# 250147 - PROORGEMP - Projects and Business Organisation

## 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 CIVIL ENGINEERING (Syllabus 2010). (Teaching unit Compulsory)
BACHELOR'S DEGREE IN CIVIL ENGINEERING (Syllabus 2017). (Teaching unit Compulsory)

## ECTS credits:
4.5

### Teaching languages:
Catalan, Spanish, English

## Teaching staff

### Coordinator:
ALVARO GAROLA CRESPO, CARLES LABRAÑA DE MIGUEL

### Others:
VALENTIN ACEÑA RAMOS, EMILIO CEREJIO THOMAS, ALVARO GAROLA CRESPO, CARLES LABRAÑA DE MIGUEL, ANDRES MIRAMBELL ARRIZABALAGA, JOSE PABLO RODRIGUEZ-MARIN SASTRE, GEMA VELEZ SABATER

## Opening hours

### Timetable:
An hour after each class

## Degree competences to which the subject contributes

### Specific:
- 3019. Ability to apply environmental impact study and assessment methodologies.
- 3036. Ability to analyse health and safety issues in construction works.

### Generical:
- 3104. 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.
- 3110. 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.
Students will learn the methodology for carrying out an engineering project. They will learn to analyze safety and health problems in construction projects, and also to apply environmental impact analysis and assessment methodologies.

Upon completion of the course, students will have acquired the ability to:
1. Carry out an alternatives study before adopting a solution.
2. Formally design a civil engineering infrastructure project.
3. Conduct a comprehensive project management analysis.

Engineering project documents; Elements of engineering projects such as environmental impact, economic studies and alternatives studies; Formal design and comprehensive project management; Different types of projects by type of infrastructure (urban development, highways, hydraulic works, services, buildings, etc.); Planning, organisation and management of projects; Comprehensive project management techniques that encompass maintenance, licensing, tolls, etc., such that a facility’s entire service life is taken into account.

That students have the ability to analyze economic and financial documents of companies.

Teaching methodology

The course consists of 1.5 hours per week of classroom activity (large size group) and 1.5 hours weekly with half the students (medium size group).

The 1.5 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 1.5 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.

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 the methodology for carrying out an engineering project. They will learn to analyse safety and health problems in construction projects, and also to apply environmental impact analysis and assessment methodologies.

Upon completion of the course, students will have acquired the ability to:
1. Carry out an alternatives study before adopting a solution.
2. Formally design a civil engineering infrastructure project.
3. Conduct a comprehensive project management analysis.

Study load

| Total learning time: 112h 30m | Theory classes: 34h | 30.22% |
| Pрактические занятия: 5h | 4.44% |
| Laboratory classes: 6h | 5.33% |
| Guided activities: 4h 30m | 4.00% |
| Self study: 63h | 56.00% |
## Content

<table>
<thead>
<tr>
<th>Item 1 - Project's Meaning</th>
<th><strong>Learning time:</strong> 2h 24m</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 1h</td>
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<tr>
<td></td>
<td>Self study : 1h 24m</td>
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**Description:**
Understand what a project Oimo work unit in the life of an engineer.

**Specific objectives:**
Be aware that is a key project during the practice for most of the graduates.

<table>
<thead>
<tr>
<th>Item 2 - Draft Documents</th>
<th><strong>Learning time:</strong> 7h 11m</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 3h</td>
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<tr>
<td></td>
<td>Self study : 4h 11m</td>
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**Description:**
Description of memory and different schedules. Implementing legislation. Analysis of plans, scales, formats, level of detail. Description of the statements of condition and content. Regulations to apply. Drawing up the measurements and preparation of the project budget.

**Specific objectives:**
Learn to select and cocebir a Mamori schedules. Distiguir between imprecindible. Learning how to prepare the three documents and rationale thereof.

<table>
<thead>
<tr>
<th>Study of alternatives</th>
<th><strong>Learning time:</strong> 2h 24m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td></td>
<td>Self study : 1h 24m</td>
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</table>

**Description:**
What is a study of alternatives. How select them and how to evaluate, mainly with a multi-criteria analysis ..

**Specific objectives:**
Learning how to prepare an analysis of alternatives and decide etre them.
### Item 5 - Project Management

**Description:**
The different roles of actors in a project from the developer, the editor and the executor, through the control. Objectives and general concepts in project management.
- Life cycle of a project. Control and monitoring of deadlines, costs, quality, risk

- The award as most developed example of a PPP. Feasibility studies, demand analysis, draft concessions,....

**Specific objectives:**
- Learning to act from different points of view that requires each plaintiff
- Define roles of people in the project
  - Project Manager
  - Teamwork
  - Customer relations

- Sharpen a professional activity almost as relevant today as one's own project execution or in the provision of public work.

### Item 6 - Highway and Road Projects

**Description:**
The demand analysis. The importance of the path. The various solutions that may arise.

**Specific objectives:**
- Addressing a road project to optimize the solution and justifying the need for the

### Item 7 - Draft development.

**Description:**
The estates and facilities and services required (transportation, parking, sanamiento, supply,....) Need to get economic return to justify the investments. Polygons.

**Specific objectives:**
- Deciding how to develop following the parameters urbanísticos approved and return on investment.
### Item 8 - Water projects and maritime projects

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Pipelines, irrigation, water supplies, sanitation. Fundamental Schedules for these types of projects. Different types of maritime work: protection, docking, facilities, access, ... The importance of climate analysis.</td>
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</table>

<table>
<thead>
<tr>
<th>Specific objectives:</th>
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<tbody>
<tr>
<td>Knowing how water works project. How are plans for a Port Authority for Coastal Authority, for a developer of a marina, ...</td>
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<table>
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<tr>
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<tbody>
<tr>
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<td>Theory classes: 3h</td>
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### Item 9 - Services and Maintenance Projects

<table>
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<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Services in the engineering world. The growing importance for the proper maintenance of infrastructure works between. Different mechanisms of maintenance contracts.</td>
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<table>
<thead>
<tr>
<th>Specific objectives:</th>
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<tbody>
<tr>
<td>Understand that there are projects. Understand that we are entering a European where the provision of new infrastructure and maintenance decreases grows. Therefore, our country will follow a similar process.</td>
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<thead>
<tr>
<th>Learning time:</th>
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<tbody>
<tr>
<td>4h 48m</td>
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<tr>
<td>Theory classes: 2h</td>
</tr>
<tr>
<td>Self study: 2h 48m</td>
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</tbody>
</table>

### Item 10 - Study of Safety and Health

<table>
<thead>
<tr>
<th>Description:</th>
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<tbody>
<tr>
<td>Implementing legislation. Proactive and reactive security. Complete project within the relevant annexed. Role of coordinator.</td>
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<table>
<thead>
<tr>
<th>Specific objectives:</th>
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<tbody>
<tr>
<td>Give it the importance it really has. Affects human lives and legally requires a comprehensive control.</td>
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<table>
<thead>
<tr>
<th>Learning time:</th>
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<tbody>
<tr>
<td>2h 24m</td>
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<tr>
<td>Theory classes: 1h</td>
</tr>
<tr>
<td>Self study: 1h 24m</td>
</tr>
</tbody>
</table>
### Item 11 - Environmental Impact Study

**Learning time:** 2h 24m
- Theory classes: 1h
- Self study : 1h 24m

**Description:**

**Specific objectives:**
Knowing the importance of the environment in the drafting of projects in its pipeline and aprobación. Analizar corrective measures.

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### Visit construction or projection

**Learning time:** 7h 11m
- Laboratory classes: 3h
- Self study : 4h 11m

**Description:**
Make a site visit or project images covering the entire process from planning and design to construction of a work.

**Specific objectives:**
Perceive the change and the impact that a work dee infrastructure or equipment pose a physical and economic environment.

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### Practice Project

**Learning time:** 9h 36m
- Practical classes: 4h
- Self study : 5h 36m

**Description:**
From an existing project, a critical analysis of strengths and weaknesses, using the SWOT method.

**Specific objectives:**
Achieve distinction in a project their shortcomings and become familiar with a real project.
### Introduction to Company

**Description:**
Concept of business, and the various types. Type of society, and limited liability Limitada, concept of social capital. Features of construction companies. Introduce the concept of accounting as an element of business analysis. Account balance, profit and loss account.

**Specific objectives:**
Intended as a reminder. They are concepts that have worked the course "Economics, business and law" taught the first course and are required to be refreshed for the rest of the course.

**Learning time:** 2h 24m
- Theory classes: 1h
- Self study: 1h 24m

### Management and organization of the company

**Description:**

**Specific objectives:**
That students have a general idea of how to organize and operate a business. Understand the strategic planning processes, which are helping to make decisions about their future.

**Learning time:** 7h 11m
- Theory classes: 3h
- Self study: 4h 11m

### Analysis of Financial Statements

**Description:**

**Specific objectives:**
That students learn to interpret, through the elements that gives accounting, a business or a work situation is to know how to interpret accounting information to help make decisions in business management and responsibility of work civil engineers.

**Learning time:** 16h 48m
- Theory classes: 6h
- Practical classes: 1h
- Self study: 9h 48m
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<table>
<thead>
<tr>
<th>Construction companies</th>
<th>Learning time: 7h 11m</th>
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<tbody>
<tr>
<td></td>
<td>Theory classes: 3h</td>
</tr>
<tr>
<td></td>
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**Description:**

**Specific objectives:**
Knowing the characteristics of the construction companies, where, predictably, students work in Civil Engineering

<table>
<thead>
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<th>Review</th>
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</table>
Qualification system

There will be three assessments

- The first test will provide 40% of the final grade
- The second test will give 40% of the final grade
- The individual will work 10% of the final grade
- The case study will give 5% of the final mark (optional)

The rating will be obtained from the continuous assessment marks and corresponding laboratory and / or computer room.

Continuous assessment involves making different activities, both individual and group training and additive nature, made during the year (in the classroom and outside of it).

The rating is the average teaching laboratory activities of this kind.

The evaluation tests consist on issues concepts associated with learning objectives regarding subject knowledge and understanding, 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: