Course guide
2500042 - GECIAMBOMA - Environmental Impact on Maritime Works

Date: 04/10/2022

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.
Degree: BACHELOR'S DEGREE IN CIVIL ENGINEERING (Syllabus 2020). (Optional subject).
Academic year: 2022 ECTS Credits: 4.5 Languages: English

LECTURER

Coordinating lecturer: OCTAVIO CESAR MÖSSO ARANDA
Others: QUERALT GUERRERO SANCHEZ, JOSE LUIS MONSO DE PRAT, OCTAVIO CESAR MÖSSO ARANDA

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
14412. Capacity for construction and conservation of maritime works. (Specific technology module: Civil Construction)
14419. Knowledge and understanding of the functioning of ecosystems and environmental factors. (Specific technology module: Hydrology)

Generical:
14380. Scientific-technical training for the exercise of the profession of Technical Engineer of Public Works and knowledge of the functions of advice, analysis, design, calculation, project, construction, maintenance, conservation and exploitation.
14383. Ability to project, inspect and direct works, in their field.
14389. Knowledge of the history of civil engineering and training to analyze and assess public works in particular and construction in general.
14391. Conceive, project, manage and maintain systems in the field of construction engineering. Cover the entire life cycle of an infrastructure or system or service in the field of construction engineering. (Additional school competition).

TEACHING METHODOLOGY

The course consists of 1.5 hours per week of classroom activity (large size group) and 1.5 hours weekly with half the students (medium size group).

The 1.5 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.

The 1.5 hours in the medium size groups is devoted to solving practical problems with greater interaction with the students. The objective of these practical exercises is to consolidate the general and specific learning objectives.

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.
LEARNING OBJECTIVES OF THE SUBJECT

Knowledge of the management of marine and coastal environment. Tools to study the environmental impact and the environmental management of the coastal zone and its sustainable development. Environmental impact of coastal and port protection structures. Environmental impact of port activities. Pollution problems of the marine environment.

1 Capacity for the functional design of the main coastal protection works, as well as the basic foundations of the coastal dynamics that allow it to evaluate its interaction with the engineering works in the coastal zone (physical impact generated on the adjacent coast).
2 Ability to understand the main physical processes that control the quality of coastal waters, as well as the main effects of it due to the presence of maritime works (this section includes the design of submarine emissaries and accidental processes).

Knowledge of the main environmental aspects related to maritime works (coastal defense works, and submarine emissary) from two points of view: (i) the impact on the physical environment generated by these works and (ii) aspects related to quality of coastal waters, always starting from the environmental importance of the territory in which the student will carry out his professional activity.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Hours large group</td>
<td>22.5</td>
<td>20.00</td>
</tr>
<tr>
<td>Self study</td>
<td>63.0</td>
<td>56.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>22.5</td>
<td>20.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>4.5</td>
<td>4.00</td>
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Total learning time: 112.5 h

CONTENT

Subject Description:
It will proceed to describe the main aims and subjects of the asignatura
Impacts of effluents and the discharge of wastewater into the marine environment

Specific objectives:
Basic objectives of the subject, approach and presentation of the work to be developed during the subject. Definition of the concept of problem (processes * vs problems) and impact. Definition of the coastal zone as a multi-component system (physical, ecological and socio-economic). Concept of temporal and spatial scales for the definition of processes, problems and solutions. Basic typology of coastal problems and conceptual solutions.
Submarine outfalls. Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.

Full-or-part-time: 12h
Theory classes: 3h
Practical classes: 2h
Self study : 7h
Physical Processes in the Nearshore Zone

Description:
Review of the most relevant physical processes around the environmental impact of coastal protection structures

Specific objectives:
Processes that control the morphodynamic impact of coastal engineering works. Driving mechanisms. Coastal Hydrodynamics, Sediment transport. Coastal evolution.

Full-or-part-time: 19h 12m
Theory classes: 6h
Practical classes: 2h
Self study: 11h 12m

Cross-shore Coastal Defences

Description:
Impact of breakwaters on the coastal marine environment

Specific objectives:
Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.

Full-or-part-time: 7h 11m
Theory classes: 2h
Practical classes: 1h
Self study: 4h 11m

Longshore Coastal Defences

Description:
Impact of exempt dikes on the Coastal Marine Environment

Specific objectives:
Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.

Full-or-part-time: 9h 36m
Theory classes: 3h
Practical classes: 1h
Self study: 5h 36m
Other Longshore Structures

Description:
Impact of exempt dikes on the coastal marine environment
Impact of exempt dikes on the marine environment.

Specific objectives:
Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.
Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.

Full-or-part-time: 7h 11m
Theory classes: 1h
Practical classes: 2h
Self study: 4h 11m

Field trip

Full-or-part-time: 14h 23m
Laboratory classes: 6h
Self study: 8h 23m

Port Facilities. Typology and Impacts

Description:
Impact of port facilities on the coastal marine environment

Specific objectives:
Approach to the problem. Impacts associated with water quality. Impacts associated with interaction with the coast. Basic solutions.

Full-or-part-time: 7h 11m
Theory classes: 3h
Self study: 4h 11m

Dredging works. Types and Impacts

Description:
Impact of dredging works on the marine environment

Specific objectives:

Full-or-part-time: 7h 11m
Theory classes: 3h
Self study: 4h 11m
Processes that Control Water Quality Associated with Coastal Works

**Description:**
Review of the main processes associated with dispersal in the marine environment

**Specific objectives:**

**Full-or-part-time:** 12h
Theory classes: 3h
Practical classes: 2h
Self study: 7h

Marine Outfalls

**Description:**
Impacts of effluents and the discharge of wastewater into the marine environment

**Specific objectives:**
Objectives of this type of work and basic design criteria. Possible impacts and basic solutions.

**Full-or-part-time:** 7h 11m
Theory classes: 3h
Self study: 4h 11m

Exam

**Full-or-part-time:** 4h 48m
Laboratory classes: 2h
Self study: 2h 48m

**GRADING SYSTEM**

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: