University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Marine Communication							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
COM301	III	Fall	3	4	2	2	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				60	-	-	40
Course Venue and Time				Friday / 09:30 – 13:20			
Instructor information				**Cpt. Orhan Kamil Babaoğlu** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4040 orhankamil.babaoglu@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides students with a comprehensive understanding of maritime communication systems, methods, and international regulations. It covers both traditional and modern means of communication at sea, including visual signaling with Morse code and the International Code of Signals, as well as radio telephony and radiotelex communication. Special emphasis is placed on the Global Maritime Distress and Safety System (GMDSS), emergency communication procedures, and the use of standardized Maritime English for safety and distress messages. Through theoretical instruction and practical exercises, students gain the necessary competence to send, receive, and interpret visual and radio signals, handle emergency and search-and-rescue communications, and apply international standards to ensure safety at sea.
Course Aims and Objectives	The primary aim of this course is to equip students with the theoretical knowledge and practical skills necessary for effective and reliable maritime communication. It seeks to develop competence in the use of visual and radio communication systems, familiarize students with international regulations and standards, and enhance their ability to manage emergency and safety-related communications at sea. • Understand the principles, functions, and importance of maritime communication systems. • Gain proficiency in visual signaling methods, including Morse code and the International Code of Signals. • Apply correct procedures for radiotelephony and radiotelex communication between ships and coastal stations. • Demonstrate familiarity with the Global Maritime Distress and Safety System (GMDSS) and its operational requirements. • Acquire competence in using standardized Maritime English for distress, safety, and urgency messages. • Recognize and correctly apply international conventions and codes governing communication at sea. • Develop the ability to respond effectively to emergency and search-and-rescue (SAR) communication scenarios.

Course Learning Outcomes	**LO1:** Explain the principles and importance of maritime communication within the framework of international conventions and regulations. **LO2:** Demonstrate proficiency in transmitting and receiving information using visual signaling methods, including Morse code and the International Code of Signals **LO3:** Apply correct procedures for radiotelephony and radiotelex communication in both routine and emergency situations **LO4:** Operate and monitor communication equipment in accordance with the requirements of the Global Maritime Distress and Safety System (GMDSS) **LO5:** Use Standard Maritime Communication Phrases (SMCP) and Maritime English effectively in distress, urgency, and safety messages. **LO6:** Identify and interpret internationally recognized communication codes and symbols for safe ship operations. **LO7:** Perform emergency communication tasks related to search and rescue (SAR) operations, distress calls, and safety alerts. **LO8:** Evaluate and troubleshoot common problems related to communication systems and propose appropriate corrective measures. **LO9:** Integrate communication practices with safety management and operational procedures on board ships.

Content of the Course

Week	*Subject*
1	**Introduction to Maritime Communication** Scope, importance, and international framework
2	**Visual Signaling in Maritime Communication** Concepts and applications
3	**Visual Signaling in Maritime Communication** Concepts and applications
4	**Distress Signals** SOS in accordance with COLREG 72 Annex IV
5	**International Code of Signals** Structure, purpose, and applications
6	**Single-Letter Signals in the International Code of Signals** Visual signaling practices
7	**Radio Communication in Shipping** Radiotelephone and radiotelex operations
8	**Ship-to-Ship and Ship-to-Shore Communication** Procedures, protocols, and safety aspects
9	**Maintenance and Testing of Communication Equipment** Operational checks and reliability standards
10	**Practical Applications of the International Code of Signals** Communication exercises
11	**Global Maritime Distress and Safety System (GMDSS)** Concept, structure, and implementation
12	**Emergency Communication and Distress Alerts** Sending and responding to distress calls
13	**Relay of Distress Communications** Transmission of received calls to other stations
14	**Search and Rescue Communication** IAMSAR guidelines and coordination practices
15	**Maritime English for Emergency and Safety Messages** Standardized vocabulary, message formats, and final practice

Methods and Techniques used in the Course

Lectures and Presentations: Theoretical foundations of maritime communication, international conventions, and regulatory frameworks are delivered through instructor-led sessions.

Classroom Discussions: Interactive discussions are encouraged to enhance understanding of maritime safety communication practices.

Practical Training and Simulations: Students practice Morse signaling, radiotelephony, radiotelex, and GMDSS operations through simulated exercises.

Laboratory and Equipment-Based Learning: Use of communication equipment such as VHF radios, Aldis lamps, and GMDSS consoles for hands-on training.

Case Studies and Problem-Solving Exercises: Real-life maritime incidents and communication failures are analyzed to improve decision-making and response skills.

Role-Playing and Drills: Students perform emergency communication tasks, including distress, urgency, and safety messages, using Standard Maritime Communication Phrases (SMCP).

Collaborative Group Work: Small group exercises to encourage teamwork in communication scenarios, especially for search and rescue coordination.

Assignments and Projects: Written and practical assignments designed to assess knowledge of international signal codes, communication procedures, and operational practices.

Assessment Through Quizzes and Exams: Regular evaluation of theoretical knowledge and applied skills.

Sample Questions

Part A – Theoretical Questions

- Define the Global Maritime Distress and Safety System (GMDSS) and explain its importance for maritime safety.
- What are the basic principles of Morse code communication? Provide examples of distress signals.
- Explain the difference between radiotelephony and radiotelex communication in maritime operations.
- Discuss the role of the International Code of Signals (ICS) in maritime communication.
- What are the main types of emergency messages transmitted in maritime communication, and when are they used?

Part B – Practical/Applied Questions

- Translate the following distress message into proper Standard Marine Communication Phrases (SMCP):
  - *"We are sinking, need immediate assistance, position 35° 40′ N – 27° 15′ E."*
- Using the International Code of Signals, explain what the single-letter signals **"A"**, **"N"**, and **"O"** indicate.
- Write down the Morse code equivalent of the distress signal **SOS** and demonstrate how it would be transmitted with an Aldis lamp.
- A ship receives a MAYDAY call but cannot provide assistance directly. Describe the proper communication procedure.
- Explain how communication procedures differ between **distress**, **urgency**, and **safety** messages.

Materials Used in the Course

Textbooks and References

- Lees,G., Williams, W.G., Handbook for Marine Radio Communication, 6th Ed. Informa Law from Routledge, London.
- International Maritime Organization (IMO) publications related to communication procedures.
- *International Code of Signals (ICS)*.
- *IAMSAR Manual, Vol. III* (International Aeronautical and Maritime Search and Rescue Manual).
- *GMDSS Handbook* and related IMO model course materials.
- COLREG 1972, Annex IV – Distress Signals.
- Standard Marine Communication Phrases (SMCP) by IMO.

Supplementary Readings

- Academic articles and case studies on maritime communication, safety, and emergency response.
- National maritime communication regulations and guidelines.

Practical Training Materials

- Morse code charts and signaling guides.
- Aldis lamp and visual signaling equipment.
- GMDSS simulators and communication software.
- VHF, MF/HF radios, NAVTEX, INMARSAT terminals.

Multimedia Resources

- Training videos on distress and safety communication procedures.
- Audio recordings for practicing Standard Marine Communication Phrases.
- Interactive e-learning modules on maritime radio communication.

Classroom Materials

- Lecture notes, handouts, and PowerPoint presentations prepared by the instructor.
- Sample communication logs and report forms for practice.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**LO10**
PO1	1	1	1	1	1	1	1	1	1	NA
PO2	1	1	1	1	1	1	1	1	1	NA
PO3	1	1	1	1	1	1	1	1	1	NA
PO4	1	1	1	1	1	1	1	1	1	NA
PO5	2	2	2	2	2	2	2	2	2	NA
PO6	2	2	2	2	2	2	2	2	2	NA
PO7	1	1	1	1	1	1	1	1	1	NA
PO8	1	1	1	1	1	1	1	1	1	NA
PO9	1	1	1	1	1	1	1	1	1	NA
PO10	3	3	2	2	3	3	3	2	2	NA
PO11	2	2	2	2	2	2	2	2	2	NA
PO12	1	1	1	1	1	1	1	1	1	NA

Course Learning Outcomes/ Evaluation Method		
Course Learning Outcomes (CLOs)	**Teaching Method**	**Assessment Method**
LO1	Lecture, Question-Answer	Midterm Exam, Final Exam
LO2	Lecture, Group Discussion, Homework	Homework, In-Class Exercises, Midterm Exam
LO3	Lecture, Hands-on Practice, simulator sessions	Quizzes, Midterm Exam, Final Exam
LO4	Lecture, simulator, Hands-on Practice	Assignments, Midterm Exam, Final Exam
LO5	Lecture, simulator Sessions, In-Class Exercises	Quizzes, Midterm Exam, Final Exam
LO6	Lecture, In-Class Exercises	Midterm Exam, Final Exam
LO7	Hands-on Practice, simulator sessions	Assignments, role-play
LO8	Hands-on Practice, simulator sessions	Assignments
LO9	Hands-on Practice, simulator sessions	Assignments, role-play

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**4**	**60**
Midterm Exam	**1**	**3**	**3**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**3**	**3**
Preparation for Final Exam	**1**	**15**	**15**
Presentation(s)	**-**	**-**	**-**
Preparation for Presentation(s)	**-**	**-**	**-**
Research for Project(s)/Essay(s)	**-**	**-**	**-**
Project Writing	**-**	**-**	**-**
Group Work	**-**	**-**	**-**
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	**2**	**1**	**2**
Preparation for Quiz(es)	**-**	**-**	**-**
Laboratory	**15**	**1**	**15**
Assignment(s)/Homework/Class Works	**2**	**1**	**2**
Micro-Teaching Sessions	**-**	**-**	**-**
Lesson Planning	**-**	**-**	**-**
Materials Adaptation	**-**	**-**	**-**
Material Development	**1**	**1**	**1**
Draft Preparation	**-**	**-**	**-**
Drawing	**-**	**-**	**-**
Essay Writing	**-**	**-**	**-**
Tutorial(s)	**-**	**-**	**-**
Portfolio Preparation	**1**	**1**	**1**
Portfolio Presentation	**-**	**-**	**-**
Total Workload			**142**
ECTS Credit			**4**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	15	10
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	2	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	1	10
Project	-	-
Quiz	2	10
Midterms/Oral Exams	1	20
Final/Oral Exams	1	30
Total	**7**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Global Maritime Distress and Safety System I							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
GMS301	III	Fall	3	5	1	4	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				60	-	-	40
Course Venue and Time				Friday / 09:30 – 13:20			
Instructor information				**Cpt. Orhan Kamil Babaoğlu** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4040 orhankamil.babaoglu@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides students with a comprehensive understanding of maritime communication systems, emphasizing safety and emergency procedures at sea. It introduces the International Code of Signals (ICS), Standard Marine Communication Phrases (SMCP), radiotelephony, and radiotelegraphy for ship-to-ship, ship-to-shore, and onboard communication. Students will develop the ability to send and receive distress, urgency, and safety messages in accordance with international regulations, including SOLAS and IMO conventions. The course also covers the Global Maritime Distress and Safety System (GMDSS), focusing on equipment usage, operational procedures, and coordination with search and rescue (SAR) authorities. Through practical exercises, simulations, and role-playing scenarios, students gain hands-on experience in emergency communication, message relay, and coordination across multi-national crews. The course integrates theoretical knowledge and applies skills to ensure that students are prepared for effective and standardized communication in routine operations and emergency situations at sea.
Course Aims and Objectives	The course aims to equip students with the theoretical knowledge and practical skills necessary for effective maritime communication in both routine and emergency situations. It emphasizes the use of international communication standards, emergency protocols, and the GMDSS to ensure the safety of vessels, crew, and cargo. • Understand and apply the International Code of Signals (ICS) and Standard Marine Communication Phrases (SMCP) for ship-to-ship, ship-to-shore, and onboard communication. • Conduct voice and telegraph radio communications according to international maritime standards. • Demonstrate the ability to send and receive distress, urgency, and safety messages accurately and efficiently. • Operate GMDSS equipment and understand the procedures for emergency communication and search and rescue coordination. • Apply communication protocols to manage multi-national crews and ensure effective onboard coordination.

	• Comprehend the principles of maritime communication regulations as defined by SOLAS and IMO. • Prepare for and respond to maritime emergencies using standardized communication techniques.
Course Learning Outcomes	**LO1:** Demonstrate proficiency in visual signaling, including sending and receiving messages using Morse code and Aldis lamp. **LO2:** Apply correct procedures for radiotelephony and radio telex communication in ship-to-ship and ship-to-shore operations. **LO3:** Perform maintenance checks and functional tests on maritime communication equipment in compliance with international standards. **LO4:** Utilize the International Code of Signals effectively for routine, safety, and emergency communication. **LO5:** Explain the structure, purpose, and operation of the Global Maritime Distress and Safety System (GMDSS). **LO6:** Accurately transmit and respond to distress, urgency, and safety messages in accordance with IMO and SOLAS requirements. **LO7:** Apply the IMO Standard Marine Communication Phrases (SMCP) to ensure clear and standardized communication in English. **LO8:** Interpret and apply relevant IMO conventions, codes, and amendments related to maritime distress and safety communication.

Content of the Course

Week	*Subject*
1	**Course Introduction and Overview** • Introduction to the course objectives and structure • Importance of maritime communication for safety and operations • Overview of international regulations and conventions (IMO, SOLAS)
2	**Course Introduction and Overview** • Introduction to the course objectives and structure • Importance of maritime communication for safety and operations • Overview of international regulations and conventions (IMO, SOLAS)
3	**Ship-to-Ship, Ship-to-Shore, and Onboard English Communication** • Basic communication phrases and standard terminology • Communicating with multi-national crew onboard • Practical role-play exercises for bridge communication
4	**Vessel Traffic Services (VTS) Communication** • Introduction to VTS and its operational importance • English phrases and procedures for VTS communication • Case studies of ship-to-VTS communications
5	**IMO Standard Marine Communication Phrases (SMCP)** • Introduction to SMCP: structure and purpose • Applying SMCP in routine and emergency situations • Exercises on standardized bridge communication
6	**Types of Emergency Situations** • Overview of maritime emergency types: fire, collision, grounding, man overboard • Terminology used for reporting emergencies in English • Practical drills: emergency scenario simulations
7	**Sending and Receiving Emergency and Safety Messages** • Structure of emergency messages (Mayday, Pan-Pan, Securité) • Correct procedures for message transmission and acknowledgment • Role-playing exercises for emergency message handling
8	**Voice Communication by Radio** • Fundamentals of radiotelephony and radiotelegraphy • Ship-to-ship and ship-to-shore communication via radio • Equipment handling, maintenance, and routine checks
9	**Mid-Term Exam and Review** • Written and oral assessment on maritime English, ICS, and SMCP • Feedback and clarification of challenging topics
10	**Global Maritime Distress and Safety System (GMDSS) Overview** • Introduction to GMDSS: purpose, structure, and equipment

	• Classes of GMDSS ships and shore stations • Practical demonstration of GMDSS components
11	**Emergency Communication: Distress and Safety Procedures** • Sending distress alerts and receiving assistance calls • Coordination with rescue authorities • Exercises: simulated distress message transmission
12	**Search and Rescue (SAR) Communication** • Overview of search and rescue operations • Communication with SAR units using IAMSAR guidelines • Reporting and relaying information to other stations
13	**Advanced Emergency Communication** • Handling multiple emergencies simultaneously • Relaying received emergency messages to other vessels or shore stations • Use of English in critical decision-making scenarios
14	**Integrated Practical Exercises** • Combining ICS, SMCP, radiotelephony, and GMDSS in simulated scenarios • Role-play exercises for shipboard and ship-to-shore communications • Troubleshooting and problem-solving in emergency communication
15	**Final Assessment and Practical Evaluation** • Oral and written final exam on maritime communication and GMDSS procedures • Practical exercises: emergency simulations, message transmission, and coordination • Feedback and course wrap-up

Methods and Techniques used in the Course

Lectures and Presentations: Delivery of theoretical knowledge on GMDSS principles, communication procedures, and international regulations.

Practical Training and Simulations: Hands-on exercises with Morse signaling, radiotelephony, and GMDSS equipment using simulator-based training.

Case Studies and Problem-Solving: Analysis of real-life maritime communication incidents to enhance decision-making skills in emergency situations.

Role-Playing and Scenario-Based Learning: Simulated distress, urgency, and safety communication exercises to practice IMO Standard Marine Communication Phrases (SMCP).

Group Discussions and Collaborative Learning: Peer-to-peer interaction for exchanging ideas on communication strategies and operational challenges.

Demonstrations: Instructor-led demonstrations on equipment maintenance, reporting systems, and vessel traffic service (VTS) communication.

Independent Study and Assignments: Research and practice tasks to reinforce learning and promote self-directed competence.

Sample Questions

Part A – Theoretical Questions

- Explain the main functions of the Global Maritime Distress and Safety System (GMDSS) and its importance in maritime safety.
- Describe the procedures for making a distress call using radiotelephony.
- What are the differences between urgency and safety messages under the GMDSS framework?
- Define the role of the International Code of Signals (ICS) in maritime communication. Provide examples of its application.
- Discuss the importance of maintaining communication equipment on board and outline the responsibilities of the officer in charge.

Part B – Practical/Applied Questions

- Using Morse code (light signals), transmit the distress signal “SOS” and interpret a received response.
- Simulate a radiotelephone call between two ships reporting a collision in restricted visibility.
- Demonstrate the correct procedure for relaying a distress call received from another vessel.
- Using IMO Standard Marine Communication Phrases (SMCP), construct a dialogue for requesting tug assistance upon port approach.
- Explain the reporting requirements to Vessel Traffic Services (VTS) when entering a designated area.

Materials Used in the Course

Textbooks and Reference Materials

- Lees,G., Williams, W.G., Handbook for Marine Radio Communication, 6th Ed.
- International Maritime Organization (IMO) publications:
  - *SOLAS Convention (Safety of Life at Sea)*
  - *GMDSS Handbook*
  - *IAMSAR Manual (International Aeronautical and Maritime Search and Rescue)*
  - *International Code of Signals (ICS)*
- *IMO Standard Marine Communication Phrases (SMCP)*
- GMDSS training manuals and course notes prepared by the instructor.

Communication Equipment and Training Tools

- VHF, MF/HF, and Inmarsat simulators for practical communication exercises.
- NAVTEX and EPIRB training sets.
- DSC (Digital Selective Calling) equipment and software simulators.
- Aldis lamp or equivalent light-signaling devices for Morse code practice.

Multimedia and Digital Resources

- Interactive simulation software for distress and safety communication scenarios.
- IMO e-learning modules and digital charts.
- Audio-visual materials (demonstration videos, recorded communication samples).

Supplementary Materials

- Instructor-prepared handouts, case studies, and scenario-based exercises.
- Access to maritime communication logs and sample reports.
- Port State and Flag State guidelines on distress and safety communication.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**LO10**
PO1	1	1	1	1	0	0	1	1	1	0
PO2	3	3	3	3	2	2	3	3	3	2
PO3	2	2	2	1	1	1	2	2	2	1
PO4	0	0	0	0	0	0	0	0	0	2
PO5	2	1	2	2	0	0	1	2	1	2
PO6	1	1	1	1	0	0	1	1	1	1
PO7	1	1	1	1	0	0	1	1	1	0
PO8	1	0	0	0	0	0	1	1	1	1
PO9	1	0	1	1	0	0	1	1	1	2
PO10	1	0	1	1	0	0	1	2	2	1
PO11	1	1	1	1	0	0	1	1	1	0
PO12	3	3	3	3	2	2	3	3	3	2

Course Learning Outcomes/ Evaluation Method		
Course Learning Outcomes (CLOs)	**Teaching Method**	**Assessment Method**
LO1	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO2	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO3	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO4	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO5	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO6	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO7	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO8	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO9	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment
LO10	Lecture, Hands-On Practice, Simulator	Role-play, performance assessment

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**5**	**75**
Midterm Exam	**1**	**5**	**5**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**5**	**5**
Preparation for Final Exam	**1**	**10**	**10**
Presentation(s)	**-**	**-**	**-**
Preparation for Presentation(s)	**-**	**-**	**-**
Research for Project(s)/Essay(s)	**-**	**-**	**-**
Project Writing	**-**	**-**	**-**
Group Work	**-**	**-**	**-**
In-class Discussion(s)	**15**	**2**	**30**
Quiz(es)	**2**	**3**	**6**
Preparation for Quiz(es)	**-**	**-**	**-**
Laboratory	**-**	**-**	**-**
Assignment(s)/Homework/Class Works	**2**	**3**	**6**
Micro-Teaching Sessions	**-**	**-**	**-**
Lesson Planning	**-**	**-**	**-**
Materials Adaptation	**-**	**-**	**-**
Material Development	**-**	**-**	**-**
Draft Preparation	**-**	**-**	**-**
Drawing	**-**	**-**	**-**
Essay Writing	**-**	**-**	**-**
Tutorial(s)	**-**	**-**	**-**
Portfolio Preparation	**1**	**2**	**2**
Portfolio Presentation	**-**	**-**	**-**
Total Workload			**164**
ECTS Credit			**5**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	1	10
Laboratory	-	-
Application	2	80
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	-	-
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	1	10
Midterms/Oral Exams	-	-
Final/Oral Exams	-	-
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Maritime Law and Conventions I							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
LAW301	III	Fall	4	4	4	0	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Fundamental Legal Knowledge (Core)**	**Legal Method & Reasoning**	**Legal Skills (Research & Writing)**	**General Education**
				60%	20%	10%	10%
Course Venue and Time				E-6016 (14.30 - 17.20)			
Instructor information				**Lect. Halil Emre Gürler** Faculty of Law halilemre.gurler@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides a comprehensive introduction to maritime law, international conventions, and regulations governing the safety, operation, and management of ships at sea. It covers fundamental legal principles, the structure of national and international maritime legislation, and the legal responsibilities of shipowners, captains, and crew members. Students will gain knowledge of essential maritime conventions, including SOLAS, MARPOL, STCW, COLREG, UNCLOS, and related IMO codes, as well as conventions governing liability, compensation, search and rescue, and the transport of passengers and cargo. The course also emphasizes practical applications of maritime law, English terminology for ship documentation, and compliance with national and international regulations, providing students with the legal framework necessary for safe and effective maritime operations.
Course Aims and Objectives	The course aims to provide students with a thorough understanding of the legal framework governing maritime activities, including national and international maritime law, conventions, and regulations. It seeks to equip students with the knowledge and skills necessary to interpret, apply, and comply with maritime legal requirements, ensuring safe, lawful, and efficient ship operations. • Explain the fundamental principles, sources, and types of law, including international and national legal systems. • Define and classify maritime law, including its scope, purpose, and key components. • Understand the legal responsibilities and authorities of shipowners, captains, crew, and port authorities. • Identify and interpret essential international maritime conventions and regulations (e.g., SOLAS, MARPOL, STCW, COLREG, UNCLOS). • Apply maritime legal knowledge to practical situations, including ship documentation, safety compliance, and cargo operations. • Understand maritime English terminology for legal documents, vessel operations, and cargo management.

	• Recognize legal procedures related to maritime accidents, salvage, liability, and environmental protection. • Demonstrate awareness of national and international regulatory organizations, their roles, and enforcement mechanisms.
Course Learning Outcomes	**CLO1:** Define and explain the fundamental principles, sources, and types of law relevant to maritime operations. **CLO2:** Describe the scope and classification of maritime law, including national and international regulations. **CLO3:** Identify the legal responsibilities, authorities, and obligations of shipowners, captains, crew members, and port authorities. **CLO4:** Interpret and apply major international maritime conventions and protocols, such as SOLAS, MARPOL, STCW, COLREG, UNCLOS, and ILO Maritime Labour Convention. **CLO5:** Demonstrate the ability to read, understand, and use maritime English terminology in legal, operational, and cargo documentation. **CLO6:** Analyze maritime incidents, including collisions, salvage operations, and pollution events, and determine the legal implications and applicable conventions. **CLO7:** Evaluate compliance requirements for ship certification, documentation, and inspection processes under national and international law. **CLO8:** Apply knowledge of maritime law to practical scenarios, including cargo handling, vessel operations, and environmental protection measures. **CLO9:** Communicate effectively with stakeholders using internationally recognized maritime legal terminology.

Content of the Course

Week	*Subject*
1	**Introduction to Law** • Definition, sources, and types of law • Fundamental principles of law • Basic legal terminology • International law vs. national law: applications and sanctions
2	**Introduction to Maritime Law** • Definition and classification of maritime law • Key principles of international maritime law • Structure and sources of national maritime legislation
3	**Maritime Safety and Legal Requirements** • Laws on the protection of life and property at sea • Seafarers' employment rights and obligations (Maritime Labour Law) • Role, authority, and responsibilities of the ship captain
4	**Ship Documentation and Records** • Definition and types of ships and seaworthiness requirements • Mandatory onboard documents and records • Maritime accidents, collisions, and general average
5	**Maritime Administration and English Terminology** • National maritime organizations and regulations • International maritime organizations and conventions • Ship inspection and certification procedures • Insurance terminology and claims
6	**English for Ship and Cargo Documentation** • Deck documents and port documents • Cargo-related documentation in English
7	**Introduction to International Maritime Organization (IMO)** • IMO structure, committees, and functions • General Assembly, Council, Committees, and Secretariat
8	**SOLAS and Related Codes** • SOLAS 1974 and Protocols (1978, 1988) overview • Related codes: IBC, IMSBC, LSA, FSS, ISM, ISPS, IMDG, FTP, HSC, IGC, INF, BCH • IAMSAR Volume III and International Code of Signals
9	**MARPOL and Pollution Prevention Conventions** • MARPOL 1973 and Protocol 1997 • Annexes and record books: Oil Record, Garbage Record, Sulphur Content Monitoring, Ballast Water • Introduction to environmental protection at sea

10	**Key International Conventions** • UNCLOS 1982 (United Nations Convention on the Law of the Sea) • STCW 1978 and its amendments • COLREG 1972 (Collision Regulations) • Load Line Conventions (LL 1966, LL Protocol 1988) • Tonnage Measurement 1969
11	**Maritime Labour and Safety Codes** • ILO Maritime Labour Convention 2006 • IMO Codes of Safe Practice: CSS, BLU, TDC, OSV • FAL 1965: ship and port declarations, crew and passenger lists, dangerous goods
12	**Maritime Labour and Safety Codes** • ILO Maritime Labour Convention 2006 • IMO Codes of Safe Practice: CSS, BLU, TDC, OSV • FAL 1965: ship and port declarations, crew and passenger lists, dangerous goods
13	**Liability and Compensation Conventions** • CLC 1969 and CLC Protocol 1992 • FUND 1971 and FUND Protocol 2003 • HNS 1996 (Hazardous and Noxious Substances) • OPRC-HNS 2000 Protocol
14	**Liability and Compensation Conventions** • CLC 1969 and CLC Protocol 1992 • FUND 1971 and FUND Protocol 2003 • HNS 1996 (Hazardous and Noxious Substances) • OPRC-HNS 2000 Protocol
15	**Suppression of Unlawful Acts and Final Review** • SUA 1988 and Protocol 2005 (Suppression of Unlawful Acts Against Maritime Navigation) • Summary and integration of maritime conventions • Case studies and discussion of practical implications

Methods and Techniques used in the Course

Lectures and Presentations: Instructor-led theoretical sessions supported with visual materials and case examples.

Classroom Discussions: Interactive discussions to encourage critical thinking and deeper understanding of maritime legal issues.

Case Study Analysis: Examination of real-life maritime incidents, accidents, and disputes to apply relevant conventions and legal principles.

Document and Convention Review: Practical exercises on reading, interpreting, and analyzing international conventions, ship documents, and legal texts.

Problem-Solving Exercises: Scenario-based activities requiring application of maritime law to operational and legal problems.

Group Work and Presentations: Collaborative tasks where students prepare and present analyses of selected maritime law topics.

Simulation and Role-Play: Mock legal or operational exercises (e.g., collision responsibility, salvage agreement, or port authority inspection) to practice real-world applications.

Use of Maritime English Terminology: Emphasis on practicing and applying specialized English vocabulary in written and oral form.

Independent Study and Research: Assignments and projects requiring students to explore maritime legal resources, conventions, and academic literature.

Sample Questions

Short Answer / Definition Questions:

- Define the term *avarya (general average)* and explain its significance in maritime law.
- What are the main sources of maritime law at both national and international levels?
- Briefly describe the duties and responsibilities of a shipmaster under international maritime law.
- What is the primary purpose of the *International Convention on Load Lines (1966)*?
- List the essential ship certificates required to be carried on board under SOLAS.

Essay / Long Answer Questions:

- Discuss the role and structure of the **International Maritime Organization (IMO)** and explain how its conventions influence national maritime legislation.
- Explain the legal consequences of a collision at sea under the **COLREG 1972** Convention, including the allocation of liability.
- Analyze the scope and application of **MARPOL 73/78** with specific reference to oil pollution prevention measures.
- Evaluate the impact of the **STCW 1978 Convention** on the training and certification of seafarers.
- Compare and contrast the concepts of *salvage* and *towage* in maritime law.

Problem-Solving / Case Study Questions:

- A cargo ship suffers a fire at sea and jettisons part of its cargo to save the vessel. Discuss the legal implications for the shipowner and cargo owners under the principle of general average.
- A tanker collides with another vessel in international waters, causing oil pollution. Apply the relevant conventions (COLREG, CLC, MARPOL) to determine liability and possible compensation mechanisms.
- During a port inspection, authorities discover that a vessel's *Garbage Record Book* has not been properly maintained. Identify the applicable convention and discuss potential consequences for the ship and the master.
- A seafarer claims his employment contract has been violated under the Maritime Labour Convention (MLC 2006). Discuss the rights and remedies available to the seafarer.
- A ship is detained at a foreign port due to deficiencies in its safety equipment. Explain which international conventions and codes may apply to this case.

Materials Used in the Course

Primary References:

- International Maritime Organization (IMO) Conventions and Protocols:
  - SOLAS 1974 (International Convention for the Safety of Life at Sea)
  - MARPOL 73/78 (International Convention for the Prevention of Pollution from Ships)
  - COLREG 1972 (Convention on the International Regulations for Preventing Collisions at Sea)
  - STCW 1978 (International Convention on Standards of Training, Certification and Watchkeeping for Seafarers)
  - UNCLOS 1982 (United Nations Convention on the Law of the Sea)
  - LL 1966 (Load Line Convention) and 1988 Protocol
  - ILO Maritime Labour Convention, 2006 (MLC 2006)
  - Other relevant IMO codes (ISM, ISPS, IMDG, LSA, FSS, CSS, BLU, TDC, OSV Codes, etc.)

Secondary References:

- Özdemir, H. (Latest Edition). *Maritime Law: National and International Perspectives.*
- Berlingieri, F. *International Maritime Conventions.*
- Mukherjee, P.K., & Brownrigg, M. *Farthing on International Shipping.*
- Churchill, R.R., & Lowe, A.V. *The Law of the Sea.*
- Tetley, W. *Marine Cargo Claims.*

IMO Publications:

- International Code of Signals (INTERCO)
- IAMSAR Manual (Vol. III)
- Oil Record Book, Garbage Record Book, Ballast Water Record Book
- IMO Safety and Environmental Circulars

Legislation and Regulations:

- National Maritime Legislation (relevant laws, regulations, and decrees)
- Port State Control guidelines and procedures
- Case law and judicial precedents in maritime law

Supplementary Materials:

- Lecture slides and course notes prepared by the instructor
- Case studies and practical scenarios from real maritime incidents
- Legal documents such as bills of lading, charter parties, crew contracts, insurance policies
- Access to IMO's online databases and digital libraries

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	
PO1	2	2	1	1	2	1	3	3	1	
PO2	2	2	1	2	2	1	2	2	2	
PO3	2	3	2	1	2	1	1	3	3	
PO4	2	2	3	3	3	2	2	2	2	
PO5	1	2	2	2	3	3	2	2	1	
PO6	3	3	3	3	3	2	3	3	2	
PO7	2	2	2	2	1	2	3	3	2	
PO8	1	2	2	2	2	1	1	3	3	
PO9	2	2	2	3	2	2	2	3	3	
PO10	3	3	3	3	3	3	3	3	3	
PO11	2	2	2	2	3	3	3	2	2	
PO12	2	3	3	3	3	3	3	2	2	

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1 – Fundamental Principles of Maritime Law	Lecture, Multimedia Presentation, Case Studies	Quizzes, Assignments, Participation
CLO2 – Scope & Classification of Maritime Law	Lecture, Group Discussions, Tutorials	Quizzes, Written Assignments, Midterm Exam
CLO3 – Legal Responsibilities of Stakeholders	Case Studies, Role-Playing, Problem-Based Learning	Assignments, Observation, Practical Exercises
CLO4 – International Maritime Conventions	Lecture, Workshops, Simulation Exercises	Assignments, Midterm Exam, Practical Case Analysis
CLO5 – Maritime English Terminology in Legal Contexts	Lecture, Guided Practice, Document Analysis	Written Exercises, Quizzes, Assignments
CLO6 – Analysis of Maritime Incidents	Case Studies, Scenario-Based Learning, Group Work	Practical Case Reports, Assignments, Participation
CLO7 – Compliance & Certification Requirements	Lecture, Tutorials, Simulation	Assignments, Quizzes, Practical Exercises
CLO8 – Application of Maritime Law in Operations	Problem-Based Learning, Simulation, Workshops	Case Study Reports, Practical Exams, Assignments
CLO9 – Communication Using Maritime Legal Terminology	Role-Playing, Group Exercises, Presentations	Oral Presentations, Assignments, Observation

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**4**	**60**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**15**	**15**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**20**	**20**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	-	-	-
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**10**	**10**
Individual Reading / Research	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**139**
ECTS Credit			**4**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Heat Transfer							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MEC301	III	Fall	3	3	2	2	0
Department: Marine Engineering							
Course type: Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				20	-	30	50
Course Venue and Time				Wednesday 09.30-12.20			
Instructor information				**Prof. Dr. Şenol Başkaya** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4060 senol.baskaya@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	The **Heat Transfer** course provides students with a comprehensive understanding of the mechanisms of energy transfer in the form of conduction, convection, and radiation. The course begins with an introduction to the basic concepts of heat transfer and progresses to the derivation and application of the heat conduction equation, both in steady and transient conditions. Students will learn analytical and approximate methods to solve heat transfer problems, including the use of the thermal resistance concept and extended surfaces (fins). The course covers convection heat transfer fundamentals with emphasis on external and internal forced convection, as well as natural convection phenomena. Special attention is given to the practical applications of finned surfaces for heat transfer enhancement. Radiation heat transfer, its governing laws, and analytical methods are also introduced. The course concludes with the study of mass transfer, highlighting the similarities and differences between heat and mass transfer processes. Through theoretical lectures and practical applications, students will develop the ability to analyze, model, and solve heat and mass transfer problems in engineering systems. The course builds a strong foundation for applications in thermal system design, energy technologies, and industrial processes.
Course Aims and Objectives	The aim of this course is to provide students with a solid theoretical and practical foundation in the principles and applications of heat and mass transfer, enabling them to analyze, design, and optimize engineering systems involving thermal processes. • Introduce the fundamental mechanisms of heat transfer: conduction, convection, and radiation. • Develop the ability to apply the heat conduction equation to steady and transient problems. • Teach the use of analytical and approximate methods for solving heat transfer problems in different geometries and boundary conditions. • Provide knowledge on convection heat transfer, including external and internal forced convection, and natural convection. • Explain the thermal resistance concept and its application in composite systems and finned surfaces for heat transfer enhancement. • Introduce the principles of radiation heat transfer and analytical techniques for radiation exchange. • Establish the relationship between heat and mass transfer, emphasizing analogies and engineering applications. • Strengthen problem-solving, analytical thinking, and engineering judgment in the context of thermal systems. • Prepare students for advanced courses in thermal sciences and for solving real-world engineering problems related to energy, propulsion, and industrial processes.

Course Learning Outcomes	**CLO1 — Explain Fundamental Heat Transfer Mechanisms** Understand and explain conduction, convection, radiation, and the fundamental principles governing heat and mass transfer. **CLO2 — Apply Conduction and Transient Heat Transfer Analysis** Apply steady-state and transient heat conduction equations to solve one-dimensional and multi-dimensional engineering problems. **CLO3 — Analyze Thermal Resistance Networks and Extended Surfaces** Evaluate thermal resistance networks, composite materials, and finned surfaces to assess system performance. **CLO4 — Evaluate Convective and Radiative Heat Transfer** Analyze internal and external convective heat transfer (natural and forced) and perform radiation heat transfer calculations using surface interactions and radiation networks. **CLO5 — Apply Heat–Mass Transfer Analogies and Solve Engineering Problems** Use heat–mass transfer analogies and analytical techniques to solve practical engineering problems with appropriate approximations and engineering judgment. **CLO6 — Integrate Theory with Applications and Optimize Thermal Systems** Integrate heat/mass transfer theory with practical applications—including heat exchangers, cooling systems, and thermal management—and evaluate/optimize systems for efficiency, safety, and sustainability.

Content of the Course

Week	*Subject*
1	Introduction and basic concepts
2	Heat conduction equation
3	Analytical solutions
4	Steady heat conduction
5	Thermal resistance concept, finned surfaces
6	Introduction to transient heat conduction
7	Transient heat conduction calculations
8	Fundamentals of convection
9	External forced convection
10	Internal forced convection
11	Natural convection
12	Finned surfaces
13	Fundamentals of thermal radiation
14	Radiation heat transfer analysis
15	Mass transfer

Methods and Techniques Used in the Course

Lectures – Comprehensive explanation of heat transfer theories, principles, and governing equations.

Problem-Solving Sessions – Step-by-step demonstrations of analytical solutions for conduction, convection, and radiation problems.

Tutorials – Guided practice on applying heat transfer concepts to real-world engineering scenarios, including marine and industrial applications.

Laboratory Experiments – Hands-on activities to observe heat transfer phenomena, measure temperature distributions, and validate theoretical models.

Case Studies – Analysis of practical engineering systems such as heat exchangers, cooling systems, and thermal management of machinery.

Simulations and Computational Tools – Use of software (e.g., MATLAB, ANSYS, or similar) to model and analyze heat transfer processes.

Group Work and Projects – Collaborative exercises to design, analyze, and optimize heat transfer systems.

Quizzes and Assignments – Continuous assessment through problem sets and short exercises to reinforce understanding of concepts.

Discussion and Interactive Learning – In-class discussions of recent research, technological applications, and engineering challenges in heat transfer.

Sample Questions

Conduction

- Derive the steady-state one-dimensional heat conduction equation for a plane wall with constant thermal conductivity.
- Calculate the temperature distribution along a fin of uniform cross-section and given boundary conditions.

Convection

- Determine the convective heat transfer coefficient for a fluid flowing over a flat plate under laminar flow conditions.
- Compare the Nusselt number correlations for internal forced convection in circular pipes for laminar and turbulent flow.

Radiation

- Explain the difference between blackbody and graybody radiation and compute the net radiative heat transfer between two surfaces.
- Solve a problem involving radiation exchange between multiple surfaces using the view factor method.

Transient Heat Conduction

- Derive the lumped capacitance model for a body with a small Biot number and solve for temperature as a function of time.
- Calculate the time required for a solid sphere to cool from an initial temperature to a final temperature using the transient heat conduction equation.

Combined Modes of Heat Transfer

- Analyze a system where conduction, convection, and radiation occur simultaneously, and compute the total heat transfer rate.
- Design a basic heat exchanger to achieve a given temperature difference between hot and cold fluids.

Mass Transfer (Optional / Coupled Heat-Mass Transfer)

- Solve a problem involving simultaneous heat and mass transfer, such as evaporation from a liquid surface.
- Determine the effect of diffusivity and convective coefficients on mass transfer rates in each system.

Materials Used in the Course

Textbooks

- Incropera, F. P., DeWitt, D. P., Bergman, T. L., & Lavine, A. S., *Fundamentals of Heat and Mass Transfer*, 8th Edition, Wiley, 2018.
- Çengel, Y. A., *Heat and Mass Transfer: Fundamentals and Applications*, 5th Edition, McGraw-Hill, 2019.
- Holman, J. P., *Heat Transfer*, 11th Edition, McGraw-Hill, 2010.

Reference Books

- Kakac, S., Liu, H., & Pramuanjaroenkij, A., *Heat Exchangers: Selection, Rating, and Thermal Design*, 3rd Edition, CRC Press, 2012.
- Bergman, T. L., Lavine, A. S., Incropera, F. P., & DeWitt, D. P., *Introduction to Heat Transfer*, Wiley, 2011.

Software & Simulation Tools

- MATLAB / Simulink – for solving transient and steady-state heat conduction problems.
- ANSYS Fluent – for computational fluid dynamics (CFD) simulations involving convection and radiation.
- EES (Engineering Equation Solver) – for solving coupled heat and mass transfer problems.

Academic Papers & Journals

- International Journal of Heat and Mass Transfer
- Applied Thermal Engineering
- Experimental Thermal and Fluid Science

Laboratory Equipment *(for practical sessions)*

- Heat conduction apparatus (plane wall, cylinder, and sphere models)
- Forced and natural convection rigs
- Radiation heat transfer setup with blackbody and graybody surfaces
- Finned surface heat transfer rigs
- Thermocouples, data loggers, and infrared thermometers

Supplementary Materials

- Lecture slides and notes provided by the instructor
- Example problem sets and solution manuals
- Case studies on industrial applications of heat transfer, e.g., heat exchangers, electronic cooling, and HVAC systems

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of marine engineering principles, systems, and machinery operations, and effectively apply this knowledge to ensure safe, efficient, and sustainable vessel performance in compliance with IMO and STCW standards.				✓	Technical Knowledge & Applied Sciences
2	Apply advanced engineering design principles to develop, adapt, and optimize mechanical, electrical, and control systems onboard ships and in shore-based industrial contexts, integrating safety, cost-efficiency, and environmental considerations.				✓	Analytical & Computational Skills
3	Perform engineering watchkeeping duties and operational management with professional responsibility, situational awareness, and adherence to international maritime conventions and best practices.				✓	Sustainable Design & Safe Operating
4	Identify, formulate, and analyze complex engineering problems using appropriate theoretical, computational, and experimental techniques to derive sound, data-driven solutions in marine and related engineering domains.			✓		Research & Experimentation
5	Integrate principles of safety culture, risk assessment, and environmental protection into all engineering practices, promoting sustainable operations aligned with IMO conventions such as MARPOL and SOLAS.			✓		Innovation & Digital Competence
6	Employ advanced digital tools, diagnostic systems, and automation technologies for monitoring, control, and performance assessment of marine and industrial systems, in line with the requirements of the evolving maritime digitalization era.				✓	Regulatory Frameworks & Safety
7	Demonstrate competence in planning, executing, and managing engineering projects, including resource allocation, budgeting, and maintenance planning, while ensuring quality, safety, and compliance with regulatory frameworks.				✓	Teamwork & Leadership
8	Function effectively as a leader and member of multidisciplinary and multicultural teams, fostering collaboration, ethical conduct, and efficient communication in dynamic and often high-stress maritime environments.				✓	Project Management & Entrepreneurship
9	Communicate effectively in both written and oral forms with clarity, professionalism, and technical precision in English and other relevant languages within maritime and industrial contexts.			✓		Ethics & Professionalism
10	Adhere to the ethical and professional standards of the engineering and maritime professions, demonstrating accountability, integrity, and a commitment to continuous professional development and lifelong learning.				✓	Lifelong Learning & Adaptability
11	Evaluate and implement sustainable engineering practices and emerging green technologies to minimize the environmental footprint of marine and industrial operations.			✓		Communication Competence
12	Exhibit the flexibility and interdisciplinary mindset required to transfer marine engineering knowledge and skills to diverse sectors, contributing effectively to innovation and technological advancement beyond the maritime industry.			✓		Global Vision & Societal Impact

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution						
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
PO1	3	3	2	2	2	3
PO2	2	3	3	3	3	3
PO3	2	2	2	2	2	3
PO4	1	2	2	3	3	3
PO5	2	2	2	2	2	3
PO6	1	2	2	2	2	3
PO7	1	1	2	2	2	2
PO8	1	1	2	2	2	2
PO9	1	1	1	2	2	2
PO10	1	2	2	3	3	3
PO11	1	1	2	2	2	3
PO12	1	1	2	2	2	3

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1	Lecture, Problem-solving sessions	Midterm exam, Quizzes
CLO2	Lecture, Tutorial exercises, Example demonstrations	Midterm exam, Homework assignments
CLO3	Lecture, Analytical exercises, In-class practices	Midterm exam, Final exam
CLO4	Lecture, Case studies, Simulation-based learning	Final exam, Project/Report
CLO5	Lecture, Engineering applications, Design/problem tasks	Project, Practical evaluation
CLO6	Lecture, Case studies, Group work, Applied problem-solving	Project report, Presentation, Final exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	-	-	-
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**6**	**6**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**6**	**6**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Case Studies / Critical Thinking	-	-	-
Project Writing	**1**	**20**	**20**
Group Work	-	-	-
In-class Discussion(s)	-	-	-
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory / Practical Applications	-	-	-
Assignment(s)/Homework/Class Works	**1**	**15**	**15**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**96**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	1	10
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	Course Grade	Coefficient
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Machine Component Design							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MEC303	III	Fall	3	3	2	2	0
Course type: Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				20	30	30	20
Course Venue and Time				Wednesday 09.30-12.20			
Instructor information				**Chf. Eng. Volkan Varışlı** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4095 volkan.varisli@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	The **Machine Component Design** course provides a comprehensive understanding of the fundamental principles and analytical techniques used in the design of machine elements and mechanical systems. The course introduces the mechanical behavior of engineering materials, including their properties, selection criteria, and manufacturing considerations relevant to machine design. Students learn to analyze stresses in machine components under various loading conditions—axial, shear, torsional, and bending—through graphical and analytical methods such as **Mohr's Circle**. Emphasis is placed on the application of safety factors, failure theories, and design criteria to ensure the reliability and durability of mechanical systems. The course also covers the design and analysis of essential machine elements such as **riveted joints, welded and screwed connections, shafts, clutches, bearings, and springs**, examining their functions, failure modes, and design optimization principles. Practical applications are reinforced through problem-solving exercises, quizzes, and case studies reflecting real-world engineering challenges. Through this course, students gain the ability to apply engineering knowledge, material science, and mechanical design principles to the creation of safe, efficient, and cost-effective machine components that meet performance and operational requirements.
Course Aims and Objectives	The primary aim of this course is to equip students with the theoretical knowledge and practical skills necessary for designing, analyzing, and evaluating machine components that operate safely and efficiently under various loading and environmental conditions. The course bridges the gap between fundamental mechanics and real-world engineering design by integrating concepts from material science, stress analysis, and manufacturing processes. • **To introduce the principles of mechanical design** and the systematic approach used in developing machine components that meet functional, economic, and safety requirements. • **To develop students' ability to analyze stresses and deformations** in mechanical members subjected to axial, torsional, bending, and combined loads using analytical and graphical methods. • **To provide a thorough understanding of material selection** and the influence of material properties and manufacturing processes on design performance and reliability. • **To enable students to apply failure theories and design criteria** for static and dynamic loading conditions, incorporating factors of safety and service conditions. • **To teach the design and operational characteristics of common machine elements**, including riveted joints, welded and screwed connections, shafts, clutches, bearings, and springs.

	• **To enhance problem-solving and decision-making skills** in the context of mechanical design, considering constraints such as cost, efficiency, and sustainability. • **To prepare students for professional engineering practice** by emphasizing the importance of design documentation, engineering ethics, and compliance with standards and design codes.
Course Learning Outcomes	**CLO1 – Fundamental Principles of Machine Design** Explain the fundamental principles of machine design, including the relationships among loads, stresses, strains, material properties, and mechanical behavior of components. **CLO2 – Stress, Strain & Failure Analysis** Analyze stress and strain distributions in machine elements under axial, torsional, bending, and combined loading using analytical, graphical, and computational methods; apply failure theories and safety factors for static and dynamic load conditions. **CLO3 – Material & Component Selection** Select appropriate engineering materials and mechanical components (shafts, bearings, springs, clutches, joints) based on mechanical properties, design standards, manufacturing constraints, operational requirements, and cost considerations. **CLO4 – Design of Machine Elements** Design and evaluate mechanical joints (riveted, welded, screwed), shafts, bearings, clutches, and springs; perform related calculations and ensure the required reliability, functionality, and safety margins. **CLO5 – Advanced Stress Analysis & Analytical Tools** Interpret and apply advanced analytical tools—including Mohr's Circle, principal stresses, and strain transformation—to assess complex loading conditions and ensure optimal design performance. **CLO6 – Integration, CAD Application & Professional Practice** Integrate material, design, and manufacturing principles; utilize CAD tools and design standards for modeling and validating machine components; prepare professional engineering reports while adhering to ethical and safety practices.

Content of the Course

Week	*Subject*
1	Introduction, course overview
2	Engineering Materials and Their Properties Manufacturing Consideration of Machine Design
3	Quiz I
4	Stress • Shear Stress • Tortional Shear Stress • Bending Stress • Mohr Cycle
5	Stress • Shear Stress • Tortional Shear Stress • Bending Stress • Mohr Cycle
6	Quiz II
7	Factors of Safety, Plain and rolling bearings,
8	Mid-term Exam
9	Riveted Joints
10	Quiz III
11	Welding
12	Screwing
13	Shafts and clutches / Quiz IV
14	Springs
15	Final Exams

Methods and Techniques Used in the Course

Lectures and Theoretical Explanations:

Core concepts of mechanical design, material behavior, and stress analysis are introduced through instructor-led lectures supported by visual materials, design standards, and real-world examples.

Problem-Solving Sessions:

Students engage in analytical exercises and numerical problem-solving related to stress, strain, and component design to strengthen their ability to apply theoretical knowledge to engineering scenarios.

Case Studies and Design Applications:

Real-life engineering problems, such as the design of shafts, bearings, and joints, are analyzed to illustrate the integration of mechanical design principles with practical constraints.

Laboratory and Computational Activities:

Practical applications are supported through hands-on activities, including CAD-based component modeling and computational analysis using engineering software where applicable.

Group Projects and Design Assignments:

Students collaborate in small teams to design, evaluate, and present machine components, fostering teamwork, communication, and project management skills.

Quizzes and Midterm/Final Examinations:

Regular quizzes and exams assess comprehension, analytical skills, and the ability to apply mechanical design principles under given constraints.

Interactive Discussions and Feedback:

Classroom discussions encourage critical thinking, problem interpretation, and peer learning, supported by instructor feedback on design solutions and analytical methods.

Use of Standards and Design Codes:

Students are guided in applying relevant engineering standards (e.g., ISO, ASME, DIN) in mechanical design to ensure accuracy, safety, and compliance with industrial practices.

Sample Questions

Stress Analysis and Mohr's Circle

- Determine the normal and shear stresses acting on an inclined plane of a shaft subjected to combined bending and torsion.
- Draw Mohr's circle for a given state of stress and determine principal stresses and maximum shear stress.

Factor of Safety and Material Selection

- Calculate the factor of safety for a shaft subjected to fluctuating loads, considering both static and fatigue conditions.
- Recommend suitable materials for a high-speed rotating shaft, considering mechanical properties and manufacturing constraints.

Design of Bearings

- Design a plain journal bearing for a given load, speed, and lubrication condition.
- Calculate the required dimensions of a rolling bearing for a shaft under radial and axial loads.

Riveted and Welded Joints

- Determine the stresses in a riveted lap joint subjected to tensile load and suggest design improvements.
- Design a welded joint for a structural component, specifying the type and size of weld required to resist the applied load.

Shafts and Couplings

- Design a shaft to transmit a specified power at a given speed, considering torsion, bending, and combined loading.
- Select and design a coupling to connect two shafts, ensuring alignment and torque transmission.

Springs and Energy Storage Components

- Calculate the dimensions and stiffness of a helical compression spring subjected to an axial load.
- Determine the deflection and stress in a leaf spring used in a mechanical assembly.

General Design and Problem Solving

- Evaluate a failed machine component using given load conditions, material properties, and failure modes.
- Compare two design alternatives for a mechanical assembly and justify the selection based on strength, manufacturability, and safety.

Materials Used in the Course

Textbooks and Reference Books

- Shigley, J.E., Mischke, C.R., & Budynas, R.G., *Mechanical Engineering Design*, 11th Edition, McGraw-Hill, 2019.
- Spotts, M.F., Shoup, T.E., & Hornberger, K.E., *Design of Machine Elements*, 9th Edition, Pearson, 2014.
- Juvinall, R.C., & Marshek, K.M., *Fundamentals of Machine Component Design*, 5th Edition, Wiley, 2012.

Lecture Notes and Course Handouts

- Detailed notes on stress analysis, Mohr's circle, shaft and bearing design, riveted and welded joints, springs, and couplings.
- Sample design problems and solutions for mechanical components.

Software Tools

- **CAD Software:** SolidWorks / AutoCAD for modeling and visualization of machine components.
- **FEA Software:** ANSYS / SolidWorks Simulation for stress analysis and deformation studies.
- **Spreadsheet Tools:** Microsoft Excel for calculations, data organization, and iterative design checks.

Laboratory and Workshop Materials

- Material samples for tensile, shear, and torsion testing (steel, aluminum, and non-ferrous alloys).
- Riveted and welded joint samples for strength and failure study.
- Bearing and coupling prototypes for practical understanding and measurement exercises.
- Helical, leaf, and torsion spring samples for stress and deflection experiments.

Online Resources

- Access to academic journals (e.g., *Journal of Mechanical Design*, *International Journal of Mechanical Sciences*) for recent research and case studies.
- Standards and codes: ISO, ASME, and ASTM standards relevant to machine design and material selection.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of marine engineering principles, systems, and machinery operations, and effectively apply this knowledge to ensure safe, efficient, and sustainable vessel performance in compliance with IMO and STCW standards.				✓	Technical Knowledge & Applied Sciences
2	Apply advanced engineering design principles to develop, adapt, and optimize mechanical, electrical, and control systems onboard ships and in shore-based industrial contexts, integrating safety, cost-efficiency, and environmental considerations.				✓	Analytical & Computational Skills
3	Perform engineering watchkeeping duties and operational management with professional responsibility, situational awareness, and adherence to international maritime conventions and best practices.				✓	Sustainable Design & Safe Operating
4	Identify, formulate, and analyze complex engineering problems using appropriate theoretical, computational, and experimental techniques to derive sound, data-driven solutions in marine and related engineering domains.			✓		Research & Experimentation
5	Integrate principles of safety culture, risk assessment, and environmental protection into all engineering practices, promoting sustainable operations aligned with IMO conventions such as MARPOL and SOLAS.			✓		Innovation & Digital Competence
6	Employ advanced digital tools, diagnostic systems, and automation technologies for monitoring, control, and performance assessment of marine and industrial systems, in line with the requirements of the evolving maritime digitalization era.				✓	Regulatory Frameworks & Safety
7	Demonstrate competence in planning, executing, and managing engineering projects, including resource allocation, budgeting, and maintenance planning, while ensuring quality, safety, and compliance with regulatory frameworks.				✓	Teamwork & Leadership
8	Function effectively as a leader and member of multidisciplinary and multicultural teams, fostering collaboration, ethical conduct, and efficient communication in dynamic and often high-stress maritime environments.				✓	Project Management & Entrepreneurship
9	Communicate effectively in both written and oral forms with clarity, professionalism, and technical precision in English and other relevant languages within maritime and industrial contexts.			✓		Ethics & Professionalism
10	Adhere to the ethical and professional standards of the engineering and maritime professions, demonstrating accountability, integrity, and a commitment to continuous professional development and lifelong learning.				✓	Lifelong Learning & Adaptability
11	Evaluate and implement sustainable engineering practices and emerging green technologies to minimize the environmental footprint of marine and industrial operations.			✓		Communication Competence
12	Exhibit the flexibility and interdisciplinary mindset required to transfer marine engineering knowledge and skills to diverse sectors, contributing effectively to innovation and technological advancement beyond the maritime industry.			✓		Global Vision & Societal Impact

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution						
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
PO1	3	3	2	2	2	2
PO2	2	3	3	3	3	2
PO3	2	3	3	3	3	2
PO4	1	2	3	3	3	2
PO5	1	2	2	3	2	2
PO6	1	2	2	2	3	2
PO7	1	1	2	2	2	2
PO8	1	1	2	2	2	3
PO9	1	1	1	1	2	3
PO10	2	2	2	3	3	2
PO11	1	2	2	2	2	3
PO12	1	2	2	2	2	3

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1	Lectures, Conceptual Explanation, Problem-Solving Sessions	Midterm Exam, Quizzes
CLO2	Lectures, Analytical Exercises, Example Problems	Midterm Exam, Problem Sets
CLO3	Case Studies, Design-Oriented Problem Solving, Tutorials	Midterm Exam, Final Exam
CLO4	Material Selection Workshops, Interactive Lectures	Assignments, Design Reports
CLO5	Lab Demonstrations, Technical Applications, Design Practice	Lab Reports, Project Evaluation
CLO6	CAD-Based Sessions, Design Simulations, Group Projects	Project Report, Presentation, Final Exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**4**	**60**
Midterm Exam	**1**	**1**	**1**
Preparation for Midterm Exam	**1**	**4**	**4**
Final Exam	**1**	**1**	**1**
Preparation for Final Exam	**1**	**4**	**4**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Case Studies / Critical Thinking	-	-	-
Project Writing	**1**	**4**	**4**
Group Work	**1**	**4**	**4**
In-class Discussion(s)	-	-	-
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory / Practical Applications	**2**	**4**	**8**
Assignment(s)/Homework/Class Works	**4**	**4**	**16**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**117**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	2	20
Field Work	1	5
Special Course Internship (Work Placement)	-	-
Homework/Assignments	4	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	1	5
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	30
Total	**10**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Fluid Mechanics							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MEC305	III	Fall	3	4	3	0	0
Course type: Compulsory Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				20	-	30	50
Course Venue and Time				Wednesday 09.30-12.20			
Instructor information				**Prof. Dr. Şenol Başkaya** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4060 senol.baskaya@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	The ***Fluid Mechanics*** course provides students with a comprehensive understanding of the fundamental principles governing fluid behavior and their applications in engineering systems. The course begins with an introduction to the basic concepts and properties of fluids, followed by an in-depth study of pressure, fluid statics, and hydrostatic forces. Students will learn to analyze fluid motion through kinematics, flow visualization, and flow patterns, and will apply fundamental equations such as the Bernoulli and general energy equations to practical problems. The course also emphasizes energy and momentum analysis of steady flow systems, including applications of linear and angular momentum equations. Internal flows are studied with a focus on pipe networks and minor losses, while external flow topics introduce concepts of drag and lift that are critical in marine and mechanical engineering applications. By the end of the course, students will develop the ability to model, analyze, and solve real-world engineering problems related to fluid mechanics, preparing them for advanced courses and professional applications in fields such as ship design, propulsion systems, and energy systems.
Course Aims and Objectives	**Course Aims and Objectives** The primary aim of this course is to provide students with a solid foundation in the principles of fluid mechanics and their applications in engineering systems, particularly within maritime and mechanical engineering contexts. The course seeks to equip students with both theoretical understanding and analytical skills required to model, analyze, and interpret fluid flow phenomena. • Understand the fundamental properties of fluids and the basic principles of fluid statics and dynamics. • Analyze hydrostatic forces on submerged surfaces and evaluate fluid pressure distributions. • Apply the Bernoulli and general energy equations to practical engineering systems. • Perform energy and momentum analysis of steady-state flow systems. • Examine internal flows with emphasis on pipe networks, head losses, and flow distribution. • Understand the principles of external flows, including drag and lift forces, and their relevance in engineering applications. • Develop problem-solving skills by applying theoretical concepts to real-world scenarios in marine and mechanical systems. • Foster critical thinking and analytical reasoning for advanced studies and professional practice in fluid-related engineering fields.

Course Learning Outcomes	**CLO1 – Understand Fundamental Fluid Mechanics Concepts** Define and explain the essential properties of fluids and core principles of fluid mechanics, including fluid statics, kinematics, and dynamics, using appropriate engineering terminology. **CLO2 – Analyze Hydrostatic Pressure and Forces** Analyze pressure distributions in static fluids and calculate hydrostatic forces acting on submerged and floating bodies, applying these principles to marine and engineering structures. **CLO3 – Apply Fluid Flow and Energy Principles** Apply Bernoulli's equation, the general energy equation, and momentum analysis to solve engineering problems involving fluid motion, steady flow systems, pipelines, and channels. **CLO4 – Evaluate Flow Losses and System Behavior** Evaluate frictional and minor head losses in internal flows and design simple piping networks, interpreting flow behavior through fluid kinematics and flow visualization patterns. **CLO5 – Analyze External Flows and Engineering Applications** Explain and calculate drag and lift forces in external flows and relate these phenomena to practical engineering applications such as ships, turbines, aerodynamic surfaces, and propulsion systems. **CLO6 – Demonstrate Engineering Problem-Solving and Communication Skills** Integrate theoretical principles with practical engineering applications to solve fluid-related problems, effectively communicate technical results using diagrams and engineering reasoning, and demonstrate readiness for advanced hydraulics, hydrodynamics, and marine engineering courses.

Content of the Course

Week	*Subject*
1	Introduction Basic Concepts
2	Properties of fluids
3	Pressure and fluid statics
4	Hydrostatic forces
5	Fluid kinematics
6	Flow patterns and flow visualization
7	Bernoulli equation
8	General energy equation
9	Energy analysis of steady flows
10	Momentum analysis of flow systems
11	Linear and angular momentum equations
12	Internal flow
13	Minor losses piping networks
14	Introduction to external flow
15	Drag and lift

Methods and Techniques Used in the Course

Lectures and Theoretical Explanations – Delivery of fundamental fluid mechanics concepts supported by visual aids, diagrams, and real-world engineering examples.

Problem-Solving Sessions – Step-by-step analysis of sample problems to reinforce theoretical knowledge through quantitative applications.

Classroom Discussions and Q&A – Interactive discussions to encourage critical thinking and conceptual understanding.

Case Studies – Examination of real engineering problems related to hydraulics, marine hydrodynamics, and aerodynamics.

Group Work – Collaborative problem-solving and discussions to enhance teamwork and communication skills.

Assignments and Homework – Regularly assigned exercises to improve analytical and practical skills.

Visual and Simulation Tools – Use of flow visualization, diagrams, and, where applicable, basic computational tools to support understanding of abstract fluid phenomena.

Exams and Quizzes – Midterm and final exams, along with short quizzes, to assess comprehension, problem-solving ability, and application of concepts.

Sample Questions

Conceptual Questions

- Define the basic properties of fluids and explain the difference between compressible and incompressible fluids.
- Discuss the physical significance of Bernoulli's equation and provide two practical engineering applications.
- Explain the difference between laminar and turbulent flow.

Problem-Solving Questions

- A tank is filled with water to a depth of 4 m. Calculate the hydrostatic force on a vertical rectangular plate of 2 m width and 3 m height, fully submerged in water.
- Water flows through a horizontal pipe that narrows from a cross-sectional area of 0.05 m^2 to 0.01 m^2. If the velocity in the wider section is 2 m/s, calculate the velocity in the narrower section using the continuity equation.
- Using Bernoulli's equation, determine the pressure difference between two points in a horizontal pipeline if the velocity changes from 3 m/s to 6 m/s. Assume water density = 1000 kg/m^3.

Applied/Advanced Questions

- A pump delivers 0.2 m^3/s of water to a reservoir 15 m above the pump inlet with a total head loss of 3 m. Calculate the required pump power if the pump efficiency is 70%.
- A pipe system has three parallel branches with different diameters and lengths. Discuss how you would approach calculating the flow distribution in the network.
- An airfoil with a chord length of 2 m experiences a lift force of 5000 N when exposed to an airflow velocity of 30 m/s at sea-level conditions. Calculate the lift coefficient.

Materials Used in the Course

Textbooks and References

- *Fluid Mechanics* by Frank M. White, McGraw-Hill.
- *Fundamentals of Fluid Mechanics* by Munson, Young, Okiishi, and Huebsch.
- *Mechanics of Fluids* by Merle C. Potter and David C. Wiggert.
- Additional academic papers and case studies related to fluid dynamics applications.

Lecture Materials

- Instructor-prepared lecture notes and slides.
- Problem sets and sample solutions.
- Supplementary reading materials provided via the learning management system.

Software and Computational Tools

- MATLAB for solving fluid mechanics problems numerically.
- ANSYS Fluent or OpenFOAM for Computational Fluid Dynamics (CFD) simulations.
- Microsoft Excel for data analysis and graphing.

Visual and Demonstrative Materials

- Flow visualization videos (laminar vs. turbulent flow, drag/lift demonstrations).
- Laboratory demonstrations (if available) such as manometers, Venturi meters, and flow channels.
- Virtual labs and online simulation tools for fluid flow experiments.

Assessment Tools

- Homework assignments and practice problem sets.
- Mid-term and final exams (theoretical and problem-solving).
- Optional project or report on a selected fluid mechanics topic.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of marine engineering principles, systems, and machinery operations, and effectively apply this knowledge to ensure safe, efficient, and sustainable vessel performance in compliance with IMO and STCW standards.				✓	Technical Knowledge & Applied Sciences
2	Apply advanced engineering design principles to develop, adapt, and optimize mechanical, electrical, and control systems onboard ships and in shore-based industrial contexts, integrating safety, cost-efficiency, and environmental considerations.				✓	Analytical & Computational Skills
3	Perform engineering watchkeeping duties and operational management with professional responsibility, situational awareness, and adherence to international maritime conventions and best practices.				✓	Sustainable Design & Safe Operating
4	Identify, formulate, and analyze complex engineering problems using appropriate theoretical, computational, and experimental techniques to derive sound, data-driven solutions in marine and related engineering domains.			✓		Research & Experimentation
5	Integrate principles of safety culture, risk assessment, and environmental protection into all engineering practices, promoting sustainable operations aligned with IMO conventions such as MARPOL and SOLAS.			✓		Innovation & Digital Competence
6	Employ advanced digital tools, diagnostic systems, and automation technologies for monitoring, control, and performance assessment of marine and industrial systems, in line with the requirements of the evolving maritime digitalization era.				✓	Regulatory Frameworks & Safety
7	Demonstrate competence in planning, executing, and managing engineering projects, including resource allocation, budgeting, and maintenance planning, while ensuring quality, safety, and compliance with regulatory frameworks.				✓	Teamwork & Leadership
8	Function effectively as a leader and member of multidisciplinary and multicultural teams, fostering collaboration, ethical conduct, and efficient communication in dynamic and often high-stress maritime environments.				✓	Project Management & Entrepreneurship
9	Communicate effectively in both written and oral forms with clarity, professionalism, and technical precision in English and other relevant languages within maritime and industrial contexts.			✓		Ethics & Professionalism
10	Adhere to the ethical and professional standards of the engineering and maritime professions, demonstrating accountability, integrity, and a commitment to continuous professional development and lifelong learning.				✓	Lifelong Learning & Adaptability
11	Evaluate and implement sustainable engineering practices and emerging green technologies to minimize the environmental footprint of marine and industrial operations.			✓		Communication Competence
12	Exhibit the flexibility and interdisciplinary mindset required to transfer marine engineering knowledge and skills to diverse sectors, contributing effectively to innovation and technological advancement beyond the maritime industry.			✓		Global Vision & Societal Impact

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution						
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
PO1	1	2	2	2	3	2
PO2	2	3	3	3	3	3
PO3	1	2	2	2	2	2
PO4	1	2	2	2	2	2
PO5	3	1	1	1	1	2
PO6	1	1	1	1	1	2
PO7	1	1	1	1	1	2
PO8	1	1	1	1	1	2
PO9	1	1	1	1	1	1
PO10	0	2	2	2	2	3
PO11	2	1	1	1	1	2
PO12	3	1	1	1	1	2

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1 – Define and explain the basic properties of fluids and fundamental concepts of fluid mechanics.	Lectures, Interactive Discussion, Concept Demonstrations	Quizzes, Midterm Exam
CLO2 – Analyze pressure distributions in static fluids and calculate hydrostatic forces on submerged and floating bodies.	Lectures, Problem-Solving Sessions	Assignments, Midterm Exam
CLO3 – Apply Bernoulli and energy equations to solve problems involving fluid motion and energy transfer.	Lectures, Worked Examples, Simulation-Based Demonstrations	Quizzes, Midterm Exam, Final Exam
CLO4 – Perform energy and momentum analyses of steady flow systems.	Lectures, Problem-Solving Workshops, Case Studies	Assignments, Midterm Exam, Final Exam
CLO5 – Evaluate head losses and design simple piping networks.	Lectures, Practical Examples, Group Work	Assignments, Project, Final Exam
CLO6 – Communicate technical findings effectively and demonstrate readiness for advanced courses.	Group Projects, Presentations, Report Writing	Project Report, Presentation, Final Exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	-	-	-
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**6**	**6**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**6**	**6**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Case Studies / Critical Thinking	-	-	-
Project Writing	**1**	**20**	**20**
Group Work	-	-	-
In-class Discussion(s)	-	-	-
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory / Practical Applications	-	-	-
Assignment(s)/Homework/Class Works	**1**	**20**	**20**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**101**
ECTS Credit			**4**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	1	10
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	Course Grade	Coefficient
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Marine Diesel Engines II							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MED305	III	Fall	3	3	2	2	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				20	30	30	20
Course Venue and Time				Wednesday 09.30-12.20			
Instructor information				**Chf. Eng. Volkan Varışlı** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4095 volkan.varisli@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides an in-depth study of modern marine diesel engines, focusing on advanced combustion processes, fuel injection systems, performance analysis, and engine management techniques. Students will explore the principles of fuel combustion, injection timing, and electronic control systems, as well as the analysis of engine efficiency using P-V and T-S diagrams. The course covers variable injection timing, electronic governors, and performance metrics, including the identification and troubleshooting of injection failures. Emphasis is placed on the integration of supercharging and turbocharging systems, air charge management, and the optimization of engine operation for maximum efficiency. Students will also study dual-fuel and tri-fuel engines, as well as new-generation marine engine models. Practical aspects include cooling and lubrication systems, starting and control air mechanisms, and waste gas treatment in compliance with MARPOL Annex VI regulations for air pollution prevention. The course combines theoretical understanding with applied case studies, such as engine failure analysis and efficiency management. Additionally, students will gain knowledge of safe engine operations during maneuvering, port operations, and watchkeeping, including abnormal running conditions and torsional vibrations. By the end of the course, students will have acquired the skills necessary for analyzing, operating, and optimizing marine diesel engines under various operational and environmental conditions.
Course Aims and Objectives	The primary aim of this course is to provide students with a comprehensive understanding of advanced marine diesel engine technology, including combustion processes, fuel injection systems, engine performance, and efficiency optimization. The course also aims to develop students' practical skills in engine monitoring, troubleshooting, and operational management in accordance with international regulations. • Understand advanced combustion principles and fuel injection techniques used in marine diesel engines. • Analyze engine performance using P-V and T-S diagrams and other performance metrics. • Identify, diagnose, and troubleshoot common engine failures, including injection and combustion-related issues. • Apply electronic control systems, variable injection timing, and governor technologies for engine optimization. • Understand and operate dual-fuel, tri-fuel, and next-generation marine engines. • Manage engine auxiliary systems such as cooling, lubrication, starting, and control air systems. • Comply with environmental regulations, including MARPOL Annex VI, for exhaust gas and pollution control. • Conduct safe engine operations during maneuvering, port operations, and watchkeeping. • Apply theoretical knowledge to practical scenarios through case studies on engine failure analysis and efficiency management. This course equips students with both theoretical knowledge and practical skills necessary for the efficient, safe, and environmentally compliant operation of marine diesel engines.

Course Learning Outcomes	**CLO1:** Explain advanced combustion processes and the functions of fuel injection systems in marine diesel engines. **CLO2:** Interpret and analyze engine performance using P–V and T–S diagrams to identify efficiency losses and improvement opportunities. **CLO3:** Diagnose common marine engine failures and apply appropriate troubleshooting techniques using specialized tools and automation systems. **CLO4:** Apply concepts of electronic injection, electronic governors, and variable injection timing to optimize engine performance. **CLO5:** Compare and evaluate dual-fuel, tri-fuel, and next-generation marine diesel engine technologies in terms of efficiency and environmental impact. **CLO6:** Operate and manage key auxiliary systems, including cooling water, lubrication, and starting/control air systems, in accordance with operational standards.

Content of the Course

Week	*Subject*
1	Combustion activity and aspects of fuel injection with exhaust outputs
2	Fuel systems, Injection models and injection failures and ANNEX VI Limitations
3	Variable injection timing model, electronic injection, electronic governors and performance metrics
4	Performance analysis of the Diesel engines, P-V and T-S Diagrams, failure analysis with special tools/remote automation facilities, engine losses and recovery
5	Charging air and premature air charge, supercharging, turbochargers and modular integration of combustion control systems, combustion element's temperature and pressure
6	Combustion power management of diesel engines and engine power calculation. Optimal engine operation and efficiency with engine attachments
7	Dual-fuel, tri-fuel engines and new generation models
8	Mid-term Exam / Application (Case study: Engine failure analysis)
9	Engine cooling systems, cooling water systems, water quality parameters and onboard tests, sea cooling water systems
10	Theory of lubrication, lubricating oil systems, oil quality and onboard tests, Starting and control air systems with their mechanisms
11	Waste gas systems, Exhaust gas systems and Economizer, Regulations for the Prevention of Air Pollution from Ships Marpol Annex VI and waste gas treatment applications
12	Operation for maneuvering (Preparation, engine starting and stop)
13	Principle of watch-keeping at sailing and port / testing of engine safety control devices
14	Abnormal running conditions, torsional vibration and emerg. running applications.
15	Final Exams / Application (Case study: Engine efficiency management)

Methods and Techniques Used in the Course

Lectures and Presentations – Core theoretical concepts such as combustion processes, fuel injection, turbocharging, and emission control are explained through structured lectures supported by multimedia presentations.

Case Studies and Problem-Solving Sessions – Real-life examples of engine failures, efficiency management, and emission-related issues are analyzed, allowing students to develop critical thinking and decision-making skills.

Laboratory Applications and Simulations – Engine performance analysis, cooling and lubrication system tests, and exhaust gas monitoring are practiced using simulation software and laboratory equipment.

Demonstrations and Practical Training – Demonstrations of engine components, fuel injection models, governors, and auxiliary systems are provided to enhance practical understanding.

Class Discussions and Collaborative Learning – Group activities and discussions encourage teamwork, knowledge sharing, and problem-solving related to operational scenarios.

Use of Engine Room Simulators (ERS) – Advanced simulators replicate shipboard conditions, enabling students to practice maneuvering, watchkeeping, and emergency running procedures in a safe training environment.

Regulation-Oriented Learning – MARPOL Annex VI and IMO requirements are integrated into coursework to familiarize students with international maritime standards and legal responsibilities.

Assignments and Projects – Students complete technical reports, efficiency analysis projects, and documentation tasks to develop their research and academic writing skills.

Midterm and Final Case Study Applications – Assessments include applied case studies on engine failure analysis and efficiency management, ensuring students can connect theory with practice.

Sample Questions

Short-Answer / Knowledge Questions

- Define the role of fuel injection timing in diesel engine performance and emission control.
- What are the primary causes of cavitation in cooling water systems, and how can they be prevented?
- Explain the differences between supercharging and turbocharging in marine diesel engines.
- List the main pollutants regulated under **MARPOL Annex VI** and explain their environmental impact.
- What are the common types of failures in fuel injection systems? Provide at least two examples.

Analytical / Problem-Solving Questions

- A marine diesel engine operating at 85% load shows increased exhaust gas temperature and reduced efficiency. Identify possible causes and suggest corrective measures.
- Given a **P-V diagram** of a diesel engine cycle, calculate the **indicated mean effective pressure (IMEP)** and comment on the engine's performance.
- An engine shows signs of abnormal torsional vibration during maneuvering operations. Explain how this condition can be detected, its potential risks, and corrective actions.

Application / Case Study Questions

- During a voyage, the lubricating oil analysis shows high levels of metallic particles. As the ship's engineer, what steps would you take to identify the source of contamination and mitigate the issue?
- A dual-fuel engine is experiencing misfiring when operating on LNG. Discuss potential causes and propose troubleshooting methods.
- Prepare a brief **checklist for engine room staff** before maneuvering operations, including safety and performance checks.

  In case of exhaust gas economizer fouling, explain how it would affect engine performance and compliance with emission regulations.

Essay / Discussion Questions

- Discuss the importance of **engine efficiency management** in modern shipping in relation to both economic and environmental sustainability.
- Compare the advantages and disadvantages of **electronic fuel injection systems** versus traditional mechanical systems in marine diesel engines.
- Evaluate the role of **remote monitoring and automation systems** in detecting engine failures. What are their limitations?

Materials Used in the Course

Textbooks and Reference Books

- Heywood, J. B. *Internal Combustion Engine Fundamentals*. McGraw-Hill.
- Woud, H. K., & Stapersma, D. *Diesel Engine Systems Design*. Springer.
- Pounder, C. C., & Bailey, M. *Pounder's Marine Diesel Engines and Gas Turbines*. Butterworth-Heinemann.
- MAN Energy Solutions & Wärtsilä Technical Manuals (selected chapters).

International Regulations and Guidelines

- **MARPOL Annex VI** – Regulations for the Prevention of Air Pollution from Ships.
- **SOLAS Convention** (Safety of Life at Sea) – relevant engine room safety provisions.
- **IMO Guidelines** on ship energy efficiency and emission control.

Lecture Materials and Handouts

- Instructor-prepared lecture slides, notes, and supplementary reading materials.
- Case studies and technical reports on engine performance and failures.
- Diagrams and charts (P–V, T–S diagrams, fuel injection schematics, turbocharger systems).

Multimedia and Digital Resources

- Engine simulation software and performance monitoring tools.
- Video demonstrations of fuel injection systems, turbochargers, and failure analysis.
- Online resources from marine engine manufacturers (e.g., MAN, Wärtsilä, Caterpillar).

Laboratory and Onboard Training Materials

- Engine models and cutaway parts for visualization of fuel, cooling, and lubrication systems.
- Diagnostic instruments and testing kits for oil/water quality.
- Onboard training manuals for watchkeeping, maneuvering, and emergency operations.

Language and Communication Support

- IMO Standard Marine Communication Phrases (SMCP).
- English terminology guides for technical documentation and reporting.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of marine engineering principles, systems, and machinery operations, and effectively apply this knowledge to ensure safe, efficient, and sustainable vessel performance in compliance with IMO and STCW standards.				✓	Technical Knowledge & Applied Sciences
2	Apply advanced engineering design principles to develop, adapt, and optimize mechanical, electrical, and control systems onboard ships and in shore-based industrial contexts, integrating safety, cost-efficiency, and environmental considerations.				✓	Analytical & Computational Skills
3	Perform engineering watchkeeping duties and operational management with professional responsibility, situational awareness, and adherence to international maritime conventions and best practices.				✓	Sustainable Design & Safe Operating
4	Identify, formulate, and analyze complex engineering problems using appropriate theoretical, computational, and experimental techniques to derive sound, data-driven solutions in marine and related engineering domains.			✓		Research & Experimentation
5	Integrate principles of safety culture, risk assessment, and environmental protection into all engineering practices, promoting sustainable operations aligned with IMO conventions such as MARPOL and SOLAS.			✓		Innovation & Digital Competence
6	Employ advanced digital tools, diagnostic systems, and automation technologies for monitoring, control, and performance assessment of marine and industrial systems, in line with the requirements of the evolving maritime digitalization era.				✓	Regulatory Frameworks & Safety
7	Demonstrate competence in planning, executing, and managing engineering projects, including resource allocation, budgeting, and maintenance planning, while ensuring quality, safety, and compliance with regulatory frameworks.				✓	Teamwork & Leadership
8	Function effectively as a leader and member of multidisciplinary and multicultural teams, fostering collaboration, ethical conduct, and efficient communication in dynamic and often high-stress maritime environments.				✓	Project Management & Entrepreneurship
9	Communicate effectively in both written and oral forms with clarity, professionalism, and technical precision in English and other relevant languages within maritime and industrial contexts.			✓		Ethics & Professionalism
10	Adhere to the ethical and professional standards of the engineering and maritime professions, demonstrating accountability, integrity, and a commitment to continuous professional development and lifelong learning.				✓	Lifelong Learning & Adaptability
11	Evaluate and implement sustainable engineering practices and emerging green technologies to minimize the environmental footprint of marine and industrial operations.			✓		Communication Competence
12	Exhibit the flexibility and interdisciplinary mindset required to transfer marine engineering knowledge and skills to diverse sectors, contributing effectively to innovation and technological advancement beyond the maritime industry.			✓		Global Vision & Societal Impact

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution						
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**
PO1	1	2	2	2	3	2
PO2	2	3	3	3	3	3
PO3	1	2	2	2	2	2
PO4	1	2	2	2	2	2
PO5	3	1	1	1	1	2
PO6	1	1	1	1	1	2
PO7	1	1	1	1	1	2
PO8	1	1	1	1	1	2
PO9	1	1	1	1	1	1
PO10	0	2	2	2	2	3
PO11	2	1	1	1	1	2
PO12	3	1	1	1	1	2

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1	Lecture, Question-Answer, Discussion, Productional application,	Application, Quiz, Midterm Exam, Final Exam
CLO2	Lecture, Problem-Solving Sessions, Group Discussion, Production	Assignments, In-Class Application, Term Project, Midterm Exam
CLO3	Lecture, Problem-Solving, Hands-on Practice, Brainstorming, Production	Project, Assignments, Quizzes, Midterm Exam, Final Exam
CLO4	Lecture, Demonstration, Hands-on Practice	Productional applicationi Assignments, Midterm Exam, Final Exam
CLO5	Lecture, Practice Sessions, In-Class Activities	Application, Assignments, Quizzes, Midterm Exam, Final Exam
CLO6	Lecture, Question-Answer, Discussion, Brain Storming	Midterm Exam, Final Exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**4**	**60**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**4**	**4**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**6**	**6**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Case Studies / Critical Thinking	-	-	-
Project Writing	-	-	-
Group Work	**2**	**4**	**8**
In-class Discussion(s)	-	-	-
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory / Practical Applications	**2**	**4**	**8**
Assignment(s)/Homework/Class Works	**4**	**4**	**16**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**121**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	2	10
Field Work	2	10
Special Course Internship (Work Placement)	-	-
Homework/Assignments	4	20
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	30
Total	**8**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Supply Chain Management							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MMD301	III	Fall	3	4	3	0	0
Course type: Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				-	-	-	100
Course Venue and Time				Friday / 08:30 – 11:20			
Instructor information				**Assist. Prof. Dr. Pınar Sharghi** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4120 pinar.sharghi@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	The course *Supply Chain Management* provides students with a comprehensive understanding of how global supply chains are structured, operated, and optimized, with a special emphasis on the maritime and port logistics sectors. It explores the key components of supply chain systems—including procurement, production, warehousing, transportation, and distribution—and examines how these processes interact within international trade networks. Students will analyze the pivotal role of maritime transportation, ports, and logistics service providers in sustaining global supply chain efficiency. The course also covers modern challenges such as digitalization, sustainability, supply chain disruptions, and the increasing demand for resilience in global logistics. Real-world maritime case studies, industry tools, and contemporary strategies are integrated throughout the course to prepare students for decision-making roles in the maritime business environment.
Course Aims and Objectives	The primary aim of this course is to equip students with the knowledge and analytical skills necessary to understand, design, and manage efficient and resilient supply chains within the global maritime logistics environment. The course integrates theoretical foundations with practical maritime applications to develop competencies required in modern logistics and shipping industries. • **Understand the structure and functions of global supply chains**, with a focus on the role of maritime transportation and ports. • **Analyze the interactions between suppliers, manufacturers, logistics providers, and customers** within integrated supply chain networks. • **Evaluate key logistics processes**, including procurement, inventory management, warehousing, transportation, and distribution. • **Examine the strategic importance of maritime shipping, containerization, and port operations** in global supply chain performance. • **Assess supply chain risks and vulnerabilities**, including disruptions in shipping, port congestion, and market fluctuations. • **Apply supply chain optimization tools and techniques**, such as forecasting, demand planning, and network design. • **Interpret the impact of digitalization**, including big data, automation, blockchain, and smart port technologies on supply chain efficiency. • **Understand sustainability and green logistics practices**, including carbon reduction strategies and eco-efficient maritime operations. • **Develop strategies for improving supply chain agility, resilience, and competitiveness** in the maritime sector.

	• **Use real-world maritime supply chain case studies** to enhance decision-making and problem-solving skills.
Course Learning Outcomes	**LO1 — Fundamental Concepts** Explain the fundamental concepts, components, and functions of supply chain management within global trade. **LO2 — Maritime Supply Chain Role** Describe the role and importance of maritime transportation, ports, terminals, and shipping companies within global supply chain networks. **LO3 — Supply Chain Process Integration** Analyze procurement, production, inventory management, warehousing, and distribution processes and how these processes integrate across the supply chain. **LO4 — Demand Forecasting & Planning** Apply demand forecasting, planning, and scheduling techniques to improve efficiency and alignment across supply chain functions. **LO5 — Supply Chain Network Design** Design and interpret supply chain network models, including routing, mode selection, distribution channels, and maritime logistics flows. **LO6 — Costing & Financial Evaluation** Evaluate supply chain costs, pricing strategies, and financial performance indicators relevant to maritime logistics operations. **LO7 — Risk & Disruption Management** Identify potential risks and disruptions—including port congestion, geopolitical tensions, supply shortages, weather events—and propose mitigation strategies. **LO8 — Technology & Digitalization** Assess the role of digital tools and innovations (blockchain, IoT, AI, big data, automation, smart ports) in improving supply chain visibility and operational efficiency. **LO9 — Sustainability & Green Logistics** Explain sustainability principles, green logistics practices, emissions regulations, and environmental management strategies in global and maritime supply chains. **LO10 — Managerial Decision-Making & Problem-Solving** Use analytical and critical thinking skills to propose solutions for real-world supply chain problems and make effective managerial decisions.

Content of the Course

Week	*Subject*
1	**Introduction to Supply Chain Management** • Definition, scope, and importance of SCM • Supply chain actors and flows (materials, information, finance) • SCM in global and maritime industries
2	**Supply Chain Structures and Models** • Supply chain types (lean, agile, hybrid) • Port-centric and maritime supply chains • Network design concepts
3	**Logistics and Supply Chain Integration** • Relationship between logistics and SCM • Integrated logistics systems • Maritime logistics integration in global trade
4	**Demand Planning and Forecasting** • Demand forecasting methods • Inventory implications in maritime logistics • Forecasting challenges in volatile shipping markets
5	**Procurement and Supplier Relationship Management** • Strategic sourcing • Supplier selection and evaluation • Maritime procurement processes (fuel, spare parts, port services)
6	**Inventory and Warehousing Management** • Inventory models (EOQ, safety stock, JIT) • Port and terminal warehousing operations • Cold chain logistics and special cargo considerations
7	**Transportation Management in Supply Chains** • Modal comparison: sea, road, rail, air • Freight management and routing • Multimodal and intermodal transport systems
8	**Maritime Transport and Port Operations in SCM** • Role of maritime transport in global supply chains • Port functions, bottlenecks, and competitiveness • Integration of ports with hinterland logistics
9	**Global Supply Chain Strategies** • Outsourcing, offshoring, and reshoring • Global trade patterns and risks • Role of shipping alliances and logistics service providers
10	**Technology and Digitalization in Supply Chains** • IoT, AI, blockchain, digital twins

	• Supply chain visibility and tracking systems • Maritime digital platforms (Port Community Systems, Single Window)
11	**Risk Management in Global Supply Chains** • Disruptions: pandemics, conflicts, port closures • Maritime shipping risks (accidents, piracy, congestion) • Building resilient supply chains
12	**Sustainable and Green Supply Chains** • Environmental regulations in shipping (IMO, EU) • Green logistics strategies • Carbon footprint measurement and reduction
13	**Performance Measurement and KPIs** • Supply chain metrics (cost, time, service level, reliability) • Port performance indicators • Balanced Scorecard and continuous improvement
14	**Case Studies in Maritime Supply Chain Management** • Real-world analyses (Maersk, MSC, major ports) • Best practices and failures • Group presentations and discussions
15	**Course Review and Final Exam Preparation** • Revision of key concepts • Integrated supply chain scenario exercises • **Final Examination**

Methods and Techniques used in the Course

Lectures & Theoretical Instruction

- Instructor-led presentations on key concepts, frameworks, and supply chain models.
- Use of real-world maritime logistics examples, case notes, and industry updates.

Case Studies (Maritime & Logistics Focused)

- Analysis of real supply chain disruptions, port operations, carrier alliances, and logistics failures.
- Group discussion of case results and managerial decision-making.

Interactive Class Discussions

- Debates on current developments in global supply chains, shipping markets, and sustainability trends.
- Problem-solving sessions encouraging critical thinking.

Practical Exercises & Problem-Solving Sessions

- Demand forecasting exercises
- Network design calculations
- Cost analysis workshops
- Risk assessment simulations

Supply Chain Simulation Tools (If available)

- Digital supply chain games
- Port operations simulation
- Transportation route optimization tools

Video Demonstrations & Industry Examples

- Videos from port operations, warehousing systems, automation technologies, and maritime logistics platforms.
- Documentaries on global shipping, supply chain disruptions, and digital ports.

Group Projects & Collaborative Learning

- Team-based supply chain model development
- Case-based presentations
- Problem-based learning oriented to real logistics scenarios

Guest Lectures from Industry Professionals

- Port managers, ship operators, freight forwarders, and logistics technology experts.
- Sharing current trends, challenges, and technological innovations.

Research Assignment & Report Preparation

- Students investigate a supply chain topic (global or maritime-focused).
- Emphasis on academic research and applied industry insight.

Field Visits (If applicable)

- Visits to ports, warehouses, logistics centers, or maritime agencies for practical observation.

Sample Questions

Short Answer / Conceptual Questions

- Define the term *supply chain management* and explain its relevance in the maritime industry.
- What is the difference between logistics and supply chain management?
- Explain the role of port terminals in global supply chains.
- What is lead time? How does it affect overall supply chain performance?
- Describe the bullwhip effect and provide an example relevant to maritime logistics.

Long Answer / Analytical Questions

- Discuss the main factors influencing the efficiency of maritime transportation within global supply chains.
- Analyze how digitalization (e.g., IoT, blockchain, AIS data) is transforming supply chain visibility in the shipping sector.
- Evaluate the impact of supply chain disruptions (such as pandemics, port congestion, or geopolitical risks) on maritime operations.

Calculation / Problem-Solving Questions

- A shipping company must transport 12,000 TEUs within 6 months. The company's vessels have capacities of 1,500 TEUs per voyage. How many voyages are required, and what scheduling challenges might arise?
- A warehouse processes 4,500 units per day. If demand increases to 6,200 units, calculate the capacity gap and propose operational strategies to meet the new demand.

Case-Based Questions

- A port terminal is experiencing congestion due to increased container arrivals. Identify the possible causes and suggest strategies to improve throughput.
- A global retailer collaborates with a maritime carrier to reduce carbon emissions in its supply chain. What operational changes could both parties implement?

Multiple Choice Questions (MCQ)

- Which of the following is a key component of supply chain integration?
  a) Increased paperwork
  b) Information sharing
  c) Reducing communication
  d) Increasing stockouts
- Which transportation mode has the lowest cost per ton-mile?
  a) Air
  b) Road
  c) Rail
  d) Maritime
- What does *Just-in-Time (JIT)* primarily aim to reduce?
  a) Inventory levels
  b) Transportation cost
  c) Employee turnover
  d) Port tariffs

Materials Used in the Course

Core Learning Materials

- **Lecture Slides & Presentations:**
  Weekly slides prepared by the instructor covering theoretical concepts, maritime-focused supply chain processes, case studies, and analytical models.
- **Course Textbook Chapters:**
  Selected chapters from primary textbooks on supply chain management, logistics, and maritime operations.
- **Instructor Notes & Handouts:**
  Supplementary explanations, formula sheets, process diagrams, and summary notes provided for key topics such as forecasting, inventory management, transport optimisation, and port logistics.

Digital & Multimedia Resources

- **Interactive Digital Models:**
  Supply chain flow simulations, port operations animations, vessel scheduling visualizations.
- **Online Learning Platform Resources (LMS):**
  - Lecture recordings
  - Weekly quizzes
  - Discussion forums
  - Case study datasets
  - Assignment submissions & feedback
- **Industry Videos & Webinars:**
  - Terminal operations videos
  - Maritime supply chain digitalisation webinars
  - Guest lectures from port authorities, ship operators, and logistics firms

Case Studies and Real-World Data

- **Maritime Industry Case Studies:**
  - Port congestion events
  - Supply chain disruptions (pandemic, geopolitical conflict, Suez Canal blockage)
  - Shipping line scheduling performance
  - Intermodal logistics efficiency
- **Operational Data Sets:**
  Real or simulated data for:
  - TEU flows
  - Vessel turnaround times
  - Inventory calculations
  - Demand forecasting exercises
  - Port throughput analysis

Software and Analytical Tools

- **Spreadsheet Tools:**
  Microsoft Excel / Google Sheets for modelling, forecasting, and optimisation.
- **Analytics & Visualization Tools:**
  - Power BI or Tableau (optional)
  - Basic Python notebooks (optional, for students with interest in analytics)
- **Supply Chain Simulation Tools:**
  Simple simulation models or open-source tools demonstrating network flow, scheduling, and resource allocation.

Recommended Readings & Academic Resources

- Peer-reviewed journal articles from:
  - *Maritime Policy & Management*
  - *International Journal of Logistics Management*
  - *Journal of Supply Chain Management*
  - *Transportation Research Part E*
- Reports from relevant organizations:
  - IMO
  - UNCTAD
  - World Bank
  - Major port authorities and shipping alliances

Fieldwork and Practical Materials

- **Port Visit Observations (if applicable):**
  Students may conduct structured observation tasks at nearby ports or marinas.
- **Guest Speaker Materials:**
  Presentations, reports, and working documents shared by industry professionals.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate fundamental knowledge of maritime business, shipping operations, port management, and international logistics.				✓	Maritime Business & Operations
2	Apply principles of management, economics, and finance to ship operations, chartering, brokerage, and maritime organizational decision-making.				✓	Maritime Economics & Management
3	Understand and interpret international maritime law, conventions, and trade regulations including SOLAS, MARPOL, UNCLOS, and INCOTERMS.				✓	Maritime Law & Policy
4	Plan and manage port and terminal operations efficiently, considering cargo handling systems, port logistics, and intermodal transport networks.				✓	Port & Terminal Operations Management
5	Employ digital tools and data-driven approaches in ship management, fleet performance monitoring, and maritime logistics systems.				✓	Digital Maritime Operations
6	Integrate sustainability, environmental protection, and decarbonization principles into maritime and logistics operations in line with IMO GHG strategy.			✓		Sustainability & Green Shipping
7	Demonstrate competence in maritime risk assessment, safety management systems (ISM Code), and crisis response in ship and shore-based contexts.			✓		Safety & Risk Management
8	Exhibit leadership, teamwork, and communication skills necessary for multicultural and interdisciplinary maritime organizations.				✓	Leadership & Intercultural Communication
9	Apply marketing, logistics, and supply chain strategies to global shipping and maritime transport sectors.				✓	Global Logistics & Supply Chain Management
10	Prepare and analyze charter parties, bills of lading, and other shipping documents while managing cargo claims and marine insurance issues.				✓	Maritime Documentation & Insurance
11	Utilize effective business English and Maritime English for negotiation, correspondence, and documentation within international maritime contexts.			✓		Maritime Communication & Professional English
12	Demonstrate ethical awareness, corporate responsibility, and adherence to international professional standards in maritime and logistics management.			✓		Ethics & Corporate Responsibility
13	Develop research skills and analytical thinking to identify, evaluate, and solve complex problems in maritime transport and logistics systems.			✓		Analytical Thinking & Research Skills
14	Adapt to innovations such as digitalization, automation, and smart shipping technologies through continuous professional development.				✓	Innovation & Lifelong Learning
15	Apply entrepreneurship and strategic management principles to establish or develop maritime-related enterprises in a competitive global environment.			✓		Entrepreneurship & Strategic Management

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**L10**
PO1	3	3	2	2	2	1	3	2	2	2
PO2	3	3	3	2	2	1	2	1	2	1
PO3	2	3	1	3	3	2	1	3	1	1
PO4	2	2	1	2	3	3	2	2	2	2
PO5	1	2	2	1	1	2	2	2	3	3
PO6	1	2	1	2	1	1	2	3	2	2
PO7	1	1	1	1	1	3	2	2	3	3
PO8	1	1	3	1	1	1	2	1	2	1
PO9	1	1	2	1	1	1	1	1	2	2
PO10	2	2	1	2	3	3	2	2	2	2
PO11	1	2	2	1	1	2	2	2	3	3
PO12	1	2	1	2	1	1	2	3	2	2
PO13	3	3	3	2	2	1	2	1	2	1
PO14	2	3	1	3	3	2	1	3	2	2
PO15	1	2	1	2	2	3	2	2	3	3

Course Learning Outcomes/ Evaluation Method		
Course Learning Outcomes (CLOs)	**Teaching Method**	**Assessment Method**
CLO1: Explain fundamental concepts, structures, and functions of supply chain management.	Lectures, visual presentations	Midterm exam, quizzes
CLO2: Analyse the components of maritime-related supply chains including ports, shipping lines, terminals, and intermodal systems.	Case studies, videos, class discussions	Midterm exam, case study report
CLO3: Evaluate supply chain strategies related to procurement, production, inventory, and distribution in maritime industries.	Problem-solving sessions, sample scenarios	Midterm exam, homework assignments
CLO4: Apply demand forecasting and inventory management techniques using analytical tools.	Hands-on exercises, Excel modelling tutorials	Practical assignment, quizzes
CLO5: Assess transportation, routing, and scheduling decisions for maritime and multimodal networks.	Simulation activities, scenario-based learning	Project work, practical exam
CLO6: Interpret supply chain data to support decision-making using basic quantitative methods.	Data analysis workshops, LMS-based activities	Practical assignments, final project
CLO7: Identify and evaluate risks and disruptions in global supply chains, especially in maritime contexts.	Case studies, group discussions	Case study analysis, midterm
CLO8: Develop sustainable and resilient supply chain strategies aligned with environmental and regulatory requirements.	Research tasks, reading seminars	Research report, presentation
CLO9: Demonstrate effective teamwork and communication skills in solving supply chain problems.	Group work, collaborative projects	Group project evaluation
CLO10: Integrate supply chain management concepts to create holistic solutions for real-world maritime logistics scenarios.	Capstone project, problem-based learning	Final exam, final project

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	-	-	-
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**15**	**15**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**15**	**15**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	-	-	-
In-class Discussion(s)	**15**	**2**	**30**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**15**	**15**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**124**
ECTS Credit			**4**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Blue Economy and Innovation							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MMD303	III	Fall	3	3	3	0	0
Course type: Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				-	-	-	100
Course Venue and Time				Monday / 13:30 – 16:20			
Instructor information				**Dr. Gökhan Tarı** Faculty of Maritime Studies Wednesday / 09:00 – 12:00 +90 (392) 650 26 00 / 4040 gokhan.tari@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	*Blue Economy and Innovation* introduces students to the concepts, principles, and practices of the blue economy, emphasizing sustainable and innovative use of marine and maritime resources. The course explores economic, environmental, and social dimensions of the blue economy, covering sectors such as shipping, ports, fisheries, aquaculture, marine energy, and maritime tourism. Students will examine emerging technologies, digitalization, and innovative strategies that promote sustainability, efficiency, and competitiveness in maritime industries. Through case studies, practical exercises, and project work, students develop the skills to assess, design, and implement innovative solutions that support sustainable maritime growth and resilient coastal development.
Course Aims and Objectives	The aim of *Blue Economy and Innovation* is to provide students with an in-depth understanding of the sustainable development of maritime resources and the application of innovative technologies and strategies in the maritime sector. • Introduce the concept and principles of the blue economy and its relevance to sustainable maritime development. • Examine the economic, environmental, and social dimensions of maritime industries and coastal resources. • Explore global policies, governance frameworks, and international regulations that support the blue economy. • Analyze the sustainable exploitation of marine resources, including fisheries, aquaculture, and marine biotechnology. • Evaluate the role of shipping, ports, and maritime logistics in the blue economy. • Understand and apply emerging technologies and digital innovations in maritime operations. • Examine renewable marine energy systems and innovative coastal infrastructure solutions. • Investigate sustainable maritime tourism, recreation, and eco-friendly practices. • Apply circular economy and waste management principles in maritime contexts. • Develop practical solutions and project proposals that enhance sustainability and innovation in maritime management.
	LO1. Explain the fundamental concepts, principles, and importance of the blue economy. **LO2.** Analyze the economic, environmental, and social dimensions of sustainable maritime and coastal development.

Course Learning Outcomes	**LO3.** Evaluate global policies, governance frameworks, and international regulations supporting the blue economy. **LO4.** Assess the sustainable exploitation and management of marine resources, including fisheries, aquaculture, and biotechnology. **LO5.** Examine the role of shipping, ports, and maritime logistics in promoting sustainable economic growth. **LO6.** Apply innovative technologies, digital tools, and smart solutions in maritime operations and resource management. **LO7.** Analyze renewable marine energy systems and evaluate their implementation in maritime and coastal infrastructure. **LO8.** Design sustainable maritime tourism and recreational practices minimizing environmental impact. **LO9.** Integrate circular economy principles and marine waste management strategies in maritime industries. **LO10.** Develop practical projects and strategies to enhance sustainability, innovation, and resilience in maritime management.

Content of the Course

Week	*Subject*
1	**Introduction to Blue Economy** • Definition and concept of the Blue Economy • Historical development and global significance • Relation to sustainable maritime and coastal development
2	**Principles and Dimensions of the Blue Economy** • Economic, social, and environmental dimensions • Sustainable resource management • Key sectors: fisheries, aquaculture, shipping, ports, marine energy
3	**Global Policies and Governance of Blue Economy** • United Nations Sustainable Development Goals (SDG 14) • International conventions and maritime governance frameworks • Regional and national strategies for Blue Economy development
4	**Marine Resources and Sustainable Exploitation** • Renewable and non-renewable marine resources • Sustainable fisheries, aquaculture, and marine biotechnology • Resource management and environmental considerations
5	**Maritime Transport and Blue Economy** • Role of shipping and ports in supporting Blue Economy • Sustainable shipping and logistics practices • Blue economy opportunities in maritime trade
6	**Innovation in Maritime Industries** • Emerging technologies: digitalization, automation, and smart shipping • Green shipping technologies and energy efficiency • Innovation management in maritime companies
7	**Marine Renewable Energy** • Offshore wind, tidal, wave, and solar energy • Technology, infrastructure, and economic feasibility • Environmental impacts and sustainability considerations
8	**Maritime Tourism and Recreation** • Cruise tourism, yachting, and coastal recreational activities • Economic benefits and environmental risks • Sustainable tourism strategies
9	**Ocean Governance and Policy Instruments** • Marine spatial planning and maritime zoning • Regulatory frameworks for marine resource use • Stakeholder engagement and public-private partnerships
10	**Financing and Investment in Blue Economy** • Public and private investment models

	• Risk management and insurance in maritime innovation • Funding sustainable maritime projects
11	**Digitalization and Smart Technologies for Blue Economy** • IoT, AI, and Big Data in maritime industries • Smart ports, automated shipping, and digital monitoring of marine resources • Case studies on digital innovation
12	**Innovation in Coastal and Port Management** • Sustainable port development and green infrastructure • Smart terminal operations and logistics innovation • Eco-friendly technologies for port and coastal management
13	**Circular Economy and Marine Waste Management** • Marine pollution, plastics, and waste management • Circular economy principles applied to maritime sectors • Innovative solutions for reducing ecological footprint
14	**Case Studies and Best Practices in Blue Economy** • Successful examples from global maritime industries • Lessons learned from innovative projects and sustainable initiatives • Discussion on replicable strategies
15	**Course Review and Final Assessment** • Summary of concepts, trends, and innovations • Student presentations on Blue Economy projects • **Final Exam**

Methods and Techniques used in the Course

Lectures and Theoretical Instruction

- Presentation of fundamental concepts of blue economy, sustainability, and innovation.
- Use of multimedia tools to illustrate case studies and real-world applications.

Case Studies and Industry Examples

- Analysis of successful projects in sustainable maritime industries, ports, shipping, and marine energy.
- Lessons learned from global and regional initiatives.

Practical Exercises and Group Work

- Development of project proposals for sustainable maritime operations.
- Problem-solving exercises focused on marine resource management and innovation strategies.

Class Discussions and Debates

- Critical discussions on policy frameworks, governance, and environmental challenges.
- Exchange of ideas on emerging trends and best practices in blue economy sectors.

Guest Lectures and Industry Insights

- Presentations from experts in maritime innovation, port management, and marine energy.
- Real-life insights into the challenges and opportunities of the blue economy.

Research and Independent Study

- Literature reviews, policy analysis, and innovation strategy studies.
- Preparation of reports and assignments addressing sustainable maritime solutions.

Digital Tools and Simulation Exercises

- Use of software and digital platforms for monitoring marine resources, simulating maritime logistics, and evaluating environmental impact.

Project-Based Learning

- Group projects focusing on innovative solutions for maritime sustainability.
- Application of theory to practical scenarios in maritime management.

Sample Questions

- Define the concept of the blue economy and explain its significance for sustainable maritime development.
- Identify and discuss the economic, environmental, and social dimensions of the blue economy.
- Explain the role of international policies and governance frameworks in supporting sustainable maritime industries.
- Analyze the sustainable management of marine resources, such as fisheries, aquaculture, and marine biotechnology.
- Discuss how shipping, ports, and maritime logistics contribute to the blue economy.
- Describe innovative technologies and digital solutions that enhance sustainability and efficiency in maritime operations.
- Evaluate the potential of marine renewable energy systems, such as offshore wind and tidal power, for sustainable maritime development.
- Propose strategies for sustainable maritime tourism that minimize environmental impact.
- Explain the principles of circular economy and marine waste management in the context of maritime industries.
- Develop a brief project plan or strategy that integrates innovation and sustainability in maritime management.

Materials Used in the Course

Primary Textbooks

- **Blue Economy: 10 Years, 10 Opportunities, 100 Innovations** – Gunter Pauli, 2010.
- **Talley, Wayne K.** – *Maritime Logistics: A Guide to Contemporary Shipping and Port Management*, 2nd Edition, Kogan Page, 2013.
- **Stopford, Martin** – *Maritime Economics*, 3rd Edition, Routledge, 2009.

Recommended References

- **United Nations – Sustainable Development Goal 14: Life Below Water**
- **OECD – *The Ocean Economy in 2030***
- **Academic Journals**
- **Industry Reports**

Supplementary Learning Materials

- **Case Studies**

Successful projects in maritime innovation, sustainable ports, and marine energy initiatives.

- **Practical Exercises and Simulations**

Scenario-based exercises for sustainable maritime operations and innovation strategy design.

- **Digital Tools and Platforms**

Applications for monitoring marine resources, simulating logistics, and evaluating environmental impact.

- **Videos and Webinars**

Presentations on blue economy innovations, sustainable shipping, and marine technology trends.

- **Policy and Regulatory Documents**

International conventions, national strategies, and local policies on sustainable maritime development.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate fundamental knowledge of maritime business, shipping operations, port management, and international logistics.				✓	Maritime Business & Operations
2	Apply principles of management, economics, and finance to ship operations, chartering, brokerage, and maritime organizational decision-making.				✓	Maritime Economics & Management
3	Understand and interpret international maritime law, conventions, and trade regulations including SOLAS, MARPOL, UNCLOS, and INCOTERMS.				✓	Maritime Law & Policy
4	Plan and manage port and terminal operations efficiently, considering cargo handling systems, port logistics, and intermodal transport networks.				✓	Port & Terminal Operations Management
5	Employ digital tools and data-driven approaches in ship management, fleet performance monitoring, and maritime logistics systems.				✓	Digital Maritime Operations
6	Integrate sustainability, environmental protection, and decarbonization principles into maritime and logistics operations in line with IMO GHG strategy.			✓		Sustainability & Green Shipping
7	Demonstrate competence in maritime risk assessment, safety management systems (ISM Code), and crisis response in ship and shore-based contexts.			✓		Safety & Risk Management
8	Exhibit leadership, teamwork, and communication skills necessary for multicultural and interdisciplinary maritime organizations.				✓	Leadership & Intercultural Communication
9	Apply marketing, logistics, and supply chain strategies to global shipping and maritime transport sectors.				✓	Global Logistics & Supply Chain Management
10	Prepare and analyze charter parties, bills of lading, and other shipping documents while managing cargo claims and marine insurance issues.				✓	Maritime Documentation & Insurance
11	Utilize effective business English and Maritime English for negotiation, correspondence, and documentation within international maritime contexts.			✓		Maritime Communication & Professional English
12	Demonstrate ethical awareness, corporate responsibility, and adherence to international professional standards in maritime and logistics management.			✓		Ethics & Corporate Responsibility
13	Develop research skills and analytical thinking to identify, evaluate, and solve complex problems in maritime transport and logistics systems.			✓		Analytical Thinking & Research Skills
14	Adapt to innovations such as digitalization, automation, and smart shipping technologies through continuous professional development.				✓	Innovation & Lifelong Learning
15	Apply entrepreneurship and strategic management principles to establish or develop maritime-related enterprises in a competitive global environment.			✓		Entrepreneurship & Strategic Management

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**L10**
PO1	3	3	2	2	2	1	3	2	2	2
PO2	3	3	3	2	2	1	2	1	2	1
PO3	2	3	1	3	3	2	1	3	1	1
PO4	2	2	1	2	3	3	2	2	2	2
PO5	1	2	2	1	1	2	2	2	3	3
PO6	1	2	1	2	1	1	2	3	2	2
PO7	1	1	1	1	1	3	2	2	3	3
PO8	1	1	3	1	1	1	2	1	2	1
PO9	1	1	2	1	1	1	1	1	2	2
PO10	2	2	1	2	3	3	2	2	2	2
PO11	1	2	2	1	1	2	2	2	3	3
PO12	1	2	1	2	1	1	2	3	2	2
PO13	3	3	3	2	2	1	2	1	2	1
PO14	2	3	1	3	3	2	1	3	2	2
PO15	1	2	1	2	2	3	2	2	3	3

Course Learning Outcomes/ Evaluation Method		
Course Learning Outcomes (CLOs)	**Teaching Method**	**Assessment Method**
LO1. Explain the fundamental concepts, principles, and importance of the blue economy.	Lectures, Case Studies	Quizzes, Short Assignments
LO2. Analyze the economic, environmental, and social dimensions of sustainable maritime and coastal development.	Lectures, Discussions, Case Studies	Assignments, Participation
LO3. Evaluate global policies, governance frameworks, and international regulations supporting the blue economy.	Lectures, Guest Lectures, Group Discussions	Case Study Reports, Quizzes
LO4. Assess the sustainable exploitation and management of marine resources, including fisheries, aquaculture, and biotechnology.	Practical Exercises, Group Work	Assignments, Project Reports
LO5. Examine the role of shipping, ports, and maritime logistics in promoting sustainable economic growth.	Lectures, Case Studies	Assignments, Quizzes
LO6. Apply innovative technologies, digital tools, and smart solutions in maritime operations and resource management.	Practical Exercises, Demonstrations	Project Work, Practical Reports
LO7. Analyze renewable marine energy systems and evaluate their implementation in maritime and coastal infrastructure.	Lectures, Case Studies	Assignments, Case Study Reports
LO8. Design sustainable maritime tourism and recreational practices minimizing environmental impact.	Group Work, Discussions	Project Reports, Presentations
LO9. Integrate circular economy principles and marine waste management strategies in maritime industries.	Lectures, Practical Exercises	Assignments, Project Reports
LO10. Develop practical projects and strategies to enhance sustainability, innovation, and resilience in maritime management.	Project-Based Learning, Group Work	Final Project, Presentation, Final Exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	-	-	-
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**10**	**10**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	-	-	-
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**15**	**15**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**99**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Ocean Governance and Policy							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
MMD305	III	Fall	3	3	3	0	0
Course type: Elective				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				-	-	-	100
Course Venue and Time				Monday / 13:30 – 16:20			
Instructor information				**Dr. Gökhan Tarı** Faculty of Maritime Studies Wednesday / 09:00 – 12:00 +90 (392) 650 26 00 / 4040 gokhan.tari@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	**Ocean Governance and Policy** is an interdisciplinary course that examines the legal, institutional, and strategic frameworks regulating the world's oceans. Rooted in the principles of international maritime law and global policy-making, the course explores how states, international organizations, regional bodies, and private stakeholders shape the governance of marine spaces and resources. Students will engage with the United Nations Convention on the Law of the Sea (UNCLOS), international maritime regulations, environmental protection regimes, and contemporary issues such as maritime security, climate change, blue economy initiatives, and the governance of emerging technologies. Emphasis is placed on understanding how governance and policy decisions influence maritime operations, global trade, sustainability, and international relations. Through case studies, comparative policy analysis, and scenario-based exercises, students will develop the skills necessary to interpret legal frameworks, evaluate ocean policies, and contribute to effective maritime governance in a rapidly changing global context.
Course Aims and Objectives	The primary aim of this course is to equip students with a comprehensive understanding of the legal, regulatory, and policy frameworks that govern the world's oceans, while developing their ability to analyze, interpret, and apply these frameworks within maritime industry contexts. • **Understand the foundations of ocean governance**, including the historical evolution of maritime law and the role of key international institutions. • **Explain the structure and principles of UNCLOS**, and evaluate how it regulates maritime zones, navigational rights, and state responsibilities. • **Analyze major international and regional ocean policies**, including environmental protection, maritime security, resource management, and fisheries governance. • **Assess the impact of global maritime policies** on commercial shipping, port operations, offshore activities, and global trade networks. • **Examine emerging issues**, such as climate change impacts, Arctic governance, marine biodiversity beyond national jurisdiction (BBNJ), and the governance of maritime technologies. • **Interpret and critique real-world policy documents, agreements, and international conventions** related to ocean and coastal governance.

	• **Develop policy-oriented thinking**, enabling students to propose effective regulatory and governance solutions to contemporary maritime challenges. • **Collaborate in discussions and case analyses** to understand the roles and interactions of states, organizations, NGOs, and industry stakeholders in ocean governance. • **Apply governance frameworks in crisis or conflict scenarios**, such as maritime disputes, security incidents, or environmental emergencies. • **Strengthen analytical, research, and strategic decision-making skills** relevant to maritime management and international policy environments.
Course Learning Outcomes	**LO1:** Explain the fundamental concepts, principles, and historical development of global ocean governance. **LO2:** Interpret the structure of UNCLOS and analyze maritime zones and jurisdictional rights. **LO3:** Identify the roles and responsibilities of international, regional, and national ocean governance institutions. **LO4:** Analyze governance and policy issues related to maritime security, environmental protection, and resource management. **LO5:** Evaluate the impact of international maritime policies on shipping, ports, marine resources, and coastal states. **LO6:** Apply legal and policy frameworks to real-world case studies, including maritime boundary disputes and governance challenges. **LO7:** Develop policy recommendations related to sustainability, marine protection, blue economy, or maritime security. **LO8:** Interpret maritime jurisdiction, boundary delimitation, and ocean-use conflicts through practical scenarios. **LO9:** Demonstrate effective teamwork and communication skills during simulations, debates, and group policy projects. **LO10:** Produce well-structured academic reports, policy briefs, and presentations on ocean governance issues.

Content of the Course

Week	*Subject*
1	**Introduction to Ocean Governance** • Definition, scope, and evolution of ocean governance • Importance for global trade, environment, and maritime management • Key actors: states, IGOs, NGOs, private sector
2	**Historical Development of Ocean Governance** • Mare Liberum vs. Mare Clausum • Evolution of maritime zones • Development of international maritime law
3	**The United Nations and Global Maritime Governance** • UN structure relevant to oceans • UN bodies influencing maritime governance (UNGA, UNEP, UNDP, UNCTAD) • UN Sustainable Development Goals (SDG 14: Life Below Water)
4	**UNCLOS: The Constitution of the Oceans (Part I)** • Structure and principles of UNCLOS • Maritime zones: internal waters, territorial sea, contiguous zone • Innocent passage and coastal state rights
5	**UNCLOS (Part II): Continental Shelf, EEZ, and High Seas** • Jurisdiction, rights, and responsibilities of states • Resource exploitation and environmental obligations • Freedoms of the high seas
6	**Maritime Boundary Delimitation and Dispute Settlement** • Delimitation principles • Case studies: Aegean, South China Sea, Arctic disputes • International Court of Justice (ICJ) and ITLOS
7	**International Maritime Organizations and Regulatory Frameworks** • IMO: structure, functions, and key conventions • ILO, FAO, IMO–ILO joint initiatives • Regional seas organizations
8	**Marine Environmental Protection and Pollution Control** • MARPOL and environmental obligations • Ballast water management, ship recycling, air emissions (IMO 2020/2050 targets) • Protection of sensitive sea areas (PSSAs, MPAs)
9	**Oceans and Climate Change** • Impact of climate change on maritime activities • Sea-level rise, acidification, extreme weather risks • International policies: Paris Agreement, climate mitigation in maritime sector
10	**Blue Economy Governance**

	• Sustainable use of marine resources • Fisheries governance (FAO regulations, RFMO structures) • Offshore energy (wind, tidal, wave), seabed mining governance
11	**Maritime Security Governance** • Piracy, armed robbery, illegal fishing (IUU), smuggling, maritime terrorism • International legal responses • Regional cooperation frameworks (ReCAAP, EUNAVFOR, Combined Task Forces)
12	**Ocean Policy-Making and National Maritime Strategies** • How states formulate maritime policy • Examples: EU Integrated Maritime Policy, US Ocean Policy, Turkey's maritime strategy • Role of maritime administrations
13	**Stakeholder Engagement and Ocean Diplomacy** • Role of port authorities, coastal communities, NGOs • Corporate responsibility and sustainability standards • Maritime diplomacy and conflict resolution
14	**Emerging Issues in Ocean Governance** • Autonomous ships, digital compliance, maritime cybersecurity • Arctic governance and new shipping routes • Marine genetic resources and BBNJ Agreement (2023)
15	**Course Review & Case Studies + Final Exam Preparation** • Comprehensive review of key governance frameworks • Group case studies on real-world ocean policy issues • Final exam briefing

Methods and Techniques used in the Course

Lectures and Interactive Discussions:
Used to introduce foundational concepts of ocean governance, maritime law, and policy frameworks.

Case Study Analysis:
Examination of real-world issues such as maritime boundary disputes, marine environmental incidents, and governance challenges.

Problem-Based Learning (PBL):
Students work on complex maritime governance problems requiring legal, managerial, and policy-based solutions.

Group Projects and Collaborative Work:
Development of policy briefs, governance proposals, and analysis of institutional frameworks.

Simulations and Role-Playing Exercises:
Mock negotiations on UNCLOS-related issues, maritime security scenarios, and international policy dialogues.

Guest Lectures / Expert Sessions:
Talks by practitioners from IMO, maritime authorities, environmental NGOs, or port administrations.

Digital Tools and Data Platforms:
Use of GIS-based maritime maps, AIS data platforms, legal databases, and marine policy resources.

Video-Based Learning and Multimedia Resources:
Documentaries, IMO materials, and digital content to understand real maritime governance challenges.

Research and Report Writing:
Preparation of analytical papers and policy reports on governance and ocean management issues.

Student Presentations:
Presentation of case-study findings, policy recommendations, or group project outcomes.

Sample Questions

Short Answer Questions

- Define *Ocean Governance* and explain its importance for global maritime activities.
- What are the main objectives of the United Nations Convention on the Law of the Sea (UNCLOS)?
- Explain the difference between *Territorial Sea*, *Exclusive Economic Zone (EEZ)*, and *High Seas*.
- What is the role of the International Maritime Organization (IMO) in ocean governance?
- Briefly describe the concept of *Marine Spatial Planning (MSP)*.

Essay / Long-Form Questions

- Discuss how environmental protection principles under UNCLOS influence national maritime policies. Provide examples.
- Evaluate the challenges of governing the High Seas in the context of illegal fishing, piracy, and environmental degradation.
- Explain the importance of ocean governance for the sustainable management of marine resources within the Blue Economy framework.

Case Study / Applied Questions

- A maritime boundary dispute has arisen between two neighboring coastal states. Using UNCLOS principles, outline how such a dispute should be resolved.
- A major oil spill occurs in a nation's EEZ. Analyze the roles and responsibilities of the coastal state, shipowner, IMO, and other relevant international bodies in responding to the crisis.
- You are tasked with developing a Marine Spatial Plan for a region with fisheries, tourism, shipping lanes, and offshore energy development. Explain the steps you would follow and the stakeholders involved.

Multiple Choice Questions (MCQ)

- Which organization is primarily responsible for regulating global shipping safety?
  a) FAO
  b) IMO
  c) UNESCO
  d) ILO
- The EEZ of a coastal state extends up to:
  a) 12 nautical miles
  b) 24 nautical miles
  c) 200 nautical miles
  d) 350 nautical miles
- Which of the following is *not* considered a High Seas challenge?
  a) Piracy
  b) Overfishing
  c) Marine pollution
  d) Port State Control

Critical Thinking / Policy Questions

- Propose a governance model that could improve cooperation between coastal states in managing shared marine ecosystems.
- How can digital technologies (AIS, satellite monitoring, big data) improve compliance and enforcement in ocean governance?

Materials Used in the Course

Primary Textbooks

- **Rothwell, D. R., & Stephens, T. (2016).** ***The International Law of the Sea*****.** Cambridge University Press.
- **de la Fayette, L., & Oude Elferink, A. G. (Eds.). (2019).** ***Ocean Governance: Sustainable Development of the Seas*****.** Brill Academic Publishers.
- **Tanaka, Y. (2015).** ***The International Law of the Sea*****.** Bloomsbury Publishing.

Recommended References

- **Churchill, R., Lowe, A., & Sander, V. (2022).** ***The Law of the Sea*****.**
- **IMO Publications –** ***International Conventions and Codes*** **(SOLAS, MARPOL, ISPS, etc.)**
- **UN (2017).** ***United Nations Convention on the Law of the Sea (UNCLOS)*****.** *Core text governing maritime jurisdiction; required reading.*
- **Cicin-Sain, B., & Belfiore, S. (2005).** ***Marine Policy & Governance: Global and Regional Perspectives*****.**
- **Trevisanut, S., Kraska, J., & Vodičková, A. (Eds.). (2020).** ***The Future of Ocean Governance and Capacity Development*****.**

Supplementary Learning Materials

- **Academic Journals**
  Marine Policy
  Ocean & Coastal Management
  The International Journal of Marine and Coastal Law
  Maritime Affairs: Journal of the National Maritime Foundation
- **Online Platforms & Reports**
  IMO e-Library – latest conventions, circulars, and guidelines
  UN Ocean Portal – global ocean policy material
  FAO Fisheries & Aquaculture Reports
  OECD Ocean Economy and Blue Growth Reports
- **Case Studies & Legal Databases**
  ITLOS Case Judgments and Summaries (International Tribunal for the Law of the Sea)
  ICJ Maritime Boundary Case Files
  GIS Marine Spatial Planning tools (EU MSP Platform)
- **Documentaries & Media Resources**
  National Geographic: *Ocean Governance & Marine Conservation*
  BBC Earth: *Ocean Challenges*
  UN World Oceans Day recorded seminars
- **Technical Tools**
  MarineTraffic / AIS data platforms (for maritime situational awareness)
  EMSA (European Maritime Safety Agency) reports and dashboards

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate fundamental knowledge of maritime business, shipping operations, port management, and international logistics.				✓	Maritime Business & Operations
2	Apply principles of management, economics, and finance to ship operations, chartering, brokerage, and maritime organizational decision-making.				✓	Maritime Economics & Management
3	Understand and interpret international maritime law, conventions, and trade regulations including SOLAS, MARPOL, UNCLOS, and INCOTERMS.				✓	Maritime Law & Policy
4	Plan and manage port and terminal operations efficiently, considering cargo handling systems, port logistics, and intermodal transport networks.				✓	Port & Terminal Operations Management
5	Employ digital tools and data-driven approaches in ship management, fleet performance monitoring, and maritime logistics systems.				✓	Digital Maritime Operations
6	Integrate sustainability, environmental protection, and decarbonization principles into maritime and logistics operations in line with IMO GHG strategy.			✓		Sustainability & Green Shipping
7	Demonstrate competence in maritime risk assessment, safety management systems (ISM Code), and crisis response in ship and shore-based contexts.			✓		Safety & Risk Management
8	Exhibit leadership, teamwork, and communication skills necessary for multicultural and interdisciplinary maritime organizations.				✓	Leadership & Intercultural Communication
9	Apply marketing, logistics, and supply chain strategies to global shipping and maritime transport sectors.				✓	Global Logistics & Supply Chain Management
10	Prepare and analyze charter parties, bills of lading, and other shipping documents while managing cargo claims and marine insurance issues.				✓	Maritime Documentation & Insurance
11	Utilize effective business English and Maritime English for negotiation, correspondence, and documentation within international maritime contexts.			✓		Maritime Communication & Professional English
12	Demonstrate ethical awareness, corporate responsibility, and adherence to international professional standards in maritime and logistics management.			✓		Ethics & Corporate Responsibility
13	Develop research skills and analytical thinking to identify, evaluate, and solve complex problems in maritime transport and logistics systems.			✓		Analytical Thinking & Research Skills
14	Adapt to innovations such as digitalization, automation, and smart shipping technologies through continuous professional development.				✓	Innovation & Lifelong Learning
15	Apply entrepreneurship and strategic management principles to establish or develop maritime-related enterprises in a competitive global environment.			✓		Entrepreneurship & Strategic Management

***0:** No Contribution **1:** Little Contribution **2:** Partial Contribution **3:** Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
	LO1	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**	**LO7**	**LO8**	**LO9**	**L10**
PO1	3	3	2	2	2	1	3	2	2	2
PO2	3	3	3	2	2	1	2	1	2	1
PO3	2	3	1	3	3	2	1	3	1	1
PO4	2	2	1	2	3	3	2	2	2	2
PO5	1	2	2	1	1	2	2	2	3	3
PO6	1	2	1	2	1	1	2	3	2	2
PO7	1	1	1	1	1	3	2	2	3	3
PO8	1	1	3	1	1	1	2	1	2	1
PO9	1	1	2	1	1	1	1	1	2	2
PO10	2	2	1	2	3	3	2	2	2	2
PO11	1	2	2	1	1	2	2	2	3	3
PO12	1	2	1	2	1	1	2	3	2	2
PO13	3	3	3	2	2	1	2	1	2	1
PO14	2	3	1	3	3	2	1	3	2	2
PO15	1	2	1	2	2	3	2	2	3	3

Course Learning Outcomes/ Evaluation Method		
Course Learning Outcomes (CLOs)	**Teaching Method**	**Assessment Method**
CLO1: Explain the fundamental concepts, principles, and frameworks of ocean governance at global and regional levels.	Lectures, interactive discussions	Midterm exam, quizzes
CLO2: Interpret the structure, role, and provisions of UNCLOS and related international maritime conventions.	Lectures, case studies, legal text analysis	Midterm exam, written assignments
CLO3: Identify maritime zones, jurisdictional boundaries, and coastal state rights and obligations.	Lectures, GIS demonstrations, problem-solving exercises	Quizzes, case-based assessment
CLO4: Analyze key ocean governance challenges such as maritime security, resource management, and environmental sustainability.	Case studies, group discussions	Written reports, midterm exam
CLO5: Evaluate the roles of global institutions (IMO, UN, regional bodies) in shaping maritime policy frameworks.	Seminars, research activities	Research paper, presentations
CLO6: Assess maritime boundary disputes and real-world legal cases involving oceans and seas.	Case study analysis, legal scenario solving	Case study report, class participation
CLO7: Examine the relationship between ocean governance, blue economy development, and sustainability goals.	Lectures, workshops	Term paper, project
CLO8: Apply policy analysis tools to propose effective governance strategies for marine resources and maritime activities.	Workshops, simulations	Group project, presentations
CLO9: Demonstrate understanding of compliance, enforcement, and monitoring mechanisms in the maritime domain.	Practical examples, interactive discussions	Written assignments, quizzes
CLO10: Develop critical thinking and communication skills through policy evaluation, debate, and professional reporting.	Debates, role-play, presentations	Oral presentation, participation, final exam

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	-	-	-
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**10**	**10**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	-	-	-
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**15**	**15**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**99**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Ship Handling							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
SHA301	III	Fall	3	3	2	2	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				40	-	-	60
Course Venue and Time				Friday / 09:30 – 12:20			
Instructor information				**Cpt. Mehmet Emin Debeş** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4060 mehmetemin.debes@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course introduces the fundamental principles and practices of ship maneuvering and handling under various operational and environmental conditions. Students will examine the factors affecting ship maneuverability, including environmental forces, propulsion systems, and hydrodynamic effects. Topics include the use of main engines, propellers, rudders, bow and stern thrusters, and mooring lines during berthing, unberthing, and anchoring operations. The course also covers turning circles, shallow water and narrow channel effects, tug assistance, and safe maneuvering practices. Emphasis is placed on applying theoretical knowledge to practical ship-handling scenarios to ensure safety, efficiency, and compliance with international maritime regulations.
Course Aims and Objectives	• Provide students with a comprehensive understanding of the factors influencing ship maneuverability. • Develop the ability to analyze and evaluate the effects of propulsion, rudders, thrusters, and environmental conditions on ship handling. • Equip students with practical knowledge for safe and effective ship operations, including berthing, unberthing, anchoring, and maneuvering in restricted waters. • Enhance decision-making and situational awareness skills to support safe navigation and ship control. • Prepare students to apply international rules and best practices in ship maneuvering and handling.
Course Learning Outcomes	**CLO1:** Explain the fundamental principles of ship maneuvering and the factors influencing vessel handling. **CLO2:** Identify and evaluate the advantages and limitations of various propulsion systems and steering devices in ship maneuvers. **CLO3:** Analyze the effects of environmental conditions such as shallow water, narrow channels, wind, and current on ship maneuverability. **CLO4:** Demonstrate knowledge of berthing, unberthing, mooring, and anchoring procedures and techniques. **CLO5:** Interpret and apply safe ship handling practices in accordance with international maritime safety regulations. **CLO6:** Assess the role of tug assistance, mooring lines, and other operational aids in effective ship maneuvering.

	CLO7: Apply theoretical ship-handling knowledge to practical or simulated scenarios, emphasizing safety and operational efficiency. **CLO8:** Evaluate ship handling outcomes and identify potential improvements in maneuvering strategies. **CLO9:** Integrate ship handling concepts with navigational planning to optimize voyage safety. **CLO10:** Develop critical decision-making and problem-solving skills in complex ship maneuvering situations.

Content of the Course

Week	*Subject*
1	**Introduction to Ship Handling** Importance, objectives, safety considerations
2	**Factors affecting ship maneuvering** Environmental conditions & ship characteristics
3	**Propulsive Forces and Resistances** Air and water resistance in maneuvering
4	**Main engines** Effectiveness, advantages & disadvantages of different types in maneuvering
5	**Propellers** Fixed pitch, controllable pitch, right/left handed, twin-screw effects
6	**Rudder effects** Single-screw ships
7	**Rudder effects** Twin-screw ships
8	**Bow thrusters & stern thrusters** Working principles, combined use with rudder
9	**Mooring Lines in Maneuvering** During berthing, unberthing, and other line maneuvers
10	**Turning circle** Definition, tactical diameter, advance, transfer
11	**Shallow water effects** Squat phenomenon, bank effect, narrow channel navigation
12	**Anchoring methods** Safe anchoring, techniques of anchoring and securing a vessel
13	**Tug assistance** Methods of towline connection, tug operations in maneuvering
14	**Integrated maneuvering** Case studies combining propulsion, rudder, thrusters, lines, and tugs
15	**General review & Final preparation** Discussion of maneuvering scenarios, Q&A

Methods and Techniques used in the Course

Lectures and Presentations: Theoretical knowledge supported by visual materials (slides, videos, diagrams).

Case Studies: Analysis of real-life maneuvering incidents and best practices.

Classroom Discussions: Interactive sessions to enhance critical thinking and problem-solving skills.

Demonstrations: Use of ship maneuvering models, charts, and simulation-based examples.

Problem-Solving Exercises: Assignments and scenario-based questions on ship maneuvering.

Simulation Practices (if available): Application of ship handling techniques in a controlled environment to improve situational awareness and decision-making.

Sample Questions

- Define the main environmental factors affecting ship maneuvering. Provide at least three examples.
- Explain the advantages and disadvantages of fixed-pitch and controllable-pitch propellers during maneuvering.
- What is the difference between rudder effects on single-screw and twin-screw ships? Give examples.
- Describe the squat effect in shallow waters. How does it influence ship handling?
- Explain the interaction effects when a ship is navigating in narrow channels (bank suction and cushion effects).
- Draw and explain the concept of a turning circle. What are advance, transfer, and tactical diameter?
- Discuss the role of tugboats in ship maneuvering. Mention at least two methods of tug assistance.
- What are the effects of bow thrusters and stern thrusters during berthing and unberthing operations?
- Describe the appropriate procedures and precautions for anchoring in confined waters.
- Case Study: A vessel with a single right-handed fixed-pitch propeller is attempting to berth starboard side to the quay under strong crosswinds from port.
    - What challenges will the ship face?
    - Which maneuvering techniques can be applied to ensure safe berthing?

Materials Used in the Course

Textbooks and References

- Cockcroft, A. N., & Lameijer, J. N. F. *A Guide to the Collision Avoidance Rules*.
- Bertram, V. *Practical Ship Hydrodynamics*.
- Guldhammer, H., & Harvald, S. A. *Ship Resistance and Propulsion*.
- Bowditch, N. *The American Practical Navigator*.
- IMO Model Course 7.03 – *Officer in Charge of a Navigational Watch*.

International Conventions and Guidelines

- COLREG (International Regulations for Preventing Collisions at Sea).
- SOLAS Convention (Safety of Life at Sea).
- STCW Convention (Standards of Training, Certification and Watchkeeping).

Practical Tools

- Ship maneuvering simulators.
- Maneuvering booklets of various ship types.
- Nautical charts, tide tables, and pilot books.

Supplementary Materials

- Case studies on accidents/incidents related to ship handling.
- Port authority regulations and tug assistance guidelines.
- Videos and computer animations demonstrating ship maneuvers.

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**
PO1	3	3	2	2	3	2	2	2	2	3
PO2	2	2	2	2	2	2	2	1	2	2
PO3	2	2	3	2	2	2	3	2	3	3
PO4	1	1	2	2	2	2	2	1	2	2
PO5	3	2	3	3	3	3	3	2	3	3
PO6	2	2	2	2	2	2	2	2	2	2
PO7	1	1	2	2	1	1	2	1	2	2
PO8	1	1	1	1	1	1	1	1	1	1
PO9	1	1	1	1	1	1	1	1	1	1
PO10	2	2	2	2	2	2	2	2	2	2
PO11	1	1	2	2	2	1	2	1	2	2
PO12	1	1	1	1	1	1	1	1	1	1

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1 – Principles of Ship Maneuvering	Lecture, Multimedia Presentation, Demonstration	Quizzes, Assignments, Participation
CLO2 – Propulsion and Steering Devices	Lecture, Case Studies, Simulation	Quizzes, Midterm Exam, Assignments
CLO3 – Effects of Water Depth, Channels, Wind, and Current	Simulation Exercises, Practical Demonstration	Simulation Assessment, Assignments, Lab Reports
CLO4 – Berthing, Unberthing, Mooring, Anchoring Techniques	Hands-on Practice, Simulation, Role Play	Practical Exams, Observation, Assignments
CLO5 – Ship Handling Compliance and Safety	Lecture, Scenario-Based Learning	Quizzes, Case Study Analysis, Assignments
CLO6 – Tug Assistance and Mooring Lines	Simulation, Practical Exercises	Practical Exams, Lab Reports, Assignments
CLO7 – Application of Ship Handling Theory	Bridge Simulation, Case Studies	Practical Exams, Simulation Reports, Assignments
CLO8 – Emergency Maneuvers and Contingency Planning	Scenario-Based Exercises, Simulation	Practical Exams, Simulation Reports, Participation
CLO9 – Integrated Maneuvering Exercises	Bridge Simulation, Group Exercises	Practical Exams, Project Reports, Observation
CLO10 – Decision Making in Ship Handling	Scenario-Based Learning, Simulation	Case Study Reports, Practical Exams, Simulation Assessment

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**3**	**45**
Midterm Exam	**1**	**1**	**1**
Preparation for Midterm Exam	**1**	**3**	**3**
Final Exam	**1**	**1**	**1**
Preparation for Final Exam	**1**	**3**	**3**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	**1**	**5**	**5**
Group Work	**1**	**5**	**5**
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**10**	**10**
Individual Reading / Research	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**103**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	-	-
Laboratory	-	-
Application	-	-
Field Work	1	10
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	1	10
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	40
Total	**5**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Simulator I							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
SIM301	III	Fall	3	6	1	4	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				60	-	-	40
Course Venue and Time				Wednesday 09.30-14.20			
Instructor information				**Cpt. Mehmet Emin Debeş** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4040 mehmetemin.debes@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides hands-on training in bridge simulation, focusing on the use of ARPA, ECDIS, and Bridge Team Management (BTM). Students will develop practical skills for target acquisition, radar plotting, situational awareness, and safe navigation under various operational conditions.
Course Aims and Objectives	• To understand the operational principles of ARPA, ECDIS, and BTM systems. • To develop practical skills in target acquisition, plotting, and monitoring on radar and electronic chart displays. • To integrate theoretical knowledge of navigation with bridge simulator exercises for safe and efficient ship handling. • To apply COLREG 1972 rules and other operational standards in simulated navigation scenarios.
Course Learning Outcomes	**CLO1:** Demonstrate proficiency in operating ARPA, ECDIS, and BTM systems for safe navigation. **CLO2:** Acquire, track, and accurately interpret target information for collision avoidance and situational awareness. **CLO3:** Identify, analyze, and correct errors and discrepancies in electronic navigation systems. **CLO4:** Apply COLREG rules effectively during practical simulation exercises and real-world navigation scenarios. **CLO5:** Manage bridge operations safely and efficiently using integrated electronic navigation systems. **CLO6:** Assess the limitations and risks associated with over-reliance on electronic navigation aids and implement mitigation strategies. **CLO7:** Integrate radar and ECDIS information to make informed navigational decisions in complex environments. **CLO8:** Demonstrate critical thinking and decision-making skills when interpreting navigation data under time constraints. **CLO9:** Communicate effectively with bridge team members using standard maritime communication protocols. **CLO10:** Apply knowledge of electronic navigation systems to plan, execute, and monitor safe voyages.

Content of the Course

Week	*Subject*
1	Introduction: Description and importance of ARPA, ECDIS, and BTM
2	Acquisition of targets on ARPA, ECDIS, BTM
3	Tracking capabilities, limitations, and processing delays
4	Setting up ARPA, ECDIS, and BTM systems
5	Errors of interpretation in ARPA, ECDIS, BTM
6	Errors in displayed data on ARPA, ECDIS, BTM
7	Explanation of system operational tests
8	Risk of over-reliance on ARPA, ECDIS, BTM
9	Obtaining information from ARPA, ECDIS, BTM displays
10	Application of COLREG 1972 using ARPA, ECDIS, BTM
11	Further explanation of ARPA, ECDIS, BTM operations
12	Bridge Resource Management (BRM) concepts
13	Further explanation and practical exercises
14	Revision and integration with Electronic Aids to Navigation content
15	Final Exam / Practical evaluation

Methods and Techniques used in the Course

Lectures

- Instructor-led presentations covering principles of electronic navigation, radar, ECDIS, and bridge management.
- Explanation of operational procedures, error sources, and system limitations.

Simulation Exercises

- Hands-on use of bridge simulators to practice target acquisition, tracking, and plotting.
- Realistic scenarios for collision avoidance, safe navigation, and voyage planning.
- Application of COLREG 1972 rules in simulated maritime environments.

Case Studies and Scenario Analysis

- Analysis of previous navigation incidents or hypothetical situations.
- Identification of human errors, system limitations, and risk mitigation strategies.

Practical Demonstrations

- Demonstrations of ARPA and ECDIS setup, configuration, and operation.
- Use of electronic chart data, sensor integration, and display interpretation.

Group Work / Collaborative Exercises

- Bridge Team Management exercises emphasizing coordination, communication, and decision-making in simulated bridge operations.
- Team-based problem solving for emergency scenarios or challenging navigation conditions.

Feedback and Debriefing Sessions

- Instructor-led review of simulation exercises to highlight correct procedures, errors, and best practices.
- Encouragement of critical thinking and self-assessment.

Revision and Integration

- Weekly discussions integrating theoretical principles with simulation exercises.
- Reinforcement of safe navigation practices and bridge resource management concepts.

Sample Questions

Theory & Conceptual Understanding

- Explain the main principles and limitations of ARPA and ECDIS systems.
- Describe the potential risks of over-reliance on electronic navigation aids and how to mitigate them.

Practical Scenario-Based Questions

- Given a simulated ARPA display with multiple targets, determine the Closest Point of Approach (CPA) and Time to CPA (TCPA) for two approaching vessels.
- Using a bridge simulator scenario, apply COLREG 1972 rules to safely navigate in a congested traffic area.

Error Identification and Correction

- Identify and explain possible causes of errors in displayed data on ARPA or ECDIS.
- Describe the steps to verify and correct target data when discrepancies are observed between radar and ECDIS.

Bridge Team Management (BTM)

- Explain the importance of communication and role allocation in Bridge Team Management during high-traffic navigation.
- How would you coordinate with other team members to manage a simulated emergency, such as a sudden target crossing your path?

Integration of Systems

- Describe how information from ARPA, ECDIS, and GPS can be integrated for safe navigation during restricted visibility conditions.
- Explain the procedure for setting up and maintaining the ARPA and ECDIS displays according to manufacturer recommendations and operational standards

Materials Used in the Course

Textbooks & Reference Books

- *Radar Navigation and Maneuvering Board Manual* – International Maritime Organization (IMO)
- *Electronic Navigation* – Thomas H. Malone
- *Bridge Team Management (BTM) and ECDIS Operations* – Nautical Institute
- *COLREG 1972: International Regulations for Preventing Collisions at Sea* – IMO

Electronic and Simulator Tools

- ARPA (Automatic Radar Plotting Aids) simulator systems
- ECDIS (Electronic Chart Display and Information Systems) simulator
- BTM simulation exercises for decision-making and communication practices
- GPS and other electronic positioning systems integrated in simulators

Charts, Manuals, and Publications

- Nautical charts (paper and electronic) for simulation exercises
- Radar and ECDIS operational manuals (manufacturer guidelines)
- Bridge procedures and navigation record templates
- IMO performance standards documents for ARPA and ECDIS

Software and Digital Resources

- Simulation software for radar and ECDIS training
- Scenario-based training modules for collision avoidance and route planning
- Data logging software for bridge team exercises

Supplementary Materials

- Case studies on navigation incidents and ARPA/ECDIS failures
- Training handouts on error identification, correction, and best practices
- Videos and animations illustrating safe navigation techniques and system integration

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**
PO1	3	3	3	3	3	2	2	2	2	3
PO2	2	3	2	3	2	2	2	3	3	2
PO3	2	2	3	2	3	3	2	2	2	3
PO4	1	2	2	2	2	2	1	2	2	2
PO5	3	3	3	2	3	3	3	2	3	3
PO6	2	2	2	2	2	2	2	2	2	2
PO7	1	1	1	1	1	1	1	1	1	1
PO8	1	1	1	1	1	1	1	1	1	1
PO9	1	1	1	1	1	1	1	1	1	1
PO10	1	1	1	2	2	2	1	2	2	2
PO11	1	1	1	1	1	1	1	1	1	1
PO12	1	1	1	1	1	1	1	1	1	1

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1 – Proficiency in ARPA, ECDIS, and BTM	Lecture, Demonstration, Bridge Simulation	Quizzes, Lab Reports, Practical Simulation Exams
CLO2 – Acquire, track, and interpret target information	Hands-on Simulation, Problem-Solving Exercises	Practical Exercises, Simulation Performance, Assignments
CLO3 – Identify and correct errors in electronic navigation systems	Lecture, Case Studies, Simulation Exercises	Practical Tests, Assignments, Scenario-based Evaluation
CLO4 – Apply COLREG rules in practical exercises	Lecture, Simulation, Role-Playing	Simulation Performance, Midterm Exam, Assignments
CLO5 – Manage bridge operations safely using integrated navigation systems	Bridge Simulation, Scenario-based Exercises	Practical Exams, Observation, Assignments
CLO6 – Understand risks of over-reliance on electronic navigation aids	Lecture, Discussions, Case Studies	Quizzes, Assignments, Scenario Analysis
CLO7 – Integrate electronic navigation data for decision-making	Problem-Based Learning, Simulation	Practical Exams, Assignments, Group Projects
CLO8 – Evaluate navigation performance under simulated conditions	Simulation Exercises, Case Studies	Simulation Reports, Practical Performance, Assignments
CLO9 – Communicate navigation decisions effectively	Role-Playing, Group Exercises	Observation, Peer Assessment, Assignments
CLO10 – Apply theoretical knowledge to practical ship-handling scenarios	Scenario-Based Exercises, Bridge Simulation	Practical Exams, Project Reports, Simulation Assessment

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**5**	**75**
Midterm Exam	**1**	**5**	**5**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**5**	**5**
Preparation for Final Exam	**1**	**10**	**10**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	**15**	**1**	**15**
In-class Discussion(s)	**15**	**2**	**30**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**10**	**10**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	**1**	**10**	**10**
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**185**
ECTS Credit			**6**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	1	30
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	-	-
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	30
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		

University of Kyrenia

Faculty of Maritime Studies

Maritime Transportation Management Engineering

Syllabus

Course name: Technical Ship Management I							
Code	**Year**	**Semester**	**Credit**	**ECTS**	**Course application, Hour/Week**		
					Theoretical	**Application**	**Laboratory**
TSM301	III	Fall	3	3	2	2	0
Course type: Compulsory				**Prerequisite: x**		**Language:** English	
% Contribution to the Professional Fundamental Component				**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
				-	-	-	100
Course Venue and Time				Tuesday / 10:30 – 13:20			
Instructor information				**Cpt. Caner Özbilgiç** Faculty of Maritime Studies Wednesday / 09:00 - 12:00 +90 (392) 650 26 00 / 4060 mehmetemin.debes@kyrenia.edu.tr www.kyrenia.edu.tr			

Course Description	This course provides an in-depth exploration of the fundamental principles and practices of maritime commercial and technical ship management. It covers the operational, legal, and financial aspects of maritime trade, including liner and tramp markets, chartering practices, freight markets, and key shipping documentation. Students will learn the technical management requirements of ships, including maintenance, classification, surveys, compliance with international regulations, and safety audits. The course also emphasizes safety, environmental protection, and quality management systems in accordance with international conventions such as the ISM Code and MARPOL. In addition, students will develop leadership, decision-making, and teamwork skills essential for effective crew and resource management. A significant focus is placed on maritime English terminology used in commercial and technical documentation, enhancing students' ability to operate in an international maritime environment. Through theoretical lectures, case studies, and practical applications, students gain a comprehensive understanding of how modern shipping companies manage vessels efficiently while meeting safety, environmental, and commercial obligations.
Course Aims and Objectives	**Aim:** The primary aim of this course is to equip students with the theoretical knowledge and practical skills required to effectively manage commercial and technical aspects of maritime operations while ensuring compliance with international safety, environmental, and quality standards. **Objectives:** By the end of the course, students will be able to: 1. **Understand and analyze** the structure and dynamics of maritime markets, including liner and tramp shipping, chartering practices, and freight contracts. 2. **Interpret and apply** international maritime laws, conventions, and regulations related to ship operations, safety management, and environmental protection. 3. **Develop and implement** safety and quality management systems (SMS & QMS) in compliance with ISM Code and other relevant standards. 4. **Manage technical operations** of ships, including maintenance planning, classification surveys, and regulatory inspections. 5. **Apply leadership and decision-making skills** for effective crew management, workload planning, and resource allocation onboard and ashore. 6. **Use professional maritime English terminology** accurately in commercial, technical, and regulatory documentation, including INCOTERMS, charter parties, statements of facts, and time sheets. 7. **Evaluate and improve operational performance** of shipping companies while balancing safety, environmental, and commercial considerations.

Course Learning Outcomes	**CLO1: Explain** the fundamental principles of maritime commercial operations, including liner and tramp shipping, chartering types, and freight markets. *(Knowledge/Understanding)* **CLO2: Interpret and apply** international maritime conventions, safety and environmental regulations, and quality management standards (e.g., ISM Code, classification society requirements). *(Application)* **CLO3: Analyze** various types of charter parties and shipping documentation (e.g., bills of lading, statements of facts, time sheets) and their legal and commercial implications. *(Analysis)* **CLO4: Develop** maintenance, inspection, and technical operation plans for ships in accordance with regulatory requirements and industry best practices. *(Synthesis/Design)* **CLO5: Assess and manage** risks related to maritime safety, environmental protection, and cargo operations, including pollution prevention measures. *(Evaluation)* **CLO6: Communicate effectively** in professional maritime English using correct terminology for technical, operational, and commercial contexts (e.g., INCOTERMS, ship management reports). *(Communication)* **CLO7: Demonstrate** leadership, teamwork, and decision-making skills in managing shipboard personnel, workload planning, and emergency situations. *(Professional/Soft Skills)* **CLO8: Evaluate and propose improvements** to safety, quality, and technical management systems to enhance overall operational efficiency and compliance. *(Evaluation/Problem-Solving)*

Content of the Course

Week	*Subject*
1	**Introduction to Technical Ship Management** • Overview of ship technical management • Tracking regulations and compliance requirements • Ship documentation and inspection procedures
2	**Maintenance and Record Keeping** • Maintenance management and record-keeping systems • Correspondence and reporting in technical management • Planning for repairs and preventive maintenance
3	**Personnel and Training Management** • Crew management principles • Training programs and competency tracking • Safety and supply management related to personnel
4	**Material and Inventory Management** • Materials tracking and record keeping • Planning for equipment and supply needs • Stock management and logistic coordination
5	**Concepts of Safety, Environment, and Quality** • Introduction to safety management • Environmental protection principles • Quality concepts in maritime operations
6	**Marine Environmental Protection and Pollution Prevention** • Measures to prevent marine pollution • Pollution prevention procedures and equipment • Importance of proactive environmental protection
7	**Legal and Commercial Requirements for Safety and Quality Management** • ISM Code overview • International and national quality standards • Regulatory compliance for safety and environmental protection
8	**Safety and Quality Management Systems (Preparation and Implementation)** • Establishing a Safety Management System (SMS) • Implementing a Quality Management System (QMS) • Internal and external audits: techniques and application
9	**Leadership and Teamwork in Maritime Operations** • Crew management and education strategies • Effective team communication and coordination • Motivational and leadership skills development
10	**Maritime Legislation and Regulations** • International conventions and national maritime legislation

	• Compliance and enforcement mechanisms • Legal obligations related to ship operations
11	**Task and Workload Management** • Planning and task allocation • Prioritization under time and resource constraints • Delegation and monitoring of tasks onboard
12	**Resource Management in Maritime Operations** • Allocation and prioritization of resources • Effective ship-to-shore communication • Lessons from team experience and decision-making reflection
13	**Decision-Making Techniques I** • Situation and risk assessment • Evaluating alternatives and selecting actions • Decision-making frameworks and approaches
14	**Decision-Making Techniques II** • Implementing decisions in real operational scenarios • Monitoring and adjusting actions • Evaluating effectiveness of decisions
15	**Integration and Practical Application** • Case studies of technical ship management • Simulation of safety, quality, and operational decision-making • Review and consolidation of leadership, management, and technical skills

Methods and Techniques used in the Course

- **Interactive Lectures** – Instructor-led sessions to explain core concepts of technical management, safety, quality, and environmental regulations.
- **Case Studies** – Analysis of real-world scenarios to illustrate challenges in ship management, maintenance, and compliance.
- **Group Discussions** – Collaborative discussions to develop problem-solving skills and exchange ideas on operational and safety topics.
- **Problem-Solving Exercises** – Practical exercises focusing on planning, decision-making, and prioritization in ship operations.
- **Document Analysis and Simulation** – Reviewing ship documents, audits, and reports to practice regulatory compliance and management procedures.
- **Role-Playing and Scenario-Based Learning** – Simulating onboard situations such as emergencies, resource allocation, and crew management to develop leadership and decision-making skills.

Sample Questions

- Explain the key principles of technical ship management and their importance for safe and efficient vessel operation.
- Describe the main components of a Safety Management System (SMS) according to the ISM Code.
- How would you plan preventive maintenance for a ship's machinery and equipment?
- Discuss the steps involved in preparing a ship for dry-docking.
- Explain how crew training and resource management contribute to the effective operation of a ship.
- What are the legal and regulatory requirements for environmental protection on ships?
- Describe the process of conducting internal and external audits for technical management and quality systems.
- How can decision-making and prioritization techniques be applied in case of multiple technical issues on board?
- Identify the main challenges in technical ship management and propose solutions to mitigate them.
- Discuss the role of documentation and record-keeping in ensuring compliance with international maritime standards.

Materials Used in the Course

Textbooks & Reference Books

- IMO **International Safety Management (ISM) Code** documentation
- Manuals on **ship maintenance and machinery operation**
- Books on **maritime technical management and leadership**
- Industry standards on **environmental protection and quality management**

International and National Regulations

- SOLAS (Safety of Life at Sea)
- MARPOL (Marine Pollution)
- Flag state regulations
- Port state control guidelines

Guidelines & Reports

- Shipboard **Safety Management System (SMS)** manuals
- Technical and operational checklists
- Dry-docking and survey reports

Online Resources & Industry Databases

- IMO and ILO websites for updates on maritime regulations
- Industry publications and case studies on **ship management best practices**

Practical Materials

- Sample **maintenance logs, inspection checklists, and vessel records**
- Crew management and training materials
- Templates for **risk assessment, decision-making, and reporting**

All the above listed books are available at UoK's Grand Library

Program Outcomes Matrix

	Program Outcomes	*Level of Contribution				Targeted Competence Areas
		0	1	2	3	
1	Demonstrate comprehensive knowledge of navigation sciences, ship handling, cargo operations, and seamanship in accordance with STCW requirements.				✓	Technical & Navigational Expertise
2	Operate and manage shipboard systems, electronic navigation equipment (ECDIS, ARPA, GMDSS), and emerging smart technologies with precision and reliability.				✓	Digital Navigation & Operations
3	Apply maritime safety standards, emergency procedures, and risk assessment practices to ensure the safety of life at sea and environmental protection.				✓	Safety & Risk Management
4	Employ advanced meteorology, oceanography, and route planning methods to optimize voyages under changing environmental and economic conditions.				✓	Voyage Planning & Environmental Awareness
5	Demonstrate leadership, decision-making, and crisis management skills in multicultural and interdisciplinary maritime teams.				✓	Leadership & Decision-Making
6	Apply international maritime law, conventions, and flag state regulations in navigation, cargo management, and ship operations.			✓		Maritime Law & Compliance
7	Manage cargo operations (loading, stowage, securing, and discharge) with attention to safety, efficiency, and international trade standards.			✓		Cargo & Logistics Management
8	Integrate principles of sustainability and green shipping in ship operations, voyage optimization, and environmental protection measures.				✓	Sustainability & Environmental Stewardship
9	Utilize project management, business acumen, and managerial competencies for effective maritime transport operations and logistics planning.				✓	Project & Transport Management
10	Communicate effectively in maritime English, applying IMO SMCP (Standard Marine Communication Phrases) and professional reporting techniques.				✓	Maritime Communication
11	Commit to ethical conduct, professional responsibility, and respect for cultural diversity within the global maritime workforce.			✓		Ethics & Professionalism
12	Engage in lifelong learning, continuous professional development, and adaptation to technological innovations in the maritime transport sector.			✓		Lifelong Learning & Adaptability

***0:** No Contribution
1: Little Contribution
2: Partial Contribution
3: Full Contribution

Program Outcomes /Course Learning Outcomes Matrix **Level of Contribution**:**0**-No Contribution **1**-Little Contribution **2**-Partial Contribution **3**-Full Contribution										
PO	**CLO1**	**CLO2**	**CLO3**	**CLO4**	**CLO5**	**CLO6**	**CLO7**	**CLO8**	**CLO9**	**CLO10**
PO1	3	3	2	3	3	2	2	2	0	0
PO2	2	3	2	3	2	3	2	2	0	0
PO3	3	2	3	2	3	2	3	2	0	0
PO4	2	3	2	3	2	3	2	2	0	0
PO5	3	2	3	2	3	2	3	2	0	0
PO6	2	2	2	3	2	2	2	3	0	0
PO7	2	2	2	2	2	2	2	2	0	0
PO8	1	1	1	2	2	1	1	2	0	0
PO9	1	1	1	1	2	1	1	2	0	0
PO10	1	1	2	1	2	2	2	2	0	0
PO11	1	1	1	2	1	1	2	1	0	0
PO12	1	1	1	2	1	1	2	1	0	0

Course Learning Outcomes/ Evaluation Method		
CLO	**Teaching Method**	**Assessment Method**
CLO1 – Maritime Commercial Principles	Lecture, Case Studies, Group Discussion	Quizzes, Written Assignments, Midterm Exam
CLO2 – International Regulations & Standards	Lecture, Tutorials, Problem-Solving Sessions	Assignments, Case Study Reports, Midterm Exam
CLO3 – Charter Parties & Documentation Analysis	Lecture, Practical Exercises, Document Review	Assignments, Written Case Studies, Project Work
CLO4 – Maintenance & Technical Operations Planning	Workshops, Simulations, Group Projects	Project Reports, Practical Exercises, Presentations
CLO5 – Risk Assessment & Management	Case Studies, Problem-Based Learning, Simulations	Risk Assessment Reports, Quizzes, Practical Exercises
CLO6 – Professional Maritime English	Role-Playing, Communication Exercises, Presentations	Oral Presentations, Written Assignments, Participation
CLO7 – Leadership & Teamwork	Group Exercises, Simulations, Scenario-Based Learning	Peer Evaluation, Practical Exercises, Observation
CLO8 – Safety, Quality & Technical Management Evaluation	Case Studies, Workshops, Problem-Solving Exercises	Project Reports, Assignments, Presentations

ECTS / Workload Table			
Activities	**Number**	**Duration (Hours)**	**Total Workload**
Preparation for lectures	**15**	**1**	**15**
Lectures	**15**	**4**	**60**
Midterm Exam	**1**	**2**	**2**
Preparation for Midterm Exam	**1**	**10**	**10**
Final Exam	**1**	**2**	**2**
Preparation for Final Exam	**1**	**10**	**10**
Presentation(s)	-	-	-
Preparation for Presentation(s)	-	-	-
Research for Project(s)/Essay(s)	-	-	-
Project Writing	-	-	-
Group Work	-	-	-
In-class Discussion(s)	**15**	**1**	**15**
Quiz(es)	-	-	-
Preparation for Quiz(es)	-	-	-
Laboratory	-	-	-
Assignment(s)/Homework/Class Works	**1**	**20**	**20**
Micro-Teaching Sessions	-	-	-
Lesson Planning	-	-	-
Materials Adaptation	-	-	-
Material Development	-	-	-
Draft Preparation	-	-	-
Drawing	-	-	-
Essay Writing	-	-	-
Tutorial(s)	-	-	-
Portfolio Preparation	-	-	-
Portfolio Presentation	-	-	-
Total Workload			**134**
ECTS Credit			**3**

Evaluation System		
Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation	15	10
Laboratory	-	-
Application	-	-
Field Work	-	-
Special Course Internship (Work Placement)	-	-
Homework/Assignments	1	10
Providing reliability and motivation of the individual homework completion and Submission	-	-
Presentation/Jury	-	-
Project	-	-
Quiz	-	-
Midterms/Oral Exams	1	30
Final/Oral Exams	1	50
Total	**4**	**100**

	Percentage	**Course Grade**	**Coefficient**
Grading Policy	90-100	AA	4.0
	85-89	BA	3.5
	80-84	BB	3.0
	75-79	CB	2.5
	70-74	CC	2.0
	60-69	DC	1.5
	50-59	DD	1.0
	49 and below	FF	0.0
	Less than 70% attendance	NA	-
Course Requirements and Policies	• Alerted attendance at the lectures is essential! • Students are expected to check frequently the instructor's web page for the course announcements. • University of Kyrenia honor code will be strictly enforced regarding any issues concerning cheating.		