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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: 2018

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 CEREIJO 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:

587. ENTREPRENEURSHIP AND INNOVATION - Level 3. Using knowledge and strategic skills to set up and manage projects. Applying systemic solutions to complex problems. Devising and managing innovation in organizations.

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 3 hours per week of classroom activity (large 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 other 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.

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

Knowledge of the methodology to carry out engineering projects. Ability to analyze the problems of safety and health in the construction works. Capacity to apply methodologies of studies and evaluations of environmental impact.

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1. Carry out a study of alternatives, before adopting the solution to be projected. 2. Make a formal design of an infrastructure in civil engineering. 3. Make an integral management analysis of a project.

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Knowledge of the documents that make up an engineering project. Knowledge of the projectual elements such as environmental impact, economic studies, studies of alternatives. Knowledge of formal design and integral management of the project. Knowledge of the different types of projects according to the type of infrastructure (urbanization, road, hydraulic work, services, construction, etc.). Capacity to plan, organize and manage the execution of works. Incorporation of techniques for the integrated management of projects, including maintenance, concessions, tolls, etc. so that all the useful life of the infrastructure is taken into account.
Train students in matters related to business management. Special emphasis is placed on companies related to the construction and public works sector.

Knowledge related to the company's accounting cycle. Interpretation of the accounting statements of the company. Knowledge about business financing. Financial function and its evolution, Sources of financing. Knowledge about business

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management and management. Strategic plans.

Analysis of the construction sector. Characteristics of the construction companies. Current strategies.

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

Study load

Total learning time: 112h 30m	Hours large group:	34h	30.22%
	Hours medium group:	5h	4.44%
	Hours small group:	6h	5.33%
	Guided activities:	4h 30m	4.00%
	Self study:	63h	56.00%

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Content

Item 1 - Project's Meaning

Learning time: 2h 24m

Theory classes: 1h
Self study : 1h 24m

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.

Item 2 - Draft Documents

Learning time: 7h 11m

Theory classes: 3h
Self study : 4h 11m

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.

Study of alternatives

Learning time: 2h 24m

Theory classes: 1h
Self study : 1h 24m

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.

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Item 5 - Project Management

Learning time: 12h

Theory classes: 5h
Self study : 7h

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

Learning time: 4h 48m

Theory classes: 2h
Self study : 2h 48m

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.

Learning time: 4h 48m

Theory classes: 2h
Self study : 2h 48m

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

Specific objectives:
Deciding how to develop following the parameters urbnísticos approved and return on investment.

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Item 8 - Water projects and maritime projects

Learning time: 7h 11m

Theory classes: 3h
Self study : 4h 11m

Description:
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

Specific objectives:
Knowing how water works project
How are plans for a Port Authority for Coastal Authority, for a developer of a marina, ...

Item 9 - Services and Maintenance Projects

Learning time: 4h 48m

Theory classes: 2h
Self study : 2h 48m

Description:
Services in the engineering world
The growing importance for the proper maintenance of infrastructure works between. Different mechanisms of maintenance contracts.

Specific objectives:
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.

Item 10 - Study of Safety and Health

Learning time: 2h 24m

Theory classes: 1h
Self study : 1h 24m

Description:
Implementing legislation. Proactive and reactive security. Complete project within the relevant annexed. Role of coordinator.

Specific objectives:
Give it the importance it really has. Affects human lives and legally requires a comprehensive control

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Item 11 - Environmental Impact Study	Learning time: 2h 24m Theory classes: 1h Self study : 1h 24m

Description:
The environmental context rush current engineering tasks. Environmental Sustainability. Legislation. Environmental Assessment of Plans and Programs. The legal framework and practical examples. Environmental Impact Studies. The legal framework and practical examples

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

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

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.

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Introduction to Company

Learning time: 2h 24m

Theory classes: 1h
Self study : 1h 24m

Description:
Concept of business, and the various types. Type of society, and limited liability l.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.

Management and organization of the company

Learning time: 7h 11m

Theory classes: 3h
Self study : 4h 11m

Description:
Concept of business management. Basics of business management. Strategic planning. Analysis of the industry. SWOT Matrix. Arrays Portfolio business. Competitive strategies. Decisions. Management projects. Different areas of the company

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

Analysis of Financial Statements

Learning time: 16h 48m

Theory classes: 6h
Practical classes: 1h
Self study : 9h 48m

Description:
Concept of Analytical Accounting. Cycle accounting company. Table of funding. The financial cycle of the company. Static and Dynamic Analysis of Income Statement and Balance. Economic and Financial Analysis through ratios. Ratios company management and the works. Case Studies. Jobs in the classroom by students. Problems

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.

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Construction companies	Learning time: 7h 11m Theory classes: 3h Self study : 4h 11m

Description:
Characteristics of the construction sector. Special features of the construction companies. Structure and characteristics of construction firms in Spain, Catalonia and global scale. Business strategies in construction. Analysis of Case Studies

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

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

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Qualification system

There will be three assessments

Test of the part of projects that will provide 40% of final mark
Test of the part of organization of companies that will provide 40% of final mark
A work in group work that incorporates elements of project and organization of companies. The work provides 20% of final mark.

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 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.

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Lleonart, P. Estrategias empresariales de las constructoras españolas y europeas: los grandes grupos especializados. Barcelona: Gabinet d'Estudis Econòmics, 1998. ISBN 8492078588.

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Neufert, E. Arte de proyectar en arquitectura. 15a ed. Barcelona: Gustavo Gili, 2006. ISBN 9788425220517.

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