SUBJECT TEACHING GUIDE

588 - Coastal and Port Engineering

Master's Degree in civil Engineering, Canal and Port Engineering

Academic year 2025-2026

1. IDENTIFYING DATA					
Degree	Master's Degree in civil Engineering, Canal and Port Engineering			Type and Year	Compulsory. Year 2
Faculty	School of civil Engineering				
Discipline	COAST AND PORT ENGINEERING				
Course unit title and code	588 - Coastal and Port Engineering				
Number of ECTS credits allocated	4,5	Term		Semester based (1)	
Web					
Language of instruction	English	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. CIENCIAS Y TECNICAS DEL AGUA Y DEL MEDIO AMBIENTE
Name of lecturer	JAVIER LOPEZ LARA
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Other lecturers	ALEXANDRA TOIMIL SILVA

3.1 LEARNING OUTCOMES
- Distinguish the most relevant dynamics that affect the design, project, construction and exploitation of infrastructures on the coast, their link with the morphodynamics of the coast and the risks that may derive from their impact on the coast.
- Identify the principles that govern the morphodynamics of beaches,
- Characterize and model the different actions on beaches (regeneration and monitoring).
- Identify the types of infrastructure, maritime works and protection works that can be built on the coast based on their functionality and stability
- Classify, characterize and model the failure modes of maritime works

4. OBJECTIVES
The student is able to identify the characteristics of the different types of maritime works and design the most common maritime protection works, used both in port engineering and coastal engineering
The student has the knowledge for the design, construction and management of actions on the coast whose purpose is the restoration and regeneration of beaches.
The student has knowledge related to risk and can carry out a coastal risk assessment, particularly associated with the risk of flooding and erosion

6. SUBJECT PROGRAM	
CONTENTS	
1	Beach morphodynamic evolution models
2	Beach profile
3	Beach planform
4	Beach nourishment
5	Risk on the coast: introduction and basic concepts
6	Types of coastal risks
7	Coastal Risk Assessment Methods
8	Risk assessment applications: Flooding and Coastal Erosion
9	Characterization of the port system
10	Typology of maritime works
11	Design criteria and ROM program
12	Functional and structural design of mound breakwaters
13	Functional and structural design of vertical breakwaters

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Beach section: Practices	Work	No	Yes	15,00
Written test 1	Written exam	No	Yes	25,00
Risk section: Practices	Work	No	Yes	20,00
Coastal works section: Practices	Work	No	Yes	15,00
Written test 2	Written exam	No	Yes	25,00
TOTAL				100,00

Observations

Final remarks:
As a general criterion and unless something else is specified in this guide, a student may only take up the recovery of those activities that he has not passed, that is, in which he has not obtained a minimum grade of four out of ten.
As a general criterion and unless something else is specified in this guide, in the recovery period the evaluation procedure of an activity will be the same as that of the activity that originates it.
Only for duly justified reasons (eg health restrictions), the assessment tests may be organized remotely, with prior authorization from the Center's Management.

Advance evaluation
Those students who request early evaluation will be evaluated with a written test corresponding to the contents of written tests 1 and 2.

Observations for part-time students

Observations Part time students Evaluation
Part - time students will be subject to the same assessment criteria as full - time students . The temporary distribution of activities will be adapted to the particular conditions of each student when deemed necessary.
In accordance with the regulations of the evaluation processes of the University of Cantabria, students enrolled part-time may undergo a single evaluation process that will consist of a written exam of the whole of the course on the date established for this purpose by the Civil Eng. School Dean.
The student enrolled part-time must, at the beginning of the subject, communicate in writing to the professor in charge the evaluation option that he wishes to follow, continuous evaluation or single evaluation.

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Vicente Negro, Ovidio Varela, Jaime H. García y José Santos. Diseño de diques verticales. Colegio de Ingenieros de Caminos, Canales y Puertos. 2001
Vicente Negro y Ovidio Varela. Diseño de diques rompeolas. Colegio de Ingenieros de Caminos, Canales y Puertos. 2002
Hsu, John R.C. (1999) Coastal stabilization. Advances Series on Ocean Engineering. Ed. World Scientific
Dean, R.G. (2002) Beach nourishment: theory and practice. Advances Series on Ocean Engineering. Ed. World Scientific S
ROM 0.0-01. Procedimiento General y Bases de Cálculo en el Proyecto de Obras Marítimas y Portuarias. (2001) Puertos del Estado. ISBN: 84-88975-30-9.
ROM 1.0-09. Recomendaciones del diseño y ejecución de las Obras de Abrigo (2009) Puertos del Estado. ISBN: 978-84-88975-73-7.
ROM 1.1-18. Recomendaciones para el Proyecto de Construcción de diques de abrigo (2018) Puertos del Estado. ISBN: 978-84-88740-11-3.
Ayyub, B. M. (2014). Risk analysis in engineering and economics. Crc Press.
Collins M., M. Sutherland, L. Bouwer, S.-M. Cheong, T. Frölicher, H. Jacot Des Combes, M. Koll Roxy, I. Losada, K. McInnes, B. Ratter, E. Rivera-Arriaga, R.D. Susanto, D. Swingedouw, and L. Tibig, (2019). Extremes, Abrupt Changes and Managing Risk. Chapter 6 of the “IPCC Special Report on the Ocean and Cryosphere in a Changing Climate”
Rougier, J., Hill, L. J., & Sparks, R. S. J. (2013). Risk and uncertainty assessment for natural hazards. Cambridge University Press.