Course guide
2500050 - GECENGPORT - Port Engineering

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: Catalan

LECTURER
Coordinating lecturer: FRANCESC XAVIER GIRONELLA I COBOS
Others: CORRADO ALTOMARE, FRANCESC XAVIER GIRONELLA I COBOS, XAVIER PASCUAL LORENTE, JUAN PABLO SIERRA PEDRICO

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
14412. Capacity for construction and conservation of maritime works. (Specific technology module: Civil Construction)

General:
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.
14384. Capacity for the maintenance and conservation of hydraulic and energy resources, in its field.
14386. Capacity for maintenance, conservation and exploitation of infrastructure, in its 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 3 hours a week of classes during the second semester, divided into classes of theory, practice and real cases. Support material is used in the format of a detailed teaching plan through the ATENEA virtual campus: contents, programming of assessment and guided learning activities and bibliography. In general, teachers will teach their lectures in catalan. Professor Corrado Altomare, in english, professors Xavier Pascual, Joan Pau Sierra and Xavi Gironella, in catalan.

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


1 Capacity for the design of port structures.
2 Ability to understand port activity and exploitation.


Ability to design port structures.
Ability to understand port activity and operation

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours large group</td>
<td>22,5</td>
<td>20.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>18,0</td>
<td>16.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>4,5</td>
<td>4.00</td>
</tr>
<tr>
<td>Self study</td>
<td>63,0</td>
<td>56.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>4,5</td>
<td>4.00</td>
</tr>
</tbody>
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Total learning time: 112.5 h

CONTENTS

Introduction

Description:
Approach of the subject and development of the course. Generalities. Review of basic concepts. Classification and typology of port works (dikes, docks, dredging, ...).

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

Hydrodynamic and structural parameters

Description:
Definition of the main parameters involved in the design of external maritime structures. Waves-Structure Interaction. Main formulations of run-up, run-down, overtopping, reflection and transmission.

Full-or-part-time: 4h 48m
Theory classes: 2h
Self study : 2h 48m
### Rubble mound breakwaters

**Description:**
Sections. Types of breakwaters. Stability of the main armour, the berm and the crown wall. Toe protections. Head breakwater design. Construction process.

**Practices**

**Full-or-part-time:** 20h 24m
- Theory classes: 4h
- Practical classes: 4h 30m
- Self study: 11h 54m

### Caisson breakwaters

**Description:**

**Practices**

**Full-or-part-time:** 20h 24m
- Theory classes: 4h
- Practical classes: 4h 30m
- Self study: 11h 54m

### Physical modeling in maritime engineering

**Description:**
Concepts of similarity. Scale and laboratory effects. Instrumentation, applications and examples.

**Practices**

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

### Probabilistic design

**Description:**
Introduction to probabilistic design. Concepts on probabilistic methods of levels III, II and I. Monte Carlo simulation.

**Practices**

**Full-or-part-time:** 14h 23m
- Theory classes: 2h
- Practical classes: 4h
- Self study: 8h 23m

### Plant layout design

**Description:**
Dimensions, orientation and draft of the harbour mouth.

**Full-or-part-time:** 4h 48m
- Theory classes: 2h
- Self study: 2h 48m
Inner harbour structures

Description:
Actions to consider in the design of quays, jetties. Flooring quays.
Practices

Full-or-part-time: 14h 23m
Theory classes: 3h
Practical classes: 3h
Self study: 8h 23m

Case studies

Description:
Maritime engineering projects. Real cases.

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

Evaluations

Full-or-part-time: 9h 36m
Laboratory classes: 4h
Self study: 5h 36m

GRADING SYSTEM

The rating of the course is obtained from a system of continuous assessment which includes conducting a series of tests and a set of practices.
Continuous assessment includes the completion of two exams during the semester to help with a weight of 60% in the final and the completion of a set of practices of different issues that contribute to the remaining 40%.

Criteria for re-evaluation qualification and eligibility: students that failed the ordinary evaluation and have regularly attended all evaluation tests will have the opportunity of carrying out a re-evaluation test during the period specified in the academic calendar. Students who have already passed the test or were qualified as non-attending will not be admitted to the re-evaluation test. The maximum mark for the re-evaluation exam will be five over ten (5.0). The non-attendance of a student to the re-evaluation test, in the date specified will not grant access to further re-evaluation tests. Students unable to attend any of the continuous assessment tests due to certifiable force majeure will be ensured extraordinary evaluation periods.

These tests must be authorized by the corresponding Head of Studies, at the request of the professor responsible for the course, and will be carried out within the corresponding academic period.

BIBLIOGRAPHY

Basic:

Complementary: