

## Course guide

# 280703 - 280703 - Management of Maritime Safety and Pollution Prevention

Last modified: 11/06/2025

<b>Unit in charge:</b>	Barcelona School of Nautical Studies	
<b>Teaching unit:</b>	742 - CEN - Department of Nautical Sciences and Engineering.	
<b>Degree:</b>	MASTER'S DEGREE IN NAUTICAL SCIENCE AND MARITIME TRANSPORT MANAGEMENT (Syllabus 2016). (Compulsory subject). MASTER'S DEGREE IN THE MANAGEMENT AND OPERATION OF MARINE ENERGY FACILITIES (Syllabus 2016). (Compulsory subject).	
<b>Academic year:</b> 2025	<b>ECTS Credits:</b> 5.0	<b>Languages:</b> Spanish

## LECTURER

<b>Coordinating lecturer:</b>	JAIME RODRIGO DE LARRUCEA
<b>Others:</b>	Primer quadrimestre: JAIME RODRIGO DE LARRUCEA - ERAS, MGOIE, MNGTM, MUENO

## PRIOR SKILLS

Basic knowledge of maritime safety and pollution

## REQUIREMENTS

Not Compulsory

## DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

### Specific:

CE18-MNGTM. Dret marítim nacional i internacional.

CE21-MNGTM. Conocimientos de Convenios Internacionales y Nacionales Marítimos.

CE1-MNGTM. Coneixements adequats per iniciar l'activitat investigadora. Metodologia de la investigació aplicada a l'àmbit de l'especialitat

### Generical:

CG15-MNGTM. (ENG) Capacidad para resolver problemas complejos y tomar decisiones con responsabilidad sobre bases científicas y tecnológicas en el ámbito de su especialidad

CG21-MNGTM. (ENG) Capacidad para realizar tareas de investigación, desarrollo e innovación en el ámbito de su especialidad

### Transversal:

CT3. TEAMWORK: Being able to work in an interdisciplinary team, whether as a member or as a leader, with the aim of contributing to projects pragmatically and responsibly and making commitments in view of the resources that are available.

CT1. ENTREPRENEURSHIP AND INNOVATION: Knowing and understanding the organization of a company and the sciences that govern the activity; be able to understand the business rules and relationships between planning, industrial and commercial strategies, quality and profit.



**Basic:**

CB6. Possess knowledge and understanding that provide a basis or opportunity be original in the development and / or application of ideas, often in a research context.

CB7. That the students can apply their knowledge and ability to solve problems in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their study area.

CB8. Students should be able to integrate knowledge and handle the complexity of making judgments based on information that, being incomplete or limited, includes reflections on the responsibilities social and ethical linked to the application of their knowledge and judgments.

CB9. That students can communicate their conclusions and the knowledge and Latest rationale underpinning to specialists and non Specialty clearly and unambiguously.

CB10. Students must possess the learning skills that enable them continue studying in a way that will be largely self-directed or autonomous.

## TEACHING METHODOLOGY

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MD-1- Expositive Method and magistral class

MD-2- Expositive lessons and exercises

MD-3- Authonom learning and practical exercises

## LEARNING OBJECTIVES OF THE SUBJECT

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The student will acquire training that will cover all aspects of maritime risks, management of safety and prevention management and pollution control, from the perspective of engineering and operational, and the regulations and requirements for safety and health. It addresses the needs of both professionals and students working in related management of shipping, ship design, naval architecture and transport management fields and fields including security management, insurance and accident investigation .

On the other hand, one of the objectives of this course is to provide knowledge, understanding and proficiency of skills "COORDINATION OF OPERATIONS SAR", "RESPOND TO NAVIGATIONAL EMERGENCIES"". "MONITORING AND ENFORCEMENT OF LEGAL REQUIREMENTS AND MEASURES TO ENSURE THE LIFE AT SEA, MARITIME SECURITY AND POLLUTION PREVENTION "," KEEP THE TERMS OF SAFETY AND PROTECTION OF PASSENGERS AND CREW AND OPERATING CONDITIONS OF RESCUE SYSTEMS, FIRE FIGHTING AND OTHER SECURITY SYSTEMS "," EMERGENCY MANAGEMENT AND DAMAGES CONTROL including ("Technology of materials Naval architecture and ship construction, including damage control") competencies required and defined in Section a-II / 2 and a-III / 2 of the International Convention on Standards of Training, Certification and Watchkeeping for seafarers STCW 78/95/2010.

This course will evaluate the following STCW competences:

Plan and schedule operations

Ensure safe working practices

Monitor and control Compliance with legislative requirements and measures to ensure safety of life at sea, security and protection of the marine environment

Maintain safety and security of the vessel, crew and passengers and the operational condition of life saving, fire fighting and other safety systems.

Develop emergency and damage control plans and handle emergency situations Control trim, stability and stress.

More detailed:

Ch. 4.-Coordinate search and rescue operations: 4.1 A thorough knowledge research and and ability to apply the rescue procedures contained in operations the International Aeronautical and Maritime Search and Rescue (IAMSAR) Manual.

Ch. 9.-Respond to navigational emergencies

9.1 Precautions when beaching a ship

9.2 Action to be taken if grounding is imminent, and after grounding

9.3 Refloating a grounded ship with and without assistance

9.4 Action to be taken if collision is imminent and following a collision or impairment of the watertight integrity of the hull by any cause

9.5 Assessment of damage control

9.6 Emergency steering

9.7 Emergency towing arrangements and towing procedure

Ch. 17.-Maintain safety and security the ship's crew and passengers and the operational condition of lifesaving, firefighting and other safety systems

17.1 Thorough knowledge of life-saving appliance regulations (International Convention for the Safety of Life at Sea)

17.2 Organization of fire drills and abandon ship drills

17.3 Maintenance of operational condition of life-saving, firefighting and other safety systems

17.4 Actions to be taken to protect and safeguard all persons on board in emergencies

17.5 Actions to limit damage and salve the ship following afire, explosion, collision or grounding

## STUDY LOAD

Type	Hours	Percentage
Self study	80,0	64.00
Hours large group	45,0	36.00

**Total learning time:** 125 h

## CONTENTS

### ITEM 1: MARITIME SAFETY MANAGEMENT. ISM CODE: SMS & SMC. EMERGENCY PLANS. ISO RULES AND KPI

#### Description:

The ISM Code: the ship and company safety management system. The Designated Person (DPA). Emergencies and emergency plans. ISO standards: procedure management; labour and environmental risks. The KPIs.

**Full-or-part-time:** 21h 40m

Theory classes: 5h

Self study : 16h 40m

### ITEM 2. SAFETY THEORY AND SCIENCE. MODEL ACCIDENTS AND MODEL RISKS. RESILIENCE ENGINEERING. HUMAN FACTOR

#### Description:

Theoretical models of safety: the study of accidents and incidents. The risk analysis. Theoretical models. The human factor: Swiss cheese and HFCAS. The human factor in the marine environment.

**Full-or-part-time:** 26h 40m

Theory classes: 5h

Self study : 21h 40m

### ITEM 3. PROACTIVE RISK MANAGEMENT. BAYES THEOREM. FORMAL SAFETY ASSESMENT: STEPS. ALARP PRINCIPLE

#### Description:

The analysis, evaluation and risk management. Bayesian networks and inferences. The formal safety assessment: its 5 stages. The ALARP principle. HAZID and HAZOP by type of vessel.

**Full-or-part-time:** 28h

Theory classes: 8h

Self study : 20h

### ITEM 4. SEARCH AND RESCUE OPERATIONS (SAR)

#### Description:

The SAR Hamburg 79 Convention and the IAMSAR Manual. Operations coordination. Phases of operations. Search techniques (expansive square; by sectors, coordinated cross-sections, etc.). Search operations. Humanitarian Salvage. Operations procedure.

**Full-or-part-time:** 30h

Theory classes: 10h

Self study : 20h



## GRADING SYSTEM

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Final mark:  $0.5 \cdot FE + 0.5 \cdot Nt1$

Final exam: 50%

Nt1: work's mark 1

## EXAMINATION RULES.

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- Not be able to pass the course if the student have submitted all the works and activities of continuous assessment and submitted to the final test
- He deemed NOT PRESENTED to the student who fails to appear at the evaluable tests
- In no event shall dispose of any kind of forms or documents in controls or tests

## BIBLIOGRAPHY

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### Basic:

- Rodrigo de Larrucea, Jaime. Seguridad marítima : teoría general del riesgo. Barcelona: Marge Books, 2015. ISBN 9788416171002.
- Rodrigo de Larrucea, Jaime. La Investigación en seguridad : del Titanic a la ingeniería de la resiliencia. Barcelona: Marge Books, 2018. ISBN 9788417313715.
- Organització Internacional Marítima. Manual IAMSAR : manual internacional de los servicios aeronáuticos y marítimos de búsqueda y salvamento. Londres: OMI, 2019. ISBN 9789280131659.
- Convenio Marpol : artículos, protocolos, anexos e interpretaciones unificadas del Convenio internacional para prevenir la contaminación por los buques, 1973, modificado por el Protocolo de 1978 y 1997. Ed. refundida. Londres: Organizacion Maritima Internacional, 2011. ISBN 9789280131031.
- Oltedal, Helle A.; Lützhöft, Margareta. Managing Maritime Safety [on line]. Oxon: Routledge, 2018 [Consultation: 01/09/2022]. Available on : <https://www-taylorfrancis-com.recursos.biblioteca.upc.edu/books/edit/10.4324/9780203712979/managing-maritime-safety-helle-oltedal-margarera-l%C3%Bctzh%C3%B6ft>. ISBN 9781351363938.
- Kristiansen, Svein. Maritime transportation : safety management and risk analysis. Amsterdam: Elsevier, 2005. ISBN 0750659998.
- Cortés Díaz, José María. Técnicas de prevención de riesgos laborales : seguridad e higiene en el trabajo. 11a ed. Madrid: Tébar, 2012. ISBN 9788473604796.

## RESOURCES

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### Other resources:

See ATENEA multimedia resources and specialised bibliography.