

Course guide

280808 - 280808 - Construction, Repair and Life Cycle of Ship and Ocean Structures

Last modified: 27/05/2025

Unit in charge: Barcelona School of Nautical Studies
Teaching unit: 742 - CEN - Department of Nautical Sciences and Engineering.
Degree: MASTER'S DEGREE IN NAVAL AND OCEAN ENGINEERING (Syllabus 2017). (Compulsory subject).
Academic year: 2025 **ECTS Credits:** 5.0 **Languages:** Spanish, English

LECTURER

Coordinating lecturer: FRANCISCO LAGE RODRIGUEZ
Others: Segon quadrimestre:
FRANCISCO LAGE RODRIGUEZ - MUENO

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

MUENO_CE5. Knowledge of the shipbuilding and repair markets and their legal and economic aspects, for their application to the corresponding contracts and specifications
MUENO_CE6. Ability to define the construction strategy of ships and to plan and control their development
MUENO_CE13. Knowledge of systems engineering applied to the definition of a ship, artifact or maritime platform through the analysis and optimization of its life cycle
MUENO_CE16. Ability to develop and manage logistics support engineering, maintenance and repair of ships and artifacts

Generical:

MUENO_CG2. Ability to conceive and develop solutions that are technically, economically and environmentally appropriate to the needs of maritime or integral transportation of people and goods, of the use of oceanic resources and of the marine subsoil (fishing, energy, minerals, etc.), adequate use of the marine habitat and means of defense and maritime security)
MUENO_CG5. Ability to design and control the construction, repair, transformation, maintenance and inspection processes of previous mills
MUENO_CG6. Ability to conduct research, development and innovation in naval and ocean products, processes and methods
MUENO_CG7. Ability to integrate complex maritime systems and translation into viable solutions
MUENO_CG8. Ability to analyze and interpret measurements, calculations, evaluations, appraisals, studies, reports, work plans and other similar works
MUENO_CG9. Ability to draft specifications that comply with the provisions of contracts, regulations and standards of the naval and industrial field
MUENO_CG12. Ability to manage the operation of ships and maritime devices, and the engineering necessary for their safety, operation, logistical support and maintenance
MUENO_CG14. Ability to analyze, assess and correct the social and environmental impact of technical solutions
MUENO_CG15. Ability to organize and direct multidisciplinary work groups in a multilingual environment, and to generate reports for the transmission of knowledge and results

Transversal:

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.

CT2. SUSTAINABILITY AND SOCIAL COMMITMENT: Know and understand the complexity of economic and social phenomena typical of the welfare society, being able to relate welfare to globalization and sustainability; acquire skills to use in a balanced manner compatible technology, technology, economics and sustainability.

CT3. TEAMWORK: Ability to work as a member of an interdisciplinary team, either as a member or performing management tasks, with the aim of contributing to projects pragmatically and sense of responsibility, assuming commitments considering the resources available.

CT4. EFFECTIVE USE OF INFORMATION RESOURCES: Manage the acquisition, structuring, analysis and visualization of data and information in the field of specialty, and critically evaluate the results of this management.

CT5. THIRD LANGUAGE Learning a third language, preferably English, with adequate oral and written and in line with the future needs of the graduates.

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

Perform information searches, regulations, analyzes, plans, projects.

Elaboration of concrete projects.

LEARNING OBJECTIVES OF THE SUBJECT

Relate the technical knowledge of design with the practical application and its implications of quality, cost and term.

Learn the keys to design an efficient Constructive Strategy.

Know the specificities of the Planning and Management of complex multidisciplinary projects.

Knowing the development environment of the industrial activity in shipbuilding in its technical, competitiveness and social aspects.

Know the process of putting into operation, testing and acceptance of the ship.

Identify the keys of efficiency in the management of productive processes.

Know the technology involved in the shipbuilding processes and their specific application.

Identify the keys to the execution of the construction and repair in the environment of the complete project.

Familiarize the student with the techniques of improving current business results.

STUDY LOAD

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

Total learning time: 125 h

CONTENTS

1. The Maritime Sector and Naval Construction

Description:

- 1.1. The Maritime Sector. The Naval Construction Market. Civil market. Military Market.
- 1.2. Cycles of the Naval Construction Market.

Full-or-part-time: 16h

Theory classes: 5h

Guided activities: 2h

Self study : 9h

2. The ship's project

Description:

- 2.1. Development of the project for construction.

Full-or-part-time: 23h

Theory classes: 10h

Guided activities: 4h

Self study : 9h

3. Production and control methodologies. Production processes. Organization of the shipyards.

Description:

- 3.1. The construction shipyard.
- 3.2. Integral Construction Process. Main processes and flows.
- 3.3. The ship as an aggregation of intermediate products: Materials, equipment, systems and painting.

Full-or-part-time: 23h

Theory classes: 10h

Guided activities: 4h

Self study : 9h

4. Constructive strategies of ships, platforms and oceanic artifacts.

Description:

- 4.1. Contract terms.
- 4.2. Planning and monitoring of the project. Critical points.

Full-or-part-time: 16h

Theory classes: 4h

Guided activities: 2h

Self study : 10h

5. Technological processes associated with different construction strategies.

Description:

- 5.1. Steel Processes: Forming, cutting, pre-cutting, panels, blocks and assembly units. Testing and Delivery of the structure.
- 5.2. Armament Processes: Manufacture of tubes and modules. Assembly processes of systems, equipment and accommodation.
- 5.3. Functional integration Commissioning, testing, delivery and warranty.

Full-or-part-time: 23h

Theory classes: 8h

Guided activities: 4h

Self study : 11h

6. Stranding of boats.

Description:

- 6.1. Maintenance of buoyance. Damages, treatments, cleaning.
- 6.2. Repair and / or refit of ships and boats.
- 6.3. Repair of marine structures.

Full-or-part-time: 24h

Theory classes: 7h

Guided activities: 2h

Self study : 15h

GRADING SYSTEM

The final qualification is the sum of the following partial qualifications:

$$N_{\text{final}} = 0,3 N_{\text{pf}} + 0,4 N_{\text{pp}} + 0,3 N_{\text{ac}}$$

N_{final} : final qualification

N_{pf} : final test qualification

N_{pp} : partial test qualification

N_{ac} : continuous evaluation

Each test, of whatever type, must be passed with a grade of 5 out of 10 or higher.

The parts that are exceeded are released until the final evaluation.

The partial and final tests consist of a part with questions about concepts associated with the learning objectives of the subject in terms of knowledge or understanding, and a set of application exercises.

The continuous evaluation consists in doing different activities, both individual and group, of cumulative and formative nature, made during the course.

EXAMINATION RULES.

It is mandatory to attend the evaluation activities and participate in the classes, activities and visits that take place during the course, will determine the continuous assessment note.

BIBLIOGRAPHY

Basic:

- González López, Primitivo B.. Técnicas de Construcción Naval. 2a ed. Coruña: Universidade de Coruña, 2005. ISBN 849749167X.
- González de Lema Martínez, Francisco Javier. Tecnología de la construcción del buque. 2a ed. A Coruña: Imoversidade da Coruña, 2007. ISBN 9788497492737.
- Chorro Oncina, Rosendo . Construcción Naval III. Madrid: ETSIN. Sección de Publicaciones, [197?].
- Fernández González, Francisco. Construcción Naval I. Madrid: ETSIN. Sección de Publicaciones, [1987?].
- Alvariño, Ricardo; Azpíroz Juan José; Meizoso, Manuel. El proyecto básico del buque mercante . 2a ed. Madrid: Colegio Oficial de Ingenieros Navales, 2007. ISBN 9788492175024.
- Bonilla de la Corte, Antonio . Construcción naval y servicios . [Vigo]: San José, 1984. ISBN 843982629X.
- Ingeniería Naval [on line]. Madrid: Asociación de Ingenieros Navales de España, 1929- [Consultation: 11/10/2018]. Available on: <http://sectormarítimo.es/archivo-de-revistas>.
- Verney, Michael. Guía completa del mantenimiento y conservación de barcos. 3a ed. Madrid: Tudor, 2008. ISBN 9788479022914.
- Murrant, Jim. Reparación de embarcaciones deportivas. [s.l]: Libros cúpula, 1990. ISBN 9788432919305.
- Manley, Pat. Mantenimiento sencillo de barcos. [Barcelona]: Noray, 2007. ISBN 9788474861730.