Degree competences to which the subject contributes

**Specific:**
3081. Ability to construct and conserve maritime works

**General:**
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.
3113. Students will learn to identify user requirements, to draft definitions and specifications of the product, process or service in question, including a product design specification (PDS) document, and to follow industry-standard design management models. Students will be expected to show advanced knowledge of the steps involved in the design, execution and operation phases and to use the knowledge and tools covered in each subject area to the design and execution of their own projects. Finally, students will assess the impact of national, European and international legislation applicable to engineering projects.

**Transversal:**

586. ENTREPRENEURSHIP AND INNOVATION - Level 2. Taking initiatives that give rise to opportunities and to new products and solutions, doing so with a vision of process implementation and market understanding, and involving others in projects that have to be carried out.

589. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 2. Applying sustainability criteria and professional codes of conduct in the design and assessment of technological solutions.

594. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.

584. THIRD LANGUAGE. Learning a third language, preferably English, to a degree of oral and written fluency that fits in with the future needs of the graduates of each course.

**Teaching methodology**

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**

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.

**Study load**

<table>
<thead>
<tr>
<th>Total learning time: 112h 30m</th>
<th>Theory classes: 26h 23.11%</th>
<th>Practical classes: 8h 7.11%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laboratory classes: 11h 9.78%</td>
<td>Guided activities: 4h 30m 4.00%</td>
<td>Self study: 63h 56.00%</td>
</tr>
</tbody>
</table>

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.
## INTRODUCTION AND FUNDAMENTAL ASPECTS

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

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

## DESIGN TOOLS

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

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

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

## HYDRODYNAMICS - STRUCTURAL PARAMETERS

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

**Specific objectives:**
To assess experimentally the transmission of the waves over a structure

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

**Description:**
- Cross sections
- Stability of section
- Exercises of breakwaters

**Learning time:** 14h 23m
- Theory classes: 3h
- Practical classes: 2h
- Laboratory classes: 1h
- Self study: 8h 23m

## Vertical and Composite Breakwaters

**Description:**
- Requests hydrodynamic
- Calculation of stability
- Caisson type breakwaters

**Learning time:** 14h 23m
- Theory classes: 4h
- Practical classes: 1h
- Laboratory classes: 1h
- Self study: 8h 23m

## Interior Port Works

**Description:**
- Types of work
- Design Recommendations
- Flooring

**Learning time:** 7h 11m
- Theory classes: 3h
- Self study: 4h 11m

## Port Operation

**Description:**
- Port Operations
- Visit to a Catalan port

**Learning time:** 14h 23m
- Theory classes: 3h
- Laboratory classes: 3h
- Self study: 8h 23m
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.

**Qualification system**

<table>
<thead>
<tr>
<th>PLANT DESIGN IN</th>
<th>Learning time: 24h</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 5h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 3h</td>
</tr>
<tr>
<td></td>
<td>Self study: 14h</td>
</tr>
</tbody>
</table>

**Description:**
- Entrance areas and flotation
- Port agitation
- Interaction Harbour - Coast
- Exercise. Interaction Harbour - Coast
- Water quality

<table>
<thead>
<tr>
<th>And dredging infillings</th>
<th>Learning time: 7h 11m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td></td>
<td>Practical classes: 1h</td>
</tr>
<tr>
<td></td>
<td>Self study: 4h 11m</td>
</tr>
</tbody>
</table>

**Description:**
- Characterisation of dredged material
- Maintenance of access channels and docks
- Enclosures

**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.
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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).


Ministerio de Fomento-Puertos del Estado. ROM 0.2-90. Acciones en el Proyecto de Obras Marítimas y Portuarias.

Complementary:


