250700 - Fundamentals of Structural Projects

Coordinating unit: 250 - ETSECCPB - Barcelona School of Civil Engineering
Teaching unit: 751 - DECA - Department of Civil and Environmental Engineering
Academic year: 2019
Degree: MASTER'S DEGREE IN STRUCTURAL AND CONSTRUCTION ENGINEERING (Syllabus 2015).
(Teaching unit Compulsory)
ECTS credits: 6
Teaching languages: Spanish

Teaching staff

Coordinator: ALBERTO DE LA FUENTE ANTEQUERA
Others: ANGEL CARLOS APARICIO BENGOECHEA, JUAN RAMON CASAS RIUS, ROLANDO ANTONIO CHACÓN FLORES, ALBERTO DE LA FUENTE ANTEQUERA, ANTONIO RICARDO MARI BERNAT, EVA OLLER IBARS, ESTHER REAL SALADRIGAS

Opening hours

Timetable: It will be published at the beginning of the course according the mentoring hours for each teacher

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.

Generically:
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.
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**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><strong>Total learning time</strong>: 150h</th>
<th>Theory classes:</th>
<th>25h 58,8m</th>
<th>17.32%</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes:</td>
<td>13h 01,2m</td>
<td>8.68%</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes:</td>
<td>13h 01,2m</td>
<td>8.68%</td>
</tr>
<tr>
<td></td>
<td>Guided activities:</td>
<td>1h 58,8m</td>
<td>1.32%</td>
</tr>
<tr>
<td></td>
<td>Self study:</td>
<td>96h</td>
<td>64.00%</td>
</tr>
</tbody>
</table>
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## Content

<table>
<thead>
<tr>
<th>Topic</th>
<th>Learning time</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition of Limits States and introduction to structural safety</td>
<td>24h</td>
<td>Actions on structures and Introduction to Structural Safety</td>
</tr>
<tr>
<td>Technology of prestressing</td>
<td>28h 47m</td>
<td>Tecnology and Structural Analysis of Prestressing</td>
</tr>
<tr>
<td>Structural Response of Concrete according Eurocod EC-2</td>
<td>28h 47m</td>
<td>Introduction to the european conception of Structural Concrete according to</td>
</tr>
<tr>
<td>Structural Response of Steel Structures According Eurocod EC3</td>
<td>38h 24m</td>
<td>Introduction to european conception of Steel Structures</td>
</tr>
<tr>
<td>Block exams</td>
<td>4h 48m</td>
<td>Laboratory classes: 2h</td>
</tr>
</tbody>
</table>

## Learning time:
- Theory classes: 10h
- Self study: 14h
- Theory classes: 12h
- Self study: 16h 47m
- Theory classes: 12h
- Self study: 16h 47m
- Theory classes: 16h
- Self study: 22h 24m
- Laboratory classes: 2h
- Self study: 2h 48m
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Qualification 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.

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:


Marí A, Molins C, Bairán JM, Oller E. Formigó armat i pretensat. Exercicis curts de bases de càlcul i estats límit adaptat a la Instrucció EHE-08. Barcelona: Edicions UPC, 2009..

