250722 - Advanced Technics in Construction

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).
(教学 unit Optional)
ECTS credits: 5  Teaching languages: Catalan, Spanish, English

Teaching staff
Coordinator: ANTONIO AGUADO DE CEA
Others: ANTONIO AGUADO DE CEA, JESÚS MIGUEL BAIRÁN GARCÍA, MARIA DEL MAR CASANOVAS RUBIO

Degree competences to which the subject contributes

Specific:
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?).
13367. To apply innovative and sustainable technological aspects in the management and implementation of projects and works.
13370. To analyze the multiple technical and legal conditions arising in the construction of public works, and use proven methods and proven technologies with the aim of achieving greater efficiency in construction while respecting the environment and protecting the safety and health of workers and users of public works.

General:
13361. To develop, improve and use conventional materials and new construction techniques to ensure the safety requirements, functionality, durability and sustainability.
13362. To define construction processes and methods of organization and management of projects and works.
13363. To design plans for safety, quality and environmental and socioeconomic impacts related to the construction process.

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
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Subject to deepen in modern construction techniques

- Knowledge of the most modern and with more future construction techniques in the field of civil engineering, building and industrial constructions.


Study load

<table>
<thead>
<tr>
<th>Total learning time: 125h</th>
<th>Hours large group:</th>
<th>19h 30m</th>
<th>15.60%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group:</td>
<td>9h 45m</td>
<td>7.80%</td>
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<tr>
<td></td>
<td>Hours small group:</td>
<td>9h 45m</td>
<td>7.80%</td>
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<td></td>
<td>Guided activities:</td>
<td>6h</td>
<td>4.80%</td>
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<tr>
<td></td>
<td>Self study:</td>
<td>80h</td>
<td>64.00%</td>
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**Content**

**Block 1: General Issues concerning the construction sector**

**Description:**
Block 1: General Issues concerning the construction sector practice Lab

**Specific objectives:**

**Learning time:** 31h 12m
- Theory classes: 7h
- Practical classes: 4h 18m
- Laboratory classes: 1h 42m
- Self study : 18h 12m

**Block 2: Basics of execution. Policy cases**

**Description:**
Block 2: Basics of execution. Policy cases practice Lab

**Specific objectives:**
Review basics of construction. Critical analysis of different cases called type. From the macro-micro processes. See examples attached sheets. Standard, spatial and temporal climatic incidents

**Learning time:** 31h 12m
- Theory classes: 7h
- Practical classes: 4h 18m
- Laboratory classes: 1h 42m
- Self study : 18h 12m
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**Block 3: Aspects específicos implementation**

<table>
<thead>
<tr>
<th>Learning time: 31h 12m</th>
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<tbody>
<tr>
<td>Theory classes: 7h</td>
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<td>Laboratory classes: 1h 42m</td>
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<td>Self study: 18h 12m</td>
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<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Block 3: Specific aspects of implementation</td>
</tr>
<tr>
<td>practice</td>
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<tr>
<td>Lab</td>
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<table>
<thead>
<tr>
<th>Specific objectives:</th>
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<tr>
<td>Construction in adverse situations: Climate (hot-cold), under water, at high altitude, difficult sites, etc. Special Techniques: pushing, lifting, turning, transportation. Rationale for them. Description with specific cases.</td>
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<tr>
<td>Construction foundation elements and other works directly related field (extensions, tunnels, screens, etc.). Hormigo singular constructions (elevated tanks, towers, blades, etc.). Singulares constructions of metal structures (tall buildings, towers, covers, etc.). Other singular constructions (marine environments, waterworks, etc.).</td>
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<tr>
<td>Demolition techniques works.</td>
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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:**

Aguado, A. Apuntes de la asignatura.