

Master's Thesis (250611)

General Information

School	ETSECCPB
Departments	Departament d'Enginyeria Civil i Ambiental (DECA)
Credits	30.0 ECTS
Programs	MÀSTER UNIVERSITARI ERASMUS MUNDUS EN ENGINYERIA I GESTIÓ COSTANERA I MARÍTIMA (pla 2022)
Course	2025/26

Main teaching language at each group

- Group 10Q1 English (Q1)
- Group 10Q2 English (Q2)

Faculty

Responsible Faculty: Octavio Cesar Mössó Aranda
Faculty: Octavio Cesar Mössó Aranda

Objectives of Education

The main objective of a master's thesis is to demonstrate that the student has acquired the necessary knowledge and developed the skills to carry out a research or project in the field of coastal and maritime engineering and management. The student must demonstrate analytical, critical and problem solving skills to apply and synthesize the information acquired during the courses in the universities of the consortium and contribute to the existing knowledge in the field of CoMEM+.

It should also enable the student to develop written communication and oral presentation skills.

Competencies

Especific

MetOcean main physical processes and their effects on the port and waterways infrastructure.
Numerical and laboratory modelling techniques.
Geotechnical aspects related to foundations for port and waterways structures.
Management techniques.
Port planning and operation.
Environmental issues before and after construction of e.g. a port.
Entrepreneurship and corporate social responsibility.
How climate change uncertainties can be managed to reduce risks when designing and operating resilient infrastructure.
Perform time and frequency domain analysis of MetOcean data to provide operational and design values.
Design navigational infrastructure with resilience and adaptation to climate change in mind.
Perform risk management (concepts and techniques).
Know how to make the stakeholders and community to work together to make a project acceptable and wanted.
Coastal hydrodynamics and processes.
Short-term and long-term wave climate.
Sediment transport and morphology.
Tidal currents.
Coastal and oceanographic numerical modelling.
Physical models for coastal processes, structures and their interactions.
Coastal vulnerability within a sustainable framework.

Field campaigns and data treatment to evaluate problematic situations and plan/design solutions.
 Developing beach management strategies for real-world coastal systems.
 The basis behind climate change and its effect on the coast.
 How to cooperate with administrations and private companies.
 Design coastal interventions.
 Understand and predict the impacts of coastal interventions.
 Offer alternatives to hard coastal engineering.
 Analyse and interpret collected field data in order to understand the physical drivers at short, mid and long-time or climatic scales.
 Apply state-of-the-art wave, flow and morphological models.
 Compute the risk, vulnerability and hazard analysis including the decadal (climatic) scale.

Generic

Design methods for ports, waterways and other coastal facilities.
 Dredging and disposal solutions for contaminated sediments.
 Design and operation of inland waterways hydraulic structures and riverbanks.
 Social responsibility of business and entrepreneurship.
 Develop knowledge and understanding of the coastal environment at an advanced level, applying classic (hard and soft) coastal engineering complemented with building with nature concepts, with ability to analyse, evaluate, assess and synthesis of data and information from different sources with contemporary techniques and technologies.
 Handle engineering problems dealing with waves, currents, their interactions, their effects on the coastline and man-made interventions, spanning from short (storms) to decadal scales, to incorporate the climate change dimension.
 Propose creative and innovative solutions by themselves or as a work group for current and future problems by enhancing their own interpersonal understanding, work as a team and oral and written communication skills.
 Take a leadership role in the community, exerting awareness of ethical, cultural and social issues within a global context in the exercise of their professional skills and responsibilities.

Total hours of student work

		Hours	Percentage
Supervised Learning	Large group	0.0 h	0 %
	Medium group	0.0 h	0 %
	Laboratory classes	0.0 h	0 %
	Guided Activities	0.0 h	0 %
Self Study		0.0 h	

Contents

Master Thesis

Completion of a final degree project in the field of Coastal and Marine Environmental Engineering of a professional nature where the skills acquired in the courses are synthesized and integrated

Specific Objectives

It is a research work that promotes both an advance in knowledge and human and sustainable development, with a theoretical, qualitative or experimental, practical and quantitative approach in the context of Coastal and Maritime Engineering and Management, in any of its branches: biology (biotechnology), geology, chemistry, physics, engineering, coastal or maritime or technology.

Teaching Methodology

The course consists of 0 hours per week of classroom activity (large size group).

The 0 hours in the large size groups are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

Support material in the form of a detailed teaching plan is provided using the virtual campus ATENEA: content, program of learning and assessment activities conducted and literature.

Although most of the sessions will be given in the language indicated, sessions supported by other occasional guest experts may be held in other languages.

Grading Rules

() The evaluation calendar and grading rules will be approved before the start of the course.*

The mark of the course is obtained from the ratings of continuous assessment and their corresponding laboratories and/or classroom computers.

Continuous assessment consist in several activities, both individually and in group, of additive and training characteristics, carried out during the year (both in and out of the classroom).

The teachings of the laboratory grade is the average in such activities.

The evaluation tests consist of a part with questions about concepts associated with the learning objectives of the course with regard to knowledge or understanding, and a part with a set of application exercises.

Bibliography

Basic

- Heerkens, G. [Project management](#). 2nd ed. New York: McGraw-Hill, 2014. ISBN 9780071818483.
- Munier, N. [Project management for environmental, construction and manufacturing engineers](#). New York: Springer, 2013. ISBN 9789400744769.
- Crawford-Brown, D.J. [Risk-based environmental decisions: culture and methods](#). New York: Springer, 1999. ISBN 9781461373827.