritime conventions, and to train them to independently perform basic maritime safety tasks, including search and rescue at sea, emergency communications, survival at sea and firefighting, in accordance with the provisions of the STCW Convention. Through practical work on the exercises, students should acquire skills in case of emergency situations, especially fire on board, abandoning ship, survival at sea and communication within the GMDSS system.

1.2. Prerequisites for Course Registration

Students who have not graduated from nautical maritime schools are required to attend and successfully complete the Introductory Differentiation Program (D2 - Special Program of Basic Shipboard Safety).

1.3. Expected Learning Outcomes

After learning, the student will be able to:

1. enumerate and interpret the legal sources of the international and national safety and security system,
2. present the basic actions and procedures in search and rescue at sea,
3. interpret and distinguish between means of communication in distress,
4. describe the procedure for abandoning the ship with dedicated life-saving appliances,
5. analyze and differentiate the procedures after abandoning ship in different situations,
6. explain the functional properties, technological conditions and maintenance of fire-fighting equipment on ships.

1.4. Course Outline

International and national safety system, search and rescue at sea, maritime incidents, rescue equipment, communications during emergency situations, abandoning ship and survival at sea, man overboard, fire protection, maintenance and supervision of all safety systems on board, development and preparation of emergency plans and organization and conduct of drills on board.

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

1.6. Comments	Part of the exercises related to procedures in emergency situations are performed on the designated practicums: shore-based davits - lowering the lifeboat into the sea; and firefighting training area - fire extinguishing techniques.

1.7. Student Obligations

The condition for taking the final oral exam is a successfully passed written exam.
The final exam tests the completeness of theoretical knowledge in the field of safety at sea.
The method of student assessment is:
- Passing the written exam: 50% of the grade points
- Final Oral Exam: 50% of grade points.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam	2	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

1. Written exam in the field of the international system of maritime safety, search and rescue at sea, maritime incidents, lifesaving appliances, communication during emergency situations, abandoning ship, survival at sea and fire protection (it is necessary to achieve a minimum of 50% correct answers, all learning outcomes)
2. Oral exam - the completeness of theoretical knowledge in the field of safety at sea is checked (it is necessary to achieve a minimum of 50% of the required theoretical knowledge)

Examples of evaluation of learning outcomes in relation to set learning outcomes are:
1. Describe the content of the chapters of the SOLAS Convention. (1)
2. Sort out the ways in which people are assisted at sea by type of threat. (2)
3. Describe the application of different search patterns at sea. (3)
4. Specify the means of maritime communication for making distress calls. (4)
5. Explain the procedure for abandoning ship. (5)
6. List and explain how the ship's fire protection systems work. (6)

1.10. Main Reading

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

1.11. Recommended Reading

1. International Maritime Organization, SOLAS, London, 2020.
2. International Maritime Organization, SAR, London, 2003.
3. International Maritime Organization, IAMSAR, Vol. 1, Vol. 2, Vol. 3, 2016.

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.

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3.2. Course description

Generic information			
Head of Course	**Associate professor David Brčić, PhD**		
Course	**Terrestrial navigation**		
Study Programme	Nautical Studies and Maritime Transport Technology		
Level	University undergraduate study program		
Type of Course	Mandatory		
Year of Study	2.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		7
	Number of Hours (L+E+S)		(45+45+0) (3+3+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to introduce and to familiarise students to the fundamental concepts of maritime surface navigation, including key parameters for ship handling using terrestrial positioning methods, orientation at sea, fundamental elements of ship movement, terrestrial and ship magnetism and magnetic compasses, theoretical foundations and applications of marine cartography, nautical charts and publications, tides and currents, buoyage systems and marking of navigable waterways, theoretical foundations of positioning errors at sea, navigation methods, navigation in restricted or difficult conditions, and vessel's drift.

1.2. Prerequisites for Course Registration

Students who have not completed nautical schools are required to attend and successfully pass the Introductory Differential Program - Navigation basics

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Analyse, describe, and accurately interpret the fundamental concepts of maritime surface navigation and orientation at sea,
2. Explain and apply terrestrial positioning methods in ship handling/navigation,
3. Apply knowledge of error theory to analyse positioning errors in maritime navigation and compare positioning methods,
4. Describe and analyse geo- and vessel magnetism, and apply knowledge for the correct use of ship magnetic compasses,
5. Categorise, analyse, and describe maritime chart projections, nautical charts, and navigation handbooks; apply knowledge in their selection and use; and successfully solve navigation problems using nautical charts,
6. Explain the fundamental concepts of the ECDIS system and compare its use with traditional navigation methods,
7. Describe and analyse relevant elements related to ship movement, drift, and the marking of navigable waterways, and explain the application of these parameters in navigation,
8. Analyse and calculate relevant tidal parameters,
9. Analyse, describe, and calculate navigational parameters in loxodromic, great circle (orthodromic), combined, and special-case navigation,
10. Identify, list, and describe navigation under restricted or difficult conditions and apply appropriate knowledge and procedures in such situations.

1.4. Course Outline

Fundamental concepts of maritime surface navigation. Geographic position of points on Earth. Orientation at sea. Basic plane angles in navigation. Special cases of navigation in maritime practice. Rhumb line (loxodromic) navigation. Great circle (orthodromic) navigation. Combined navigation. Navigation under restricted or difficult conditions. Course and speed as basic parameters of ship movement. Basic navigational information. Distance and ship's travelled path. Terrestrial magnetism. Ship magnetism. Ship magnetic compasses. Magnetic compass corrections. Chart projections. Nautical charts and other types of maps. Navigational publications. ECDIS system. Working with nautical charts and the use of other charts and publications. Tides and tidal currents. Marking of maritime navigable waterways (buoyage). Geometrical foundations of ship positioning. Types of visual fixes. Types and accuracy of positions in terrestrial navigation. Positioning precision. Basic elements and parameters of positioning accuracy. Ship drift. Coastal navigation, navigational aids, and voyage preparation.

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

1.6. Comments	

1.7. Student Obligations

Active attendance of classes and at least 70% of course (for obtaining a confirmation for STCW certificate at least 95 % of attended course).
Passed all four colloquiums/written exams and the final oral exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	3	Class participation	1	Seminar paper		Experiment	
Written exam		Oral exam	1	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

70 % during the semester and 30 % at the final oral exam (Learning Outcomes 1–10) in accordance with the Regulations on Study Programmes of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka.

Classroom activity includes individual (on the board) and group solving of numerical problems, as well as the completion of homework assignments. The latter may contribute up to 5 points.

Continuous Knowledge Assessment:
1st Colloquium – Learning Outcomes 1–3 *(Numerical problem-solving and theoretical background)*
Maximum score: 20 points
Example questions:

1. Determine the difference in latitude and longitude between the following two positions:
   φ_1 = 72°43.8' N φ_2 = 24°17.2' S
   λ_1 = 130°32.0' W φ_2 = 078°51.8' E
2. Calculate the distance between the following two positions:
   φ_1 = 59°23.7' N φ_2 = 39°13.2' N
   λ_1 = 096°29.0' W λ_2 = 154°59.8' W
3. The rhumb line distance (DL) between two places is 3620 NM. Convert this into arc units.
4. The magnetic variation in 2017 was 0°14' W, with an annual increase of 5'. Determine the variation in 2020.
5. The course read from the chart is 232°, the variation is 3°W, and the deviation is -3°. What course should be steered using the magnetic compass?
6. A radar bearing is taken at 263°, and the magnetic compass reads 125°. The variation is 2°W, and the deviation is -3°. Calculate the true bearing (azimuth) to be plotted on the chart.
7. While checking deviation on a magnetic compass course of 345°, the sun's observed azimuth is 146° and the calculated azimuth is 147°. The variation is 4°E. What is the magnetic compass deviation?
8. The magnetic compass course reads 131°, and the gyrocompass reads 133°. The gyro deviation is 0°, and the variation is 3°E. Determine the magnetic compass deviation.
9. Calculate the time difference Δx between the following positions:
   φ_1 = 36°35.2' S φ_2 = 18°32.5' S
   λ_1 = 029°08.0' W λ_2 = 165°01.0' E
10. Convert the distance of 2100 NM into days, hours, and minutes for a vessel sailing at 19 knots.
11. Convert the following compass directions into degrees: NNE, ESE, SE, and WNW.
12. Define the term "absolute coordinates" and state the possible values.
13. What is a course?
14. What is a knot?
15. What is an azimuth? Write the formula and draw a diagram showing the relationship between azimuth, course, and relative bearing.
16. Define magnetic variation and deviation.
17. How are compasses classified according to their physical properties?
18. What is the difference between a compass rose and a wind rose?
19. List the methods for determining the deviation of a magnetic compass.
20. List the scientific disciplines or branches of maritime navigation.

2nd Colloquium – Learning Outcomes 4–5, 7 *(Practical work on charts, numerical and theoretical tasks)*
Maximum score: 15 points
Example:
MK – 22: Korčula VB = 12.0 knots
Voyage Planning:
Plot waypoints and connect them.

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- Wp1 [φ = 43°00.4'N; λ = 016°49.3'E]
  ↓
  K = 058°
  D = _____

Sailing on course 058° until the abeam of Rt Lovišće lighthouse

- Wp2 φ = _____; λ = _____
  ↓
  K = _____
  D = _____
- Wp3 [φ = 43°02.8'N; λ = 017°15.7'E]

Navigation:

- At 20:15, observe lighthouse Pločica B Fl(2) 10s bearing ω = 245° and Rt Lovišće B Fl(3) 10s bearing ω = 102°.
  Determine vessel's position from these azimuths:
  φ = _____
  λ = _____
- From that position, what course must be steered to Wp2, and what is the ETA?
  K = _____
  ETA = _____
- At 21:15, observe lighthouse Rt Sućuraj B Iso 4s bearing ω = 049°.
  At 21:39, observe the same lighthouse bearing ω = 357°.
  Determine the ship's position at the time of the second observation:
  φ = _____ λ = _____

Chart questions:

2. Identify the chart symbols at the following positions:
   [φ = 42°56.5'N; λ = 016°47.7'E] = _____
   [φ = 43°03.2'N; λ = 017°19.1'E] = _____
   [φ = 43°05.2'N; λ = 016°59.7'E] = _____
3. What symbol is found at position ω = 183°, d = 0.8 NM from lighthouse Sestrice (east Pelješac Channel)?
4. Identify the light characteristic: BC Fl 10s 16m 14M
5. Calculate the magnetic variation for 2019 from the compass rose on the chart.
6. How are map projections classified based on distortions or projection properties?
7. List the characteristics of the Mercator chart.
8. Describe and classify nautical charts.
9. Name and describe standard navigational publications.
10. Describe the marking of navigable waterways.

3rd Colloquium – Learning Outcomes 6, 9 *(Numerical/graphical problem-solving and theory)*
Maximum score: 10 points
Example:

1. What are tides?
2. What is high water?
3. What is chart datum (hydrographic zero)?
4. What is the difference between sea depth and charted depth?
5. What is the tidal amplitude?
6. What is spring tide?
7. Describe and mathematically express the tidal force.
8. Explain progressive tidal waves.
9. Illustrate the relationship between ship and environmental parameters concerning draught, UKC, depth, and tide height.
10. On 17.12.2019 at 14:00, the ship arrives near port A. Determine the time window for safe entry, ensuring a 0.5 m UKC. Charted depth = 6.4 m; ship's draught T = 8.3 m.
    Extract from A.T.T.:
    06:00 – 1.9 m
    11:25 – 3.2 m

16:20 – 1.6 m
21:45 – 4.4 m

4th Colloquium – Learning Outcomes 8, 10 *(Numerical/graphical tasks and theoretical background)*
Maximum score: 20 points
Example:

1. What is saving (distance/time/efficiency)?
2. List and describe rhumb line tasks.
3. List navigation quadrants and how to identify which one the voyage belongs to.
4. List and describe special cases of navigation.
5. List the elements of great circle navigation.
6. Describe combined navigation.
7. Describe the vertex of a great circle.
8. When do rhumb line and great circle distances not differ significantly?
9. Define rhumb line vs. great circle.
10. On 26.12.2017 at tX = 19:30, a vessel departs from φ = 41°34.0' S; λ = 074°08.0' W (Chile) to φ = 47°35.0' S; λ = 167°42.0' E (New Zealand) at 16.0 knots. Calculate:

- Great circle distance, initial and final great circle course
- Coordinates of the great circle vertex
- Coordinates at crossing with the reference parallel
- Total distance for combined sailing along 58°S
- Coordinates of intermediate points at every 10° from the initial/final position
- Rhumb line distance and course between starting position and first intermediate point
- ETA (tX) at destination for the combined voyage
- Provide a sketch of the voyage path.

For all written exams, a minimum of 50 % is required in the theory part, and 90 % in numerical/graphical tasks.

Classroom Activity
Includes individual and group work on numerical tasks and completion of homework (Learning Outcomes 2, 4, 5, 7, 9).
Maximum score: 5 points
Example:
Examples correspond to each unit. After solving tasks during class (where students are called to the board), homework is assigned for consolidation.

Framework of Final Oral Examination (Learning Outcomes 1–10)
The student orally answers questions randomly selected from a pool covering all outcomes. Sub-questions may be asked. The question list is publicly available on the course website.
Maximum score: 30 points. Minimum required score: 50 %.

1.10. Main Reading

1. Benković F. i suradnici, *Terestrička i elektronska navigacija*, Hidrografski institut Ratne mornarice, Split, 1986.
2. Brčić, D., *Course lectures*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2025.
3. Grupa autora: *Vademecum maritimus – podsjetnik pomorcima*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2014.
4. Kos S., Zorović D., Vranić D., *Terestrička i elektronička navigacija*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2010.
5. National Geospatial-Intelligence Agency (NGIA), *American Practical Navigator: An Epitome of Navigation*. Springfield, 2021. Dostupno na: https://msi.nga.mil/Publications/APN
6. Zorović D., Kos S., Vranić D., *Brodski magnetski kompasi – teorijske osnove*, Pomorski fakultet u Rijeci, Rijeka, 1998.

1.11. Recommended Reading

1. Baric, M., Brčić, D., Kosor, M., Jelic, R. An Axiom of True Courses Calculation in Great Circle Navigation. *J. Mar. Sci. Eng.*, 2021, 9, 603. https://doi.org/10.3390/jmse9060603
2. Frančula, N., *Kartografske projekcije*. Sveučilište u Zagrebu, Geodetski fakultet, Zagreb, 2004.
3. House D., *Navigation for Masters*, Whittherby & Co. Ltd., London, 1998.
4. Radulić, R. *Terestrička navigacija 1*. Profil, Zagreb, 2002.
5. Radulić, R. *Terestrička navigacija 1*. Profil, Zagreb, 2003.
6. Simović, A. I., *Terestrička navigacija: Udžbenik za pomorske škole i priručnik za pomorce*, Školska knjiga, Zagreb, 2001.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Terestrička i elektronska navigacija (1)	2	60
Course lectures (2)	available online	
Vademecum maritimus – podsjetnik za pomorce (3)	10	
Terestrička i elektronička navigacija (4)	10	
American Practical Navigator: An Epitome of Navigation (5)	available online	
Brodski magnetski kompasi – teorijske osnove (6)	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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3.2. Course description

Generic information			
Head of Course	Renato Ivče full professor, Ph.D		
Course	Cargo handling 2		
Study Programme	Nautical Studies and Maritime Transport Technology		
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)		(30 + 30 +0) (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course aims to introduce students to the principles of handling certain types of cargo, planning cargo loading on ships of various technologies, and safety measures when transporting cargo by sea.

1.2. Prerequisites for Course Registration

Passed Cargo handling 1 exam

1.3. Expected Learning Outcomes

1. Critically assess and apply the principles of planning the distribution of cargo on ships of various technologies.
2. Assess the importance and apply the rules and codes relating to the handling and transport of cargo by sea.
3. Compare and apply the requirements for the transport of various types of dry cargo by sea.
4. Compare and apply the requirements for the transport of various types of liquid cargo by sea.
5. Determine the principles of creating a database for the planning and transport of various types of cargo by sea and their application in the computer programs used in this process.

1.4. Course Outline

Introductory considerations. Transportation of general cargo by sea. Transportation of containers by sea. Transportation of bulk cargo by sea. Transportation of grain by sea. Transportation of liquid cargo by sea. Transportation of crude oil and products by sea. Transportation of chemicals in bulk by sea. Transportation of liquefied gases by sea. Transportation of timber cargo by sea. Transportation of refrigerated cargo by sea. Transportation of cargo by RO-RO vessels (Ships for carrying pallets), LASH vessels. Transportation of heavy cargo by sea. Transportation of various types of cargo by sea. Comparative analysis of the transporting and handling outputs of the considered

1.5. Modes of Instruction	X Lectures ☐ Seminars and workshops X Exercises ☐ E-learning ☐ Field work	☐ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship X Practical work on cargo simulator
1.6. Comments		

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

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

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

Through continuous assessment of knowledge during classes, 70% of the acquired learning outcomes are evaluated through:
1st preliminary exam – learning outcomes 1-4 (1.0 ECTS (30%)) theory,
2nd preliminary exam – learning outcomes 1-4 (1.0 ECTS (30%)) practical tasks.
In addition, the student must achieve a minimum of 52% of points for each preliminary exam.
Practical demonstration of knowledge of working with computer ship programs for planning loading, calculating stability, ship structure loads, and calculating the mass of cargo on board (0.5 ECTS (10%)), learning outcome 5, and final exam (1.5 ECTS (30%)) of the acquired learning outcomes (1-5), whereby the student must achieve a minimum of 52% of points to pass the final exam.

Examples of evaluation of individual learning outcomes during classes and at the final exam
1. Define, explain the principles of planning cargo layout on ships for the transport of general cargo,
2. Define, explain, and apply the BLU code,
3. Formulate and apply requirements for the transport of bulk cargo by sea,
4. Formulate and apply requirements for the transport of crude oil by sea,
5. Principles of using a computer program for loading containers on a container ship

Example: The ship "Sava" loads wheat in bulk into holds 1,2,4,5,6, and 7, and the rest into hold number 3. After the cargo loading is completed, the planned displacement of the ship is 37,520 tons, the height of the ship's systematic center of gravity above the keel KG=7.92 m, and the free surface 0.21 m. It was determined that there is a total of 2,920 tons of ballast in the ship's tanks. The wheat stowage factor is 1.288 m3/t. The length between perpendiculars is 182.88 m. The light ship has a deadweight of 8001 tons, and the deadweight is 330 tons. The cargo in the holds is leveled. Determine the distribution of cargo in each hold, the initial transverse metacentric height corrected for the influence of free surfaces, the assumed angle of heel of the ship due to grain shifting, and the remaining dynamic stability of the ship.

1.10. Main Reading

1. D.J.House, Cargo Work, Butterworth-Heinemann, Elsevier, 2005
2. Vranić, D., Kos, S., Morska kontejnerska transportna tehnologija, Rijeka,2008
3. Komadina P. , Prijevoz ukapljenih plinova morem Rijeka, 1998
4. Komadina P. Tankeri, Rijeka 2000
5. Ivče, R.., teaching materials from the course Cargo handling 2 on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka

1.11. Recommended Reading

1. Approved code of practice for loading and unloading cargo at ports andon ships, June 2024
2. Code of Safe Working Practices forMerchant Seafarers, October 2019

1.12. Number of Main Reading Examples

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Title	*Number of examples*	*Number of students*
1. Cargo Work	web	
2. Morska kontejnerska transportna tehnologija,	3	
3. Prijevoz ukapljenih plinova morem	7	
4. Tankeri	5	
5. Teaching materials from the course Cargo handling 2	web	

1.13. Quality Assurance

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.

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3.2. Course description

Generic information			
Head of Course	**Associate professor David Brčić, PhD**		
Course	**Electronic navigation**		
Study Programme	Nautical Studies and Maritime Transport Technology		
Level	University undergraduate 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)		(30+30+0) (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course Electronic Navigation is to acquaint students with the basic principles of modern electronic technologies and navigation and non-navigation devices used in maritime navigation, and with the correct using of these devices, crucial for quality and safe conducting of maritime navigation.

1.2. Prerequisites for Course Registration

Attended and passed the courses: Mathematics and Ship Electrical Engineering. Students who have not completed nautical schools are required to attend and successfully pass the Introductory Differential Program (Monitoring and plotting with a radar device and the use of ARPA devices, working level).

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Analyse, describe, and accurately interpret the fundamental concepts of electronic navigation, radio wave propagation characteristics, and the frequency bands in use,
2. Classify bridge navigation equipment according to primary (course, speed, position), supplementary (environmental data), and related information, as well as by the level of system integration,
3. Describe the operating principles, features, and purpose of electronic navigation systems, and demonstrate proficiency in their operation,
4. Correctly analyse and interpret the navigational image displayed on various electronic navigation system screens,
5. Calculate basic and essential parameters for collision avoidance using radar plotting techniques,
6. Recognise inaccurate or technically faulty navigational displays and apply acquired knowledge to resolve such issues,
7. Apply acquired knowledge in conducting coastal navigation tasks using electronic navigation systems,
8. Describe the core services, operating principles, errors, and applications of satellite navigation systems,
9. Compare and discuss different satellite positioning methods and other position-fixing techniques used in electronic navigation,
10. Describe and explain the fundamental features and operating principles of navigational information systems, and demonstrate their practical use.

1.4. Course Outline

Fundamental concepts and features of electronic navigation and associated navigational tasks. Types of electronic navigation systems. Basic and supplementary navigation equipment and devices. Gyrocompasses and other compasses, speed logs, and echo sounders. Equipment-related risks, errors, and anomalies. Radar navigation – operating principles, system characteristics, applications, and sources of error. Fundamentals of maritime kinematics – radar plotting for collision avoidance at sea. Satellite navigation systems (GNSS) – key features, principles, operation, and applications. Total positioning error budget of satellite-derived position. Automatic Identification System (AIS). Voyage Data Recorder (VDR). Hyperbolic navigation systems – fundamentals and overview. Inertial navigation systems. Electronic Chart Display and Information System (ECDIS) – fundamentals, core features, and system architecture.

1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☒ Simulator exercises
1.6. Comments	Course exercises are conducted on a navigation simulator, which includes the familiarisation with, use of, and application of electronic navigation systems and equipment (related learning outcomes), as well as classroom-based numerical exercises focusing on numerical and graphical radar plotting tasks (related learning outcomes).	

1.7. Student Obligations

Active attendance of classes and at least 70% of course (for obtaining a confirmation for STCW certificate at least 95% of attended course).
Passed colloquiums (with mandatory homework) and successful demonstration of acquired knowledge related to describing and interpreting the work of individual electronic navigation systems and practical guidance of electronic navigation with their help and passed the final oral exam.

1.8. Assessment[1] of Learning Outcomes

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

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

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

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

70% through continuous assessment during the course and 30% in the final examination (in accordance with the Regulations on Study Programmes of the University of Rijeka and the Regulations on Studying at the Faculty of Maritime Studies in Rijeka).

Continuous assessment:

I. Theoretical colloquium/exam on the fundamentals of electronic navigation – a minimum of 50% of the total score must be achieved (learning outcomes 1, 2, 3, 4, 6). A maximum of 30 points can be earned in this quiz.
Example:

1. Describe the principle of measuring angles and distances using a radar system,
2. Describe the basic navigation devices and essential navigation information,
3. Analyse the settings of navigation system displays and interpret navigation images,
4. Describe the movement of a tracked target based on radar navigation data,
5. List and describe the types of radar displays,
6. Describe common issues in radar image display,
7. Explain the positioning errors associated with satellite navigation systems,
8. Describe and compare different methods of satellite-based positioning,
9. Explain the propagation characteristics of UHF and VHF radio waves,
10. Describe the working principle of an ultrasonic echo sounder,

II. Theoretical colloquium/exam on satellite and inertial navigation – a minimum of 50% of the total score must be achieved (learning outcomes 7, 8, 9, 10). A maximum of 30 points can be earned in this quiz.
Example:

1. Describe the basic principle of position determination using GNSS systems,
2. Describe the purpose and key features of the Voyage Data Recorder (VDR),
3. Describe the Automatic Identification System (AIS), list data categories, and explain the complete application of AIS,
4. Analyse the movement of a tracked vessel based on AIS transponder navigation data,
5. Compare radar and AIS systems in terms of purpose, function, operating principles, and their mutual advantages and disadvantages,
6. Describe the ECDIS system, interpret navigational information within the system, and explain related navigational tasks,
7. Describe the concept of Integrated Navigation System (INS) and Integrated Bridge System (IBS),
8. Describe and apply various electronic position-fixing methods in coastal navigation,
9. Describe the features of e-navigation,
10. Describe levels of integration of bridge electronic equipment,

III. Numerical/graphical colloquium/exam on radar plotting – at least 90% of the task must be completed successfully (learning outcomes 4, 5). A maximum of 10 points can be earned in this quiz.
Example:
An officer observes vessel B on the radar with the following parameters:

1. t = 11:59 ω = 111° D = 8 NM
2. t = 12:05 ω = 111.5° D = 6.5 NM

Own ship's course is C_o = 039°, speed V_o = 15.5 kn, avoidance time is scheduled for t_a = 12:11, and the minimum passing distance is D_{min} = 2 NM.

- It is necessary to determine the following:
- Relative course of vessel B (CRB);
- Relative speed of vessel B (VRB);
- Closest Point of Approach – CPA;
- Time to Closest Point of Approach – TCPA;

- True course of vessel B (CB);
- True speed of vessel B (VB);
- Avoidance speed (V_{avoi}d) and left and right avoidance courses (CLAV, CRAV) in relation to the given minimum passing distance.

Final examination:
The final exam assesses the completeness of theoretical and practical knowledge covered in the course – a minimum of 50% of the required theoretical knowledge must be demonstrated. All defined learning outcomes are included in the final examination.

1.10. Main Reading

1. Benković F. et al. *Terestrička i elektronska navigacija*, Hidrografski institut Ratne mornarice, Split, 1986.
2. Brčić, D., *Course lectures*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2025.
3. Grupa autora: *Vademecum maritimus – podsjetnik pomorcima*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2014.
4. Kos S., Zorović D., Vranić D., *Terestrička i elektronička navigacija*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2010.
5. National Geospatial-Intelligence Agency (NGIA), *American Practical Navigator: An Epitome of Navigation*. Springfield, 2021. Dostupno na: https://msi.nga.mil/Publications/APN
6. Zorović, D., Kos, S. *Geometrijsko plotiranje u izbjegavanju sudara na moru s riješenim zadacima*, Sveučilište u Rijeci, Pomorski fakultet, 2001.

1.11. Recommended Reading

1. Brčić D., Kos S., Žuškin S. Navigation with ECDIS: Choosing the Proper Secondary Positioning Source. *TransNav, the International Journal on Marine Navigation and Safety of Sea Transportation*, 9, 3, pp. 317-326, 2015. doi:10.12716/1001.09.03.03
2. Brčić, D., Žuškin, S., Valčić, S., Rudan, I. ECDIS transitional period completion: analyses, observations and findings. *WMU J Marit Affairs*, 18, pp. 359–377, 2019. https://doi.org/10.1007/s13437-019-00173-z
3. Kristić, M., Žuškin, S., Brčić, D., Valčić, S. Zone of Confidence Impact on Cross Track Limit Determination in ECDIS Passage Planning. *J. Mar. Sci. Eng.*, 2020, 8, 566. https://doi.org/10.3390/jmse8080566
4. Kos. S., Pongračić, B. & Brčić, D. A study on multi-constellation GNSS positioning performance in terms of maritime requirements. *Proceedings of 12th Annual Baška GNSS Conference*, 2016. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 7-9. 5. 2018. str. 69-84.
5. Sickle, J. V. *GPS for Land Surveyors*, Third Edition. Bosa Roca, CRC Press, 2016.
6. Sušanj, J: Navigacijski radar, Pomorski fakultet u Rijeci, Rijeka, 2006.
7. Sušanj, J: Radar i radarsko osmatranje, Pomorski fakultet u Rijeci, Rijeka, 2001.
8. Weintrit, A: The Electronic Chart Display and Information System (ECDIS): An Operational Handbook, Taylor & Francis, Abingdon, 2009.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Terestrička i elektronska navigacija (1)	2	60
Course lectures (2)	available online	
Vademecum maritimus – podsjetnik za pomorce (3)	10	
Terestrička i elektronička navigacija (4)	10	
American Practical Navigator: An Epitome of Navigation (5)	available online	
Geometrijsko plotiranje u izbjegavanju sudara (6)	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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3.2. Course description

Generic information			
Head of Course	Prof. Goran Vukelić, PhD.		
Course	Engineering Mechanics		
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		4
	Number of Hours (L+E+S)		30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Acquiring theoretical knowledge that is the basis for problem solving in the field of solid mechanics (statics, kinematics, dynamics) and fluid mechanics.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, the student will be able to:
1. Describe the axioms of statics and laws of mechanics.
2. Apply the laws of mechanics to solve the problems of determining the reactions of rigid bodies on friction(less) surfaces.
3. Dimension loaded beams.
4. Analyze the strength of a loaded beam.
5. Apply the laws of mechanics to the fluid mechanics problems.
6. Analyze the fluid flow.

1.4. Course Outline

Colinear, concurrent, parallel and general planar system of forces. Resultant of a forces and equilibrium of a body. Moment of a system of forces. Force couple. Analysis of a system of forces. Friction. Pappus-Guldin theorems. Beams and trusses.
Normal and tangential stress. Stress and strain dependence. Allowed stress. Axial load, shear stress, torsion, bending, buckling. Dimensioning of beams and shafts.
Coordinate system and position of a body within. Motion. Degrees of freedom. Kinematics of a particle: rectilinear and curvilinear motion.
Dynamics of a particle: inertia, inertia force, D'Alembert principle. Work, energy and power.
Fluid mechanics: general physical values and parameters. Fluid statics. Pressure and change of pressure. Measuring the pressure. Pressure force. Buoyancy. Stability of a floating body. Pascal law. Hydraulic press. Fluid motion. Laws of fluid motion. Euler and Bernoulli equation. Fluid flow. Fluid circulation. Cavitation.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☐ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	-	
1.7. Student Obligations		
Attending the lectures and exercises (min. 70%), attending the assessment and exams, submitting results of assignments.		
1.8. Assessment[1] of Learning Outcomes		

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

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

According to the study rulebooks of University of Rijeka and Faculty of Maritime Studies:

- through continuous assessment during the semester (70% of learning outcomes)
  - 1. colloquium - learning outcomes 1-2 (25%),
  - 2. colloquium - learning outcomes 3-4 (25%),
  - homework assignments - learning outcomes 1-6 (20%),
- through final exam (30% of learning outcomes (5-6)) with passing rate set at min. 50% of final exam points.

Examples of evaluation in correlation to learning outcomes:

1. Determine the equilibrium of a body exposed to a system of forces.
2. Determine the free-body diagram of a rigid body.
3. Determine the free-body diagram of a beam and determine the distribution of forces and moments.
4. Determining stress, strain, and stability of a beam.
5. Calculate pressure, change of pressure, pressure force, and buoyancy.
6. Calculate fluid motion between two points.

1.10. Main Reading

J. Brnić: Mehanika i elementi konstrukcija, Školska knjiga, Zagreb, 1996.
M. Pečornik: Tehnička mehanika fluida, Školska knjiga, Zagreb, 1985.

1.11. Recommended Reading

Video lectures on Merlin.
J. Brnić: Statika, Tehnički fakultet, Rijeka, 2004.
R. Žigulić, S. Braut: Kinematika, Sveučilište u Rijeci, Tehnički fakultet, Rijeka, 2012.
M. Krpan et al..: Dinamika, Tehnički fakultet, Rijeka, 2001.
G. Vizentin, G. Vukelić, L. Murawski, N. Recho, J. Orović: Marine propulsion system failures - A review, Journal of marine science and engineering, 2020.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
J. Brnić: Mehanika i elementi konstrukcija	6	80
M. Pečornik: Tehnička mehanika fluida	5	80

1.13. Quality Assurance

According to the ISO 9001 system set at the Faculty of Maritime Studies, Rijeka. Once a year, an analysis of the passing exam rate is conducted. Once a semester, an anonymous online survey of students is conducted.

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3.2 Course description

Generic information			
Head of Course	Sandra Tominac Coslovich, PhD, Full professor		
Course	Maritime English 4		
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		4
	Number of Hours(L+E+S)		15+30+0 (1+2+0)

1.GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to master the basic and specialized linguistic knowledge and skills required for education and training for certification under the provisions of IMO STCW Convention 1995, as amended, for a watch-keeping officer on ships of 500 GT or more, Chief Mate and Master of ships of 3000 GT or more, as well as to acquire communicative competence in English for the purpose of ensuring safety of navigation and marine environment protection in ship handling, collision avoidance, interpretation of nautical marks and use navigational equipment. Furthermore, the goal is to develop the level of knowledge of maritime and general English language, as well as to master the linguistic knowledge and skills to enable students to learn, gain knowledge and adapt to the technological advances in the global maritime industry and further develop the four language skills: reading, listening, writing and speaking and the team work abilities

1.2. Prerequisites for Course Registration

Completing the course Maritime English 3

1.3. Expected Learning Outcomes

After taking the course, the student will be able to:
1. name and describe different ship handling situations (berthing, unberthing, anchoring, pilotage, towage) by using relevant terminology in English
2. distinguish, define and apply ship handling terms associated with berthing, unberthing, anchoring, pilotage and towage in English
3. name and explain COLEREGS in English
4. interpret and apply terms regarding navigational marks, aids and modern navigational equipment in English
5. make an oral presentation on a maritime topic in English

1.4. Course Outline

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The course content meets the requirements of the IMO STCW Convention 1995, as amended.

The communicative approach to learning is a dominant characteristic of learning since it focuses on student-cantered language learning, group work and development of language learning cognitive abilities.
The course focuses on the following:

- professional maritime lexis/terms in nautical and technical register of Maritime English (simple lexical forms, compounds, collocations, lexical sets) regarding ship handling (berthing, unberthing, anchoring, pilotage, towage), collision avoidance, markings and aids in navigation and modern navigational equipment

- application of Standard Marine Communication Phrases (SMCP 2001) regarding berthing, unberthing, anchoring, pilotage, towage

- grammar: pronunciation and intonation; syntax (dominant grammatical structures in a maritime text/discourse)

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

Class attendance, activities, continuous assessment and final exam

1.8. Assessment[1] of Learning Outcomes

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

Learning outcomes are assessed in class through two written exams (midterm exams), a presentation and the final exam (oral) – 80 % in class (two midterm exams 60 %, presentation 20 %), 20 % on the final exam (oral)
1st midterm exam for the outcomes 1, 2 (25 %)
2nd midterm exam for the outcomes 1, 2, 3, 4 (25 %)
Presentation for the outcome 5 (20 %)
Final exam for the outcomes 1, 2, 3, 4, 5 (30 %)

Examples of assessment for individual outcomes in midterm exams and the final exam:

1. Describe the Mediterranean moor in English (outcome 1)
2. Describe the anchoring procedure in English (outcome 2)
3. Describe in English the actions to be undertaken by the give-way vessel and the stand-on vessel accordin to the COLREGS (outcome 3)
4. Describe the north cardinal buoy in English (outcome 4)
5. Assemble and deliver a presentation on the aids to navigation in English (outcome 5)

1.10. Main Reading

- Pritchard, B. (1995) Maritime English 1, Školska knjiga, Zagreb,(Units: 18 Unberthing and leaving dock, 19 Vessel underway, 21 Arrival at a port, 22 Anchoring, 23 Berthing, 26 NavAids, 33 Colregs, 35 Aids to Navigation, Buoyage) – available in Merlin (moodle.srce.hr)
- Standard Marine Communication Phrases (IMO SMCP 2001). Pomorski fakultet u Rijeci, 2006.
- MarEng, Web-based Maritime English Learning Tool, EU Leonardo Project - http://mkkdok.utu.fi/mat/marengplus_learning_tool/index.html
- Activities and materials on e-learning platform Merlin (moodle.srce.hr)

1.11. Recommended Reading

-- Tominac Coslovich, S. (2024) Jezična obilježja pomorskih radiokomunikacija na engleskome jeziku na primjeru komunikacije brodova i obalnih stanica. U: Jezik i migracije. Zbornik radova s međunarodnoga znanstvenog skupa Hrvatskog društva za primijenjenu lingvistiku, Pon, Leonard; Šarić Šokčević, Ivana (ur.). Zagreb: Hrvatsko društvo za primijenjenu lingvistiku, str. 165–189. ISBN 978-953-7494-05-6
- Kluijven, P. van (2003) International Maritime English Programme. Alk & Heijnen, Alkmaar
- Kegalj, J., Borucinsky, M., Tominac Coslovich, S. (2023) Data-driven learning approach to Maritime English. Pedagogika-Pedagogy: Bulgarian journal of educational research and practice, 95(5s); 51–63. ISSN: 0861-3982, eISSN: 1314-8540
- Tominac Coslovich, S., Kegalj, J. (2021) Using Authentic Materials in Developing Maritime English Students' Listening Skills. Inter Alia (Ljubljana), 7. 45–55. ISBN 978-961-95543-0-2
- Luzer-Spinčić: Gramatička vježbenica za pomorce, Pomorski fakultet, Rijeka 2001.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pritchard, B. (1995) Maritime English 1, Školska knjiga, Zagreb, (Units: 18 Unberthing and leaving dock, 19 Vessel underway, 21 Arrival at a port, 22 Anchoring, 23 Berthing, 26 NavAids, 33 Colregs, 35 Aids to Navigation, Buoyage)	Available online Merlin (moodle.srce.hr)	50
Standard Marine Communication Phrases (IMO SMCP 2001). Pomorski fakultet u Rijeci, 2006.	10	50
MarEng, Web-basedMaritime English Learning Tool, EU Leonardo Project	Available online http://mkkdok.utu.fi/m	50

	at/marengplus_learning_tool/index.html	
Activities and materials on e-learning platform Merlin	Available online Merlin (moodle.srce.hr)	50

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.

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3.2. Course description

Generic information			
Head of Course	**Biserka Rukavina, PhD**		
Course	**Maritime Private Law**		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Core		
Year of Study	2.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		3
	Number of Hours (L+E+S)		30+ 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Provide students with basic knowledge of the legal principles and standards relating to the essential institutes of maritime property law, as well as to instruct students in the legality of the functioning of the essential participants of the navigation business. The aim is to enable students to understand the fundamental legal concepts on which maritime property law is based, to the extent necessary for the successful and sovereign performance of the duties of deck officers on merchant ships.

1.2. Prerequisites for Course Registration

No.

1.3. Expected Learning Outcomes

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

1. Define and interpret the basic legal principles and norms relating to the essential institutes of maritime property law.
2. Explain the basic concepts of proprietary rights on a ship and distinguish and describe the specifics of right of ship owner and other proprietary rights on a ship (mortgage and maritime lien).
3. Define and explain the rights, obligations and responsibilities of the essential participants of navigation business on the basis of international and national maritime property law.
4. Distinguish and interpret the contracts for the exploitation of ships and the documents used in the sea trade.
5. Explain and interpret the basic features of maritime accident, general average, ship collisions, prevention of marine pollution and rescue at sea.
6. Explain the role and importance of insurance in maritime sector, interpret the specifics of the hull and machinery insurance, the insurance of goods and describe the organization, activities and function of P&I clubs.

1.4. Course Outline

The legal sources of maritime private law. The proprietary rights on board (the right of the ship owner - concept, acquisition and loss of rights; modern structure of shipping company; lien on board - term and type, acquisition, termination, settlement). Persons in maritime trade (charterer, shipper, consignee, maritime agent, freight forwarder, stevedore, ship owner and operator; insurer). Contracts for the exploitation of merchant ships - term and division; bareboat charter; contracts for the carriage of goods by sea; contract for the carriage of passengers and luggage; towage contract. Contractual and non-contractual liability of ship owners and operators in the maritime business. General average – term; liquidation. The role of master in the event of general average. Collision of ships – term; civil liability rules. The role of the master in the event of a collision. Rescue at sea – concept and division; salvage reward; specific compensation; standard forms. The role of the ship's master in the salvage operation. Pollution of the marine environment with oil – the responsibility of the ship owner for damage; the role of the ship's master commander in preventing marine pollution. Maritime insurance – concept and division; characteristics and elements of insurance contracts; insurance policy; hull and machinery insurance; insurance of goods in maritime transport; P&I Insurance; co-insurance and reinsurance. Arrest of ship.

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

1.7. Student Obligations

The student must attend at least 70 % of the total hours of lectures and exercises, and must have passed colloquia (continuous knowledge testing) and a positively evaluated presentation (ppt presentation) to take the final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	1,5	Class participation		Seminar paper	0,25	Experiment	
Written exam	0,5	Oral exam		Essay		Research	
Project		Continuous Assessment	0,75	Presentation		Practical work	
Portfolio							

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

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

The process of evaluation of the acquired learning outcomes takes place during continuous assessments through 2 midterm examinations (60 %), student presentation (10 %) and at the final part of the exam (30 %).

Examples of Assessment of Learning Outcomes:

1. Specify and compare the international and national legal sources governing charter parties.
2. Explain the basic characteristics of maritime liens, especially on the example of seafarers' wages.
3. Describe the difference between the owner of the ship, the operator and the company
4. Indicate the fundamental differences between the time charter party and voyage charter party.
5. Explain the role of the ship's master and crew in the event of a collision.
6. Interpret the Certificate on civil liability for oil pollution damage caused by ships.

1.10. Main Reading

1. Authorized lectures on the e-learning platform MERLIN (online materials).
2. Pavić, Drago, Pomorsko imovinsko pravo, Književni krug, Split, 2006.
3. Pomorski zakonik, pročišćeni tekst.

1.11. Recommended Reading

1. Pavić, Drago, Pomorsko osiguranje, Pravo i praksa, Split, 2012.
2. Pavić, Drago, Pomorsko pravo, Knjiga druga: Pravo pomorskih prijevoza, Split, 2002.
3. Pavić, Drago, Pomorsko pravo, Knjiga treća: Pomorske nezgode-pomorsko osiguranje, Split, 2000.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pavić, Drago, Pomorsko imovinsko pravo, Književni krug, Split, 2006.	5	60
Pomorski zakonik, Consolidated text.	Unlimited – Official Gazzette	

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	PhD Mirano Hess		
Course	Ship organization and management		
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		3
	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 procedures for organized teamwork, human resource management, and leadership on board ships in accordance with the latest recommendations and regulations in maritime.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

1. Interpret procedures for performing maritime watches.
2. Identify factors influencing the planning and organization of teamwork.
3. Evaluate elements of human resource management on board ships.
4. Distinguish and compare the impact of human and other factors on situational awareness and decision-making processes.
5. Explain the similarities and differences between selected leadership styles.

1.4. Course Outline

1. Organization of duties and distribution of responsibilities among the crew, shipmaster, and navigation watchkeeping.
2. Port watchkeeping, general requirements for ship crews.
3. Human resource management, error chains, analysis, and prevention.
4. Situational awareness.
5. Leadership and work organization, team member relationships.
6. Management and attitude, communication.
7. International and national regulations and recommendations, maritime organizations, and institutions.
8. Emergency preparedness and danger response.
9. Planning work activities.
10. Leadership styles and teamwork, task execution capability, and workload management.
11. Practical knowledge of crew management and training.
12. Knowledge and skills for effective resource management and decision-making methods.
13. Correlation between human factors and maritime accidents, analysis of selected maritime accidents.

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

1.7. Student Obligations

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

1.8. Assessment[1] of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	0.5	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

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. Interpret what officers must agree on and consider when taking over the bridge watch. (I1)
2. Identify and explain factors the captain must consider when organizing the bridge watch. (I2)
3. Evaluate how certain types of subordination affect team degradation and how to prevent it. (I3)
4. Distinguish indicators of reduced or lost situational awareness and compare ways to maintain awareness. (I4)
5. Explain the characteristics of a leader who follows situational leadership principles. (I5)

1.10. Main Reading

1. Hess, M.: Organizacija rada i upravljanje na brodu, 2025, na Merlinu (https://moodle.srce.hr).

1.11. Recommended Reading

1. Bridge Procedures Guide, ICS, 2022
2. Bridge Team Management: A Practical Guide, Nautical Institute, 2004
3. Pomorski zakonik RH
4. Konvencija STCW 1978/2022
5. Code of Safe Working Practices for Merchant Seamen Consolidated Edition, TSO, 2024
6. Mišković, Darijo ; Ivče, Renato ; Hess, Mirano ; Koboević, Žarko: The Influence of Shipboard Safety Factors on Quality of Safety Supervision: Croatian Seafarer's Attitudes // Journal of marine science and engineering, 10 (9) (2022)
7. Mišković, Darijo ; Ivče, Renato ; Hess, Mirano ; Đurđević-Tomaš, Ivica: The influence of organisational safety resource- related activities and other exploratory variables on seafarers' safety behaviours // Journal of navigation, 75 (2022)
8. 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.: Organizacija rada i upravljanje na brodu, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	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 University of Rijeka. Once a year, the results of the transience are analyzed and appropriate measures are adopted.

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Course description

Generic information			
Head of Course	Head of Department - Vlado Frančić, Full Professor, Ph.D.		
Course	Vocational training		
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		5
	Number of Hours (L+E+S)		0 + 30 + 0 (0 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to introduce students to practical work on board ships, with a focus on safety at sea. This includes hands-on training with life-saving appliances (LSA), fire-fighting equipment (FFE), and communication systems. Students will also become familiar with the proper use of distress signals at sea and acquire basic seamanship skills.

1.2. Prerequisites for Course Registration

Completion of the course Safety at Sea is required.
For students who did not attend maritime secondary schools, the prerequisites for enrolment include successful completion of the bridging training programs: Ship and Cargo Familiarization, Basic Safety Training Program, Seamanship Skills, and Fundamentals of Navigation.

1.3. Expected Learning Outcomes

Upon completion of the course, the student is expected to be able to:

1. Demonstrate the use of personal life-saving appliances and fire-fighting equipment.
2. Explain the procedure for launching and deploying a life raft.
3. Demonstrate proficiency in the use of life-saving appliances at sea.
4. Demonstrate the use of maritime communication equipment.
5. Demonstrate the ability to tie maritime knots and perform other essential seamanship skills.

1.4. Course Outline

Types of hazards and general safety guidelines. Drills and preparedness for handling survival craft. Procedures following alarm signals on board. Abandon ship procedures. Lifeboats, life rafts, rescue boats. Davits for lifeboats, life rafts, and rescue boats. Free-fall davits and hydrostatic release units. Marine evacuation systems (MES). Launching and recovery of life-saving craft. Life raft deployment and abandonment from the vicinity of the vessel. Towing life rafts and rescuing survivors from the sea. Launching and recovery in rough weather. Survival procedures. Use of lifeboat engines and onboard equipment. Use of fire extinguishers and fire main systems. Handling lifeboats and life rafts. Approaching the shore procedures. Survival craft procedures: initial and routine actions. Use of survival equipment. Distribution of food and water. Procedures for locating survival craft. Hypothermia prevention. Use of communication equipment: portable VHF radios, EPIRBs, SARTs. Distress signals and signalling equipment, including pyrotechnics. Maritime distress signaling system (GMDSS basics). First aid provision. Drills for launching and recovering lifeboats and life rafts. Inspection and maintenance of fire-fighting appliances and equipment. Fire alarms and detection systems. Fixed fire-fighting installations. Fire hydrants, hoses, and nozzles. Portable and mobile fire-fighting equipment. Personal fire-fighting equipment. Fire control plans. Firefighting drills under various

conditions (training). Seamanship skills. Use of mooring and anchoring equipment. General seamanship techniques		
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	Part of the course is conducted on the training ship "Kraljica mora", as well as in the Maritime Safety Training Facility "Torpedo"	

1.7. Student Obligations

Students are required to complete all assigned practical exercises.
Attendance at practical classes is mandatory (100% attendance required / full 100 points).

1.8. Assessment[1] of Learning Outcomes

Course attendance	0,5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam		Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	1.5
Portfolio							

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

Students are required to attend 100% of the practical classes.
Learning outcomes are assessed through practical exercises covering ship equipment familiarization, maritime safety, communication systems, and seamanship skills.
A minimum of 80% proficiency in practical knowledge in these areas is required to pass.
Students holding the appropriate certification (Officer in charge of a navigational watch on ships of 500 GT or more, STCW II/1), or those with prior sea-going service, are exempt from participating in the Professional Internship course.
Examples of learning outcome assessment in relation to the stated outcomes:

- Preparing a life raft for launching (related to Learning Outcomes 1 and 2)
- Demonstrating various types of seamanship skills.

1.10. Main Reading

1. Group of authors : Vademecum maritimus , podsjetnik pomorcima , Pomorski fakultet u Rijeci , Rijeka, 2014.
2. Zec, D., Sigurnost na moru, Pomorski fakultet u Rijeci, Rijeka, 2001.
3. Simović, A., Mornarske vještine, Školska knjiga, Zagreb, 1991.
4. International Code of Signals, IMO, 1987.

1.11. Recommended Reading

Annual editions of the following manuals:
1. IMO model courses 2.03 Advanced training in firefighting, IMO, London, 2001.
2. IMO model courses 1.23 Proficiency in survival craft and rescue boats (other than fast rescue boats),IMO, London ,
3. IMO model courses 1.19 Proficiency in personal survival techniques, IMO, London, 2000.
4. IMO model courses 1.13 Elementary first aid, IMO, London, 2000.
5. IMO model courses 1.20 Fire prevention and firefighting, IMO, London, 2000.
6. IMO model courses 1.2 1 Personal safety and social responsibility, IMO, London, 2000

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

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1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1-3	*4*	*15*
4	*2*	

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; additionally, once a year, pass rate results are analyzed and appropriate measures are taken.

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Course description

Generic information			
Head of Course	PhD Tanja Poletan Jugović, Full Professor		
Course	Cargo Flows		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Optional		
Year of Study	3		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The primary objectives of the course are to acquire knowledge about the basic elements, principles, as well as the geo-transport, socio-economic, and logistical factors influencing the formation and distribution of cargo flows; to analyze relevant indicators of cargo flow formation worldwide with an emphasis on maritime and land transport; and to gain knowledge of the fundamental prerequisites for attracting cargo flows and valuing transport routes in the transport services market.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

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

1. Describe and interpret the basic elements, key principles, and specific characteristics of the formation of cargo flows within logistics and transport networks.
2. Differentiate and explain types of cargo flows according to various criteria such as type of goods, direction of cargo flows, types of transport modalities, territorial scope, etc.
3. Describe and interpret geo-transport, socio-economic, and logistical factors that influence the distribution and consolidation of cargo flows in a global and regional context.
4. Explain the general and specific characteristics of the development and sustainability of modern transport at the global, regional, and national levels.
5. Argue the significance of key components in the valuation and competitiveness of transport routes (corridors) in the transport services market.
6. Analyze and interpret the intensity, structure, and dynamics of cargo flows on various transport routes and corridors (maritime, land, river, air, etc.).
7. Compare relevant indicators of cargo flows at different types of cargo terminals (port, land, air terminals), including intensity, structure, and dynamics of cargo flows.
8. Apply the acquired knowledge to a specific practical example through the preparation of a research assignment using relevant theoretical and statistical data sources.

1.4. Course Outline

Theoretical determinants and principles of the formation and distribution of cargo flows that govern the consolidation, distribution, and optimization of cargo flows in global and regional networks. Geo-transport factors influencing the formation and distribution of cargo flows. Socio-economic factors influencing the formation and distribution of cargo flows. Other assumptions and criteria for the formation and distribution of cargo flows. The state and general characteristics of cargo transport worldwide. International cargo flows in maritime transport. International cargo flows in land transport. International cargo flows on inland waterways. International cargo flows in air transport. Cargo flows in the context of sustainability.

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

1.7. Student Obligations

- 1st exam (with a minimum achievement of 50% of the points)
- 2nd exam (with a minimum achievement of 50% of the points)
- Seminar – independent research and presentation (evaluation according to detailed criteria with a minimum achievement of 50% of the points)
- Final exam (with a minimum achievement of 50% of the points)

1.8. Assessment[1] of Learning Outcomes

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

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

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

- continuous knowledge assessment during classes – evaluates 70% of the acquired learning outcomes (LO): 1st exam – 25% (LO 1-5), 2nd exam – 25% (LO 6-7), seminar (preparation and presentation of the seminar within the research work) – 20% (LO 8), which is evaluated based on detailed criteria; the student must achieve at least 50% of the points in each activity;
- final exam – evaluates 30% of the acquired learning outcomes (LO 1-7), whereby the student must achieve at least 50% of the points to pass.

Examples of assessing learning outcomes in relation to the established learning outcomes are:

1. Define the key elements influencing the formation of maritime cargo flows.
2. Classify cargo flows according to the criteria of territorial coverage and direction of cargo flows, and explain the specificities and significance of different types of cargo flows.
3. List the geo-transport factors influencing the formation of cargo flows and argue their relative or absolute impact on cargo flows.
4. Name the key maritime regions and the leading ports by region in the context of global container cargo flows.
5. Systematize the factors affirming cargo flows using the example of a corridor (e.g., Baltic–Adriatic corridor).
6. Identify the routes of the most significant global maritime routes for liquid cargo flows.
7. Explain the intensity, structure, and dynamics of cargo flows using the example of the Northern Adriatic ports (Koper, Trieste, Rijeka).
8. Apply and present the acquired knowledge through a concrete practical example (independent research and presentation).

1.10. Main Reading

1. teaching material available within the e-course Cargo Flows – published on the e-learning system Merlin (https://moodle.srce.hr) in the current academic year
2. Tanja Poletan Jugović , „Robni tokovi“, Pomorski fakultet, Sveučilište u Rijeci, 2014.

1.11. Recommended Reading

1. Rodrigue, Jean-Paul, The Geography of Transport Systems, Fifth edition, New York: Routledge, 2020. (selected chapters)
2. Current statistical sources with up-to-date data: Review of Maritime Transport – UNCTAD, Shipping Statistics and Market Review, ISL (Institute of Shipping Economics and Logistics), Bremen; Statistical Yearbook of the Republic of Croatia, Croatian Bureau of Statistics, and others.
3. Scientific and professional papers by the course instructor and other authors published in international journals (Journal of Transportation Geography, Transportation Research, etc.) and domestic journals (Pomorstvo, Naše more, etc.), as well as projects and other research on the topic of cargo flows

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
teaching material available within the e-course Cargo Flows - published on the e-learning system - Merlin (https://moodle.srce.hr) in the current academic year	unlimited	30
T. Poletan Jugović, Robni tokovi, Pomorski fakultet, Sveučilište u Rijeci, 2014.	5	30

1.13. Quality Assurance

The quality of studying is continuously monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of exam results is prepared annually, and a student survey is conducted once per semester.

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3.2. Course description

Generic information			
Head of Course	Igor Rudan, PhD		
Course	Carriage of liquid cargoes by sea		
Study Programme	Nautical Studies and Maritime Transport Technology		
Level	Undergraduate degree programme		
Type of Course	Elective		
Year of Study	3st		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		45+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim is to introduce students to the specifics of liquid cargo ships (tankers) and the liquid cargo transportation market. Students are introduced to International Regulations, Recommendations and Standards regarding Tankers. Detailed introduction and analysis of the structural characteristics of liquid cargo ships. Through practical work on the exercises, students need to acquire skills in cargo scheduling, on-boarding and unloading on board ships, and on the specifics of loading / unloading and transporting liquid cargo by sea.

1.2. Prerequisites for Course Registration

No prerequisites

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Describe and interpret the structural characteristics of various types of liquid cargo vessels (tankers).
2. Classify and compare the features of cargo handling systems used on different types of tankers.
3. Analyze and explain cargo planning procedures for tank arrangements, and classify and compare cargo preservation systems across different types of tankers.
4. Plan loading and unloading operations on oil tankers.
5. Sequence and present the operation of various systems involved in the cargo loading/unloading process for different types of tankers.
6. Identify and discuss the hazards associated with transporting various types of cargo on different types of tankers.

1.4. Course Outline

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Structural properties of oil tankers. Characteristics of cargo systems used on oil tankers. Analyse and explain cargo plan and parse the planning of loading and unloading of cargo on oil tankers. Construction characteristics of chemical tankers. Analyse and explain cargo plan and parse the planning of loading and unloading of cargo on chemical carriers. Characteristics of cargo systems used on chemical tankers. Structural properties of liquefied gas vessels (LNG, LPG, …). Characteristics of the cargo systems used on liquefied gas vessels. Analyse and explain cargo plan and to parse the planning of loading and unloading of cargo on LNG and LPG vessels. International regulations, recommendations and standards related to tanker ships technology.

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 of classes over 70 %. Longitudinal and transversal ship drawing – student task. Passed two written exams. Final oral exams.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2.5	Class participation		Seminar paper	0,25	Experiment	
Written exam		Oral exam	1	Essay		Research	
Project		Continuous Assessment	1.25	Presentation		Practical work	
Portfolio							

1.9. Assessment of Learning Outcomes and Examples of Evaluat

70 % of the course grade is based through 2 written exams in class and 30 % of the course grade is based in the oral 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.

Continuous assessment: Each written exam must have at least 60 % score.
Final oral exam (learning outcomes 1- 7) checks the competences of theoretical knowledge where it is necessary to achieve a minimum of 50 % of the required theoretical knowledge.

1.10. Main Reading

1. Rudan, I., teaching materials from the course *Ship design and construction* on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka
2. Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions
3. Sumner, M., Tehnologija prijevoza ukapljenih plinova morem- Merlin (https://moodle.srce.hr)
4. Komadina, P., Tankeri, Pomorski fakultet u Rijeci, Rijeka, 1994.

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.

1. International Chamber of Shipping, International Safety Guide for Oil Tankers & Terminals, Witherby & Co. LTD., London 2020.
2. The Society of International Gas Tanker and Termnal Operators; Liquefield Gas Handling Principles on Ships and Terminals; SIGTTO, 2016.
3. IMO, Tanker familiarization, IMO Model Course 1.01,
4. Jovanović, Filip; Rudan, Igor; Žuškin, Srđan; Sumner, Matthew Comparative analysis of natural gas imports by pipelines and FSRU terminals. // Pomorstvo, 33 (2019), 1; 110-116 doi:10.31217/p.33.1.12
5. Sumner, Matthew; Rudan, Igor A Hybrid MCDM Approach to Transshipment Port Selection. // Pomorstvo, 32 (2018), 2; 258-267 doi:10.31217/p.32.2.11
6. Ivče, Renato; Rudan Igor; Rudan Mateo: Management and Usage of Nitrogen Systems on Liquefied Natural Gas (LNG) Carriers.// Pomorski zbornik, 55(2018), 219-227
7. Vuskovic, B.; Rudan, I.;Sumner, M. Fostering Sustainable LNG Bunkering Operations: Development of Regulatory Framework. Sustainability 2023, 15, 7358. https://doi.org/10.3390/su15097358
8. Dan Martinčević,, Igor Rudan, Davor Šakan; The Panama Canal drought crisis and its impact on the tanker market; Book of Abstracts, 8th My First Conference, 19 September 2024, Rijeka
9. Leopold Mandić, Alen Jugović, Josip Orović, Igor Rudan; Analysis of port infrastructure on the Croatian coast of Adriatic sea for berthing ships powered by alternative fuels; 3rd International Conference of Maritime Science & Technology; Dubrovnik, 14 – 16 September 2023

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials from the course Carriage of liquid cargoes by sea	MERLIN – online	
Sumner, M., Tehnologija prijevoza ukapljenih plinova morem	MERLIN – online	
Ocean Technologies Group – Ocean Learning Platform (OLP); training solutions	Web - online	
Komadina, P., Tankeri, Pomorski fakultet u Rijeci, Rijeka, 1994.	20	

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 analysed and appropriate measures are adopted.

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3.2. Course description

Generic information			
Head of Course	Biserka Rukavina, Ph. D.		
Course	Commercial Law		
Study Programme	Nautical Studies and Marine Transport Technology		
Type of Course	Elective		
Year of Study	3.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		3
	Number of Hours (L+E+S)		30+0+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The main objectives of the course are to acquire knowledge about the theory of state and law, the fundamental characteristics of real rights, and to familiarize students with the essential elements of contract law. Furthermore, the aim of the course is to familiarize students with the structure of certain types of commercial enterprises, the importance of the court register, and the effects of contractual and non-contractual liability of commercial law stakeholders.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able:

1. to list and describe the fundamental elements of the theory of state and law.
2. to distinguish between individual categories of real rights.
3. to describe and interpret the process of concluding a contract and its legal consequences.
4. to compare types of companies.
5. to explain the general and specific characteristics of each type of contract.
6. to analyze and interpret contractual and non-contractual liability.

1.4. Course Outline

Basic terms of the law and the state. Legal and business capacity. Structure and significance of the court register. Company. Organization of commercial enterprises – general provisions. Analysis of the organization and operation of a capital company (corporation). Analysis of the organization and operation of a general and limited partnership. Bodies of a commercial enterprises. Law of obligations – general provisions. Principles of the law of obligations. Analysis of individual types of contracts (purchase and sale contract, contract of lease, lien and mortgage, employment contract, contract of carriage, commission, contract warehousing, forward contract, insurance contract).

1.5. Modes of Instruction

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

1.6. Comments	

1.7. Student Obligations

The student must attend at least 70 % of the total hours of lectures and exercises, and must have passed colloquia (continuous knowledge testing) and a positively evaluated presentation (ppt presentation) to take the final exam.

1.8. Assessment[1] of Learning Outcomes

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

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

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

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

Examples of Assessment of Learning Outcomes:

1. Define the principles of the law of obligations.
2. Classify the types of commercial enterprises.
3. List the responsibilities of the assembly.
4. Explain the liability for compensation for damage.
5. Explain the importance of a bank guarantee.
6. Explain the role of the insurer.

1.10. Main Reading

1. Authorized lectures on the e-learning platform MERLIN (online materials).
2. Gorenc, Vilim, Pravo trgovačkih društva, Baltazar Adam Krčelić, Zaprešić, 2011.
3. Slakoper, Zvonimir, Kačer, Hrvoje, Luttenberger, Axel, Osnove prava trgovačkih ugovora i vrijednosnih papira, Mikrorad, Zagreb, 2009.

1.11. Recommended Reading

1. Companies Act, Consolidated text.
2. Civil Obligations Act, Consolidated text.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1. Gorenc, Vilim, Pravo trgovačkih društva, Baltazar Adam Krčelić, Zaprešić, 2011.	5	55
2. Slakoper, Zvonimir, Kačer, Hrvoje, Luttenberger, Axel, Osnove prava trgovačkih ugovora i vrijednosnih papira, Mikrorad, Zagreb, 2009.	5	55

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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Course description

Generic information			
Head of Course	PhD Tanja Poletan Jugović, Full Professor		
Course	Freight Forwarding		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Optional		
Year of Study	3		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours (L+E+S)		30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Explain the role and significance of freight forwarding logistics in the global transport system and international trade. Identify and analyze the relationship of the freight forwarder with other stakeholders in the logistics chain and the contribution of forwarding to the optimization of international trade flows. Analyze the legal definition of the international freight forwarding system. Distinguish and describe the business processes, activities, and tasks of an international freight forwarder, including the management of physical cargo flows, organization of transport, and proper use of documentation for import, export, and transit processes. Simulate real scenarios of organizing, planning, and implementing import, export, or transit operations. Identify and apply Incoterms terms in various international trade scenarios. Analyze contemporary trends and challenges in the operations of international freight forwarders as logistics operators.

1.2. Prerequisites for Course Registration

-

1.3. Expected Learning Outcomes

1. Explain the basic concepts and key characteristics of freight forwarding in the modern transport environment.
2. Investigate the role of freight forwarding logistics in global trade and interpret the impact of freight forwarding on the efficiency of the transport system.
3. Analyze legal sources, contracts, documents, and certificates that regulate the liability of freight forwarders and other stakeholders in international trade, including international conventions and national regulations.
4. Describe the basic tasks and activities of an international freight forwarder in planning, organizing, and executing import, export, or transit operations.
5. Describe the specific tasks and activities of a freight forwarder that depend on the specifics of the cargo, user requirements, and market conditions, including comprehensive logistical solutions and services.
6. Distinguish between transport and other documents and certificates used in import, export, and transit, and apply the appropriate documents in different scenarios depending on the type of transport, type of cargo, etc.
7. Use Incoterms terms with interpretation of the responsibilities of individual foreign trade entities and other stakeholders in the logistics chain.
8. Analyze current trends and challenges in the international freight forwarding industry and explore strategies to improve the role of freight forwarders in the global logistics system.

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1.4. Course Outline

The concept and relevant characteristics of freight forwarders and freight forwarding. Affirmation and development of freight forwarding in the modern transport environment. The significance of freight forwarding logistics in the transport system. The role of the freight forwarder in the supply chain and the international trade system. Characteristics of the freight forwarding system. Organization of professional systems in freight forwarding – national and international organizations. Legal regulation of freight forwarding activities – relevant laws and regulations, as well as the rights, obligations, and responsibilities of the international freight forwarder. Basic and specialized tasks, activities, and duties of the international freight forwarder. Incoterms terms in international trade. Contemporary trends and challenges in the operations of international freight forwarders as logistics operators (digitalization, automation, globalization and consolidation of logistics operators, environmental challenges, and sustainability).

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

1.7. Student Obligations

- 1st exam (with a minimum achievement of 50% of the points)
- 2nd exam (with a minimum achievement of 50% of the points)
- Seminar – independent research and presentation (evaluation according to detailed criteria with a minimum achievement of 50% of the points)
- Final exam (with a minimum achievement of 50% of the points)

1.8. Assessment[1] of Learning Outcomes

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

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

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

- Continuous knowledge assessment during classes – evaluates 70% of the acquired learning outcomes (LO): 1st exam – 25% (LO 1-4), 2nd exam – 25% (LO 5-8), preparation and presentation of a seminar within the research work – 20% (LO 9), which is evaluated based on detailed criteria; for each activity, the student must achieve at least 50% of the points;
- Final exam – evaluates 30% of the acquired learning outcomes (LO 1-8), whereby the student must achieve at least 50% of the points to pass the final exam.

Examples of assessing learning outcomes in relation to the established learning outcomes are:

1. Define and explain key terms (e.g., freight forwarder, logistics operator, 3PL, 4PL, etc.) and explain the differences between these terms.
2. Explain the role and significance of freight forwarding logistics in international trade using a concrete example.
3. List the key legal sources regulating freight forwarding activities and analyze the rights, obligations, and responsibilities of the freight forwarder arising from these sources.
4. List and explain the basic tasks of a freight forwarder (e.g., routing, cargo receipt, concluding transport contracts, concluding transport insurance contracts, etc.) and interpret the legal status and role of the freight forwarder within these tasks.
5. Analyze an example of a specific freight forwarding task conditioned by specific cargo (e.g., dangerous goods, live animals), explaining the role of the freight forwarder, specific activities, and documentation.
6. Interpret the purpose, function, and data contained within documents used in freight forwarding operations (e.g., bills of lading, waybills, single customs declarations, etc.).
7. Explain the role of Incoterms and interpret the obligations of the seller and buyer using a concrete Incoterm example (e.g., EXW, CIF, FOB, etc.).
8. Explain and analyze the impact of contemporary trends in the logistics services market (e.g., globalization, sustainability, digitalization, etc.) on the development and affirmation of logistics operators.
9. Apply and present acquired knowledge through research of a practical case from freight forwarding business practice.

1.10. Main Reading

1. teaching material available within the e-course Freight Forwarding - published on the e-learning system - Merlin (https://moodle.srce.hr) in the current academic year
2. Babić, D., Stanković, R., Bajor, I., Špediterski poslovi u logističkoj djelatnosti, Sveučilište u Zagrebu, Fakultet prometnih znanosti, Zagreb , 2020.
3. Zelenika, R., Temelji logističke špedicije, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2005.

1.11. Recommended Reading

1. Incoterms 2020, Pravila tumačenja trgovinskih termina Međunarodne trgovinske komore, HGK, 2020.
2. Zelenika, R., Logistički sustavi, Ekonomski fakultet u Rijeci, Rijeka, 2005.
3. Zelenika, R. Incoterms 2000 u teoriji i praksi – 100 savjeta i 100 primjera , Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2002.
4. Andrijanić, I., Aržek, Z., Prebežac, D., Zelenika, R., Transportno i špeditersko poslovanje, Zagreb, 2001.
5. Zelenika, R., Međunarodna špedicija, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2000.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
teaching material available within the e-course Freight Forwarding - published on the e-learning system - Merlin (https://moodle.srce.hr) in the current academic year	unlimited	30
Babić, D., Stanković, R., Bajor, I., Špediterski poslovi u logističkoj djelatnosti, Sveučilište u Zagrebu, Fakultet prometnih znanosti, Zagreb , 2020.	3	30
Zelenika, R., Temelji logističke špedicije, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2005.	5	30

1.13. Quality Assurance

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The quality of studying is continuously monitored in accordance with the ISO 9001 system implemented at the Faculty of Maritime Studies in Rijeka. An analysis of exam results is prepared annually, and a student survey is conducted once per 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.

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3.2. Course description

Generic information		
Head of Course	Associate professor David Brčić, PhD	
Course	Integrated Navigation Systems	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University undergraduate study program	
Type of Course	Elective	
Year of Study	3.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	(30+30+0) (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the proposed course is to familiarise students with the concepts, features, and operation of navigational information systems, which are increasingly present on ship bridges. This primarily refers to mandatory devices that are replacing traditional methods of navigation. In addition, the course covers other systems and devices that are directly or indirectly connected to navigational tasks.
Through the planned course delivery, one of the key aims is to develop students' critical thinking based on acquired knowledge. This particularly relates to the integration of legacy and modern technologies, raising awareness of the potential risks associated with increasingly sophisticated devices and systems, and the dangers of overreliance on technology.
The course also aims to develop knowledge, skills, and competencies in understanding and operating individual navigation devices, as well as integrated navigation systems with unified data flow, and the integrated navigation system as a component of the integrated bridge system.
Knowledge transfer further includes the understanding of connectivity between devices and standardised communication protocols, both from the ship to external entities and vice versa.

1.2. Prerequisites for Course Registration

The prerequisite of Course Registration is attendance of the courses Terrestrial navigation and Electronic navigation, while the prerequisite for the final exam is that the student have passed the same course.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Classify the standards and performance requirements set by relevant international organisations related to navigational information and integrated systems,
2. Evaluate and compare the characteristics of traditional and digital maritime navigation,
3. Describe the architecture of ECDIS, INS, and IBS systems,
4. Describe the operating principles of the basic navigation sensors used in ECDIS systems,
5. Accurately classify and interpret the comprehensive data display on the ECDIS screen,
6. Correctly carry out the voyage planning procedure using the ECDIS system,
7. Evaluate the accuracy and reliability of own ship's position previously determined by different methods,
8. Assess the reliability of electronic navigational charts,
9. Compare the causes of maritime accidents and identify common contributing factors, distinguishing between human and technical influences,
10. Critically evaluate the circumstances of maritime accidents where the ECDIS system was a direct or indirect contributing factor.

1.4. Course Outline

Course introduction. Application of standards set by the International Maritime Organization (IMO), International Hydrographic Organization (IHO), and International Electrotechnical Commission (IEC). Fundamentals of vector graphics. Geographic Information System (GIS). Horizontal and vertical reference systems. IT and operational characteristics of integrated systems. Standardised displays of navigational information. Electronic Chart Display and Information System (ECDIS). Features and components of the ECDIS system. Navigational tasks within the ECDIS system. ECDIS as part of integrated navigation systems. Voyage planning using ECDIS. ECDIS as critical bridge equipment. Maritime accidents and detentions. Standardised communication protocols. Integrated Navigation Systems (INS). Features and components of the INS. Integrated Bridge (IB). Integrated bridge hardware. Navigational and related software tools and applications. Development of new navigation systems. Features of e-navigation. Watch officer's user interface.

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

1.7. Student Obligations

Introductory knowledge assessment, written colloquium/exam, practical skills assessment, project assignment (seminar paper and presentation), final exam.

1.8. Assessment[1] of Learning Outcomes

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

Evaluation of student engagement throughout the semester (attendance, continuous knowledge checks, assessment of knowledge and skills in handling navigational equipment, class activity, and project assignment). Students are expected to attend at least 70 % of classes (combined – lectures and exercises).

The **written colloquium/exam** assesses learning outcomes 1, 2, 3, 4, 8. A maximum of 15 points can be earned.

Example:

1. What is the ECDIS system (explanation of the acronym and definition)?
2. What is ENC (explanation of the acronym and definition)?
3. Which reference coordinate system is used for ship position coordinates on an ENC chart?
4. What is the difference between ECS and ECDIS systems? The answer must include both the description and translation of acronyms.
5. What are the three main sensors of the ECDIS system?
6. What navigational tasks are performed using the ECDIS system?
7. Which reference coordinate system is used for ship positions displayed on RNC charts?
8. List the prescribed display modes (information levels) on the ECDIS screen.
9. Under which conditions is navigation without paper charts permitted?
10. How will depth soundings equal to or less than the defined safety depth be displayed on the ENC chart when the display level is set to “All info”? (circle the correct answer):
    a. in black
    b. in grey
    c. in blue
    d. not displayed

The practical skills assessment evaluates learning outcomes 5, 6, 7. A maximum of 15 points can be earned.

Example:

1. Determine the distance and bearing from the radar target displayed on screen.
2. Change the ETA on the AIS to today’s date with arrival time at 12:00.
3. Set the ship’s position display to a symbol showing heading line and HDG vector.
4. Enable the confidence zone display.
5. Insert a pilot boarding mark at position: latitude 45°14.0' N; longitude 014°22.0' E.
6. Find the NAVTEX symbol, open it, and describe the notification it refers to.
7. Enable the additional/secondary position source.
8. Set the safety frame to 4 cables port and starboard, and 10 minutes ahead of the ship.
9. Open Chart 1.
10. Enable full chart data display.

In individually conducted **checks during classes,** all learning outcomes are covered. A maximum of 10 points can be earned.

Example:

During class, before each new topic or task, theoretical and practical knowledge from the previous topic is assessed individually for each student.

The project assignment assesses learning outcomes 9 and 10. A maximum of 30 points can be earned.

Example:

Seminar paper and presentation on the topic *"Maritime accidents in which ECDIS or ECS systems were a direct or indirect contributing factor"*, observation period from 1 July 2012 to 1 February 2018.

In the **final examination**, a maximum of 30 points can be earned, with a minimum of 15 points required to pass. A prerequisite for taking the final exam is achieving at least 50 % of the total points in each of the previously listed activities/requirements. The final exam assesses **all learning outcomes**, including the **defence of the seminar paper**.

1.10. Main Reading

1. Brčić, D., *Course lectures*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2025. *[online]*
2. Grupa autora: *Vademecum maritimus – podsjetnik pomorcima*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2014.
3. Kos S., Zorović D., Vranić D., *Terestrička i elektronička navigacija*, Sveučilište u Rijeci, Pomorski fakultet, Rijeka, 2010.
4. International Maritime Organization (IMO). Izvedbeni zahtjevi za vezanu navigacijsku opremu. London, IMO, 2025 *[online]: https://www.imo.org/en/KnowledgeCentre/IndexofIMOResolutions/Pages/Default.aspx]*
5. International Hydrographic Organization (IHO). Current IHO ECDIS and ENC Standards. IHO, Monaco, *[online: https://iho.int/en/standards-in-force]*.
6. Norris, A. *Integrated Bridge Systems Vol. 1: Radar and AIS*. The Nautical Institute, London, UK, 2008.
7. Norris, A. *Integrated Bridge Systems Vol. 2: ECDIS and positioning*. The Nautical Institute, London, UK, 2010.

1.11. Recommended Reading

1. Admiralty (2025). Maritime Data Solutions. Dostupno na: https://www.admiralty.co.uk/
2. Bauk, S. I. (2017). Prilozi digitalizaciji u pomorstvu. Kotor: Scientific Publishing Hub. Dostupno na: http://sphub.org/wp-content/uploads/2017/01/Digitalization_in_Maritime_Community-1.pdf
3. Brčić, D., Kos, S. & Žuškin, S. (2015). Navigation with ECDIS: Choosing the proper secondary positioning source. International Journal on Marine Navigation and Safety of Sea Transportation (TransNav). 9(3). pp. 317-326.
4. Brčić, D., Kos, S. & Žuškin, S. (2016). Partial structural analysis of the ECDIS EHO research: The handling part. Proceedings of the 24nd International Symposium on Electronics in Transport (ISEP). Electrotechnical Association of Slovenia & ITS Slovenia, Ljubljana, Slovenija, 29-30. 3. 2016.
5. Brčić, D., Žuškin, S. 2015. ECDIS EHO. [online] https://www.researchgate.net/project/ECDIS-EHO
6. Brčić, D., Žuškin, S., Valčić, S. & Rudan, I. (2019). ECDIS transitional period completion: Analyses, observations and findings. WMU journal of maritime affairs, 18(2). str. 359-377.
7. Furuno. (2022). Product Solutions. Dostupno na: https://www.furuno.com/en/
8. GIS Geography. (2020). GPS Accuracy: HDOP, PDOP, GDOP, Multipath & the Atmosphere. Dostupno na: https://gisgeography.com/gps-accuracy-hdop-pdop-gdop-multipath/
9. GIS Geography. (2020). World Geodetic System (WGS84). Dostupno na: https://gisgeography.com/wgs84-world-geodetic-system/
10. Grupa autora. (2014). Vademecum Maritimus – podsjetnik pomorcima. Rijeka: Sveučilište u Rijeci, Pomorski fakultet.
11. Kristić, M., Žuškin, S., Brčić, D., Valčić, S. Zone of Confidence Impact on Cross Track Limit Determination in ECDIS Passage Planning. *J. Mar. Sci. Eng.*, 2020, 8, 566.
12. International Electrotechnical Commission (IEC). (2020). International Standards and Conformity Assessment for all electrical, electronic and related technologies. Dostupno na: https://www.iec.ch/standardsdev/?ref=menu
13. Kaplan, E. D. i Hegarty, C.J. (ur.) (2006). Understanding GPS: Principles and Application. Second edition. Boston: Artech House.
14. Kos, S. Zorović, D. & Vranić D. (2010). Terestrička i elektronička navigacija. Rijeka: Sveučilište u Rijeci, Pomorski fakultet.
15. Kos, S., Vojković, L. & Brčić, D. (2014). Development of AIS and its influence on marine traffic control. Proceedings of the 8th Global Navigation Satellite Systems Vulnerabilities and Solutions Conference. The Royal Institute of Navigation, London & University of Rijeka, Faculty of Maritime Studies. Baška, Hrvatska, 7-9. 5. 2014. str. 47-67. Dostupno na: pfri.uniri.hr/web/hr/dokumenti/zbornici-gnss/2014-GNSS-8.pdf
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17. Marine Insight. (2025). Dostupno na: https://www.marineinsight.com/
18. Marine Traffic. (2025). Dostupno na: marinetraffic.com/
19. Mathias Jonas, M. & Melles, J. (2003). Study on ENC Loading Strategy in Relation to SCAMIN Effects and 'Overscale' Indications. International Hydrographic Review, 4(2), pp. 1-56.
20. National Aeronautics and Space Administration (NASA). (2020). Earth's Atmospheric Layers. Dostupno na: https://www.nasa.gov/mission_pages/sunearth/science/atmosphere-layers2.html
21. National Oceanic and Atmospheric Administration Office of Coast Survey (NOAA OCS) (2020). Dostupno na: https://www.nauticalcharts.noaa.gov/
22. Norris, A. (2008). ECDIS and Positioning: Integrated Bridge Systems Vol. 2. London: The Nautical Institute.
23. Norris, A. (2010). RADAR and AIS: Integrated Bridge Systems Vol. 1. London: The Nautical Institute.
24. Novatel. (2025). An Introduction to GNSS, Chapter 5: Resolving Errors. Dostupno na: https://www.novatel.com/an-introduction-to-gnss/chapter-5-resolving-errors/gnss-data-post-processing/
25. Rutkowski, G. (2018). ECDIS Limitations, Data Reliability, Alarm Management and Safety Settings Recommended for Passage Planning and Route Monitoring on VLCC Tankers. TransNav, 12(3), pp. 483-490.
26. Sickle, J. V. (2015). GPS for Land Surveyors, Third Edition. Bosa Roca: CRC Press.
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28. Strabić, M., Brčić, D., Frančić, V. & Komadina, P. (2022). On the possibility of COLREGS/STM integration. U: Martinez de Oses, F.X., La Castellis i Sanabra, M. (ur.) *Proceedings of the 9th International Conference on Maritime Transport*. ISBN: 978-84-9880-591-8. Barcelona, 27–28.6.2022. p. 11. doi: 10.5821/mt.10925
29. Subirana, J. S., Zornoza, J. J. M. i Hernandez-Pajares, M. (2013). GNSS Data Processing. Volume I: Fundamentals and Algorithms. Noordwijk, The Netherlands: ESA Communications
30. United Nations (UN). (2022). UN/LOCODE Code List by Country and Territory. Dostupno na: unece.org/cefact/locode/service/location
31. Wartsila. (2024). Dostupno na: https://www.wartsila.com/transas
32. Weintrit, A. 2009. The Electronic Chart Display and Information System (ECDIS) – An Operational Handbook. Taylor & Francis, Abingdon.
33. Žuškin, S., Brčić D. & Kos, S. (2016) . Partial structural analysis of the ECDIS EHO research: The safety contour. International Conference on Maritime Transport (MT16). Barcelona, 27-29 June 2016. Barcelona: UPC

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Course lectures (1)	available online	30
Vademecum maritimus – podsjetnik za pomorce (2)	10	
Terestrička i elektronička navigacija (3)	10	
IMO Performance Standards (4)	available online	
IHO ECDIS and ENC Standards (5)	available online	
Integrated Bridge Systems Vol. 1: Radar and AIS (6)	2	
Integrated Bridge Systems Vol. 2: ECDIS and positioning (7)	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.

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3.2. Course description

Generic information		
Head of Course	**dr. sc. Zoran Mrak** **dr.sc. Sanjin Valčić**	
Course	**Maritime Communications**	
Study Programme	**Undergraduate**	
Type of Course	Compulsory	
Year of Study	3	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	5
	Number of Hours (L+E+S)	30+45+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objectives of this unit are to gain knowledge of the GMDSS system required to properly handle communications devices on board, and to prepare students for the title of General Operator (GOC). The course syllabus is based on the STCW Convention and "IMO Model Course 1.25", with the addition of a necessary part in which the required backgrounds in electronic communications are addressed.

1.2. Prerequisites for Course Registration

1.3. Expected Learning Outcomes

It is expected that students, after regulating the anticipated obligations from this course, will be able to:

1. Describe the modes of propagation of electromagnetic waves as a function of frequency bands
2. Describe the basic elements of radio communication systems (receiver, modulation transmitter, antennas, transmission lines)
3. Indicate the role of individual maritime communications institutions
4. Define and describe the individual elements of the GMDSS system
5. Describe individual communication equipment
6. Indicate the purpose of each communication equipment
7. Handle all ship communication equipment in the GMDSS system
8. Use the devices in the proper manner for the purpose of proper communication
9. Use the supporting literature of the ship's radio station and keep documentation properly.

1.4. Course Outline

Development of maritime communications; The role of individual institutions; Introduction to radiocommunication systems; Information; Analog and digital systems; Electromagnetic waves, modulations, antennas, transceiver ...; GMDSS system; Communication functions; Areas of navigation; MSI Transmission Systems; Marine Communication Equipment (DSC system; VHF radiotelephone transceiver; MF / HF radiotelephone device; NAVTEX system and receiver; INMARSAT devices; SART and AIS SART device; EPIRB devices); Procedures in radio communications (routine communications, communications in the event of danger, emergency and safety ...); Use of compulsory marine literature and radio logging.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☐ Practical work ☒ Multimedia and Network ☒ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	The lectures and exercises are fully compliant with the STCW Convention and "IMO Model Course 1.25". The exercises take place in a specialized simulator for GMDSS communication devices.	

1.7. Student Obligations

Active attendance and at least 70% of course attendance; 2 written and one oral colloquium; final written exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2,5	Class participation		Seminar paper		Experiment	
Written exam	1	Oral exam		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

The total number of credits consists of 10% attendance and activity in teaching, 60% achieved through continuous examination and 30% in the final exam.

Continuous assessment:
- 1st colloquium, written test 20 questions, learning outcomes 1-3 (20%)
- 2nd colloquium, written test 20 questions, learning outcomes 4-6 (20%)
- 3rd colloquium, oral-practical simulator work - knowledge of devices, procedures and communication, learning outcomes 4-9 (20%)

Final exam:
- final exam is a 30-question test, learning outcomes 1-9 (30%). The passage requires a minimum of 50% points

Examples of evaluating learning outcomes in relation to set learning outcomes are:
1. Describe the propagation of the electromagnetic waves of the HF region.
2. Describe the SSB modulation technique and indicate what types of communications are used.
3. List the communication functions for the needs of the GMDSS system prescribed by the SOLAS Convention.
4. Describe the role of MRCC in the GMDSS system.
5. Describe the parts of the MF DSC equipment.
6. Specify the purpose of the SART equipment.
7. Distress alerting procedure with the INMRSAT F-77.
8. Demonstrate the process of sending a SAFETY priority message using a VHF equipment.
9. Perform a weekly test of the device and record the test results.

1.10. Main Reading

1. Tehnički temelji GMDSS sustava; Josip Sušanj
2. Komunikacijski uređaji i postupci u GMDSS sustavu; Zoran Mrak
3. GMDSS sustav i sigurnost plovidbe; Damir Zec
4. Handbook for marine radio communication; Graham D. Lees, William G. Williamson

1.11. Recommended Reading

1. Manual for use by the Maritime Mobile and Maritime Mobile-Satelite Services; ITU
2. GMDSS/GOC Model Training Course 1.25; IMO
3. Standard Marine Communication Phrases; IMO
4. International Code of Signals; IMO

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Teaching materials (Lectures) available on the Merlin e-learning system	unlimited	
Teaching materials (Exercises) available on the Merlin e-learning system	unlimited	
Tehnički temelji GMDSS sustava; Josip Sušanj	faculty library	
Komunikacijski uređaji i postupci u GMDSS sustavu; Zoran Mrak	faculty library	
GMDSS sustav i sigurnost plovidbe; Damir Zec	faculty library	

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 insurance quality that is implemented at the Faculty of Maritime Studies in Rijeka. Once a year, the results of transience are analyzed and yielded appropriate measures.

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3.2. Course description

Generic information			
Head of Course	Biserka Rukavina, Ph.D.		
Course	Maritime agencies		
Study Programme	Nautical Studies and Maritime Transport Maritime Technology		
Type of Course	Elective		
Year of Study	3.		
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 of the basic characteristics of maritime agents. Understanding of the historical development of maritime agencies and the purpose of their establishment. Knowledge of the structure and the functions of maritime agents and identification the role and significance of maritime agents in the transport process. Affiliation this content with related courses in order to achieve and implement a multidisciplinary approach.

1.2. Prerequisites for Course Registration

None.

1.3. Expected Learning Outcomes

After passing the exam, students will be able:

1. to distinguish and compare the international and national legal sources governing the organization and activities of maritime agencies and explain the role of international and national professional associations.
2. to classify and interpret certain types of the maritime agent (port agent, shipbroker, special operations).
3. to describe and explain ship arrival and departure procedures.
4. to describe and analyze the contents of the disbursement account.
5. to explain and identify the essential elements of the maritime agency contract and analyze and compare individual types of contracts.
6. to analyze, compare and demonstrate the specifics of the operations of maritime agents on the example of concrete maritime agencies.

1.4. Course Outline

The term and types of maritime agents. International and national legal sources governing the organization and activities of maritime agencies. Organization of maritime agencies. Port agent activities. Shipbroker activities. Disbursement account. Maritime Agency Contract – parties, subject matter of the contract, duration and termination of the contract. Analysis of individual type contracts (Agency Appointment Agreement, General Agency Agreement). The rights, obligations and liability of the maritime agent.

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

1.7. *Student Obligations*

The student must attend at least 70 % of the total hours of lectures and exercises, and must have passed colloquia (continuous knowledge testing) and a positively evaluated presentation (ppt presentation) to take the final exam.

1.8. *Assessment[1] of Learning Outcomes*

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

The process of evaluation of the acquired learning outcomes takes place during continuous assessments through 2 midterm examinations (60 %), student presentation (10 %) and at the final part of the exam (30 %).

Examples of Assessment of Learning Outcomes:

1. Define a maritime agent in accordance with national legal sources.
2. Provide two examples of shipbroker functions.
3. Describe one document to be provided by the ship/master/agent in international navigation in the document Notice of Arrival and explain the purpose of obtaining it.
4. Explain the possible consequences of the agent's conduct contrary to the principal's order.
5. Describe the structure of the modern maritime agency.

1.10. *Main Reading*

1. Authorized lectures on the e-learning platform MERLIN (online materials).
2. Mandić, Nikola, Lovrić, Ivana, Pomorske agencije i otpremništvo, Split, 2019.

1.11. *Recommended Reading*

1. Pomorski zakonik (Consolidated text) - Ugovor o pomorskoj agenciji čl. 674. – 683.
2. Opći uvjeti poslovanja pomorskih agenata, 2009.; Udruga pomorskih agenata Hrvatske.

1.12. *Number of Main Reading Examples*

Title	*Number of examples*	*Number of students*
Mandić, Nikola, Lovrić, Ivana, Pomorske agencije i otpremništvo, Split, 2019.	3	40

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.

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3.2 Course description

Generic information			
Head of Course	Sandra Tominac Coslovich, PhD, Full professor		
Course	Maritime English 5		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Elective		
Year of Study	3rd		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours(L+E+S)		15+30+0 (1+2+0)

1.GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Course objectives meet the requirements of the enrichment level of the IMO STCW Convention 1995 and the requirements for obtaining a B.Sc. degree in Maritime Transport – Nautical Science and Safety of Navigation

- Maritime English education and training of students for shore-based jobs and on-board duties at the managerial level
- Acquiring specialized linguistic knowledge and English language skills required for education and training for the managerial level of certification under the provisions of the IMO STCW Convention 1995
- Furthermore, the goal is to develop the level of knowledge of maritime and general English language, as well as to master the linguistic knowledge and skills to enable students to learn, gain knowledge and adapt to the technological advances in the global maritime industry and further develop the four language skills: reading, listening, writing and speaking

1.2. Prerequisites for Course Registration

Completing the course Maritime English 4.

1.3. Expected Learning Outcomes

After completing the course, the students will be able to:
1. Distinguish, define and apply different terms from the field of shipping industry (shipping economics, port economics, shipping agency and maritime law) in English and compare them to the corresponding terms and concepts in Croatian
2. Interpret and communicate information in spoken and written form from the field of shipping industry (shipping economics, port economics, shipping agency and maritime law) in English
3. To express themselves in speech and in writing and discuss specialist topics in English
4. To translate specialized texts from English into Croatian and vice versa
5. To use language skills in written and spoken communication in English among different specialists in the field of maritime transport

1.4. Course Outline

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The course is based on the *communicative approach* to learning and teaching English as a Foreign Language and English as a Second Language. It is also focused on *content-based Learning* and *sudent-centered approach*. The course focuses on the acquisition and practical use of vocabulary/terminology (terms, polysemous words, multiple-word lexical units, collocations, lexical sets), discourse and pragmatic elements of shipping-related texts and communication, most frequent and typical grammatical structures and features restricted to maritime discourse (written and spoken) regarding the following topics: the structure of shipping – ship's interest, cargo interest, ancillary services, shipping procedure and documents, Bill of lading (types, functions, samples), receiving and delivering cargo, charter parties, contracts of affreightment, notice of readiness, cargo damage, cargo claims, note of protest, sea protest, various matters of maritime correspondence.

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		
Class attendance, activities, continuous assessment and final exam		
1.8. Assessment[1] of Learning Outcomes		

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

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

2 continuous written assessments/tests + final oral exam

2. Explain the terms 'shipper' and 'carrier' in English and provide the Croatian equivalents

1. Describe the shipping procedure in English

3. Enumerate and explain the different types and functions of the Bill of lading

4. Translate the text on Voyage charter parties from English into Croatian using the appropriate terminology

5. Write a Note of protest against the negligent work of stevedores

1.10. Main Reading

- Pritchard, B. (1994) *Ship's Business in English*. Pomorski fakultet, Rijeka, selected units on Merlin (moodle.srce.hr)
- L. Jones & R. Alexander (2000) *New International Business English*. Cambridge Univeristy Press
- Activities and materials on e-learning platform Merlin (moodle.srce.hr)

1.11. Recommended Reading

- *MarEng & MarEng+,* Web-based Maritime English Learning Tool, EU Leonardo Project, http://mkkdok.utu.fi/mat/marengplus_learning_tool/index.html
- Kluijven, P. van (2003) *International Maritime English Programme.* Alk & Heijnen, Alkmaar
- Luzer-Spinčić (2002) *Gramatička vježbenica za pomorce*, Pomorski fakultet, Rijeka

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pritchard, B. (1994) *Ship's Business in English*. Pomorski fakultet, Rijeka, selected units	Available online Merlin (moodle.srce.hr)	20
L. Jones & R. Alexander (2000) *New International Business English*. Cambridge Univeristy Press	10	20
Teaching materials on e-learning platform Merlin (moodle.srce.hr)	Available online Merlin (moodle.srce.hr)	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 analyzed and a survey is conducted among the students once per semester.

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3.2. Course description

Generic information		
Head of Course	**Robert Mohović, PhD, Full professor, Đani Mohović, PhD, Associate professor**	
Course	**Ship handling**	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	University undergraduate study program	
Type of Course	Mandatory	
Year of Study	3.	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	**5**
	Number of Hours (L+E+S)	45+30+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to familiarize students with the factors that influence ship maneuvering, ship maneuvering characteristics, maneuvering with different types of ships in all conditions, including extraordinary circumstances, safety measures during maneuvering and during the stay of the ship at the berth. A detailed introduction and analysis of the International Rules on avoidance of collisions at sea. Practical work on drills and navigation practice requires students to acquire skills in accordance with the STCW Convention. Also, the course provides a scientific basis for a more detailed study of this field.

1.2. Prerequisites for Course Registration

Ship design and construction 1 and Terrestrial Coastal navigation - attended lectures
Students who have not completed maritime schools in the nautical field are required to attend and successfully master the Introductory Differential Program

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. analyse and properly interpret the International Regulations for Preventing Collisions at Sea,
2. describe and define the factors that influence ship maneuvering,
3. analyze and correctly interpret the ship's maneuverability,
4. analyze and correctly interpret the principles of maneuvering for different types of ships in all conditions, including extraordinary circumstances,
5. analyze and correctly interpret safety measures during maneuvering and during the stay of the ship at the berth,
6. be able to operate the ship in navigation simulators and navigation practice,
7. apply skills in the field of ship maneuvering in accordance with the requirements of the STCW 1978 Convention.

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1.4. Course Outline

Introduction, concept and division of ship handling. Analysis of International Rules for the Prevention of Collisions at Sea. Influence of geometric and structural features on the maneuverability of a ship. Rudder and rudder action. Ships propulsion. External factors - influence on ship maneuvering. Interaction. Types of maneuvers and safety during ship maneuvering. Types and technical and technological characteristics of tugboats - influence on ship maneuvering. Ship maneuvering with and without tugboats in all conditions. Safety during the stay of the ship at the berth. Special cases of maneuvering. Emergency maneuvering. Support system for maneuvering. The human factor and its impact on ship maneuvering. Development of a ship maneuvering system. STCW Convention requirements.

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	*Part of the exercises related to the International Rules for the Prevention of Collisions at Sea are related to the "case study" and contain an analysis of events and conclusions in accordance with the Rules. The second part of the exercises refers to the practical work of students on specialized simulators of navigation and ship maneuvering. Part of the practical work is carried out in the framework of navigation practice on board.*	

1.7. Student Obligations

Active attendance of classes and at least 70% of completed classes.
Passed midterm colloquiums and successful demonstration of ship handling techniques using ship's simulator.
The student is required to pass the final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendanc	2.5	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	1,5	Essay		Research	
Project		Continuous Assessment	1	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.

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1.9. Assessment of Learning Outcomes and Examples of Evaluation during Classes and on the Final Exam
70% in class and 30% in final oral 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) *Continuous assessment:* *-2 colloquiums in the field of International rules on collision avoidance at sea - minimum 80% of correct answers required* *-2 colloquiums in the field of ship handling technique (ship maneuvering) - theoretical part - must be accomplished a minimum of 60% correct answers.* *-Exercises in the navigation simulator where it is necessary to show the ship's handling skills - should be shown minimally 80% of the required skills.* *Final exam:* *Final exam (oral exam) checks the completeness of theoretical knowledge in the field of course Ship handling, it is necessary to achieve a minimum of 50% of the required theoretical knowledge.*
1.10. Main Reading
1. R. Mohović, Ship handling, lectures on the web pages of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2016. – 2018.. *2. R.W. Rowe, The Shiphandler's Guide, The Nautical Institute, London, 2000.* *3. Sijekavica, I., Kačić, H., Pravila za izbjegavanje sudara na moru, Školska knjiga Zagreb* *4. e.colregs - Link: http://www.ecolregs.com/index.php?lang=hr*
1.11. Recommended Reading
1. H. Hensen, Tug Use in Port, A practical guide, The Nautical Institute, London, 1997. *2. Mooring Equipment Guidelines, Oil Companies International Marine Forum, Witherby & Co. Ltd., London, 1997.* *3. D.H. MacElrevey, Shiphandling for the Mariner, Cornell Maritime Press, Ins. Centerville, 1998.* *4. Pilotage and Shiphandling, The Nautical Institute, London, 1990.* *5. A.Vučinić, Hidrodinamika plovnih objekata (Otpor i propulzija), Tehnički fakultet Sveučilišta u Rijeci, Rijeka, 1997.* *6. R. Ratko, Manevriranje brodom, Profil International d.o.o., Zagreb, 2001.* *7. Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2002.* *8. Pomorska enciklopedija, Leksikografski zavod Hrvatske, Zagreb* *9. P.R. Williamson, Ship Manoeuvring Principles and Pilotage, Witherby & Co. Ltd., London, 2001.* *10. K.J. Rawson, E.C. Tupper, Basic Ship Theory, Longman Scientific & Technical, Essex, 1984.*

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Ship handling technique, lectures on web pages	*unlimited*	
The Shiphandler's Guide	*available on web pages*	*50 - full-time students* *30 - part-time students* *(Academic year 2019/2020)*
International Regulations for Preventing Collisions at Sea	*5*	
COLREG-c ACT-s	*available on web pages*	

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1.13. Quality Assurance

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3.2. Course description

Generic information			
Head of Course	Renato Ivče full professor, Ph.D		
Course	Ship maintenance		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Mandatory		
Year of Study	3		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	3	
	Number of Hours (L+E+S)	(30 + 15 +0) (2+1+0)	

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to acquaint students with the importance of the ship maintenance system, methods of maintenance, and direct and indirect costs of maintenance. Introduce students to corrosion processes, effects on the ship's structure, the need for corrosion protection, and methods of corrosion protection. and protecting the ship's hull from fouling

1.2. Prerequisites for Course Registration

Passed Ship design and construction 1 exam

1.3. Expected Learning Outcomes

1. Assess the need for and conditions affecting the maintenance of ship systems.
2. Differentiate and evaluate methods of maintaining ship systems.
3. Assess and compare direct and indirect maintenance costs.
4. Determine the kinetics of corrosion development and its forms.
5. Evaluate the corrosion characteristics of key structural metals and their alloys.
6. Examine the kinetics of corrosion processes and apply protection against corrosion and fouling to the underwater part of the ship's hull.

1.4. Course Outline

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Introductory considerations. Importance of the ship maintenance system. Methods of maintenance. Maintenance costs. Material degradation. Corrosion of metals and forms of corrosion. Corrosion properties of individual technical materials. Corrosion protection. Cathodic and anodic protection. Protection of the underwater part of the hull with anti-fouling coatings. Maintenance of handling equipment. Maintenance of significant deck appliances and systems, categories of vessels

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

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		Experiment	
Written exam		Oral exam	0,5	Essay		Research	
Project		Continuous Assessment	1,0	Presentation		Practical work	0,5
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 1-3 (0,5 ECTS (30%)) theory,
2nd preliminary exam – learning outcomes 4-6 (0,5 ECTS (30%)) practical tasks.
In addition, the student must achieve a minimum of 52% of points for each preliminary exam.
Final exam (0,5 ECTS (30%)) of the acquired learning outcomes (1-6), whereby the student must achieve a minimum of 52% of points to pass the final exam.

Examples of evaluation of individual learning outcomes during classes and at the final exam
1. Define who determines the maintenance requirements of ship systems for the shipowner.
2. Explain the calendar-based maintenance method.
3. Define the indirect maintenance costs associated with ship downtime.
4. Explain the formation and role of the oxide layer on aluminum.
5. Explain the importance of cathodic protection in preserving the structure of the underwater part of a ship's hull.

1.10. Main Reading

1. Renato I., Mohović R. Zorović D., Mohović Đ., Blažina A. Održavanje broda – Korozija i zaštita materijala, Rijeka 2024.
2.Zorović,D. Zaštita materijala, Fakultet za pomorstvo i saobraćaj, Rijeka, 1991.
3. Zorović D. Renato I, Mohović R., Mohović Đ., Održavanje broda – Zaštita materijala, Rijeka 2008.
4. Lovrić: Osnove brodske terotehmologije, Pomorski fakultet, Dubrovnik, 1989;
5. Ivče, R.., teaching materials from the course Ship mainteance on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka

1.11. Recommended Reading

1. Kennth A., Marine and offshore corrosion, Butterworth, 1985.
2. Caridis P., Inspection, repair and maintenance of ship structure, Witherby Co, London 2001
3. Dugi Z. i Esib I., Tehnologija zaštite od korozije, Školska knjiga, Zagreb, 2003.
4. Francis L.La Que, Marine corrosion, Copyright by John Wiley & Sons, 1975.
5. Hrvatski registar brodova, Pravila za tehnički nadzor brodova, Dio 24, Split, 2000.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1. Održavanje broda – Korozija i zaštita materijala	50	
2. Zaštita materijala	10	
3. Održavanje broda – Zaštita materijala	30	
4. Osnove brodske terotehmologije	3	
5. Teaching materials from the course Ship mainteance	web	

1.13. Quality Assurance

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.

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3.2. Course description

Generic information			
Head of Course	**Đani Mohović, PhD, Full professor**		
Course	**Technology of transportation of bulk and special cargoes**		
Study Programme	Nautical Studies and Maritime Transport Technology		
Level	University undergraduate study program		
Type of Course	Elective		
Year of Study	3.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		**5**
	Number of Hours (L+E+S)		30+30+0 (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To acquaint students with the specifics of the technology of transportation of bulk, general and special cargoes by sea. In accordance with the requirements and recommendations of the STCW Convention, students are introduced to the International Regulations, Rules, Recommendations and standards related to the technology of transportation of bulk, general and special cargoes.

The aim is to get acquainted in detail with the structural features and equipment of bulk carriers, general cargo vessels, heavy lift ships and refrigerated cargo ships. Also, students are introduced to the specifics of cargo handling, loading / discharging and transportation of this type of cargo.

1.2. Prerequisites for Course Registration

Passed Cargo Handling 1 and Cargo Handling 2 exam

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. describe and analyze the specifics of the technology of bulk, general and special cargo transportation;
2. analyze and properly interpret international regulations, rules, recommendations and standards related to technology of transportation of these cargoes;
3. describe and analyze the structural specifics of bulk, general and heavy lift ships;
4. describe and analyze the specifics of the technology of transportation of bulk, general and special cargoes by sea;
5. be able to apply the specific principles of loading / discharging and transportation of bulk, general and special cargoes.

1.4. Course Outline

Historical development of bulk and special cargo transportation by sea. International regulations, rules, recommendations and standards that relate to the technology of transportation of bulk and special cargoes (general cargo, dangerous cargo (packaged and solid bulk), heavy cargo, refrigerated cargo). Characteristics of bulk, general and heavy lift ships, construction and equipping. The technology of loading / discharging and transportation of mentioned cargoes by sea. Familiarization with ship's documentation related to cargo handling and transportation. Planning and creating stowage plans. Creating cargo loading/discharging plans. Exercises with cargo calculations in the area of bulk and special cargo transportation by sea.

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 the course of the exercises, students solve various problematic tasks in the field of planning and transportation of bulk and special cargoes by sea, while using all types of ship tables and other documents related to the transport of cargo by sea. In addition, they also use computer programs related to planning, loading / discharging and cargo transportation.*	

1.7. Student Obligations

Active attendance of classes and at least 70% of completed classes.
Create a program for cargo calculations where tasks with practical examples of planning and transportation of bulk and special cargo should be solved (Load Master)..

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	2.5	Essay		Research	
Project		Continuous Assessment		Presentation		Practical work	0.5
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.

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

70% in class and 30% in final oral 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)

Continuous assessment:

- Create a program for cargo calculations where tasks with practical examples of planning and transportation of bulk and special cargo should be solved - all tasks from the program need to be solved.

Final exam:

Final exam (oral exam) checks the completeness of theoretical knowledge in the field of course Technology of transportation of bulk and special cargoes, it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

1.10. Main Reading

1. R. Mohović, Cargo Handling 1, lectures and exercises on the web pages of the Faculty of Maritime Studies in Rijeka, Faculty of Maritime Studies, University of Rijeka, 2011.
2. D. Vranić, R. Ivče, Tereti u pomorskom prijevozu, Pomorski fakultet Rijeka, Rijeka, 2010,
3. Vademecum Maritimus, Podsjetnik pomorcima, Pomorski fakultet u Rijeci, Rijeka, 2002.
4. Biblioteka pomorskog časnika, sv. 1, sv. 2, sv. 3, sv.
5. Krcanje i slaganje tereta, Ivo Buljan, Ognjen Prica **Zagreb 1980.**

1.11. Recommended Reading

1. Thomas Stowage 6 th edition, Brown Son & Ferguson Ltd., London 2012.
2. Krcanje i slaganje tereta, Ivo Buljan, Ognjen Prica Zagreb 1980.
3. D.J.House, Cargo Work 7 th edition, Butterworth-Heinemann, UK 2005.
4. J. Uršić, Stabilitet broda I dio, Sveučilište u Zagrebu, Zagreb, 1962.
5. D. R. Derrett, C. B. Barrass, Ship Stability for the Masters and Mates, Butterworth-Heinemann, Oxford, 2011.
6. I.C. Clark, The Management of Merchant Ship Stability, Trim and Strength 6 th edition, The Nautical Institute, London, 2006.
7. M. Milošević, Nauka o brodu III dio, Pomorska škola Kotor, Kotor, 1961.
8. D. Tinsley, Short Sea Bulk Trades, , Fairplay Publications, UK 1984.
9. W.D. Ewart, Bulk Carriers, Fairplay Publications, London 1983.
10. K.J. Rawson, E.C. Tupper, Basic Ship Theory, Vol.1, Butterworth Heinemann, Boston 2001.
11. Bulk Carriers – Guidelines for Surveys, Assessment and Repairs of Hull structure, IACS 2004.
12. Pravila za tehnički nadzor pomorskih brodova, Dio 4. - Stabilitet, Hrvatski registar brodova, Split, 2013.
13. Pravila za tehnički nadzor pomorskih brodova, Dio 23. – Prijevoz tereta, Hrvatski registar brodova, Split, 2009.
14. SOLAS, Consolidated 2009, IMO
15. International maritime solid bulk cargoes code (IMSBC Code), IMO, London 2012, with supplements
16. IMDG Code, IMO, London 2012.
17. Code of Safe Practice for Cargo Stowage and Securing, IMO, 2011 with Amendments
18. Code of Safe Practice for Ships Carrying Timber Deck Cargoes, IMO, London 2011.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Cargo Handling 1, lectures and exercises on web pages	unlimited	
Authorized lectures / presentations on the subject of Bulk and Special Cargo Transportation Technology on the website	unlimited	20-50
Cargoes in maritime transport	10	
Vademecum Maritimus – A reminder to seafarers	10	
Marine officer's library	10	
Loading and stowage of cargo	2	
Bulk Carrier Practice	2	

1.13. Quality Assurance

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3.2. Course description

Generic information			
Head of Course	PhD Mirano Hess		
Course	Business operations in shipping		
Study Programme	Nautical studies and maritime transport technology		
Type of Course	Optional course		
Year of Study	3		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours (L+E+S)		30 + 15 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

To equip students with the understanding of maritime market segmentation, the correlation of influencing factors between segments, the position of carriers and charterers in the competitive modern maritime market, and the comprehension of rights and responsibilities defined by specific documents in stakeholder operations.

1.2. Prerequisites for Course Registration

/

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

1. Explain and analyze the principles, elements, and organization of the maritime market.
2. Explain and analyze the correlation between freight, shipbuilding, second-hand ships, and ship recycling segments, and analyze interaction factors.
3. Discuss the impact of costs and profits of carriers and charterers, as well as business cycles, on maritime market trends, and explain the influence of market forecasting on carrier and charterer behavior.
4. Compare different fleet management models.
5. Analyze and explain the rights and responsibilities defined by specific documents in stakeholder operations.

1.4. Course Outline

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1. Principles of maritime trade, organization of the maritime market, and profit indicators.
2. Demand, ship supply, and freight trends.
3. Impact of the global economy on maritime transport.
4. Principles of maritime trade and the maritime market.
5. International maritime trade and port traffic.
6. Segmentation of the maritime market.
7. Shipping companies, profits, revenues, and operations.
8. Maritime transport services and ship supply.
9. Shipbuilding, new orders, and ship recycling.
10. Second-hand ship market.
11. Ship recycling.
12. Market evaluation of ships in overseas trade.
13. Fleet management.
14. Business documents and clauses.

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

1.7. Student Obligations

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

1.8. Assessment[1] of Learning Outcomes

Course attendance	1.5	Class participation		Seminar paper		Experiment	
Written exam	0.8	Oral exam		Essay		Research	
Project		Continuous Assessment	1.7	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, I5). Final exam: written exam on course material, minimum 50% of grade points required (I4, I5).
Examples of Learning Outcome Assessments:

1. List and explain the impact of production-trade advantages on the organization of the maritime market. (I1)
2. What is the percentage difference between orders and actual deliveries of new ships from shipyards in the last 5 years, and explain why this difference exists. (I2)
3. Besides ship supply and demand, what else influences freight rates in the open maritime market? (I3)
4. Compare and explain the difference between linear and matrix fleet management models. (I4)
5. Analyze and explain what "Clause 6. Inspection" in the BIMCO SHIPSALE 22 contract states and how it affects ship sales. (I5)

1.10. Main Reading

1. Hess, M.: Poslovanje u brodarstvu, 2025, na Merlinu (https://moodle.srce.hr).
2. Hess, M.: Poslovni dokumenti, 2025, na Merlinu (https://moodle.srce.hr).

1.11. Recommended Reading

1. M. Hess, Poslovno dopisivanje, 2025, na Merlinu (https://moodle.srce.hr).
1. Hopkins, I.: BUSINESS AND LAW FOR THE SHIPMASTER, Brown, Son & Ferguson, Ltd., Glasgow 2017.
2. Branch, A.: ECONOMICS OF SHIPPING PRACTICE AND MANGEMENT, Chapman and Hall Ltd, London, New York, 2003.
3. Maclachlam M.: The Shipmaster's Business Companion, 4th edition, NI, 2004.
4. Spruyt, J.: SHIP MANAGEMENT, Lloyd's of London Press Ltd, 2001.
5. Strickland, Thompson: STRATEGIC MANAGEMENT, Irwin, Boston 2005.
6. Babeli, K., Hess, S., Hess, M (2022) Quay crane failure analysis with FMEA method. Zbornik Veleučilišta u Rijeci, 10 (1): 423-437
7. Mišković, D., Ivče, R., Hess, M, Đurđević –Tomaš, I. (2022) The influence of organisational safety resource - related activities and other exploratory variables on seafarers safety behaviours. Journal of navigation, 75(2): 319-332
8. Hess, M., Pavić, I. F., Kos, S., Brčić, D. (2020) Global shipbuilding activities in the modern maritime market environment. Pomorstvo: scientific journal of maritime research, 34(2): 270-281

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Hess, M.: Poslovanje u brodarstvu, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	55
Hess, M.: Poslovni dokumenti, 2025, na Merlinu (https://moodle.srce.hr).	Unlimited	55

1.13. Quality Assurance

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3.2. Course description

Generic information			
Head of Course	Renato Ivče full professor, Ph.D		
Course	Container transport technology and ro ro technology		
Study Programme	Nautical Studies and Maritime Transport Technology		
ional	Optional		
Year of Study	3		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		(30 + 30 +0) (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The aim of the course is to acquaint students with the characteristics of container ships, Ro-Ro vessels, types of containers and Ro-Ro units, principles of stowage and securing of the considered cargoes, as well as the relevant legal regulations applicable to the considering categories of vessels. Students will also become familiar with the characteristics of container shipping companies, their associations, the development trends of the respective technologies, and the terminals involved.

1.2. Prerequisites for Course Registration

Passed Cargo handling 2 exam

1.3. Expected Learning Outcomes

1. Evaluate the importance of specific characteristics of container and Ro-Ro vessels, as well as trends in the development of the discussed vessel categories.

2. Assess the key features of containers and Ro-Ro units, and apply the principles of stowage and securing.

3. Apply securing systems to container and Ro-Ro units.

4. Identify the legal regulations relevant to container and Ro-Ro vessels.

5. Compare the operations of major container shipping companies and their associations, and, based on this knowledge, evaluate the development trends of the discussed technology.

6. Rank container terminals according to their significance.

1.4. Course Outline

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• The significance of containers in maritime cargo transport. Historical overview of the development of container shipping. Characteristics of container ships. Types, features, and importance of containers. Planning the loading, stowage, and securing of containers on bord ship. Modern oganizational forms of maritime container transport. The importance of alliances among liner container carriers. Carrier liability for cargo damage. Acceptance of oversized cargo on vessels fully intended for container transport. Historical development of Ro-Ro cargo transport by sea. Characteristics of Ro-Ro vessels. Transport and transshipment of containers and Ro-Ro units carrying dangerous goods. Stowage and securing of cargo on Ro-Ro vessels. Container and Ro-Ro terminals.

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

1.7. Student Obligations

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	2,0	Class participation		Seminar paper	0,5	Experiment	
Written exam		Oral exam	1,0	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.

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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 (0,75 ECTS (30%)) theory,
2nd preliminary exam – learning outcomes 1-5 (0,75 ECTS (30%)) practical tasks.
In addition, the student must achieve a minimum of 52% of points for each preliminary exam.
Final exam (1,0 ECTS (30%)) 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 / 10%)

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

1. Explain the generational classification of container ships.
2. Define the characteristics of containers used for transporting bulk cargo.
3. Define the requirements of the CSS Code.
4. Define a consortium as an association of container shipping companies.
5. Compare container traffic in the world's largest ports.

1.10. Main Reading

1. Vranić, D., Kos, S., Morska kontejnerska transportna tehnologija. Rijeka 2003.
2. Niels P. Petersson Stig Tenold Nicholas J. White, Shipping and Globalization in the Post-War Era Contexts, Companies,Connections, Palgrave Studies in Maritime Economics,2019.
3. D.J.House, Cargo Work, Butterworth-Heinemann
4. Ivče, R.., teaching materials from the course Container transport technology and ro ro technology on the teacher's personal web site (MERLIN) of the Faculty of Maritime Studies in Rijeka

1.11. Recommended Reading

1.Kos S., Zenzerović Z. : Modelling the Transport Process in Marine Container Technology , Promet , Vol. 15 , No. 1 , Zagreb , 2003.
2. Kos S. , Zenzerović Z. : Model of Optimal Cargo Transport Structure by Full Container Ship on Predefined sailing Route , Promet , Vol. 16 , No. 1 , Zagreb , 2004.
3. Kos S. , Bukša J. : Komparativna analiza Ro-Ro/Kontejnerski brod Feeder servisa Lošinjske plovidbe , Pomorstvo , God./Vol. 18 , Rijeka, 2004.
4. Kos S., Koljatić V. : Structural elements of container transportation systems , Proceedings ISEP 2002 , Ljubljana , 2002.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1. Morska kontejnerska transportna tehnologija	10	
2. Shipping and Globalization in the Post-War Era Contexts, Companies,Connections	web	
3. Cargo Work	web	
4. Teaching materials from the course Container transport technology and ro ro technology	web	

1.13. Quality Assurance

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.

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3.2 Course description

Generic information			
Head of Course	Sandra Tominac Coslovich, PhD, Full professor		
Course	Maritime English 6		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Elective		
Year of Study	3rd		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		4
	Number of Hours(L+E+S)		15+30+0 (1+2+0)

1.GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Course objectives meet the requirements of the enrichment level of the IMO STCW Convention 1995 and the requirements for obtaining a B.Sc. degree in Maritime Transport – Nautical Science and Safety of Navigation

- Maritime English education and training of students for shore-based jobs and on-board duties at the managerial level
- Acquiring specialized linguistic knowledge and English language skills required for education and training for the managerial level of certification under the provisions of the IMO STCW Convention 1995
- Furthermore, the goal is to develop the level of knowledge of maritime and general English language, as well as to master the linguistic knowledge and skills to enable students to learn, gain knowledge and adapt to the technological advances in the global maritime industry and further develop the four language skills (reading, listening, writing and speaking), presenting skills and ability to engage in business communication in the global maritime industry

1.2. Prerequisites for Course Registration

Completing the course Maritime English 5

1.3. Expected Learning Outcomes

After taking the course, the students will be able to:
1. Distinguish and define terms and concepts in English regarding the employment of seafarers, marine insurance, marine accidents, different types of loss, marine salvage and ship management.
2. Interpret information in English in either written or spoken form associated with the employment of seafarers, marine insurance, general and particular average and ship management
3. Discuss specialist topics in English in the field of the employment of seafarers, marine insurance, general and particular average and ship management.
4. Translate relevant texts from English into Croatian pertaining to the employment of seafarers, marine insurance, general and particular average and ship management.
5. Use writing and speaking skills to communicate in English among different specialists in maritime public and private sector.
6. Write a seminar paper and deliver a presentation on one maritime accident.

1.4.Course Outline

The course is based on the *communicative approach* to learning and teaching English as a Foreign Language and English as a Second Language. It is also focused on *Content-Based Learning* and *student-centered approach*. The course focuses on the acquisition and practical use of vocabulary/terminology (terms, polysemous words, multiple-word lexical units, collocations, lexical sets), discourse and pragmatic elements of shipping-related texts and communication, most frequent and typical grammatical structures and features restricted to maritime discourse (written and spoken) regarding the following topics: marine insurance – cargo insurance, hull and machinery insurance, P&I insurance, maritime accidents, general and particular average, marine salvage, employment of seafarers – FOC vessels, ITF, employment contracts, writing CVs, job interviews, ship management

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

Class attendance, activities, continuous written assessment, presentation and final oral exam

1.8. Assessment[1] of Learning Outcomes

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

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

1 written assessment/test (50%) + seminar/presentation (20%) + final oral exam (30%)

1. *Explain in English the difference between general and particular average*
2. *Define in English the job of an average adjuster*
3. *Enumerate and explain in English the types of risks covered by the P&I insurance*
4. *Translate the text on ship management from English into Croatian by using the appropriate terminology*
5. *According to the following scenario and using the relevant terms, write an query regarding the extent of insurance cover.*
6. *Assemble a seminar paper and deliver a presentation in English on a maritime accident of your choice*

1.10. Main Reading

- Pritchard, B. (1994) *Ship's Business in English*. Pomorski fakultet, Rijeka, selected units on Merlin (moodle.srce.hr)
- L. Jones & R. Alexander (2000) *New International Business English*. Cambridge Univeristy Press
- Teaching materials on e-learning platform Merlin (moodle.srce.hr)

1.11. Recommended Reading

- *MarEng & MarEng+,* Web-based Maritime English Learning Tool, EU Leonardo Project, http://mkkdok.utu.fi/mat/marengplus_learning_tool/index.html
- Kluijven, P. van (2003) *International Maritime English Programme.* Alk & Heijnen, Alkmaar
- Luzer-Spinčić (2002) *Gramatička vježbenica za pomorce*, Pomorski fakultet, Rijeka

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pritchard, B. (1994) *Ship's Business in English*. Pomorski fakultet, Rijeka, selected units	Available online Merlin (moodle.srce.hr)	20
L. Jones & R. Alexander (2000) *New International Business English*. Cambridge Univeristy Press	10	20
Teaching materials on e-learning platform Merlin (moodle.srce.hr)	Available online Merlin (moodle.srce.hr)	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 analyzed and a survey is conducted among the students once per semester.

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Course description

Generic information			
Head of Course	Head of Department - Vlado Frančić, Full Professor, Ph.D.		
Course	On-board training		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Mandatory		
Year of Study	3	Semester 6	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		5
	Number of Hours (L+E+S)		0 + 30 + 0 (0 + 2 + 0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The course aims to familiarize students with the procedures for conducting terrestrial, electronic, and celestial navigation, the manoeuvring characteristics of the ship, and the factors influencing ship manoeuvring. Furthermore, the course aims to instruct them in the professional performance of duties and teamwork on the bridge using both electronic and traditional navigation equipment, especially ARPA devices. Finally, it introduces them to the rules for the collision prevention at sea, the organization and management of the crew, procedures in emergencies, and the handling of safety and fire-fighting equipment.

1.2. Prerequisites for Course Registration

The prerequisite for enrolling in the course is having attended the courses Maritime Transport 2, Safety at Sea, and Terrestrial Navigation, as well as being enrolled in the course Professional Practice.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Elaborate a general understanding of procedures for the safe execution of tasks on the bridge during navigation.
2. Present and interpret the rules for the collision prevention at sea.
3. Interpret the characteristics and use of navigation systems and equipment, especially radar and ARPA devices.
4. Compare the factors influencing ship maneuvering.
5. Determine the characteristics and methods of using safety and fire-fighting equipment on board.
6. Present and outline the rules for the organization and management of the ship's crew.

1.4. Course Outline

Proper watchkeeping and the use of bridge procedures. Determining the ship's position using terrestrial objects and the use of radar ARPA devices and GPS. Plotting courses and positions on a nautical chart. Reading data from electronic chart systems. Checking magnetic compass deviation using various methods. Proper use of the sextant. Determining the beginning and end of twilight, the times of true sunrise and sunset, and the Sun's transit across the upper meridian. Calculating latitude using the Sun. Determining the ship's position using the following celestial methods: running fix, direct method, and altitude method. Identification of celestial bodies. Use of nautical publications. Voyage planning. Reading synoptic charts. Calculating water height. Applying the rules for the prevention of collisions at sea. Identification of navigation lights and day shapes of surrounding vessels. Proper monitoring of surrounding vessels and assessment of collision risk. Use of ARPA radar devices in search and rescue operations at sea. Familiarization with the maneuvering characteristics of the ship. Maneuvering the ship under all conditions (influence of external meteorological factors, interaction with other ships, interaction with the shore). Practical ship maneuvering. Anchoring maneuvers under various conditions. Embarkation and disembarkation of pilots. Monitoring communication

between the ship's master and the pilot. Preparing a preliminary cargo loading plan. Use of equipment and materials for securing cargo. Procedures for the safe lowering and raising of loading and unloading ramps. Procedures in emergency situations using life-saving and fire-fighting equipment.

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	Classes are held on the training ship "Kraljica mora" or another suitable vessel in the Kvarner Bay.	

1.7. Student Obligations

Student obligations are to complete all practical exercises on the training ship "Kraljica mora" or another suitable vessel. Students are required to attend 100% of the practical classes (100 points OR 100%).

1.8. Assessment[1] of Learning Outcomes

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

Learning outcomes are assessed through practical performance and analysis, as well as solving examination tasks on board related to navigation and the use of navigational and safety equipment, ship maneuvering, work and crew organization, safety at sea, and procedures in emergency situations.
A minimum of 80% knowledge in the specified areas and properly completed practical tasks are required.
Students with the appropriate certification (Officer of the Watch on a ship of 500 GT or more (STCW II/1)) or with navigation practice are exempt from attending the navigation practice.
Examples of learning outcome assessment in relation to the set learning outcomes are:

1. Determine the collision avoidance action in accordance with the current navigational situation on board (learning outcomes 1 and 2)
2. Interpret the current radar image (Learning outcome 3)
3. Present the operation of fire-fighting equipment on board (Learning outcome 5).

1.10. Main Reading

1. Grupa autora : Vademecum maritimus , podsjetnik pomorcima , Pomorski fakultet u Rijeci , Rijeka, 2014.
2. Zec, D., Sigurnost na moru, Pomorski fakultet u Rijeci, Rijeka, 2001.
3. Simović, A., Mornarske vještine, Školska knjiga, Zagreb, 1991.
4. International Code of Signals, IMO, 1987.

1.11. Recommended Reading

Annual editions of the following manuals:

1. Hrvatski hidrografski institut, "Peljar I. Jadransko more – istočna obala".
2. Hrvatski hidrografski institut, "Nautički godišnjak".
3. Hrvatski hidrografski institut, "Tablice morskih mijena".
4. Hrvatski hidrografski institut, "Radio služba za pomorce".
5. Hrvatski hidrografski institut, "Popis svjetala i signala za maglu – Jadransko more"

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

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1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1-3	*4*	*15*
4	*2*	

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; additionally, once a year, pass rate results are analyzed and appropriate measures are taken.

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3.2. Course description

Generic information			
Head of Course	**Đani Mohović, PhD, Full professor**		
Course	**Passage planning**		
Study Programme	Nautical Studies and Maritime Transport Technology		
Level	University undergraduate study program		
Type of Course	Mandatory		
Year of Study	3.		
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		**4**
	Number of Hours (L+E+S)		30+30+0 (2+2+0)

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the course is to acquaint students with the legal sources of maritime passage planning, the elements of a passage plan,principles and order of analysis of factors affecting the choice of fairway and type of navigation, division of maritime navigation, planning of the ocean, coast and port part of the voyage, vessel traffic management information systems for specific areas, the work of the VTS service and to familiarize students with the principles of international and national regulations of watchkeeping and explain the principles of watchkeeping and their implementation on the passage plan executing.

1.2. Prerequisites for Course Registration

Passed Terrestrial Navigation and Electronic Navigation exam

1.3. Expected Learning Outcomes

It is expected that the student will be able to:
1. Identify, describe and explain the elements of a passage plan
2. Identify factors that influence the choice of a waterway and select factors that are important for the intended voyage
3. Identify factors important for planning the oceanic, coastal and port parts of a voyage
4. Develop a passage plan for the specific voyage of the ship
5. Identify the objectives and functioning of the ships routine system in specific areas
6. Describe the objectives and functioning of the vessel traffic control navigation control and management system
7. Describe the principles and technological conditions for optimizing maritime voyages

1.4. Course Outline

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The concept of maritime voyage. International maritime navigation system. International sources. International official and unofficial organizations. International Navigation Safety Organizations. Shipowners' associations and non-governmental organizations. International and national regulations and rules on the safety of navigation. Basic Maritime Conventions for Navigation Safety. Technology support for navigation safety. Navigation support. World Navigation Alert Service. Characteristics and structure of maritime navigation. Passage planning. Ocean passage Planning. Coastal passage planning. Passage planning in limited waters (inland waterways and ports). Passage planning optimization. Ship operation in time. Passage planning cost model. Keeping deck watch in navigation, at anchorage and in port. Coastal State Rights and Obligations. Domain Theory. Collision hazard coefficient. Navigation guidance. Service control of maritime navigation. Communication with the Navigation Control Service. Models of structure. Means of control and data collection. Navigation management. STCW Convention requirements.

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	*During the exercises, students make passage plans for the ships in different navigation areas, working in groups, and each student has to independently create a specific passage plan. In addition, students make passage plans when sailing on navigation practice. Part of the practical work is carried out in the framework of* ***navigation practice on board.***	

1.7. Student Obligations

Active attendance of classes and at least 70% of completed classes and exercises and is required to prepare independently a specific passage plan before taking the exam. The student is required to pass the final exam.

1.8. Assessment[1] of Learning Outcomes

Course attendance	2	Class participation		Seminar paper		Experiment	
Written exam		Oral exam	2	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.

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

70% in class and 30% in final oral 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)

Continuous assessment:

-checking the completion of thematic tasks of passage planning on exercises on paper and electronic charts and creating a concrete passage plan - the student must show complete knowledge and skill

Final exam:

Final exam (oral exam) checks the completeness of theoretical knowledge in the field of course Passage Planning, it is necessary to achieve a minimum of 50% of the required theoretical knowledge.

1.10. Main Reading

1. Zec, D., Planiranje pomorske plovidbe, Pomorski fakultet u Rijeci, Rijeka, 1997.
2. Đ. Mohović, Passage planning, lectures on web sites
3. International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW), 1995.
4. Pravilnik o uvjetima i načinu održavanja straže, te obavljanju drugih poslova na brodu kojima se osigurava sigurna plovidba i zaštita mora od onečišćenja, NN 125/2005, NN 126/2008 (izmjene i dopune)
5. Swift, A. J., Bridge Team Management, London, 2004.

1.11. Recommended Reading

1. Master's thesis: Mohović, Đ., An algorithmic approach to maritime navigation planning, Faculty of Maritime Studies in Rijeka, Rijeka, 2003.
2. Anwar, N., Khalique, A., Passage planning – Principles, Witherbys Publishing, London, 2006.
3. Anwar, N., Khalique, A., Passage planning – Practice, Witherbys Publishing, London, 2006.
4. Rowe, R. W., The Shiphandler's Guide, London, 2000.
5. The Nautical Institute on Command, London, 2000.
6. House, D. J., Navigation for Master, London, 1998.
7. Bridge Watchkeeping, London, 2003.

1.12. Number of Main Reading Examples

Title	Number of examples	Number of students
Passage Planning, lectures on web pages	unlimited	
Maritime navigation planning - textbook	10	70
STCW Convention	3	
Pravilnik o uvjetima i načinu održavanja straže, te obavljanju drugih poslova na brodu kojima se osigurava sigurna plovidba i zaštita mora od onečišćenja, NN 125/2005, NN 126/2008	unlimited	
Bridge Team Management, London, 2004.	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.

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Course description

Generic information			
Head of Course	Vlado Frančić, Full Professor, Ph.D.		
Course	Passenger Transport by Sea		
Study Programme	Nautical Studies and Maritime Transport Technology		
Type of Course	Elective		
Year of Study	3	Semester	6
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 aims to explain to students all aspects of passenger transport by sea, i.e. use of all types of passenger ships, technological systems and methods for the transportation of passengers by sea. The student will be familiarized with international regulations, codes, recommendations and standards related to the passenger transport by sea. Additionally, during the course, the knowledge related to the technical and business management of the passenger ships will be explicated. Especially, activities carried out in the cruise industry, coastal and liner passenger transport, as well as in ro-ro passenger and HSC transport, will be analysed.

1.2. Prerequisites for Course Registration

A prerequisite for the course enrolment is a successfully completed course “Ship design and construction 1” (passed exam requirement).

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Explain international and national legal regulations related to the transport of passengers by sea and to the constructional characteristics of passenger ships.
2. Present and outline the basic technical and technological characteristics of passenger ships, ro-ro passenger ships, and high-speed passenger ships, as well as the embarkation equipment for passengers and vehicles.
3. Distinguish the differences between passenger ships, ro-ro passenger ships, and high-speed passenger ships.
4. Analyze trends in the cruise line market.
5. Compare transport activities in coastal liner services using different types of passenger ships.
6. Distinguish and compare the specific safety equipment used on passenger ships compared to cargo ships.

1.4. Course Outline

Development of passenger sea transport. Classification of passenger ships. International conventions, regulations, recommendations, and standards relating to the safety of passenger sea transport. Athens Convention on Carriage of Passengers by Sea. Passenger ships in coastal navigation. Passenger ships in international navigation. Constructional characteristics of passenger ships. Passenger-cargo ships. High-speed craft (HSC). Specific features and management methods of passenger and passenger-cargo HSC vessels. Management of passenger and ro-ro passenger ships. Technical systems and pollution prevention measures. Conditions for a safe stay in port. Crew organizational structure on passenger ships. Logistical support. Operation of passenger ships.

Types and characteristics of operating costs. Fixed and variable costs. Operating costs, port costs, crew and maintenance costs. Freight contracting. Conditions of liner transport. Market characteristics. Cruise voyages. Seasonal variations. Global supply and demand. Passenger and ro-ro passenger terminals and equipment for loading and unloading passengers and 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	Part of the exercises related to the technical characteristics of ships is delivered by visiting the appropriate ships in the port or shipyard. Part of the exercises are presented using multimedia. Selected subjects are presented by active captains of cruise ships.	

1.7. Student Obligations

Active participation in classes, with at least 70% attendance. Preparation and presentation of a PPT presentation. Oral exam.

1.8. Assessment[1] of Learning Outcomes

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

70% in class and 30% in the final exam (according to the Regulations on studying of the University of Rijeka and the Regulations on studying of the Faculty of Maritime Studies in Rijeka). Continuous assessment:

- Power Point presentation on a specific topic - acceptance of presentation is required.
- Active participation in classes - performing group assignments.

The final exam (oral exam) evaluation of completeness. A minimum of 50% of the required theoretical knowledge is required.

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

1. Explain the differences between the technical and technological characteristics of different types of passenger ships (Learning Outcomes 3)
2. List and explain the application of dedicated port equipment for ro-ro passenger ships (Learning outcomes 6).
3. Evaluate the development opportunities for cruise ships worldwide and by region (Learning outcomes 4).

1.10. Main Reading

1. Lecturer notes published on official webpage – e-learning platform – Merlin (https://moodle.srce.hr)
2. SHIP DESIGN AND CONSTRUCTION, editor Thomas Lamb, the Society of Naval Architects and Marine Engineers, (SNAME), NY, 2004.
3. Technical rules for statutory certification of the Croatian Register of Shipping, Croatian Register of Shipping, Split. part 21. Passenger transport.
4. PRAVILA ZA STATUTARNU CERTIFIKACIJU PUTNIČKIH BRODOVA U NACIONALNOJ PLOVIDBI, Croatian Register of Shipping, Split.

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

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1.11. Recommended Reading

1. House, David J.: MARINE FERRY TRANSPORTS – AN OPERATORS GUIDE, Witherby, London, 2002.
2. International Maritime Organization, HSC Code, London, 2002.
3. SOLAS - Consolidated text of the International Convention for the Safety of Life at Sea, 1974, and its Protocol of 1988: articles, annexes and certificates, IMO, London.
4. Jadrolinija Rijeka, BRODOVI I SUDBINE 1947–2007, editor Marijan Žuvić, Jadrolinija, Rijeka, 2007.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1	Electronic edition	25
2-4	2	25

1.13. Quality Assurance

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

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3.2. Course description

Generic information		
Head of Course	**Livia Maglić, PhD**	
Course	**Port and Terminal Technology**	
Study Programme	**Nautical Studies and Maritime Transport Technology**	
Type of Course	Elective	
Year of Study	3	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload	4
	Number of Hours (L+E+S)	30+15+0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

This course introduces students to the fundamental technical and technological aspects of ports and terminals. Special emphasis is placed on port infrastructure and superstructure, the technical operation of port facilities and assets, as well as the various types of warehouses and the functional requirements for their design and sizing.

1.2. Prerequisites for Course Registration

No.

1.3. Expected Learning Outcomes

After completing the course, students will be able to:

1. Define basic concepts related to technology, transport technology, ports, terminals, and port/terminal technologies.
2. Classify seaports based on various criteria.
3. Describe and explain the impact of technological developments in shipping on the evolution of ports and terminals.
4. Describe port and maritime facilities and evaluate their importance in the delivery of port services.
5. Explain the key factors influencing the planning and design of ports and terminals.
6. Describe and explain the technical and technological features of terminals handling different types of cargo.
7. Differentiate and compare technological processes across various terminal types.

1.4. Course Outline

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Conceptual explanations of the port, port system, material handling equipment and cargo handling technology. The term, types, and features of ports. Impact of technological changes in shipping on the development of ports and terminals. Conditions for port planning and terminal design. Basic seaport facilities. Port warehouses. Technological processes of cargo transportation in the port. Special-purpose ports. River ports - locks. Cranes. Material handling equipment. Specialised handling facilities. Bridge cranes. Elevators. Continuous material handling systems. Comparative analysis of the application of different material handling equipment. Conceptual explanations and types of terminals. Methodology for assessment of port terminal capacity. Multipurpose and universal terminals. Terminals for unified (unit) cargo: container terminals, RO-RO terminals, LUF, and LASH terminals. Terminals for dry bulk cargo: coal and iron ore terminals, grain terminals, and terminals for phosphate. Liquid cargo and liquefied terminals: oil and oil derivatives terminals, LNG and LPG terminals, chemical products terminals. Heavy and very heavy cargo terminals. Timber and wood products terminals. Terminals for fruits & foodstuffs. Terminals for livestock. Passenger terminals.

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. Passing two colloquiums
2. Final exam

1.8. Assessment of Learning Outcomes

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

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

The process of evaluating the acquired learning outcomes takes place following 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 assessment of knowledge during classes, 70% of the acquired learning outcomes are evaluated through the 1st colloquium – learning outcomes 1-4 (35%), 2nd colloquium – learning outcomes 5-7 (35%),

• In the final part of the exam, 30% of the acquired learning outcomes (1-7) are evaluated, whereby the student must achieve a minimum of 50% of points to pass the final exam.

Examples of evaluation of learning outcomes concerning set learning outcomes are:

1. Define the term wharf.
2. Specify how special-purpose ports are divided.
3. Explain and provide the formula for calculating berth throughput.
4. List and explain the basic functions of ports.
5. Specify the various criteria used to classify the warehouses.
6. Calculate, using a given example, the required number of berths in a port and determine the necessary warehouse dimensions per berth.

1.10. Main Reading

- Dundović, Č.: Lučki terminali, sveučilišni udžbenik, Pomorski fakultet u Rijeci, Rijeka, 2002.
- Dundović, Č., Kesić, B.: Tehnologija i organizacija luka, sveučilišni udžbenik, Pomorski fakultet u Rijeci, Rijeka, 2001.

1.11. Recommended Reading

- Agerschou, H., Lundgren, H., Sorensen, T., Ernst, T., Korsgaard, J.: Planning and Design of Ports and Marine Terminals, A. Wiley - Interscience Publication, New York, 1985.
- Bruun, P.: Port Engineering Harbor Planning Breakwaters and Marine Terminals, Vol. 1, Gulf Publishing Company, Houston, 1993.
- Dundović, Č., Poletan-Jugović, T., Jugović, A., Hess, S.: Integracija i koordinacija lučkog i prometnog sustava Republike Hrvatske, Znanstvena monografija, Pomorski fakultet u Rijeci, Rijeka, 2006.
- Dundović, Č., Kolanović, I.: Tehničko-tehnološka opravdanost izgradnje višenamjenskog terminala u riječkoj luci, Pomorstvo, god. 16, Rijeka, 2002.
- Kirinčić, J.: Luke i terminali, Školska knjiga, Zagreb, 1991.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Dundović, Č.: Lučki terminali, sveučilišni udžbenik, Pomorski fakultet u Rijeci, Rijeka, 2002.	6	30
Dundović, Č., Kesić, B.: Tehnologija i organizacija luka, sveučilišni udžbenik, Pomorski fakultet u Rijeci, Rijeka, 2001.	6	30

1.13. Quality Assurance

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

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Course description

Generic information			
Head of Course	Vlado Frančić, Full Professor, Ph.D.		
Course	Safety and Quality Management in Shipping		
Study Programme	**Nautical Studies and Maritime Transport Technology**		
Type of Course	Mandatory		
Year of Study	3	Semester 6	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		3
	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 familiarize students with the principles of quality, in general, as well as with the principles of safety management systems in shipping. The basic of safety management in shipping is an International Safety Management Code (ISM Code). Students will be familiar with the requirements in accordance with the ISM Code and the application onboard and generally in shipping. In addition, students will be introduced to practical examples of the application of the safety management system on board. Also, the objective of the course is to give students knowledge for maintaining and improving the general or dedicated safety management system on ship and in the shipping companies by the proper implementation of the provisions of the ISM Code.

1.2. Prerequisites for Course Registration

The prerequisite for enrolling in the course is having attended the course "Safety at Sea," and the prerequisite for passing the course is having passed the course "Safety at Sea."

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

1. Formulate the concept of quality.
2. Formulate and interpret the standardization of quality systems.
3. Present the specific characteristics of the development of safety management systems in maritime transport.
4. Present the implementation of the ISM Code in maritime transport.
5. Synthesize the obligations of shipowners and their employees and seafarers regarding the implementation of the ISM system.
6. Demonstrate the method for assessing the quality system, i.e., the ISM system on board and within the company.

1.4. Course Outline

Introduction, the concept of quality. What is quality? Historical development of the quality system. Process of establishing a quality system. Quality standardization (ISO standards). Maritime safety and environmental management system - concepts, regulations. Basic principles of safety management in shipping. International Safety Management System - ISM Code - concepts, division, general principles and objectives, application. Safety Management System (SMS). The responsibility and authority of the company and the master responsibility and authority. Developing plans for essential shipboard operations and critical situations. Certification, evaluation and control. Amendments to the ISM Code. Risk assessment and risk management as per of ISM requirements.

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1.5. Modes of Instruction	☒ Lectures ☐ Seminars and workshops ☒ Exercises ☐ E-learning ☐ Field work	☒ Practical work ☒ Multimedia and Network ☐ Laboratory ☐ Mentorship ☐ Other _____
1.6. Comments	Exercises includes practical work with ship documentation required by the ISM codes (check list, work permit, …)	

1.7. Student Obligations

Active participation in classes (lectures and exercises) and at least 70% attendance. Completed individual assignments. Oral exam.

1.8. Assessment[1] of Learning Outcomes

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

Student obligations are: regular attendance of classes and completion of homework assignments on assigned topics in the field of ISM Code application on board. Part-time students must prepare a seminar paper on an assigned topic.
The prerequisite for taking the final exam is the completion of exercises and homework assignments (individual tasks – application of the ISM Code; solving problem tasks in groups and individually).
The final exam (oral exam) assesses the comprehensiveness of theoretical knowledge in the field of quality and safety management in maritime transport (ISM Code). A minimum of 50% of the required theoretical knowledge must be achieved.
Examples of evaluating learning outcomes in relation to preset learning outcomes are:

1. Explain the importance of the Master's overriding authority and responsibility in accordance with ISM Code (Learning outcomes 4 & 5).
2. Enlist essential shipboard operations and explain the obligations of the company in accordance with ISM regulations (Learning outcomes 5).
3. Prepare risk assessment example (Learning outcomes 3, 4 & 5).

1.10. Main Reading

1. Teaching materials on the e-learning system – Merlin (https://moodle.srce.hr)
2. ISM Code, International Safety Management Code with guidelines for its implementation, London IMO, 2018 Edition.
3. Technical Rules, Croatian Register of Shipping, Safety Management System – Part 30, 2010 Edition.
4. Lazibat Tonći: Quality Management (in Croatian) – M.E.P., 2009.

1.11. Recommended Reading

1. Guidelines on The Application Of The IMO International Safety Management (ISM) Code, International Chamber of Shipping (ICS), 2024.
2. International safety Management Code, IMO Res A.741(18) with amendments (ISM Code), IMO, London.
3. Revised Guidelines on the Implementation of the International Safety Management (ISM) Code - IMO Resolution A.1118(30).
4. Technical rules for statutory certification of the Croatian Register of Shipping, CRS, Split.
5. ANDERSON, P. / WRIGHT, J. / NICHOLLS, S./ NOONAN, S. - Cracking the Code: The relevance of the

[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.

ISM Code and its impact on shipping practices. London, Nautical Institute, 2003. (ISBN 1- 8700 – 77 – 63 - 6).
6. ANDERSON, P. - ISM Code: A practical guide to the legal and insurance implications. 2nd ed. London.
7. Kondić Živko, Quality and ISO 9000 (in Croatian) – TIVA, Varaždin, 2002.

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
1-3	Elektronsko izdanje	25
4	2	25

1.13. Quality Assurance

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

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3.2. Course Description

Generic information		
Head of Course	Igor Vio, PhD	
Course	Transport Insurance	
Study Programme	Nautical Studies and Maritime Transport Technology	
Level	Undergraduate degree programme	
Type of Course	Elective	
Year of Study	3	
Estimated Student Workload and Methods of Instruction	ECTS Coefficient of Student Workload	4
	Number of Hours (L+E+S)	45 + 0 + 0

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

Students should become familiar with international and national legal framework regulating transport insurance and gain knowledge on insurance contract features, essential elements and claim types. During this course, the emphasis is on understanding of terms and conditions concerning particular transport insurance types including modalities of insurance in maritime, air, road and railway transport. Course objectives are also to expose international trade insurance scope and modalities, and to display the functioning, significance and types of reinsurance and co-insurance contracts.

1.2. Prerequisites for Course Registration

none

1.3. Expected Learning Outcomes

After passing the exam, students will be able:

1. To indicate and interpret the basic concepts of transport insurance
2. To specify and compare international and national legal sources of transport insurance, taking into account the specific circumstances of maritime, air and land transport
3. To explain and compare the characteristics and elements of individual types of transport insurance contracts, and list and differentiate various types of insurance policy and other documents
4. To interpret the significance, characteristics and impact of the Institute Cargo Clauses for the insurance of goods in domestic and international transport
5. To enumerate and analyse the features of the Institute Hulls Clauses, and compare the conditions for insurance of boats and yachts
6. To describe and interpret the structure, activities and functions of insurance companies and P&I clubs
7. To specify and describe the conditions for insurance in land (road and railway) and air transport
8. To compare and describe procedures for obtaining evidence, drafting documents and reporting damage claims to the insurer
9. To explain the concepts of co-insurance and reinsurance and describe their application

1.4. Course Outline

Transport insurance basic features, insurance contract features, insurance contract documents, transport insurance contract elements, claim types, insurance management, insurance of goods in the

national and international transport, marine hull and machinery insurance, P&I insurance, small craft and yacht insurance, foreign trade insurance, credit insurance, coinsurance and reinsurance.

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

1.7. Student Obligations

a) Students' main obligations are active course attendance with the preparation and presentation of seminar paper and they are required to pass three tests as continuous assessment during the term.

b) As a prerequisite for the final exam, students must score at least 35 out of a possible 70 points (50%) during the classes.

c) Students must score at least 15 out of a possible 30 points on final exams (50%).

1.8. Assessment[1] of Learning Outcomes

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

The evaluation procedure consists of continuous examination of knowledge in the form of three tests and a final exam. Examples of evaluating learning outcomes during classes and on the final exam:

1. Indicate and define the basic concepts and principles of transport insurance
2. List the international and national legal sources of transport insurance and explain their specific solutions for maritime, air and land transport
3. List the basic types of transport insurance contracts and compare their characteristics and elements, and specify and describe types of insurance policy and other relevant documents
4. Explain and discuss the importance of the Institute Cargo Clauses, and in particular elaborate on the application of specific cargo clauses in domestic and international maritime, land and air transport
5. Specify and describe the most important features of the Institute Hulls Clauses, then compare the terms and conditions according to the risks covered, and elaborate the specific insurance terms for boats and yachts coverage
6. Describe the organization of P&I clubs, explain their importance for liability insurance of shipping companies, and list the most important club functions
7. List the specific terms and conditions for land and air transport insurance and explain their application
8. Interpret the features of the procedures for obtaining evidence, analyse the specifics of drafting and collecting documents and demonstrate modalities of reporting damage claims to the insurer

[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.

9. Explain the concepts and types of co-insurance and reinsurance, describe their characteristics and elaborate their application.

1.10. Main Reading

Drago Pavić: Pomorsko osiguranje – pravo i praksa, s osnovama kopnenoga i zračnog transportnog osiguranja, Književni krug, Split, 2012.
Ivan Frančišković: Sustav transportnih osiguranja, Croatia osiguranje d.d., Zagreb, 1994.
Ivan Frančišković: Međunarodna osiguranja, predavanja na mrežnim stranicama Fakulteta.

1.11. Recommended Reading

Ivan Frančišković: Ekonomika međunarodnih osiguranja, Ekonomski fakultet Rijeka, 2005.
Drago Pavić, Pomorsko imovinsko pravo, Književni krug, Split, 2006.
Drago Pavić: Pomorsko pravo, knjiga III – Pomorske nezgode i pomorsko osiguranje, Visoka pomorska škola, Split, 2000.
Pomorski zakonik, Narodne novine br. 181/04. (s kasnijim izmjenama i dopunama)
Zakon o pomorskom dobru i morskim lukama, N.N. 158/03. (s kasnijim izmjenama i dopunama)

1.12. Number of Main Reading Examples

Title	*Number of examples*	*Number of students*
Pomorsko osiguranje – pravo i praksa, s osnovama kopnenoga i zračnog transportnog osiguranja	Sufficient (in library and book shop)	12
Sustav transportnih osiguranja	Sufficient (in library and book shop)	12
Međunarodna osiguranja	Available on the website (pfri.uniri.hr)	12

1.13. Quality Assurance

Quality assurance of the course performance is continuously monitored according to ISO 9001 system applied at the University of Rijeka Faculty of Maritime Studies. An analysis of results of the final exams and a student survey are conducted and appropriate measures are adopted for each academic year.

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Course description

Generic information			
Head of Course	Head of Department - Vlado Frančić, Full Professor, Ph.D.		
Course	Undergraduate final thesis		
Study Programme	**Nautical Studies and Maritime Transport Technology**		
Type of Course	Mandatory		
Year of Study	3	Semester **6**	
Estimated Student Workload and Methods of Instruction	ECTS coefficient of Student Workload		7
	Number of Hours (L+E+S)		**0 + 30 + 0**

1. GENERAL COURSE DESCRIPTION

1.1. Course Objectives

The objective of the 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 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 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 upon registration in the sixth (summer) semester of the undergraduate study program.

1.3. Expected Learning Outcomes

It is expected that the student will be able to:

- Recognize and formalize the problem.
- Methodologically and correctly process the addressed problem.
- Write a paper in which the introduction presents the problem, provides acceptable solutions to the problem, and the conclusion briefly summarizes the results relevant to solving the analyzed problem.

1.4. Course Outline

The thesis represents an independent professional or scientific treatment of a designated topic. Through the final thesis, the student demonstrates appropriate competencies and learning outcomes in solving problems from professional and scientific fields that constitute the content of the undergraduate study of Nautical Science and Maritime Transport Technology, as well as the application of theoretical and practical knowledge acquired during undergraduate studies.
During the thesis defense process, the student must demonstrate theoretical and practical knowledge in the fields of Nautical Science and Maritime Transport Technology at the Faculty.
The final thesis is assigned, written, and defended in the Croatian language. Exceptionally, the final thesis may be written and defended in English. The defense of the thesis is conducted orally before the Committee for the Defense of the Thesis.

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, in consultation with the supervisor, is required to select a topic for the final 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.zavrsnog.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_zavrsni_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.hr/web/hr/dokumenti/pravni_akti/Pravilnik.o.zavrsnom.radu.na.sveucilisnom.prijediplomskom.studiju.pdf

1.8. Assessment[1] of Learning Outcomes

Course attendance		Class participation		Seminar paper		Experiment	
Written exam		Oral exam		Essay		Research	3
Project	2	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.

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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 thesis. Following the presentation and responses to the questions posed, the expert committee renders a decision regarding the defense and assesses the thesis, considering the quality and scope of the work, the student's answers to 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 final 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, 2022 – available at: https://www.pfri.uniri.hr/web/hr/dokumenti/Upute_za_izradu_zavrsnog_rada_PFRI_14.%2004.%202022.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.