

## Course guide

### 280814 - 280814 - Exploitation of Marine Resources

Last modified: 09/05/2023

**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:** 2023    **ECTS Credits:** 5.0    **Languages:** Spanish

#### LECTURER

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**Coordinating lecturer:** JULIAN SANCHEZ SANCHEZ

**Others:** Primer quadrimestre:  
JULIAN SANCHEZ SANCHEZ - MUENO

#### DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

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##### Specific:

MUENO\_CE11. Knowledge of the specific operations and systems of fishing boats and the ability to integrate them into the projects of said boats

MUENO\_CE12. Knowledge of the engineering of marine cultures and their exploitation and ability to project the artifacts, floating or fixed, in which they are integrated, developing their structures, materials, equipment, anchoring, stability, security, etc.

MUENO\_CE15. Knowledge of economics and business management in the maritime field

##### 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\_CG4. Capacity for the project of platforms and artifacts for the use of ocean resources

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\_CG8. Ability to analyze and interpret measurements, calculations, evaluations, appraisals, studies, reports, work plans and other similar works

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

Classes of theory in the classroom. Exhibition class with support of audiovisual material and development of examples. Proposal of different questions so that the student participates actively in the class.

Resolution of problems and practical cases in the classroom. Practical cases related to different topics from those addressed by the subject will be considered.

Development of works, reports (individual). Current problems in the sector will be sought and students will be encouraged to propose solutions to these problems. These solutions must be recorded in a written report, well presented, written and structured, with well-defined objectives and clear and specific final conclusions.

Exhibition of works, reports (as a team). Oral presentation of the students of the work done as a team. Defense of the presentation and resolution of questions raised by the professor and by the classmates.

Tutorials Individual resolution or to small groups of doubts arising during the study of the different subjects and problems of the subject

## LEARNING OBJECTIVES OF THE SUBJECT

UD1. To know the current state of the fishing resources, the world of fishing at a global, European and regional level.

UD2. Know the different fishing systems and fishing gear.

UD3. Know the different fishing vessels, their particularities and fishing maneuvers. Know the hydraulic systems of the fishing winches. Know the types and characteristics of the fishing vessel project.

UD4. Know the regulations of the sector at regional level, the particularities of fishing vessels in terms of stability, forms and propulsion and treatment of fish on board.

UD5 and 6. Know the marine cultures from the point of view of engineering. Know the engineering and the project of offshore installations.

UD7. Know the operation of the state electricity market and the current status of renewable energy implementation.

UD8 to UD11. Know the different technologies of marine energies.

## STUDY LOAD

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

**Total learning time:** 125 h

## CONTENTS

### Part I. Fishing systems

**Description:**

- UD 1. Introduction to fishing activity. State of world fisheries. Fisheries management. Fishing policies.
- UD 2. Fishing gear. Fishing gear engineering.
- UD 3. Fishing vessel typology and fishing manoeuvres. Fishing gear hydraulic systems.
- UD 4. Regulations applicable to the fishing vessel. Particularities of the fishing vessel: stability, shapes and propulsion. Treatment of fish on board.

**Specific objectives:**

1. To know the state of world fisheries and aquaculture, fisheries policies, fisheries management, state of exploitation of marine areas, etc.
2. Know and design the different fishing systems and gear.
3. Know the different types of fishing vessels, the main sets and fishing maneuvers.
4. Know the regulations of the sector.
5. Know the particularities of fishing vessels in terms of structure, propulsion and stability forms and their design.
6. Know the different techniques of fish treatment, once captured.

**Full-or-part-time:** 38h

Theory classes: 17h

Guided activities: 6h

Self study : 15h

### Part II. Marine cultures (Aquaculture)

**Description:**

- UD 5. The aquaculture activity environment. Types of culture. Culture methods of different species.
- UD 6. Types of installations. Installation projects. Vessels and auxiliary platforms.

**Specific objectives:**

7. Know the marine cultures from the point of view of engineering.

**Full-or-part-time:** 12h 20m

Theory classes: 8h 20m

Guided activities: 1h

Self study : 3h

### Part III. Marine energies

#### Description:

UD 7. Electricity market. Renewable energy plan. Introduction to marine renewable energies. State of the different technologies and implementation at European and regional level.

UD 8. Offshore wind energy.

UD 9. Undimotriz Energy.

UD 10. Tidal Energy.

UD 11. Current energies, thermal and saline energy.

#### Specific objectives:

8. Know the engineering and the project of offshore installations.

9. Know the operation of the state electricity market.

10. Know the different technologies of existing marine energies and their implementation at European and regional level.

11. Make oral and written contributions of a certain academic scope leading to a final activity, with fluency and linguistic correctness, expository amenity and communicative persuasion. (Oral presentation of the final work of the subject).

12. Properly process the available information and develop a coherent plan to resolve the situation that arises. (Intermediate works of the subject).

**Full-or-part-time:** 44h 40m

Theory classes: 25h

Guided activities: 2h

Self study : 17h 40m

### GRADING SYSTEM

Practices. There will be 5 individual works or practical cases that must be delivered telematically. Valuation of 25%.

Final project. There will be a final work of the subject (in group) that must be delivered telematically and defend oral presentation. Valuation of 25%.

Exam. There will be a final exam that will consist of answering in writing a series of theoretical and practical questions of the subject. 50% valuation.

### EXAMINATION RULES.

Practices will be sent by email and will have to be returned by email on the date set out in the statement.

The final work will have to be delivered before December 21st and will be presented in class on December 21st. It is a group task.

The final exam will be a 3-hour theoretical-practical test.

### BIBLIOGRAPHY

#### Basic:

- Fridman, A.L. Calculations for fishing gear designs. reimpr. 2013. Surrey: Fishing News Books, 1986. ISBN 0852381417.

- García-Badell, Jose Javier; Moreno Fernández, Miguel Ángel; Garcia-Badell Dufour, Eliane. Granja acuáticas modernas. Madrid: Bellisco, 2009. ISBN 9788496486850.

- Burton, Tony; Sharpe, David; Jenkins, Nick; Bossanyi, Ervin. Wind energy handbook [on line]. 2nd ed. Chichester: John Wiley & Sons, 2011 [Consultation: 01/09/2022]. Available on: <https://onlinelibrary-wiley-com.recursos.biblioteca.upc.edu/doi/book/10.1002/9781119992714>. ISBN 9780470699751.

- Waters, Rafael. Energy from ocean waves : full scale experimental verification of a wave energy converter. Tesi doctoral, Uppsala University [on line]. 2008 [Consultation: 04/10/2018]. Available on: <http://uu.diva-portal.org/smash/get/diva2:172943/FULLTEXT01.pdf>.

- Santos Rodríguez, Luis ; Núñez Basañez, José F. Fundamentos de pesca. Madrid: Fondo Editorial de Ingeniería Naval : Colegio Oficial de Ingenieros Navales, 1994. ISBN 8460087816.

#### Complementary:

- Garza Gil, Dolores. La actividad pesquera mundial : una revisión por países. Oleiros: Netbiblo, 2008. ISBN 9788497452373.

- Ross Salazar, E. Artes, métodos e implementos de pesca [on line]. San José, Costa Rica: Fundación MarViva., 2014 [Consultation: 12/12/2023]. Available on: <https://marviva.net/wp-content/uploads/2021/11/guia.pdf>.
- Asian Development Bank. Wave energy conversion and ocean thermal energy conversion potential in developing member countries [on line]. Mandaluyong: ADB, 2014 [Consultation: 05/10/2018]. Available on: <https://www.adb.org/sites/default/files/publication/42517/wave-energy-conversion-ocean-thermal-energy.pdf>. ISBN 9789292545314.

## RESOURCES

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### Other resources:

<http://www.fao.org/home/es/> Web oficial de la Organización de las Naciones Unidas para la Alimentación y la Agricultura  
<http://www.marviva.net/> /><http://www.sospesca.es> />