Course guides

250563 - IMPMEDAMAR - Marine Environmental Impact

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: 2020  ECTS Credits: 6.0  Languages: Catalan, Spanish, English

LECTURER

Coordinating lecturer: MARIANNA GARFI

Others: MARIANNA GARFI, IRENE JOSA I CULLERÉ, ROBERTO RIBES MINGUEZ

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.
13391. Participate and eventually lead multidisciplinary work teams in the field of Marine Sciences and Technologies to respond to the social challenges related to this field.
13394. Address the most relevant processes and their interactions related to their physical / chemical / biological / geological components, applying technical and scientific knowledge and criteria.
13395. To set, evaluate and propose solutions to the different conflicts of use and exploitation in the marine and coastal environment resources based on scientific and technical criteria.
13397. Carry out environmental impact, management and protection studies of the marine environment and adjacent coastal areas, including the corresponding infrastructures and their related impacts.
13403. Develop a conceptual framework to address the sustainability of the marine environment and the related socio-economic activities at different scales, explaining the effects of climate change.
13404. Set, plan and execute basic and applied research in the field of Marine Sciences and Technologies.
13405. Carry out calculations, assessments, surveys and inspections in coastal and marine environments, as well as the corresponding technical documents.
13406. Write technical reports and disseminate knowledge about the different components of the marine system, considering the applicable legal framework.
13407. Apply the necessary tools to analyze the economic and legal aspects of human actions and the related impacts on the marine environment, including technical advice and representation of companies and administrations.

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.
13385. Apply knowledge and academic experience to the biotic and abiotic resources of the marine environment, explaining their interactions with the socio-economic activities that take place in it.
TEACHING METHODOLOGY

The course consists of 4 hours per week of lectures.

2 hours are devoted to theoretical lectures, in which the teacher presents the basic concepts and topics of the subject, shows examples and solves exercises.

2 hours are 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

This subject presents the most important aspects related to the impacts that human activities have on the marine and coastal environment, such as the occupation (temporary or permanent) of the terrestrial maritime public domain and the exploitation of the resources of transitional aquatic ecosystems. The concepts related to life-cycle analysis will be introduced to the students, and the design, development and integral execution of environmental monitoring programs and the procedures to make an environmental impact statement will be addressed.

3.- Develop and design Environmental Surveillance Programs (ESP) adapted to aquatic transitional, coastal and oceanic ecosystems, including a contrast of the forecasts that allow to correct any deviation that may occur on the planned. Prepare Environmental Impact Assessments (EIA) adapted to the specific requirements and singularities of the marine environment.

This subject focuses on highlighting aspects related to the state of health of the marine environment, mainly oriented to two well differentiated but complementary aspects. On the one hand, the ecological, ecosystemic and environmental aspects, which will give the students a specific vision of the environmental problems present in the marine environment, produced by the use and exploitation of the resources that it provides.

On the other hand, this subject represents a transition of knowledge for students between the Extension of the subject of Basic Sciences, the subject of Applied Sciences and Techniques.

STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hours small group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Guided activities</td>
<td>6,0</td>
<td>4.00</td>
</tr>
<tr>
<td>Self study</td>
<td>84,0</td>
<td>56.00</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>15,0</td>
<td>10.00</td>
</tr>
<tr>
<td>Hours large group</td>
<td>30,0</td>
<td>20.00</td>
</tr>
</tbody>
</table>

**Total learning time:** 150 h
# CONTENTS

## Introduction to the subject

**Description:**
Objectives, bibliography, evaluation methodology.

**Full-or-part-time:** 2h 24m
Theory classes: 1h
Self study: 1h 24m

## Environment and sustainability

**Description:**
Management of the marine environment. Sustainable development and sustainability: background and historical development

**Full-or-part-time:** 2h 24m
Theory classes: 1h
Self study: 1h 24m

## Social aspects

**Description:**
Social impact, stakeholders, environmental education,
Qualitative analysis of the impacts on different social areas and at different stages of the life cycle

**Full-or-part-time:** 3h 24m
Theory classes: 8h
Practical: 8h
Self study: 2h 24m

## Economic aspects

**Description:**
Taxes, subsidies, monetization, externalities

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

## Technical aspects

**Description:**
Pollution by oil, ballast water, solid waste (garbage) and air pollution (climate change): basic concepts, regulations, impact, technologies and strategies for mitigation. Impact of marine works: Basic concepts, Law of Coasts, landscaping and strategies for mitigation.
Case study and practice

**Full-or-part-time:** 38h 24m
Theory classes: 8h
Practical classes: 8h
Self study: 22h 24m
Tools for the evaluation of environmental impact and measurement of sustainability

Description:
Regulations, certification, environmental verification, environmental management system (ISO, EMAS), Environmental impact assessment (EIA). Life cycle analysis (LCA), carbon footprint, water footprint, Social Life Cycle (S-LCA), Life Cycle Costing (LCC). Multi-criteria analysis (MIVES) and sustainability.
Case study and practice

Full-or-part-time: 38h 24m
Theory classes: 8h
Laboratory classes: 8h
Self study: 22h 24m

Evaluation

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

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 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.

EXAMINATION RULES

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

BIBLIOGRAPHY

Basic:

Complementary: