

Course guide

250558 - GEOLGEOMCO - Geology and Coastal Geomorphology

Last modified: 19/06/2024

Unit in charge: Barcelona School of Civil Engineering

Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.

Degree: BACHELOR'S DEGREE IN MARINE SCIENCE AND TECHNOLOGY (Syllabus 2018). (Compulsory subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: VICENTE GRACIA GARCIA

Others: CARLOS SALVADOR ASTUDILLO GUTIERREZ, VICENTE GRACIA GARCIA
Möso Aranda, Octavio Cesar

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

13388. To know and apply the lexicon and concepts of the Marine Sciences and Technologies and other related fields.

13390. Establish a good practice in the integration of common numerical, laboratory and field techniques in the analysis of any problem related to the marine environment.

13401. Apply spatial and cartographic representation techniques for different environments and scales.

Generical:

13380. Develop a professional activity in the field of Marine Sciences and Technologies.

13381. Address in a comprehensive manner the analysis and preservation of the marine environment with sustainability criteria.

TEACHING METHODOLOGY

The course consists of 4 hours a week of face-to-face classes in the classroom.

The methodology is based on:

- * Theoretical lectures where the fundamental concepts are explained.
- * Laboratory classes aimed at using techniques and tools for use in the professional field.
- * Classes of problems intended to apply the knowledge acquired in the theoretical classes.
- * Field visits to different locations to make on-site observations of coastal geomorphology concepts.

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.

LEARNING OBJECTIVES OF THE SUBJECT

In this course, the different geomorphological environments of the littoral zone are described, starting from the tectonic settings that broadly determines its characteristics at a geological scale, and the processes and factors that determine its recent morphological evolution, centered on erosion and accretion. The objective is to understand the morphological behaviour of coastal environments at different scales of time and space.

- 1.- Define the main elements of the coast, and classify the different littoral environments according to geological, hydrodynamic or geomorphological criteria.
- 2.- Show the existing differences between rocky, sedimentary coasts, intertidal flats, estuaries and coastal lagoons and Deltas. General relation the coastal typologies and the general tectonic settings.
- 3.- Understand the processes related to relative changes in sea level in a geological climate change context.



STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	30,0	20.00
Hours medium group	15,0	10.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

Introduction

Description:

Fundamental concepts
Temporal and Spatial scales
Practice evolution of the coastline
Creation of a poster as a summary of an article

Full-or-part-time: 9h 36m

Theory classes: 2h
Laboratory classes: 2h
Self study : 5h 36m

Properties of materials

Description:

Cohesive materials and rocks
Non-cohesive materials
Practice of granulometric analysis

Full-or-part-time: 14h 23m

Theory classes: 4h
Practical classes: 2h
Self study : 8h 23m

Coastal processes

Description:

Wind
Waves
The average level of the sea
The sea currents

Full-or-part-time: 19h 12m

Theory classes: 8h
Self study : 11h 12m

Rocky coastlines

Description:

Cliffs and platforms
Models of behavior

Full-or-part-time: 9h 36m

Theory classes: 2h
Laboratory classes: 2h
Self study : 5h 36m

Reefs

Description:

Characteristics and morphodynamic processes
Behavioral models

Full-or-part-time: 9h 36m

Theory classes: 4h
Self study : 5h 36m

Beaches

Description:

Morphology and typology
Morphodynamic processes
Models of behavior

Full-or-part-time: 19h 12m

Theory classes: 8h
Self study : 11h 12m

Deltas

Description:

Genesis, morphology and classification
Deltaic processes
Models of behavior
Prudential model of delta evolution
Visit to the Ebro delta

Full-or-part-time: 19h 12m

Theory classes: 6h
Laboratory classes: 2h
Self study : 11h 12m

Dunar systems

Description:

Genesis and morphology
Dune-beach interaction
Models of behavior
Morphological dune cartography

Full-or-part-time: 19h 12m

Theory classes: 6h

Laboratory classes: 2h

Self study : 11h 12m

Wetlands and lagoons

Description:

Typology and characteristics
Sedimentary dynamics

Full-or-part-time: 9h 36m

Theory classes: 4h

Self study : 5h 36m

Estuaries

Description:

Characteristics and classification
Influence on coastal dynamics

Full-or-part-time: 9h 36m

Theory classes: 4h

Self study : 5h 36m

Anthropic environments

Description:

They show the impacts induced by man on the coast
Visit to the beaches close to Barcelona

Full-or-part-time: 4h 48m

Theory classes: 2h

Self study : 2h 48m

GRADING SYSTEM

The regular assessment of the course consists of: (a) submission of various practical assignments and projects (30%); (b) submission of a field visit report (10%); and (c) two theoretical-practical exams (60%). All activities are mandatory. If any of them are not completed, they will be assigned a score of zero.

Students who fail the regular assessment but have submitted the practical assignments and the report, and have taken the theoretical exam, have the option to take a reassessment test. The maximum grade for the reassessment exam is five.



EXAMINATION RULES.

If any of the laboratory activities or continuous assessments are not completed within the scheduled period, they will be considered as a score of zero

BIBLIOGRAPHY

Basic:

- Woodroffe, C.D. Coasts: form, process and evolution. Cambridge: Cambridge university Press, 2002. ISBN 0521011833.
- Bird, E.C.F. Coastal geomorphology: an introduction. Second Edition. Chichester: John Wiley & Sons, 2008. ISBN 9780470517307.
- Komar, P.D. Beach processes and sedimentation. 2nd ed. Upper Saddle River, N.J: Prentice Hall, 1998. ISBN 0137549385.
- Haslett, S.K. Coastal systems. 3rd ed. London: Routledge, 2016. ISBN 9781783169009.

Complementary:

- Sanjaume, E.; Gracia, F.J. Las dunas en España. Puerto Real (Cádiz): Encuadernaciones Martínez, 2011. ISBN 9788461537808.
- CIIRC. Llibre verd de l'Estat de la zona costanera a Catalunya [on line]. ICGC. Generalitat, 2010 [Consultation: 30/04/2021]. Available on : <https://www.icgc.cat/Administracio-i-empresa/Serveis/Riscos-geologics/Dinamica-de-la-costa/Llibre-verd-de-l-Estat-de-la-zona-costanera-a-Catalunya-2010>.
- Dean, R.G; Dalrymple, R.A. Coastal processes: with engineering applications. Cambridge: Cambridge University Press, 2002. ISBN 0521495350.
- Wright, L.D. Morphodynamics of inner continental shelves. Boca Raton: CRC Press, 1995. ISBN 084938043X.