250237 - OAVOP - Organisation, Measurement and Budget for Public Works

**Coordinating unit:** 250 - ETSECCPB - Barcelona School of Civil Engineering  
**Teaching unit:** 751 - DECA - Department of Civil and Environmental Engineering  
**Academic year:** 2017  
**Degree:** BACHELOR’S DEGREE IN PUBLIC WORKS ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)  
**ECTS credits:** 7.5  
**Teaching languages:** Catalan, Spanish

### Teaching staff

**Coordinator:** JOSE TURMO CODERQUE  
**Others:** MARIA ELENA FILLOLA CARABALLO, ALBERT MAS SOLER, GONZALO RAMOS SCHNEIDER, JOSE TURMO CODERQUE

### Opening hours
**Timetable:** Be flexible

### Degree competences to which the subject contributes

**Specific:**

3068. Fundamental knowledge of the electrical power system: energy generation and the transport and distribution network, and the types of lines and conductors. Knowledge of the low and high voltage regulations  
3069. Ability to apply environmental impact study and assessment methodologies.  
3070. Knowledge of construction procedures, construction machinery and the techniques for organising, measuring and valuing works.  
3078. Ability to analyse health and safety issues in construction works  
3084. Ability to use the appropriate construction procedures, construction machinery and planning techniques in carrying out works  
3088. Knowledge and understanding of the functioning of ecosystems and environmental factors

**Generical:**

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.  
3108. Students will learn to identify and model complex systems and to identify the most suitable methods and tools for defining and solving the associated equations. They will acquire the knowledge and skills to perform qualitative analyses and approximations, estimate the uncertainty of results, formulate hypotheses and define experimental methods through which to validate them, establish compromises, identify principal components and prioritise their work. More generally, students will develop their capacity for critical thought.  
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.  
3114. Students will learn to identify market requirements and opportunities and to compile information from which to
determine the ideal specifications of a new product, process or service. They will acquire the skills to prepare a basic business plan, define a new product, process or service, and plan and implement the different phases in the design process.

**Transversal:**


- **590. SUSTAINABILITY AND SOCIAL COMMITMENT** - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.

- **593. EFFICIENT ORAL AND WRITTEN COMMUNICATION** - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

- **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 2.3 hours per week of classroom activity (large size group) and 1.3 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 1.3 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**

Students will learn techniques for organising, measuring, estimating and planning construction projects.

Upon completion of the course, students will have acquired the ability to: 1. Carry out a measurement and price study in a public works project. 2. Prepare a budget for a public works project using a computer tool. 3. Plan and organise a public works project. 4. Analyse and estimate public works projects in particular and construction projects in general.

Historical development of civil engineering and construction techniques applied in public works; Constituent elements of public works; Analysis and assessment criteria; Estimation of public works projects; Organisation and planning of construction projects, including prevention, safety and health, and construction quality systems; Basics of public works; Project documents and references to the budget; Contractor classification; Price justification; Lump-sum items; Budget structure; Computer tools for budget planning; Working with price databases; Budget structure: chapters and subchapters; Measurement: earthworks, drainage networks, roads and surfacing, structures; Foundations, reinforced and prestressed concrete, detailing, structural steel; Urban elements and finishes; Urban railway projects and tunnels; General aspects of construction project planning; Computer tool for creating a construction plan.
## Study load

<table>
<thead>
<tr>
<th>Total learning time: 187h 30m</th>
<th>Hours large group: 44h 23.47%</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Hours medium group: 12h 6.40%</td>
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<tr>
<td></td>
<td>Hours small group: 19h 10.13%</td>
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<tr>
<td></td>
<td>Guided activities: 7h 30m 4.00%</td>
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<tr>
<td></td>
<td>Self study: 105h 56.00%</td>
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</tbody>
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## Content

### Work Execution

**Description:**
- Organization of work
- Technical and economic planning
- Planning practices

**Learning time:** 31h 12m
- Theory classes: 8h
- Practical classes: 4h
- Laboratory classes: 1h
- Self study: 18h 12m

### Construction Procedures

**Description:**
- H 16h Terres10 Movement Structures Structures Edificació 4 OP 4 h 4h Pilots4 Works marítimes 4 Pantalles 2h 4h RAILWORKS
- Problems and practices

**Learning time:** 148h 48m
- Theory classes: 52h
- Practical classes: 6h
- Laboratory classes: 4h
- Self study: 86h 48m
Qualification system

The course grade will be obtained from continuous assessment scores. Two tests will be developed during the course (E1 and E2). Each test shall include all of the subjects taught until the test date. The final grade is the weighted sum of each of these 2 tests, being the balance, 30% max (E1 and E2), 50% E2, plus 20% corresponding to classroom exercises. Four classroom exercises will be developed, but only the 3 best obtained grades will be considered.

Screening tests consist of a part with issues associated with the learning objectives of the course in terms of knowledge or understanding concepts, and a set of application exercises.

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.

Bibliography

Basic:

Complementary: