

Univerza v Ljubljani



**Hochschule
Flensburg**
University of
Applied Sciences



Sveučilište u Zadru
Universitas Studiorum
Jadertina | 1396 | 2002 |

**University of Ljubljana, Kongresni trg 12, 1000 Ljubljana,
Slovenia**

**Flensburg University of Applied Sciences, Kanzleistr. 91-93,
24943 Flensburg, Germany**

**University of Zadar, Mihovila Pavlinovića 1, 23000 Zadar,
Croatia**

**Joint Programme International Master in Maritime
Management**

Course Catalogue

Learning outcomes

Graduates of the degree programme are expected to have achieved at least the following programme learning outcomes at graduation:

In addition to the general objectives for master level (two years) studies as stated in local legislation and rules applicable to the Partner Institutions and their master programmes, the specific goals as outlined below must be fulfilled in regards to the I3M programme.

To obtain the I3M master degree upon completion of a two-year master programme, the student should have gained a deep theoretical knowledge within the maritime area as well as in the area of management.

With this knowledge the student should:

- A. be able to make informed and responsible decisions regarding environmental protection
- B. be able to understand and apply state of the art ship technology which can influence the development of a shipping company
- C. understand the factors that influence the management and selection of human resources
- D. be able to understand the ship energy systems and to optimize the ship propulsion operations
- E. be able to evaluate and use the maritime transport data as a fundament for decision making
- F. understand the IT elements and apply IT based solutions in management
- G. be able to analyse and synthesize the complexity of the port and transport systems in the light of contemporary technologies
- H. understand the implication of law in the maritime supply chain and in environmental aspects, and provide solutions
- I. be able to adjust shipping company organization structure to the surrounding conditions and the market requirements
- J. understand the economics of maritime business and interpret financial and budget statements to support managerial decisions
- K. be able to communicate effectively in a multi-cultural environment
- L. use acquired knowledge and technological skills to identify and solve problems, generating new ideas related to the field of study
- M. be able to critically discuss the mechanisms that underlie digital and industrial transformations and technical changes as well as their implications on development and society
- N. be able to evaluate theoretical and applicative concepts and current research from the field of data science and machine learning for dealing with industrial engineering and management problems
- O. be able to recognize the capabilities and challenges of data science and machine learning models and systems,

In addition to that the I3M students are expected to acquire the following core competences and skills:

- Mathematical competences in science and technology
- Digital competences
- Proficiency in English language
- Learning to learn
- Proficiency in English language with the focus on accounting terminology
- Sense of business and entrepreneurship
- Use of port and transport terminology
- An understanding of types of evidence
- It involves creativity, precision and thoroughness in archiving evidence
- basic competence in mathematical modelling and computer simulations
- basic competence in scientific research
- basic competence in data-driven modelling, i.e. in data science and machine learning
- effective learning;
- social and civic competences;
- sense of initiative and entrepreneurship;
- cultural awareness and expression.
- familiarization with basic fairway and ship elements
- An understanding ship motions during navigation in confined waters
- Sense of safety criteria for ship during navigation in fairway limited with depth and width.
- Communication, which involves foreign (English) language, mediation skill and intercultural understanding.
- An understanding of the changes caused by human activity.
- Sense of initiative and entrepreneurship as ability to turn ideas into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives.
- Communication between contracting parties, which involves knowledge of law.
- Negotiation skills and the ability to turn ideas/decisions into a contractual relationship.

These learning outcomes will be achieved through the following courses:

1. Maritime contracting
2. Ship energy efficiency and optimization
3. Management of shipping companies
4. Management information systems
5. Data science and machine learning applications in management
6. Crisis management in shipping
7. Introduction to confined water safety of navigation
8. Mathematical modelling and simulations
9. Maritime logistics
10. Finances and accounting in maritime business
11. Coastal engineering
12. Maritime safety and risk management
13. Legal conflicts in shipping
14. Marine engineering and environmental protection

- 15. Water management aboard ships
- 16. Research project in marketing
- 17. Simulation
- 18. Supply chain management fundamentals
- 19. Advanced planning and control
- 20. Business valuation

The alignment of the learning outcomes and the courses is presented in the following matrix:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	X							X	X						
2	X	X		X	X						X				
3		X	X						X		X				
4			X		X	X					X				
5											X		X	X	X
6		X			X							X			
7							X					X			X
8	X				X							X			
9	X		X		X		X					X			
10			X		X				X	X		X			
11	X	X		X	X		X					X		X	
12			X		X		X				X	X		X	X
13								X	X						
14	X	X		X											
15	X			X											
16												X		X	
17												X	X	X	
18								X	X	X					
19									X	X				X	
20			X							X					

Curriculum

Semester 1 (University of Zadar)			
Course title	Lecturer	Contact hours	ECTS
Maritime contracting	Marija Pijaca	30+15	5
Ship energy efficiency and optimization	Josip Orović	30+15	5
Management of shipping companies	Toni Bielić	30+15	5
Management information systems	Dino Županović	30+15	5
Data science and machine learning applications in management	Marko Valčić	30+15	5
Optional courses			
Crisis management in shipping	Luka Grbić	30+15	5
Introduction to confined water safety of navigation	Mate Barić	30+15	5

Semester 2 (Maritime Faculty Portorož)			
Course title	Lecturer	Contact hours	ECTS
Mathematical modelling and simulations	Milan Batista	45+30	6
Maritime logistics	Elen Twrdy	45+30	6
Finances and accounting in maritime business	Marina Zanne	45+30	6
Coastal engineering	Marko Perković	45+30	6
Maritime safety and risk management	Peter Vidmar	45+30	6

Semester 3 (University of Applied Sciences Flensburg)				
Course title		Lecturer	Contact hours	ECTS
Legal conflicts in shipping		Sander Limant	60	6
Marine engineering and environmental protection		Rom Rabe	30+30	6
Water management aboard ships		Wiktorija Vieth	60	6
Optional courses				
MODULE 1	Research project in marketing	Nelly Oelze, Alexander Deseniss	120	12
MODULE 2	Simulation	Volker Looks	60	6
	Supply chain management fundamentals	Marcus Brandenburg	60	6
MODULE 3	Advanced planning and control	Thorsten Kümper	60	6
	Business valuation	Martin Klem	60	6

Semester 4	
Master thesis research project	30 ECTS

Teaching and assessment Methods

Each course syllabus lists the teaching and assessment methods used in that particular course, and the here are the definitions of the terms used there:

Teaching methods:

- | | |
|---------------------|--|
| 1. Lecture | Coherent presentation of the subject matter |
| 2. Exercise | Processing and deepening of the subject matter in small groups |
| 3. Seminar | Working discussions in small groups on special areas with presentations and/or that the participants have worked out independently |
| 4. Laboratory | Acquisition and deepening of knowledge by working on practical experimental tasks in small groups |
| 5. Project | Design and realization of practical solutions and questions in teamwork |
| 6. Workshop | Moderated dialogue in a small group, in which tasks are discussed and practical solutions are found. |
| 7. Distance courses | Types of courses 1 - 6, organized by the electronic networking of teachers and students |
| 8. Study trip | A trip led by a member of the teaching staff |
| 9. Other courses | Methods other than those listed under items 1 to 8 |

In the exams, the candidates should prove that they can recognize a problem using the usual methods in their field and be able to name ways to a solution, with limited time and resources. The exams are taken by all candidates of the subject and the relevant examination date simultaneously and under examination conditions.

Types of examinations

- | | |
|-----------------|--|
| 1. Written exam | Duration of an exam is at least 45 minutes and at most 180 minutes. The examiner(s) authorised for the assessment of the exams, the possibilities to resit the exam and the possibilities to be re-examined orally are defined by the study regulations of the relevant institution. In some cases, the passing the written exam is sufficient to obtain the grade, while in other cases it is only a part of exam, and it is followed by the oral part, as defined by each course syllabus. |
|-----------------|--|

2. Oral exam

Duration of an oral examination should be for each candidate usually 30 minutes, for group exams usually 15 minutes for each candidate. Candidates should prove that they recognize the connections of the examination area and be able to classify special questions in these connections. An oral exam should also be used to determine whether the candidates have broad basic knowledge. Oral exam can be the only examination method used for particular course, a part of the exam that follows after the written exam, or a re-examination method, as defined by the study regulations of the relevant institution and by the course syllabus.

3. Other examinations

Other examinations can include term papers, presentations, practical exercises, case studies, projects, drafts, computer programs or a combination of the forms mentioned. In principle, up to three possible forms are defined by the course syllabus. If there is a choice regarding the form of the other examination, this should be clearly presented to the students at the beginning of the lectures for each course.

Course syllabi

Course title	Code No.
Maritime Contracting	

Semester	Course status (mandatory or optional)
First	Mandatory

Lecturer(s)	E-Mail
Marija Pijaca Božena Bulum	mpijaca@unizd.hr bbulum@hazu.hr

Contact hours per week	Credit Points	Workload (hours per semester)	
2 (L)+1(S)	5	Presence	
		Lecture	30
		Seminar	15
		Practice	-
		Laboratory	-
		Self-study	45
		35	-
		-	-

Media (equipment)	Teaching aids (literature, group work ...)
White and smart board and overhead projector	The course is comprised of readings, lectures, group discussions, two take home assignments (individual seminar paper and group project) and assignment presentations.

Enrolment requirements and entry competences required for the course
Proficiency in English and basic computer skills.

Conditions for permission to take the exam
Successfully presented seminar paper and group project.

Assessment methods and criteria
Assessment is carried out by means of evaluation of: Seminar paper (20%) Group project (20%) Written exam (30%) Oral exam (30%)
Grades: Insufficient 0-50%

Sufficient 51%-69%
Good 70%-79%
Very good 80%-89%
Excellent 90%-100%

Learning outcomes at the programme level to which the course contributes

To understand the importance of the principles of maritime contracting, especially the importance of clearly defining a contractual relationship in maritime affairs as a good maritime manager.

Learning Outcomes

Professional competence	Key skills
<ol style="list-style-type: none"> 1. To understand the principles of contractual relations and the obligatory law. 2. To be able to recognize the rights, obligations and liability of parties of different types of contracts that occur in the maritime business. 3. To be able to work independently in the interest of the contracting party they represent. 4. To rank contractual conditions. 5. To select the best contract option for the contracting party they represent. 6. To be able to make decisions based on law in the interest of the contracting party they represent. 	<p>Communication between contracting parties, which involves knowledge of law.</p> <p>Negotiation skills and the ability to turn ideas/decisions into a contractual relationship.</p> <p>Knowledge of the basic elements of a contractual rights, obligations and liability in maritime contracting.</p>

Applicability in other courses/programs

This course is suitable for study programs dealing with management of shipping companies.

Content

1. INTRODUCTORY (GENERAL) PART:

- **Basic principles of contractual relations**
- **Basic principles of obligatory law**
- **Definition and types of obligation**

2. SPECIAL PART:

- **Types of maritime contracts**
- **Shipbuilding contract**
- **Contracts for the carriage of goods by sea**
 - **Shipping charters (time charter, voyage contract, sub-contract)**
 - **Bill of lading issues**

- **Contract for the carriage of passengers and baggage by sea**
- **Towing contract**
- **Bareboat and demise charter contract**
- **Direct and multimodal carriage**
- **Maritime agency contract**
- **Maritime insurance contract**
- **Salvage contract**
- **Yacht and boat charter agreement**
- **Storage contract (in port warehouses)**
- **Piloting contract.**

Literature

Essential:

Baughen S. (2009): Shipping Law, 4th ed

Curtis S. (2012): The Law of Shipbuilding Contracts, 4th ed

Gürses O. (2016): Marine Insurance Law, 2nd ed

**Standard contract forms for shipbuilding, time charter, voyage charter, towing, bareboat and demise charter, salvage, yacht and boat charter agreement, storage contract (in port warehouses), piloting contract
Bill of lading contract forms**

Supplementary:

Coghlin T., Baker A.W., Kenny J., Kimball J.D. (2008): Time Charters, 6nd ed

Young T et al (2007): Voyage Charters, 3rd ed

Aikens R., Lord, R., Bools, M (2006): Bills of Lading

Davis M. (2005): Bareboat Charter, 2nd ed

Amendment Log

Version No.:	Date:	Changes:	Name:
1	2		

Course title	Code No.
Ship energy efficiency and optimization	

Semester	Course status (mandatory or optional)
1st semester	Mandatory

Lecturer(s)	E-Mail
Josip Orović	jorovic@unizd.hr

Contact hours per week	Credit Points	Workload		
2+1	5	Presence		Self-study
		Lecture	30	50
		Seminar		30
		Practice		
		Laboratory		
		Simulator	15	

Media	Teaching aids
Overhead projector, white and smart board, engine room and nautical simulators	Presentations, check lists, work groups, manuals, videos

Enrolment requirements and entry competences required for the course
None

Conditions for permission to take the exam
Completed simulator exercises and successfully presented seminar paper

Assessment methods and criteria
Assessment is carried out by means of evaluation of: Seminar paper and presentation (35%) Written exam (35%) Oral exam (30%)

Learning outcomes at the programme level to which the course contributes
Students should be: - able to understand the ship energy systems and to optimize the ship propulsion operations; - able to make informed and responsible decisions regarding environmental protection;

- able to understand and apply state of the art ship technology which can influence the development of a shipping company;
- able to evaluate and use the maritime transport data as a fundament for decision making;
- able to communicate effectively in a multi-cultural environment.

Learning Outcomes

Professional competence	Key skills
<p>The students should be able:</p> <ol style="list-style-type: none"> 1. To analyze different propulsion plants regarding the energy efficiency; 2. To identify parameters that influence ship energy efficiency; 3. To evaluate efficiency of different propulsion plants 4. To recommend the options for ship propulsion plant optimization 5. To select an appropriate maintenance model and to justify selection 6. To critically assess the various ship inspections 7. To determine and assess the effect of various faults on ship propulsion plants 	<ul style="list-style-type: none"> - communication in foreign languages; - mathematical competence and basic competences in science and technology; - digital competence; - learning to learn; - social and civic competences; - sense of initiative and entrepreneurship; - cultural awareness and expression.

Applicability in other courses/programs

This module is suitable for study programs in technical universities dealing with efficiency and optimization of marine propulsion plants.

Content

- Energy balance of ship propulsion plants: efficiency at different loads, different propulsion plants: slow speed diesel engine propulsion plant, RoPax vessel with four stroke diesel engines, steam turbine propulsion plant, diesel electric propulsion plant, combined propulsion plants - COGES or similar - hybrid, alternative fuels and GHG emission.
- Influence analysis of certain parameters at efficiency and total costs of ship plant. Engine data and weather condition: speed, power, weather, fuel oil consumption, exhaust emission. Weather routing, slow steaming, usage of different fuels, load distribution, hull and propeller fouling and similar.
- Simulation of different conditions at ship engine room simulators. Influence of different weather conditions (wind, wave, current, temperature, pressure, and humidity), maneuvering, port and open sea conditions, loading and discharging cargo, shallow water and etc.
- Ship propulsion plant and engine room process optimization: theory and practical application. Assessing potential savings in Main and Auxiliary Engines and Machinery Operation and Maintenance.
- Ship energy efficiency Management plant (SEEMP).

- **Ship inspection and classification. Managing technical systems: Planned maintenance Systems and Purchasing, Inspections: Vetting, PSCV Flag state, USCG.**
- **Advanced diagnostics: simulation and analysis of different conditions in the engine rooms of different propulsion plants (fuel oil Injection, quality, type, timing and etc.).**

Literature

- **IMO Training Course on Energy Efficient Operation of Ships**
- **ABS: Ship Energy Efficiency Measures**
- **S.S. Rao: Engineering Optimization: Theory and Practice; John Wiley & Sons, Inc., 1996**
- **A. Ravindran; K.M. Ragsdell; G.V. Reklaitis: Engineering optimization, Methods and Application; ; John Wiley & Sons, Inc., 2006**
- **Chapra, S.S.; Canale, R.P.: Numerical methods for engineers**
- **Matlab: Optimization toolbox, User's Guide**
- **International Maritime Organisation, Marine Environment Protection Committee, 2012 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP), MEPC.213(63)**
- **Lloyd's Register: Implementing a Ship Energy Efficiency Management Plan (SEEMP) Guidance for shipowners and operators**
- **Instruction manuals**
- **Simulator manuals**

Amendment Log

Version No.:	Date:	Changes:	Name:
1.	30.01.2020.		Josip Orović

Course title	Code No.
Management of Shipping Companies	

Semester	Course status (mandatory or optional)
First	Mandatory

Lecturer(s)	E-Mail
Toni Bielić	tbielic@unizd.hr

Contact hours per week	Credit Points	Workload (hours per semester)		
2+1	5	Presence		Self-study
		Lecture	30	60
		Seminar	15	45
		Practice		
		Laboratory		

Media	Teaching aids (literature, group work ...)
White and smart board, overhead projector	The course is comprised of readings, lectures, group discussions, two take home assignments (individual seminar paper and group project) and assignment presentations.

Enrolment requirements and entry competences required for the course

Proficiency in English and basic computer skills.

Conditions for permission to take the exam

Successfully presented seminar paper and group project.

Assessment methods and criteria

Assessment is carried out by means of evaluation of:

Seminar paper (20%)

Group project (20%)

Written exam (30%)

Oral exam (30%)

Grades:
Insufficient 0-50%
Sufficient 51%-69%
Good 70%-79%
Very good 80%-89%
Excellent 90%-100%

Learning outcomes at the programme level to which the course contributes

To understand and apply state of the art ship technology which can influence the development of a shipping company.

To be able to make informed decisions in the management and selection of human resources.

To be able to adjust shipping company organization structure to the surrounding conditions and the market requirements.

To be able to communicate effectively in a multi-cultural environment.

Learning Outcomes

Professional competence	Key skills
<ol style="list-style-type: none"> 1. To rank conditions of the external environment and their impact on the shipping company. 2. To critically asses processes of the shipping company. 3. To select an organizational management model and to justify selection. 4. To evaluate different types of organizational culture. 5. To estimate different approaches to human resource management. 6. To valorize the impact of the various factors on safety management in the shipping companies 	<p>Communication, which involves foreign (English) language, mediation skill and intercultural understanding.</p> <p>An understanding of the changes caused by human activity.</p> <p>Sense of initiative and entrepreneurship as ability to turn ideas Into action. It involves creativity, innovation and risk-taking, as well as the ability to plan and manage projects in order to achieve objectives.</p>

Applicability in other courses/programs	
This course is suitable for study programs dealing with management of shipping companies.	

Content	
<ol style="list-style-type: none">1. Introduction - the shipping company.2. Framework for the analysis of the organization and management of shipping companies. Socio-technics systems theory.3. External environment of the shipping companies.4. Analysis of the processes and systems of shipping companies.5. The shipping company organization.6. Factors that influence the shipping company organization.7. Design of jobs and ways of organizing work.8. Human resource management based on socio-technics systems principles.9. Teamwork culture.10. Managing cultural diversity.11. Human resource management of shore based staff.12. Management of seagoing personnel13. Safety management in shipping companies - ISM Code.14. Accident analysis and development of the SMS.15. Outsourcing of ship management.	

Literature	
<p>Essential: Theotokas, I. (2018) Management of Shipping Companies, Routledge 2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN.</p>	

Supplementary:

1) Daft, R.L. (2010) Organization Theory and Design. 10th ed. Mason, OH: South Western Cengage Learning.

2) Hofstede, G, Hofstede, GJ, Minkov, M. (2010) Cultures and Organizations: Software of the Mind. Revised and expanded 3rd Edition. New York: McGraw-Hill USA,

3) Luthans, F. (1995) Organizational Behavior. New York: McGraw-Hill.

4) Reason, J. (2016) Managing the Risks of Organizational Accidents. Routledge Taylor & Francis

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Management Information Systems	

Semester	Course status (mandatory or optional)
I.	Mandatory

Lecturer(s)	E-Mail
Dino Zupanovic	dino.zupanovic@unizd.hr

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence		Self-study
2+1	5	Lecture	30	45
		Seminar	15	45
		Practice		
		Laboratory		

Media	Teaching aids
White board, overhead projector	Lectures and individual and or small group (up to two students per group) seminar assignments and presentations

Enrolment requirements and entry competences required for the course
Ground knowledge (passed course) in computer science

Conditions for permission to take the exam
Completed seminar

Assessment methods and criteria
Assessment is carried out by means of evaluation of: Seminar paper and presentation (50%) Written exam (50%) Grades: Insufficient 0-50% Sufficient 51%-69% Good 70%-79% Very good 80%-89% Excellent 90%-100%

Learning outcomes at the programme level to which the course contributes
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1. To evaluate and use the maritime transport data as a fundament for decision making
2. To understand the IT elements and apply IT based solutions in management
3. To be able to communicate effectively in a multi-cultural environment

Learning Outcomes

Professional competence	Key skills
<ol style="list-style-type: none"> 1. Explain why information systems are essential to business 2. Describe how computers process data into useful information for problem solving and decision making 3. Identify the functions of different types of information systems in business 4. Explain what makes an information system a strategic information system 5. Identify fundamental requirements for developing strategic information systems 6. Identify various business functions and the role of ISs in these functions 7. Explain supply chains and how information technology supports management of supply chains 8. List and explain the phases in decision making 9. Differentiate structured and unstructured decision making 10. Explain the concepts of data mining and online analytical processing 11. Describe the primary goals of information security <p>Name the main types of risks to information systems</p>	<ol style="list-style-type: none"> 1. Communication in foreign languages 2. Mathematical competence and basic competences in science and technology 3. Digital competence 4. Learning to learn 5. Sense of initiative and entrepreneurship

Applicability in other courses/programs

This module is suitable for study programs involved with and related to use of information systems for management purposes.

Applicability in other courses/programs

This module is suitable for study programs involved with and related to use of information systems for management purposes.

Content

1. The Information Age
 1. Business Information Systems – Overview

- 2. Strategic Uses of Information Systems
- 3. Business Functions and Supply Chains
- 2. Information Technology
 - 1. Business Hardware
 - 2. Business Software
 - 3. Business Networks and Telecommunications
 - 4. Databases and Data Warehouses
- 3. Web-Enabled Commerce
 - 1. The Web-Enabled Enterprise
 - 2. Challenges of Global Information Systems
- 4. Decision Support and Business Intelligence
 - 1. Decision Support and Expert Systems
 - 2. Business Intelligence and Knowledge Management
- 5. Planning, Acquisition and Controls
 - 1. Systems Planning and Development
 - 2. Choices in Systems Acquisition
 - 3. Risks, Security and Disaster Recovery

Literature

Amendment Log

Version No.:	Date:	Changes:	Name:
1	2020-01-30	Initial version	Dino Zupanovic
2	2022-04-20	ECTS update	Dino Zupanovic

Course title	Code No.
Data science and machine learning applications in management	

Semester	Course status (mandatory or optional)
1st semester	Mandatory

Lecturer(s)	E-Mail
Marko Valčić	mvalcic@unizd.hr

Contact hours per week	Credit Points	Workload	
		Presence	Self-study
2+1	5	Lecture	30
		Seminar	
		Practice	15
		Laboratory	
		Simulator	

Media	Teaching aids
Overhead projector, white board, PC/laptop, graphic tablet, software environment for data science and machine learning (MATLAB, Python)	Presentations (ppt/pdf), references (pdf), video materials (mp4), e-learning materials (online), small group work.

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Completed/solved exercises/problems and successfully presented seminar paper.

Assessment methods and criteria
Assessment is carried out by means of evaluation of: Seminar paper and presentation (35 %) Written exam (35 %) Final (oral) exam (30 %)

Learning outcomes at the programme level to which the course contributes
Students should be able: – to critically discuss the mechanisms that underlie digital and industrial transformations and technical changes as well as their implications on development and society

- to evaluate theoretical and applicative concepts and current research from the field of data science and machine learning for dealing with industrial engineering and management problems
- to recognize the capabilities and challenges of data science and machine learning models and systems,
- to communicate effectively in a multi-cultural environment.

Learning Outcomes

Professional competence	Key skills
<ol style="list-style-type: none"> 1. To classify and compare various concepts and methods of data science and machine learning from engineering and management point of view 2. To explain and discuss the key principles of selected data science and machine learning concepts and methods 3. To identify problems and propose appropriate solutions in implementing various data science and machine learning strategies 4. To analyse the process of building and developing machine learning projects in industry and identify the main issues and obstacles 5. To compare and discuss application of different machine learning methods and provide guidelines for selecting the most appropriate one depending on predefined criteria 6. To distinguish various advance approaches of machine learning and deep learning and evaluate their capabilities for solving complex problems 7. To evaluate the results of risk assessment related to adopted models 	<ul style="list-style-type: none"> - communication in English - basic competence in data science and machine learning; - basic competence in scientific research: - effective learning; - social and civic competences; - sense of initiative and entrepreneurship; - cultural awareness and expression.

Applicability in other courses/programs

This module is suitable for study programs in technical universities dealing with data science, machine learning and deep learning applications, Industry 4.0, and industrial and engineering management.

Content

- Introduction to data science, machine learning and deep learning. Concepts, terminology and application areas.
- Machine learning and deep learning topics. The impact of machine learning and deep learning on technology and society.
- Data-driven modelling vs first principle modelling. Predictive models and learning from data.

- Scoping and managing machine learning initiatives and projects. Building and developing machine learning projects in industry.
- Digitization and digitalization. From digital transformation to semi-autonomous and fully autonomous systems. Artificial intelligence (AI) and Industry 4.0.
- The Internet of Things (IoT). Cyber-physical systems and emerging technologies. Advanced data analytics.
- Industry 4.0 and associated concepts: Management 4.0, Logistics 4.0, Supply Chain 4.0, Predictive maintenance 4.0, Maritime 4.0. Trends and perspectives.
- From data to decisions: descriptive, diagnostic, predictive and prescriptive approaches. Data analytics workflow.
- Data preparation: importing, cleaning, aggregation, big data handling, reduction, transformation, discretization, feature extraction, visualization.
- Machine learning methods in a nutshell. Supervised and unsupervised learning. Regression and classification. Clustering.
- From linear and logistic regression to neural networks. Programming languages and software environments for data science and machine learning.
- Building the machine learning model.
- Machine learning vs. deep learning. Deep learning methods in a nutshell. Applications in engineering and management.
- Beyond machine and deep learning. Reinforcement learning. Applications in engineering and management.
- Sensitivity and uncertainty analysis of machine and deep learning models. Risk analysis.

Literature

- Sharda, R., Delen, D., Turban, E. (2020). Analytics, Data Science, & Artificial Intelligence: Systems For Decision Support, 11th Ed. Pearson Education, Inc., Hoboken, NJ, USA.
- Kroese, D.P., Botev, Z.I., Taimre, T., Vaisman, R. (2020). Data Science and Machine Learning: Mathematical and Statistical Methods. CRC Press, Taylor & Francis Group, Boca Raton, FL, USA.
- Somogyi, Z. (2021). The Application of Artificial Intelligence: Step-by-Step Guide from Beginner to Expert. Springer Nature, Cham, Switzerland.
- Kordon, A.K. (2020). Applying Data Science: How to Create Value with Artificial Intelligence. Springer Nature, Cham, Switzerland.
- Hudgeon, D., Nichol, R. (2020). Machine Learning for Business: Using Amazon Sagemaker and Jupyter. Manning Publications Co., Shelter Island, NY, USA.
- Reagan, J.R., Singh, M. (2020). Management 4.0: Cases and Methods for the 4th Industrial Revolution. Springer Nature Singapore Pte Ltd., Singapore.

Amendment Log

Version No.:	Date:	Changes:	Name:
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1.0	1 April 2021	1st version	Marko Valčić

Course title	Code No.
Crisis management in shipping	

Semester	Course status (mandatory or optional)
First	Optional

Lecturer(s)	E-Mail
Luka Grbic	lugrbic@unizd.hr

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
2+1	5	Lecture	30	60
		Seminar	15	30
		Practice		
		Laboratory		

Media (equipment)	Teaching aids (literature, group work ...)
White and smart board, overhead projector	The course is comprised of readings, lectures, group discussions, home assignments (individual seminar paper).

Enrolment requirements and entry competences required for the course
Proficiency in English and basic computer skills.

Conditions for permission to take the exam
Successfully presented seminar paper.

Assessment methods and criteria
<p>Assessment is carried out by means of evaluation of:</p> <p>Seminar paper (20%) Written exam (40%) Oral exam (40%)</p> <p>Grades: Insufficient 0-50% Sufficient 51%-69% Good 70%-79%</p>

Very good 80%-89%
Excellent 90%-100%

Learning outcomes at the programme level to which the course contributes

To understand and apply problematic of evidence in crisis
To be able to use no blame approach in safety investigations
To be able to apply role of the average adjuster in critical situation

Learning Outcomes

Professional competence	Key skills
1. To rank evidence and Masters responsibilities for collecting evidence. 2. To critically assess the surveyor's perspective. 3. To select the marine claims on broker's perspective. 4. To evaluate different types of evidence for insurance claims. 5. To valorize the impact of P&I approach.	Communication An understanding of types of evidence It involves creativity, precision and thoroughness in archiving evidence

Applicability in other courses/programs

This course is suitable for study programs dealing with management of crisis in shipping

Content

- 1. Cargo Damage, Loss and Shortage**
- 2. Insurance cover and damage or failure of ship's own equipment**
- 3. Underperformance and over-consumption claims**
- 4. Unsafe ports and berths**
- 5. Damage to fixed and floating objects**
- 6. Oil Pollution**
- 7. General Average**
- 8. Salvage**
- 9. Collisions**
- 10. Labour disputes and disciplinary procedures**
- 11. Personal Injury**
- 12. Stowaways**
- 13. Refugees**

Literature

- 1. The Nautical Institute (1992), THE MARINER'S ROLE IN COLLECTING EVIDENCE (first edition), 202 Lambeth Road, LONDON**
- 2. The Nautical Institute (2002),THE MARINER'S ROLE IN COLLECTING EVIDENCE (second edition), 202 Lambeth Road, LONDON**
- 3. The Nautical Institute (2017), GUIDELINES FOR COLLECTING MARITIME EVIDENCE, Volume 1, 202 Lambeth Road, LONDON**
- 4. The Nautical Institute (2019), GUIDELINES FOR COLLECTING MARITIME EVIDENCE, Volume 2, 202 Lambeth Road, LONDON**

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Introduction to confined water safety of navigation	

Semester	Course status (mandatory or optional)
First	Optional

Lecturer(s)	E-Mail
Mate Baric	mbaric@unizd.hr

Contact hours per week	Credit Points	Workload	
		Presence	Self-study
2+1	5		
		Lecture	30
		Seminar	15
		Practice	
		Laboratory	

Media	Teaching aids
White and smart board, projector	The course is comprised, lectures, calculations, take home assignments (group project) and assignment presentations.

Enrolment requirements and entry competences required for the course
Proficiency in English and computer skills.

Conditions for permission to take the exam
Successfully presented seminar paper and oral exam

Assessment methods and criteria
<p>Assessment is carried out by means of evaluation of:</p> <p>Participation (20%) Group project (30%) Oral exam (50%)</p> <p>Grades: Insufficient 0-50% Sufficient 51%-69% Good 70%-79%</p>

Very good 80%-89%
Excellent 90%-100%

Learning outcomes at the programme level to which the course contributes

To understand basic terms of ship maneuvering systems, ship and fairway dimensions.

To be able to use appropriate methodology of ship safety during navigation in confined waters fairways to avoid grounding.

To be able to analyse fairway depth parameters to ensure adequate level of ship safety during confined water navigation.

To be able to analyse fairway width parameters to ensure adequate level of ship safety during confined water navigation.

Learning Outcomes

Professional competence	Key skills
<ol style="list-style-type: none"> 1. To define criteria for determining fairway dimensions 2. To use risk assessment methods involved with fairway dimensions and ship safety 3. To identify fairway depth parameters 4. To select appropriate method for determining fairway depth 5. To identify fairway width parameters 6. To select appropriate method for determining fairway width 	<p>Communication in English language, familiarization with basic fairway and ship elements</p> <p>An understanding ship motions during navigation in confined waters</p> <p>Sense of safety criteria for ship during navigation in fairway limited with depth and width.</p>

Applicability in other courses/programs

This course is suitable for study programs dealing with management of shipping companies.

Content

1. Introduction - basic elements involved in subject matter
2. Criteria for determining fairway and maneuvering areas dimensions
3. Risk assessment involved with fairway width
4. Ship - fairway interaction forces
5. Determining fairway depth - Water level, Static draft, Dynamic draft
6. Determining fairway depth - Dynamic draft, Probability
7. Determining fairway width methods - One way fairway - PIANC
8. Determining fairway width methods - One way fairway - ROM
9. Determining fairway width methods - One way fairway - MLIT
10. Determining fairway width methods - Two way fairway - PIANC
11. Determining fairway width methods - Two way fairway - ROM
12. Determining fairway width methods - Two way fairway - MLIT
13. Students assignment presentation
14. Students assignment presentation
15. Exam

Literature

Essential:

- Harbour approach channels design guidelines, PIANC, Report No. 121-2014.
- ROM (Puerto Del Estado) (2007): Recommendations for Designing the Maritime Configuration of Ports, Approach Channels and Harbour Basins. ROM 3.1-99. Spain: CEDEX.
- Ministry of Land, Infrastructure, Transport and Tourism (MLIT), Japan (2009): Technical Standards and Commentaries for Port and Harbour Facilities in Japan, OCDI.

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Mathematical Modelling and Simulations	

Semester	Course status (mandatory or optional)
2	Mandatory

Lecturer(s)	E-Mail
Milan Batista Blaž Luin	Milan.Batista@fpp.uni-lj.si blaz.luin@gmail.com

Contact hours per week	Credit Points	Workload	
		Presence	Self-study
5	6	Lecture	45
		Seminar	
		Practice	30
		Laboratory	
		Other	

Media	Teaching aids
Computer, digital projector, whiteboard, network	Presentations (lectures), computing exercises, real life examples

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Completed exercises.

Assessment methods and criteria
Written exam (80%) Oral exam (20%)

Learning outcomes at the programme level to which the course contributes
To select, compare, organize and use transport data. To select, compare and use simulation software and computer tools intended for mathematical modelling.

Learning Outcomes

Professional competence

- Use of different numerical methods in solving practical transport-related problems
- Critical evaluation of the results of numerical calculations
- Plan a systematic approach to problem-solving
- Develop an engineering decision making

Key skills

- Mathematical competences in science and technology
- Proficiency in English language
- Learning to learn

Applicability in other courses/programs

Content

What is mathematical modelling?

Types of problems and their solution.

Dimensional analysis and similitude modelling. Basic statistics.

Approximation and Validating Models.

Fitting curves to data.

Monte Carlo simulation.

Deterministic models.

Stochastic models.

Optimization.

Preparation and evaluation of experiments.

Exponential growth and decay.

Traffic flow models.

Modelling vibration.

Modelling ship motion.

Literature

F.R.Giordano, M.D.Weir, W.P.Fox – A First Course in Mathematical Modeling, China Machine Press, 2003

C.Dym – Principles of Mathematical Modeling, 2nd edition, Academic Press, 2004

S.Heinz – Mathematical Modeling, Springer, 2011

Amendment Log			
Version No.:	Date:	Changes:	Name:

Course title	Code No.
Maritime Logistics	

Semester	Course status (mandatory or optional)
2	Mandatory

Lecturer(s)	E-Mail
Elen Twrdy Maja Stojaković	Elen.Twrdy@fpp.uni-lj.si maja.stojakovic@fpp.uni-lj.si

Contact hours per week	Credit Points	Workload		
		Presence	Self-study	
5	6	Lecture	45	30
		Seminar	30	45
		Practice		
		Laboratory		
		Other		

Media	Teaching aids
Computer, digital projector, whiteboard, network	Presentations (lectures), group work, case studies

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Presented seminar.

Assessment methods and criteria
Written/oral exam. Written exam (50%) Oral exam (50%)

Learning outcomes at the programme level to which the course contributes
To explain the complexity of port and transport systems in the light of contemporary technology, and to integrate maritime transport data in decision making.

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Learning Outcomes	
Professional competence	Key skills
<ul style="list-style-type: none"> ▪ Explain the importance of maritime logistics for the operation of the maritime sector, ports and the economy ▪ Develop the plans within the ports ▪ Critically select the right information to determine the transport route and organize necessary processes in the port 	<ul style="list-style-type: none"> ▪ Use of port and transport terminology ▪ Proficiency in English language ▪ Learning to learn ▪ Sense of initiative
Applicability in other courses/programs	

Content
<p>Introduction to Maritime Logistics</p> <p>Maritime transport - geography and maritime trade</p> <p>Ports as members in the logistics chain</p> <p>Planning and construction of ports</p> <p>Processes in ports</p> <p>Operations at the container port</p> <p>Container hubs, transshipment and feeder services</p> <p>Connection with the hinterland and the Dry port concept</p> <p>Cooperation and competition between ports</p> <p>Short Sea Shipping</p> <p>Trends in maritime logistics</p>

Literature
<p>Song D.W. et al: Maritime logistics, A guide to contemporary shipping and port management, The Chartered institute of transport, Kogan page, 2016</p> <p>Chew E.P. et al.: Advances in maritime logistics and supply chain systems, World Scientific Publishing, 2011</p> <p>Notteboom et al.: Ports in proximity, Competition and Coordination among adjacent seaports, Ashgate Publishing, 2009</p>

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Amendment Log			
Version No.:	Date:	Changes:	Name:

Course title	Code No.
Finances and Accounting in Maritime Business	

Semester	Course status (mandatory or optional)
2	Mandatory

Lecturer(s)	E-Mail
Marina Zanne	Marina.Zanne@fpp.uni-lj.si

Contact hours per week	Credit Points	Workload		
		Presence	Self-study	
5	6	Lecture	45	30
		Seminar		
		Practice	30	45
		Laboratory		
		Other		

Media	Teaching aids
Computer, digital projector, whiteboard, network	Presentations (lectures), group work, computing exercises, case studies

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Completed exercises.

Assessment methods and criteria
Written exam.

Learning outcomes at the programme level to which the course contributes
Explain the economics of maritime business and interpret and contrast financial and budget statements to support or make managerial decisions.

Learning Outcomes	
Professional competence	Key skills

<ul style="list-style-type: none"> ▪ Master the terminology and concepts in identifying and classifying costs and revenues in maritime business ▪ Combine the elements of cost, financial and managerial accounting for the decision making in maritime business ▪ Explain and revise budget and financial statements ▪ Contrast different financing sources and their impacts in maritime business 	<ul style="list-style-type: none"> ▪ Proficiency in English language with the focus on accounting terminology ▪ Accounting and financial literacy ▪ Learning to learn
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Applicability in other courses/programs

Content

- Introduction to accounting in maritime business
 - Accounting principles
 - Costs and revenues categorization
 - Assets categorization
- Cost accounting tools and concepts
 - Cost allocation in maritime business
 - Costing methods
- Financial Accounting
 - International financial reporting standards (IFRS)
 - Financial Statements
 - Balance sheet
 - P&L statement (income statement)
 - Cash flow statement
- Management accounting - Accounting for supporting decisions
 - Methods for financing projects/sources of funds and their cost
 - Time value of money (Present value of future economic benefits)
 - Analysis and interpretation of financial and budgetary statements and key financial indicators
 - Budgeting process and control
 - Costing for decision making

Literature

- Bragg S. (2013): *Accounting for managers (3rd ed.)*
- Mott G. (2008): *Accounting for Non-Accountants: A manual for managers and students (7th ed.)*
- Fields E. (2016): *The essentials of finance and accounting for nonfinancial managers*
- Webster W. H. (2004): *Accounting for managers*

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Coastal Engineering	

Semester	Course status (mandatory or optional)
2	Mandatory

Lecturer(s)	E-Mail
Marko Perkovič Aleksander Sandro Grm	Marko.Perkovic@fpp.uni-lj.si alaksander.grm@fpp.uni-lj.si

Contact hours per week	Credit Points	Workload (hours per semester)		
5	6	Presence		Self-study
		Lecture	30	30
		Seminar	15	15
		Practice		
		Laboratory	20	20
		Simulator	10	10

Media (equipment)	Teaching aids (literature, group work ...)
Ship handling simulator, laboratory equipment (workstations, digital projector, smartboard, whiteboard, network)	Presentations (lectures), case studies, exercises, project work, fieldwork team, in situ data collection, GIS application

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Successfully defended seminar work.

Assessment methods and criteria
Project report marking (50%) Oral exam (50%)

Learning outcomes at the programme level to which the course contributes
<ul style="list-style-type: none"> Survey a port and its characteristics, including the maritime transport and transshipment factors.

- Analyse the state of the port and potential safety threats.
- Determine the solutions and compile a plan to provide safe port operations.

Learning Outcomes

Professional competence

- Chose the factors that influence the maritime aspect of planning and design of ports and waterways.
- Detect the parameters that affect the safety of seaside ship operations.
- Combine and analyze the data to determine the problem.
- Correlate the requirements of navigation safety and marine protection.

Key skills

- Mathematical competencies in science and technology
- Digital competences
- Proficiency in English language
- Learning to learn

Applicability in other courses/programs

Content

Elements of coastal engineering, detection of current problems in context in order to apply the principles and methodology necessary to investigate emerging problems and technologies and design solutions.

- Introduction to maritime design of ports and waterways.
- Definition of the correlation between the requirements of navigation safety and marine protection and the principles of design.
- Safety conditions and limitations for maneuvering by ship and at the time of berthing at the berth. Methods for determining the elements of the port and the waterways that are important for maritime design. Determination of the required depth and width of the waterway.
- Measures to upgrade the safety level during the berthing of the ship at the berthing site. Impacts of navigation and maritime security measures with regard to the economic aspect of designing or constructing ports and waterways.
- Determining the stopping distance of the ship according to the above criteria
- calculation of the required number of tugs for the safe assistance of maneuvering the flow under difficult conditions using empirical models
- calculation of the influence of low water under the keel on the maneuvering properties of the ship
- calculation of the impact of the added water mass on the speed of approaching the coast (at different angles), where all critical factors must be taken into account
- criteria for the safety of the ships for different types of ships (containers, tankers, bulk, passenger, chemicals, ro ros...)

Literature

Reeve D., Chadwick A., Fleming C. (2018). Coastal Engineering (3rd ed.) Processes, Theory and Design Practice, ISBN-13: 978-1138060425
PIANC (2014) Harbour Approach channels Design Guidelines, ISBN 978-2-87223-210-9

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Maritime Safety and Risk Management	

Semester	Course status (mandatory or optional)
2	Mandatory

Lecturer(s)	E-Mail
Peter Vidmar	Peter.Vidmar@fpp.uni-lj.si

Contact hours per week	Credit Points	Workload (hours per semester)	
		Presence	Self-study
5	6	Lecture	45
		Seminar	
		Practice	15
		Laboratory	15
		Other	

Media (equipment)	Teaching aids (literature, group work ...)
Ship simulator, computer, digital projector, whiteboard, network	Presentations (lectures), examples, exercises

Enrolment requirements and entry competences required for the course
None.

Conditions for permission to take the exam
Completed exercises.

Assessment methods and criteria
Written/oral exam.

Learning outcomes at the programme level to which the course contributes
<ul style="list-style-type: none"> Evaluate the usability and application of risk management models in maritime transport.

Learning Outcomes		
<table border="0"> <tr> <td>Professional competence</td> <td>Key skills</td> </tr> </table>	Professional competence	Key skills
Professional competence	Key skills	

- Choose the data and procedures related to maritime safety.
- Resolve complex processes in transport planning by including safety and risk management elements.

- Mathematical competences in science and technology
- Digital competences
- Proficiency in English language
- Learning to learn

Applicability in other courses/programs

Content

- Fundamentals of safety in maritime transport: technical, technological, economic, legal, sociological, cultural, medical and other traffic safety assumptions.
- Theoretical elements of maritime transport safety
- Assessment of threats and risk analysis in maritime transport
- Protection and preventive actions
- Hazard identification and risk assessment methods
- Definition of risk reduction measures
- Efficiency of risk mitigation measures
- The effectiveness of risk mitigation measures associated with the likelihood of emergencies
- Evaluation of risk reduction measures in response to response time
- Models supporting decision-making

Literature

1. Jingbo Yin, Quantitative Risk Assessment for Maritime Safety Management, LAP LAMBERT Academic Publishing (December 13, 2013), ISBN-10: 3659458864
2. Leonard Evans, Traffic Safety, Science Servnig Society, 2004.
3. Norman Fenton and Martin Neil, Risk Assessment and Decision Analysis with Bayesian Networks, CRC Press (September 24, 2012).

4. Helle A. Oltedal, Managing Maritime Safety, Routledge; 1 edition (January 31, 2018), ISBN-10: 1138559229

Amendment Log

Version No.:	Date:	Changes:	Name:

Course title	Code No.
Legal Conflicts in Shipping	--

Semester	Course status (mandatory or optional)
III.	Mandatory

Lecturer(s)	E-Mail
Prof. Sander Limant, LL.M.	Sander.limant@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board - copy of contracts forms - copy of case study 	<ul style="list-style-type: none"> - literature - presentations - legal rules (e.g. International Maritime Arbitration Committee: ICC-CMI rules, London Maritime Arbitration Association Terms; German Maritime Arbitration Association Rules, Society of Maritime Arbitration Rules) - case study - group work

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English - basic computer skills

Conditions for permission to take the exam
<ul style="list-style-type: none"> - active participation in teaching - group work presentation - two colloquiums passed

Assessment methods and criteria
Assignment 30% Written exam 70%

Learning outcomes at the program level to which the course contributes

On completing this module, students will have an understanding of

- the procedures for bringing claims in the Commercial Court;
- the distinction between litigation and arbitration, and why parties arbitrate;
- the effect of arbitration clauses in contracts, and trade arbitration rules;
- the concept of conciliation and how it is different from arbitration;
- the methods of enforcing foreign judgments and arbitration awards;
- the conflicts of law rules that arise in maritime disputes;
- policy concerns upon which the courts rely when determining conflict disputes;
- the impact of the Rome Convention and the Brussels and Lugano Convention on the courts' approach;
- the advantages of forum shopping;
- the concept of competition law under special consideration of European Rules;
- the role of community institutions under special consideration of shipping;
- anti-competitive arrangements to avoid the abuse of dominance;
- state aid and the respective rules;
- liner conferences and other consortia;
- the role of ports;
- the control of mergers under the EC Merger Regulation with regard to procedural issues.

Learning Outcomes

Professional competence

The student has the ability to

- determine various types of marine disputes, claims and approaches to resolve these;
- understand the different procedures to solve legal conflicts;
- design an arbitration regime and know about the effects of the most commonly used arbitration clauses;

Key skills

The student has the ability to

- Determine the different procedures to settle legal cases;
- Determine the economic impact of the different procedures;
- Take action to enforce legal judgements and arbitration awards;
- Understand the concept of forum shopping;
- Understanding of the impact of European Competition law on

<ul style="list-style-type: none"> - understand the process of arbitration procedures; - suggest methods of legal enforcement; - understand the general rules of competition law; - understand the basics of EC law with special consideration of transport and shipping policies; - understand the EC competition rules applying to shipping; - understand anti-competitive arrangements to tackle abuse of dominance; - determine the problem with state aid under competition rules; - determine the role of liner conferences, consortia and ports for the maritime industry; - determine means of merger control under EC merger regulation rules; - determine procedural issues. 	<p>economic actions in the shipping market;</p> <ul style="list-style-type: none"> - Understand the meaning of liner conferences under competition law; - Have knowledge on Merger Control Measures as set out in EC Merger Regulation Rules.
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Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

GENERAL PART:

- Types of Marine Disputes, Claims and Approaches to Resolution
- Procedures for Claims in Commercial Courts
- Distinction between Litigation and Arbitration
- Reasons for Arbitration
- Designing an Arbitration Regime
- Effect of Arbitration Clauses in Contracts and Trade Arbitration Rules
- The Concept of Conciliation and Distinction to Arbitration
- Arbitration Procedures
- Methods of Enforcing Foreign Judgements and Arbitration Awards
- Conflicts of Legal Rules in Maritime Disputes
- Rome Convention
- Brussels and Lugano Conventions
- Advantages of Forum Shopping

SPECIAL PART:

- Introduction to Competition Law
- Introduction to EC Law
- EC Transport Policy and Shipping Policy
- Key Provisions of EC Competition Law
- Role of Community Institutions in EC Competition Law and Shipping
- EC Competition Rules and Shipping
- Council Regulation (EEC) 4056/86 and 1419/2006
- Anti-Competitive Arrangements
- Abuse of Dominance
- State Aid
- State Authorities
- Liner Conferences
- Consortia
- Ports
- The Control of Mergers under the EC Merger Regulation
- Procedural Issues

Literature

- F. Sparka: Jurisdiction and Arbitration Clauses in Maritime Transport Documents: A Comparative Analysis, 2010, 1st ed., Springer-Verlag Berlin.
- Y. Baatz et al.: Maritime Law, 4th ed., 2017, Routledge London.
- P. K. Mukherjee, M.Q. Mejia Jr. & J. Xu: Maritime Law in Motion, 2020, 1st ed., Springer International Cham.
- H. Liu: Liner Conferences in Competition Law, 2010, Springer Berlin.
- V. Power: EU Shipping Law, 3rd ed., 2019, Routledge London.
- R. D. Blair & D. D. Sokol: The Oxford Handbook of International Antitrust Economics Vol. 1, 2015, Oxford University Press, Oxford.
- S. Baughen: Shipping Law, 7th ed., 2018, Routledge Milton.

Amendment Log

Version No.:	Date:	Changes:	Name:
1	11/06/2020		Limant

Course title	Code No.
Marine Engineering and Environmental Protection	

Semester	Course status (mandatory or optional)
3.rd	mandatory

Lecturer(s)	E-Mail
Prof. Dr.-Ing. Rom Rabe	rom.rabe@hs-flensburg.de

Contact hours per week	Credit Points	Workload		
		Presence	Self-study	
4	6	Lecture	30	60
		Seminar		
		Practice		
		Laboratory		
		Simulator	30	60

Media	Teaching aids
Overhead projector, white board, engine room and nautical simulators	Presentations, check lists, work groups, manuals, videos

Enrolment requirements and entry competences required for the course
Successfully completed “Ship energy efficiency and optimization” - course (1. Semester)

Conditions for permission to take the exam
Completed simulator-exercises and written seminar

Assessment methods and criteria
Seminar 30% Oral or written exam 70%

Learning outcomes at the programme level to which the course contributes
Students should be 1. Able to make informed and responsible decisions regarding environmental protection.

2. Able to understand and apply state of the art ship technology which can influence the development of a shipping company.
3. Able to make informed decisions in management and selection of human resources.
4. Able to understand the ship energy systems and to optimize the ship propulsion operations.

Learning Outcomes

Professional competence

The students have the ability to

- understand the main and auxiliary engines of ships as much as all systems, auxiliary machinery and systems for Exhaust gas- and Water-Cleaning on board;
- determine, asses and rectify errors in the engines and machinery and environmental-relevant systems
- understand and assess complex processes and their effects on the ships and the environment
- exercise clear communication and documentation on board and with and for the authorities

Key skills

The students have the ability to

- understand and assess complex processes and their effects on the ship;
- apply interdisciplinary knowledge and competency;
- validate and asses indicators and to initiate appropriate action
- communicate in English language professionally correct and handle complex problems in a team and demonstrate leading capacity

Applicability in other courses/programs

This module is suitable for study programs in technical universities dealing with marine engineering environmental protection

Content

Energy-saving Methods in engine room (theoretical and at ship engine room simulator)

- Propulsion plant element (propeller, engine, hybrid...) selection (theoretical)
- thermal and electrical power distribution for different scenarios – various in detail measurements, handlings, switch over – processes....
- Managing technical systems (Decision for different ways of Fresh water production (Osmosis or evaporating), AC / cooling (compressor or absorption plant), Exhaust gas energy (turbine or boiler).... For different Types of a) propulsion (LNG...) and b) vessels (passenger, container...)
- Selection of suitable Measures to meet different environmental requirements

Environmental Protection (lectures and system-demonstration in SES)

- Regulations (MARPOL I, IV, V, VI, BWC)

- Fuels (conventional, gaseous, alternative Fuels)
- Miller-Cycle, Exhaust-Gas-Recirculation
- Exhaust Gas After Treatment (DeSOx; DeNOx, Particle Filters)
- Ballast Water Convention (D2 – Systems)

Literature

- Handbook “Marine Engineering”
- Technical specifications and Manuals
- IMO Training Course on Energy Efficient Operation of Ships
- ABS: Ship Energy Efficiency Measures
- S.S. Rao: Engineering Optimization: Theory and Practice; John Wiley & Sons, Inc., 1996
- A. Ravindran; K.M. Ragsdell; G.V. Reklaitis: Engineering optimization, Methods and Application; ; John Wiley & Sons, Inc., 2006
- Chapra, S.S.; Canale, R.P.: Numerical methods for engineers
- International Maritime Organisation, Marine Environment Protection Committee, 2012 Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP), MEPC.213(63)
- Lloyd's Register: Implementing a Ship Energy Efficiency Management Plan (SEEMP) Guidance for shipowners and operators
- Simulator manuals

Amendment Log

Version No.:	Date:	Changes:	Name:
1.	01.03.2020		Rabe

Course title	Code No.
Water Management aboard Ships	--

Semester	Course status (mandatory or optional)
III.	Mandatory

Lecturer(s)	E-Mail
Prof. Dr.-Ing. Wiktoria Vith	wiktoria.vith@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board - 	-

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English -

Conditions for permission to take the exam
-

Assessment methods and criteria
- Written Exam 2 h

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will have an understanding of different water systems and plants being operated on ships. Students know legally required water specification, treatment methods and can assess the effect of water quality either regarding the safety of ship operation or environmental responsibility caused by water emissions.</p>

Learning Outcomes

Professional competence

The student has the ability to organize and assess the water pipe system aboard under consideration of regulations for use and treatment as much as environmental standards.

Key skills

The student has the ability to

- recognize and define water emissions of ships;
- know the requirements for the use of water aboard ships;
- understand the prevailing treatment technologies to produce the required water specification;
- implement the current legal requirements on maritime environment protection (i.e. MARPOL etc.) on waterborne emissions
- demonstrate an understanding of the correlation of the environmental obligations of the ship operator and the operation of water systems and plants aboard.

Applicability in other courses/programs

Content

This course gives an overview of water cycle management on ships. The contents of the course are subjected to theoretical and practical knowledge (laboratory works) of different water cycles, their regulatory background (law) and used treatment technologies on ships particularly in the following areas:

1. Ballast Water Treatment
2. Scrubber Water Treatment
3. Drinking Water Treatment
4. Boiler Water Treatment
5. Sewage Water Treatment

Literature

- Matej David, Stephan Gollasch: Global Maritime Transport and Ballast Water Management: Issues and Solutions; Springer Verlag 2014
- J.D. Edwards Industrial Wastewater Treatment; CRC Press 2019

Amendment Log

Version No.:	Date:	Changes:	Name:
1	17/07/2020		Vith

Course title	Code No.
Research Project in Marketing	--

Semester	Course status (mandatory or optional)
III.	Optional

Lecturer(s)	E-Mail
Prof. Dr. rer. pol. Nelly Oelze	nelly.oelze@hs-flensburg.de
Prof. Dr. Alexander Deseniss	deseniss@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
8	12	Presence		Self-study
		Lecture	120	240
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board 	<ul style="list-style-type: none"> - literature - presentations - project work, supported by preparational lectures and project/research support

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English

Conditions for permission to take the exam
-

Assessment methods and criteria
Project work

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will have an understanding of (when choosing transfer project)</p> <ul style="list-style-type: none"> • acquisition of projects in approaching relevant enterprises and configuring and agreeing on projects;

- development and configuration of the agreed projects and electing and combining the relevant methods for implementation in the project;
- solve problems in the project using situational reasonable methods of problem solving;
- documentation of the progress of the project and of the findings and communication in adequate style to all stakeholders;

(when choosing research project)

- application of relevant research methods and combination of these in a sensible way according to the research question;
- research and documentation of research findings in a scientific robust manner;
- achievement of scientific verified findings and documentation of these in a scientific way;
- solution of problems in research projects by situationally reasonable use of problem solving techniques.

Learning Outcomes

Professional competence

The student has the ability to use different methods and tools to solve the "given" marketing problem.

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Key skills

The student has the ability to identify, define, conceptualize and critically analyze complex marketing problems and issues, provide insights and solutions. They present solution approaches in front of professionals.

Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

1. Transfer Project or Research Project
2. Preparative Lectures on Project and/or Research Methods
3. Ongoing Project and Research Support

Literature

Literature information will be given at the beginning of the lecture.

Amendment Log

Version No.:	Date:	Changes:	Name:
1	24/06/2020		Oelze

Course title	Code No.
Simulation	--

Semester	Course status (mandatory or optional)
III.	Optional

Lecturer(s)	E-Mail
Prof. Dr. Volker Looks	Volker.looks@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board 	<ul style="list-style-type: none"> - literature - presentations - lecture with integrated application of simulation methods. - Project work (in small groups) on application of simulation methods on practical case.

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English

Conditions for permission to take the exam
-

Assessment methods and criteria
Written exam & project assignment

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will have an understanding of</p> <ul style="list-style-type: none"> • the different methods of simulation and applicability in various fields of a supply chain;

- the reasonable application of simulation methods to analyze the dynamic behavior of supply chains and test feasible improvements;
- situational adaptation of simulation methods to give due consideration to specific conditions;
- analyzing and interpreting the findings and effects of the simulations and use these for assessment of the real situation in supply chains.

Learning Outcomes

Professional competence

The student has the ability to know essential approaches to simulation and the necessary modeling. They understand the treatment of time and problems of discretization. After completing the module, students can independently work on problems for simulations. This includes modeling, the use of simulation environments and the evaluation of the results. Through the practical experience in the module, the independent handling of research questions is tested and simulation is learned as a scientific method.

Key skills

The student has the ability to work in small working groups and must independently coordinate the cooperative processing of the task. You will further develop your team and social skills. Further on students are able to critically question the use of simulation for scientific questions.

Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

1. Terms, definitions and principles of simulations.
2. Overview on the fundamental methods of simulation and the applicability in supply chain management.
3. Application of the fundamental methods of simulation and derivation or testing of measures of improvement.
4. Assessment of findings and effects and extrapolation on real systems.

Literature

Will be given at the beginning of the lecture.

Amendment Log			
Version No.:	Date:	Changes:	Name:
1	24/06/2020		Looks

Course title	Code No.
Supply Chain Management Fundamentals	--

Semester	Course status (mandatory or optional)
III.	Optional

Lecturer(s)	E-Mail
Prof. Dr. rer. pol. habil. Marcus Brandenburg	Marcus.brandenburg@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
			Presence	Self-study
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board 	<ul style="list-style-type: none"> - literature - presentations - lecture with integrated application of case studies

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English

Conditions for permission to take the exam
-

Assessment methods and criteria
Seminar paper & assignment

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will have an understanding of</p> <ul style="list-style-type: none"> • scientific literature regarding supply chain management (scm); • the fundamental terms of scm; • the fundamental theories, concepts and methods of scm;

- the application of scientific and practical methods and measures of scm;
- the analysis of complex facts, correlations, interdependency and dynamics in supply chains and value networks;
- preparation of reports and elaborations on specific topics and case studies of scm;
- assessment of approaches for problems and challenges of scm.

Learning Outcomes

Professional competence

The student has the ability to analyse complex facts and dynamics in supply chains.

-

Key skills

The students should acquire the basic know-how and the decisive skills in the field of logistics and supply chain management with the aim of successfully occupying positions at the top management level or as a logistics or supply chain manager.

Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

1. Theory on Operations & Supply Chain Management
2. Supply Chain Planning
3. Supply Chain Strategy
4. Supply Chain Design & Configuration
5. Supply Chain Processes
6. Supply Chain Management and Purchasing
7. Supply chain Performance Measurement and Management
8. Supply Chain Risk Management

Literature

Selected scientific articles on supply chain management. Further literature information will be given at the beginning of the lecture.

Amendment Log

Version No.:	Date:	Changes:	Name:
1	24/06/2020		Brandenburg

Course title	Code No.
Advanced planning & Control	--

Semester	Course status (mandatory or optional)
III.	elective

Lecturer(s)	E-Mail
Prof. Dr. rer. pol. Thorsten Kümper, MBA	Thorsten.kuemper@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board 	<ul style="list-style-type: none"> - literature - presentations - Transition between different teaching forms such as tutorials, exercises, project work in groups.

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English

Conditions for permission to take the exam
-

Assessment methods and criteria
Seminar paper & assignment

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will have an understanding of</p> <ul style="list-style-type: none"> • controlling as feedback-oriented planning, control and management of a company; • application of controlling concepts and instruments and the respective assessment; • develop an own controlling conception for an enterprise using system theoretical projections; • establishment of simulation models and analysis and assessment of various scenarios; • joined-up thinking;

- practical application of scientific methods of simulation;
- compilation of team oriented solutions;
- convincing presentation of work results in English.

Learning Outcomes

Professional competence

The student has the ability to develop appropriate simulation models, analyze and evaluate results for different scenarios in a business case.

Key skills

The student has the ability to master business cases in a team-orientated way, to communicate and to present work results.

Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

4. Controlling Concepts and Instruments
 - a) Creation of a Mindmap for Controlling
 - b) Scenario Analysis
 - c) Strategy Map
 - d) Balanced Scorecard
5. Methods of System Analysis
 - a) Introduction to System Thinking
 - b) History of Foundations of System Dynamics
 - c) Causal Loop Diagramming
6. Simulation Models
 - a) Introduction to Vensim (Simulation Language)
 - b) Modelling Use Case with Vensim
 - c) Project (model a real-life company and simulate different scenarios using a balanced scorecard approach)

Literature

Hill/Jones/Schilling: Strategic Management, Stamford, CT, 2016 (12th ed.).
 Horvath/Gleich/Seiter: Controlling, Munich, 2019 (14th ed.).
 Kaplan/Norton: The Balanced Scorecard, Boston, MA, 1996.
 Morecroft, John: Strategic Modelling and Business Dynamics, Chichester, 2015 (2nd ed.).
 Sterman, John: Business Dynamics, Boston, 2017.

Script Prof. Dr. Thorsten Kümper.

Amendment Log

Version No.:	Date:	Changes:	Name:
1	24/06/2020		Kümper

Course title	Code No.
Business Valuation	--

Semester	Course status (mandatory or optional)
III.	Optional

Lecturer(s)	E-Mail
Prof. Dr. rer. soc. oec. Martin Klem	Martin.klem@hs-flensburg.de

Contact hours per week	Credit Points	Workload (hours per semester)		
		Presence	Self-study	
4	6	Lecture	60	120
		Seminar	-	-
		Practice	-	-
		Laboratory	-	-
		Other	-	-

Media (equipment)	Teaching aids (literature, group work ...)
<ul style="list-style-type: none"> - computer - projector - board 	<ul style="list-style-type: none"> - literature - presentations - Transition between different teaching forms such as tutorials, exercises, project work in groups.

Enrolment requirements and entry competences required for the course
<ul style="list-style-type: none"> - proficiency in English

Conditions for permission to take the exam
-

Assessment methods and criteria
Other examination

Learning outcomes at the program level to which the course contributes
<p>On completing this module, students will</p> <ul style="list-style-type: none"> • assess business entities independently using classic valuation methods; • analyse and assess the varying valuation methods and their outcomes; • develop a critical understanding of the strengths and weaknesses of the methods.

Learning Outcomes

Professional competence

The student has the ability to read, to extract and to process accounting information to develop an economic perspective for the reporting entity.

Key skills

The student has the ability to assess the usefulness and limitations of external financial reporting for business valuation.

The student has the ability to identify key accrual accounting schemes to forecast cash flows and other payoffs using externally available accounting information.

Applicability in other courses/programs

This module is suitable for study programs in economic fields of study.

Content

- Simulation game business valuation
- Occasions and principles of business values
- Prognosis and capitalization of future financial surpluses
- Simplified valuation methods (multiples, market values, etc)
- Limits and problems of the existing valuation methods
- Further development of business valuations by new approaches and methods
- Fundamentals of rating

Literature

Will be given at the beginning of the lecture.

Amendment Log

Version No.:	Date:	Changes:	Name:
1	30/1/2021		Klem