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

Generic:

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 1.7 hours per week of classroom activity (large size group) and 0.8 hours weekly with half the students (medium size group).

The 1.7 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 0.8 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 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. 2. Formally design a construction 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.)
## Study Load

<table>
<thead>
<tr>
<th>Study Load</th>
<th>Hours</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total learning time: 112h 30m</td>
<td>33h</td>
<td>29.33%</td>
</tr>
<tr>
<td>Hours large group:</td>
<td>3h</td>
<td>2.67%</td>
</tr>
<tr>
<td>Hours medium group:</td>
<td>9h</td>
<td>8.00%</td>
</tr>
<tr>
<td>Hours small group:</td>
<td>4h 30m</td>
<td>4.00%</td>
</tr>
<tr>
<td>Guided activities:</td>
<td>63h</td>
<td>56.00%</td>
</tr>
<tr>
<td>Self study:</td>
<td>63h</td>
<td>56.00%</td>
</tr>
</tbody>
</table>

*University of Technology of Catalonia*
## Issues prior to the Writing Project. (6 hours)

**Learning time:** 14h 23m  
Theory classes: 6h  
Self study: 8h 23m

**Description:**  
1. - Classificació dels projectes. Ens que intervenen en les diferents fases d'un projecte. (0,5 h)  
2. - Marc Legal i normativa aplicable a la redacció d'un projecte. (0,5 h)  
3. - Plantejament econòmic. Anàlisi de rendibilitat. (2h)

## T2- Writing and Processing Project. (10 hours)

**Learning time:** 24h  
Theory classes: 10h  
Self study: 14h

**Description:**  
7. - Documents del projecte. Seqüència d'elaboració d'un projecte. (1h)  
8. - Annexos de dades de partida i de càlcul. Els Plànols. (1h)  
9. - L'annex de Justificació de Preus i els Quadres de Preus. (1h)  
10. - Amidaments i Pressupostos. (1h)  
11. - Altres Annexos a la Memòria. Programa de treballs, expropiacions, serveis afectats. (1h)  
12. - L'Estudi de Seguretat i Salut. (1h)  
13. - L'estudi d' impacte ambiental. Elaboració i tramitació. (1h)  
14. - El plec de prescripcions tècniques particulars. (1h)  
15. - La Memòria Descriptiva. Edició i tramitació del projecte. (2h)

## Topic 3-Contract Works. The Contract Consulting and Support. Project Management (10 hours)

**Learning time:** 24h  
Theory classes: 10h  
Self study: 14h

**Description:**  
16. - La legislació sobre contractació pública. Disposicions generals comunes als contractes administratius. (1h)  
17. - El contracte d'obres (I): preparació, adjudicació i formalització. (1,5h)  
18. - El contracte d'obres (II): desenvolupament normal, incidències i extinció. (1,5h)  
19. - El contracte de consultoria i assistència. (1h)  
20. - Gestió de recursos. Organització del projecte. (1h)  
21. - La Qualitat. Models de Gestió. (1h)  
22. - La Direcció d'obra: qualitat i seguretat en l'execució de l'obra. (1,5h)  
23. - Gestió Integrada de Projectes. PM. (1,5h)
## Item 4 - specific projects (8 hours)

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 19h 12m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theory classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Self study: 11h 12m</td>
</tr>
</tbody>
</table>

- 24.- P's Edificació (1h)
- 25.- P's Urbanització (1h)
- 26.- P's Hidraulics (1h)
- 27.- P's Maritims (1h)
- 28.- P's Serveis (1h)
- 29.- P's Manteniment (1h)
- 30.- P's carreteres. (2h)

## Item 5 - WORK AND EXAMS (11 hours)

<table>
<thead>
<tr>
<th>Description</th>
<th>Learning time: 26h 24m</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Practical classes: 8h</td>
</tr>
<tr>
<td></td>
<td>Laboratory classes: 3h</td>
</tr>
<tr>
<td></td>
<td>Self study: 15h 24m</td>
</tr>
</tbody>
</table>

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

The first test will be assessed 30% of the final grade
The second test will be assessed 40% of the final grade
The working group will give 20% of the final grade
The case theoretical seminar "Public-Private Partnerships and civil engineering) 10% of the final grade
The case studies will give 5% of the final mark (voluntary)

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.

Failure to perform a laboratory or continuous assessment activity in the scheduled period will result in a mark of zero in that activity.