250253 - ENGPORT - Port Engineering

Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering
Academic year: 2017
Degree: BACHELOR'S DEGREE IN PUBLIC WORKS ENGINEERING (Syllabus 2010). (Teaching unit Optional)
ECTS credits: 4,5
Teaching languages: Catalan, Spanish, English

Teaching staff
Coordinator: VICENTE GRACIA GARCIA
Others: FRANCESC XAVIER GIRONELLA I COBOS, VICENTE GRACIA GARCIA, JOSE LUIS MONSO DE PRAT, JUAN PABLO SIERRA PEDRICO

Opening hours
Timetable: Schedule consultation agreed with professors of the subject

Degree competences to which the subject contributes

Specific:
3081. Ability to construct and conserve maritime works

Generical:
3105. Students will learn to identify, formulate and solve a range of engineering problems. They will be expected to show initiative in interpreting and solving specific civil engineering problems and to demonstrate creativity and decision-making skills. Finally, students will develop creative and systematic strategies for analysing and solving problems.

3106. Students will learn to assess the complexity of the problems examined in the different subject areas, identify the key elements of the problem statement, and select the appropriate strategy for solving it. Once they have chosen a strategy, they will apply it and, if the desired solution is not reached, determine whether modifications are required. Students will use a range of methods and tools to determine whether their solution is correct or, at the very least, appropriate to the problem in question. More generally, students will be encouraged to consider the importance of creativity in science and technology.

3107. Students will learn to identify, model and analyse problems from open situations, consider alternative strategies for solving them, select the most appropriate solution on the basis of reasoned criteria, and consider a range of methods for validating their results. More generally, students will learn to work confidently with complex systems and to identify the interactions between their components.

3111. Students will learn to plan, design, manage and maintain systems suitable for use in civil engineering. They will develop a systematic approach to the complete life-cycle of a civil engineering infrastructure, system or service, which includes drafting and finalising project plans, identifying the basic materials and technologies required, making decisions, managing the different project activities, performing measurements, calculations and assessments, ensuring compliance with specifications, regulations and compulsory standards, evaluating the social and environmental impact of the processes and techniques used, and conducting economic analyses of human and material resources.

3112. Students will develop an understanding of the different functions of engineering, the processes involved in the life-cycle of a construction project, process or service, and the importance of systematising the design process. They will learn to identify and interpret the stages in preparing a product design specification (PDS), draft and optimise specifications and planning documents, and apply a systematic design process to the implementation and operation phases. Students will learn to write progress reports for a design process, use a range of project management tools and prepare final reports, and will be expected to show an awareness of the basic economic concepts associated with the product, process or service in question.
Students will acquire an understanding of port and coastal engineering. Hydrology pathway

Specialised knowledge of basic port and coastal engineering concepts covered in an earlier subject on water technologies.

Design of port structures.
Knowledge of port operations and activity.

The course consists of 3 (2 +1) hours per week of lectures in a classroom. In the lectures the teacher explains the concepts and basic materials of the subject, presents examples and exercises. In practical classes approached solving problems with greater interaction with students. Exercises are conducted to consolidate the learning objectives. Support materials used in the form of detailed educational plan through the virtual campus ATENEA: content, programming and evaluation activities directed learning and literature.

Learning objectives of the subject

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## INTRODUCTION AND FUNDAMENTAL ASPECTS

**Learning time:** 7h 11m  
Theory classes: 1h  
Practical classes: 2h  
Self study: 4h 11m

**Description:**  
Presentation of the course and course development. Review of basic concepts. Classification and types of port works. Review environmental loads.

## DESIGN TOOLS

**Learning time:** 12h  
Theory classes: 4h  
Laboratory classes: 1h  
Self study: 7h

**Description:**  
The probabilistic design  
The physical model  
The numerical modeling

**Specific objectives:**  
Describe the probabilistic techniques in marine engineering design.

## HYDRODYNAMICS - STRUCTURAL PARAMETERS

**Learning time:** 7h 11m  
Theory classes: 1h  
Laboratory classes: 2h  
Self study: 4h 11m

**Description:**  
Wave-structure interaction  
The help of a wave in the channel essayg

**Specific objectives:**  
To assess experimentally the transmission of the waves over a structure
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<thead>
<tr>
<th>Breakwaters</th>
<th>Learning time: 14h 23m</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Cross sections</td>
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<td>Stability of section</td>
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<td>Exercises of breakwaters</td>
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<tr>
<th>Vertical and Composite Breakwaters</th>
<th>Learning time: 14h 23m</th>
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<tr>
<td>Description:</td>
<td>Requests hydrodynamic</td>
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<td>Calculation of stability</td>
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<td>Caisson type breakwaters</td>
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<tr>
<th>Interior Port Works</th>
<th>Learning time: 7h 11m</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Types of work</td>
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<td>Design Recommendations</td>
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<td>Flooring</td>
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<th>Port Operation</th>
<th>Learning time: 14h 23m</th>
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<tbody>
<tr>
<td>Description:</td>
<td>Port Operations</td>
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<td>Visit to a Catalan port</td>
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Qualification 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 three 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.

Regulations for carrying out activities

Failure to perform a laboratory or continuous assessment activity in the scheduled period will result in a mark of zero in that activity.
Bibliography

**Basic:**


Ministerio de Fomento-Puertos del Estado. ROM 0.4-95. Acciones Medioambientales II: Viento.


Ministerio de Fomento-Puertos del Estado. ROM 0.0. Procedimiento general y bases de cálculo en el proyecto de obras marítimas y portuarias (parte I).


**Complementary:**


Negro, V. y Varela O. Diseño de diques rompientes. Colegio de Ingenieros de Caminos, Canales y Puertos.