Course guides

250700 - 250700 - Fundamentals of Structural Design

Unit in charge: Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering.

Degree: MASTER'S DEGREE IN STRUCTURAL AND CONSTRUCTION ENGINEERING (Syllabus 2015). (Compulsory subject).

Academic year: 2020 ECTS Credits: 6.0 Languages: Spanish, English

LECTURER

Coordinating lecturer: ANTONIO RICARDO MARI BERNAT
Others: JESÚS MIGUEL BAIRÁN GARCÍA, ROLANDO ANTONIO CHACÓN FLORES, ANTONIO RICARDO MARI BERNAT, EVA MARIA OLLER IBARS, DAVID VERGES COLL

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
13364. To conceive and design civil and building structures that are safe, durable, functional and integrated into its surroundings.
13365. Designing and building using traditional materials (reinforced concrete, prestressed concrete, structural steel, masonry, wood) and new materials (composites, stainless steel, aluminum, shape memory alloys?).
13366. To evaluate, maintain, repair and strengthen existing structures, including the historic and artistic heritage.
13369. To apply methods and advanced design software and structural calculations, based on knowledge and understanding of forces and their application to the structural types of civil engineering.

General:
13360. To conceive, design, analyze and manage structures or structural elements of civil engineering or building, encouraging innovation and the advance of knowledge.
13361. To develop, improve and use conventional materials and new construction techniques to ensure the safety requirements, functionality, durability and sustainability.

TEACHING METHODOLOGY

The course consists of 2,3 hours per week of classroom activity (large size group) and 0,3 hours weekly with half the students (medium size group).

The 2,3 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 0,3 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.

The rest of weekly hours devoted to laboratory practice.

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

Subject to initiate the student in the design and calculation of concrete and steel according to European standards

Initial knowledge of the process of design of concrete and steel structures according to European Standards


STUDY LOAD

<table>
<thead>
<tr>
<th>Type</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guided activities</td>
<td>2,0</td>
<td>1.33</td>
</tr>
<tr>
<td>Hours large group</td>
<td>26,0</td>
<td>17.33</td>
</tr>
<tr>
<td>Hours medium group</td>
<td>13,0</td>
<td>8.67</td>
</tr>
<tr>
<td>Self study</td>
<td>96,0</td>
<td>64.00</td>
</tr>
<tr>
<td>Hours small group</td>
<td>13,0</td>
<td>8.67</td>
</tr>
</tbody>
</table>

Total learning time: 150 h

CONTENTS

**Definition of Limits States and introduction to structural safety**

Description:
Actions on structures and Introduction to Structural Safety

Full-or-part-time: 24h
Theory classes: 10h
Self study: 14h

**Technology of prestressing**

Description:
Technology and Structural Analysis of Prestressing

Full-or-part-time: 28h 47m
Theory classes: 12h
Self study: 16h 47m

**Structural Response of Concrete according Eurocod EC-2**

Description:
Introduction to the european conception of Structural Concrete according to

Full-or-part-time: 28h 47m
Theory classes: 12h
Self study: 16h 47m
Structural Response of Steel Structures According Eurocod EC3

Description:
Introduction to European conception of Steel Structures

Full-or-part-time: 38h 24m
Theory classes: 16h
Self study: 22h 24m

Block exams

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.

EXAMINATION RULES.

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: