

28744 - Projects

Información del Plan Docente

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|-----------------|---|
| Academic Year | 2016/17 |
| Academic center | 175 - Escuela Universitaria Politécnica de La Almunia |
| Degree | 423 - Bachelor's Degree in Civil Engineering |
| ECTS | 6.0 |
| Course | 4 |
| Period | First semester |
| Subject Type | Compulsory |
| Module | --- |

1. Basic info

1.1. Recommendations to take this course

1.2. Activities and key dates for the course

2. Initiation

2.1. Learning outcomes that define the subject

2.2. Introduction

3. Context and competences

3.1. Goals

3.2. Context and meaning of the subject in the degree

3.3. Competences

3.4. Importance of learning outcomes

4. Evaluation

5. Activities and resources

5.1. General methodological presentation

The current subject "Project design" is organized into five main groups of activities: two of them run by the teacher (lectures and problems), another carry out by the students and teacher jointly, a fourth one consisting of self-study and finally the assessment written test:

- Lectures: in which the teacher will explain the theoretical concepts of the subject topics.
- Practical sessions: The teacher will explain the practical application on the concepts developed at the theoretical lectures, resolving practical problems. This session will take place at the classroom or at the computer laboratory.
- Tutorship practical sessions: Using technical software at the computer laboratory students will resolve, individually or in groups of two of them, the practical applications of concepts detailed in above paragraphs. Depending on the

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- duration of these practices it can be only initiated at class time and later on finished as a non-class activity bases.
- Assessment written test: Students will demonstrate the knowledge gained through two not mutually exclusive methods. One by continuing assessment throughout the course or, if these midterms tests are not passed successfully, a global written test on two calls.
- Personal study: Non-class activities in which students have to study the topics learnt at the class activities in order to understand and assimilate the theory taught in lectures and train the practical cases solved in the practical classes and prepare the written test.

Besides these activities there will be individual tutorials based on personalized attention by the teacher in order to help and resolve doubts and questions about the specific areas in which students have found more difficulties to be understood.

5.2.Learning activities

To the activity groups mentioned at the previous section the following workload has been assigned:

- Lectures / Theoretical classes 11 hours
- Practical classes 2 hours
- Tutorship practical sessions 38 hours
- Assessment written test 9 hours
- Personal study 90 hours

According this hours distribution a total 150 hours workload is reached, corresponding to the 6 credits ECTS that the subject has assigned during the second quarter of the third course of the Civil Engineer Bachelor's degree.

These 150 hours involve 15 week of class.

Individual tutorials are scheduled in a two hours per week basis.

5.3.Program

To reach the subject aims, this one is structured in 9 topics.

The detailed content of these topics is as follows:

TOPIC 1. GENERAL ASPECTS OF A CIVIL ENGINEERING PROJECT

- 1.1. The civil Works as an instrument of society
- 1.2. Civil Works requirements
- 1.3. The concept of civil Works and its implementation
- 1.4. Basic elements to consider In a civil engineering project
- 1.5. Civil corks life cycle and its influence on its concept and design

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1.6. The concentration of stages at civil works process

TOPIC 2. PROJECT DESIGN CONTRACT CONCERNING TO PUBLIC WORKS

2.1. Legislation concerning to public sector contracting

2.2. Process / sequence of the tender and award of public contracts

2.3. A project design as a type of public contract

2.4. Requirement to fulfil in order to contract a project design

2.5. Preparatory actions previous to a work contract

2.6. Award of project design contracts

2.7. Specific contracting law articles concerning services contracts

TOPIC 3. PREVIOUS STUDIES: FEASIBILITY STUDIES

3.1. Introduction

3.2. Feasibility studies aims

3.3. General methodology

3.3.1. General conditions, content and format

3.3.2. Input data and project environment knowledge

3.3.3. Technical study - Alternatives

3.3.4. Economic study

3.3.5. Environmental study

3.3.6. Other ítems to consider

3.4. Tools supporting decisión making

3.5. Multicriteria decisión models. General features

3.6. Method of "Weighted averages approach"

3.7. PRESS method

3.8. Other multicriteria methods

TOPIC 4. PROJECT DESIGN STANDARD DOCUMENTS

4.1. Introduction

4.2. Basic concept on standarization

4.3. Process to develop an European standard (UNE)

4.4. Purpose and background of the "Professional collegiate authorisation"

4.5. Origin and rationale of the standards series 157000

4.6. The AEN / CTN 157 committee "Proyectos"

4.7. UNE 157001

4.7.1. Rationale, purpose and scope

4.7.2. General requirements

4.7.3. Project design basic documents content

4.8. The family of UNE 157001 standards

4.9. Conclusions

TOPIC 5. DRAWINGS

5.1. Introduction

5.2. Designing

5.3. Formal expression

5.3.1. Outline

5.3.2. Standard formats

5.3.3. Drawing data box

5.4. Delineation

5.4.1. Dimension data

5.4.2. Labeling

5.4.3. Scales

5.5. General content

5.6. Specific content depending on drawing topics

5.6.1. Situation

5.6.2. Work overview / general definition

5.6.3. Setting out top view

5.6.4. General top view

5.6.5. Longitudinal diagram

5.6.6. Standard section

5.6.7. Cross sections

5.6.8. Structures

5.6.9. Replacement of affected services

5.6.10. Expropriations

TOPIC 6. SPECIFICATION

6.1. Introduction

6.2. Specification purposes

6.3. Specification structure

6.4. Specification scope

6.5. Normative

6.6. Description of the works

6.7. Materials

6.8. Facilities and equipment

6.9. Execution of the works

6.10. Quality assurance

6.11. Measurement and evaluation

6.12. Other specifications

6.13. Particular site Works conditions

TOPIC 7. MEASUREMENTS, VALUATIONS AND WORKS ESTIMATES

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7.1. Introduction

7.2. Works units

7.2.1. Definition and its writing

7.2.2. Definitions examples

7.3. Measurements

7.3.1. Auxiliary measurements

7.3.2. Measurements of the work units

7.3.3. Measurement examples

7.3.4. Linking with the work schedule

7.3.5. Ratios measurement

7.4. Price calculation

7.4.1. Stages

7.4.2. Type of costs

7.4.3. Workforce

7.4.4. Materials

7.4.5. Machinery

7.4.6. Indirect costs

7.4.7. Auxiliary prices

7.4.8. Unit prices

7.4.9. Lump sum payment units

7.5. Prices lists

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7.5.1. Unit prices list

7.5.2. Broken down prices list

7.5.3. Price ratios

7.6. Works estimates

7.6.1. Partial and chapters estimates

7.6.2. Quality assurance and health and safety estimates

7.6.3. Woks estimates global sum

7.6.4. Works estimates for public employer understanding

TOPIC 8. QUALITY PLAN OF A PROJECT

8.1. Quality concept

8.2. ISO 9000

8.3. Quality assurance plan of a work

8.4. Quality assurance plan of a project

8.5. Final thoughts

TOPIC 9. THE PROJECT REPORT AND ITS ANNEXES

9.1. Projects documents and their interrelationships

9.2. The project document No. 1

9.2.1. Normative

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9.2.2. Content and overall structure

9.2.3. Relationship with previous studies

9.3. Project report

9.3.1. Structuring proposal

9.3.2. Contenido

9.3.3. Variantes

9.4. Project report annexes

9.4.1. Annexes structuring

9.4.2. Basic information annex

9.4.3. Solutions study annex

9.4.4. Technical and constructive annexes

9.4.5. Economical and Time of phases completion annexes

9.4.6. Supplementary annexes

9.4.7. Odd annexes

9.4.8. Relevant annexes

9.5. Final thoughts

For the practical learning of the theoretical content of the subject the following projects will be carry out by the students synchronized in time with the theoretical contents:

1. Road
2. Sanitation pipeline network or irrigation ditch
3. Water supply network and irrigation
4. Bridge abutment or concrete work

5.4.Planning and scheduling

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Plannig

The theoretical and practical workload of the different topics is distributed according the table below:

| Nº | TEMA | T | P | PT | E | TI | TOTAL |
|----|--|---|---|----|---|-----|-------|
| 1 | GENERAL ASPECTS OF A CIVIL ENGINEERING PROJECT | 1 | | | | 1,5 | 2,5 |
| 2 | PROJECT DESIGN CONTRACT CONCERNING TO PUBLIC WORKS | 2 | | | | 5 | 7 |
| 3 | PREVIOUS STUDIES: FEASIBILITY STUDIES | 1 | | | | | 1 |
| 4 | PROJECT DESIGN STANDARD DOCUMENTS | 1 | | | | 1.5 | 2,5 |
| 5 | DRAWINGS | 1 | | 16 | | 23 | 40 |
| | Written assesment test I | | | | 2 | | 2 |
| 6 | SPECIFICATION | | | 3 | | 12 | 16 |
| 7 | MEASUREMENTS, VALUATIONS AND WORKS | 2 | 2 | 12 | | 37 | 53 |

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| | ESTIMATES | | | | | | |
| | Written assesment test II | | | | 2 | | 2 |
| 8 | QUALITY PLAN OF A PROJECT | 1 | | 3 | | 4 | 8 |
| 9 | THE PROJECT REPORT AND ITS ANNEXES | 1 | | 3 | | 5 | 10 |
| | Written assesment test III | | | | 2 | | 2 |
| | Final Written assesment test | | | | 3 | | 3 |
| | | 11 | 2 | 38 | 9 | 90 | 150 |

S.- Theoretical sesions / lectures

P.- Practical sesions /Problems

PT.- Computer lab workshop

E.- Written assesment test

TI.- Personal study

DESIGNATION OF SESSIONS ACCORDING TO THE WORKLOAD

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| Nº | TEMA | T | P | PT | E |
|----|---|----------------|---|--|---|
| 0 | ACADEMIC YEAR INTRODUCTION | S-000 | | | |
| 0 | SUBJECT INTRODUCTION AND LEARNING AIMS | S-011 | | | |
| 1 | GENERAL ASPECTS OF A CIVIL ENGINEERING PROJECT | S-111 | | | |
| 2 | PROJECT DESIGN CONTRACT CONCERNING TO PUBLIC WORKS | S-212 S-222 | | | |
| 3 | PREVIOUS STUDIES: FEASIBILITY STUDIES | S-311 | | | |
| 4 | PROJECT DESIGN STANDARD DOCUMENTS | S-411 | | | |
| 5 | DRAWINGS | S-511 | | PT-5116 PT-5216 PT-5316 PT-5416 PT-5516 PT-5616 | |

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|---|--|----------------|----------------|---|--------------|
| | | | | PT-5716 PT-5816 PT-5916 PT-51016 PT-51116 PT-51216 PT-51316 PT-51416 PT-51516 PT-51616 | |
| | Written assesment test I | | | | EV-I EV-I |
| 6 | SPECIFICATION | S-611 | | PT-613 PT-623 PT-633 | |
| 7 | MEASUREMENTS, VALUATIONS AND WORKS ESTIMATES | S-712 S-722 | P-712 P-722 | PT-7110 PT-7210 PT-7310 PT-7410 PT-7510 PT-7610 | |

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| | | | | PT-7710 PT-7810 PT-7910 PT-71010 | |
| | Written assesment test II | | | | EV-II EV-II |
| 8 | QUALITY PLAN OF A PROJECT | S-811 | | PT-813 PT-823 PT-833 | |
| 9 | THE PROJECT REPORT AND ITS ANNEXES | S-911 | | PT-913 PT-923 PT-933 | |
| | Written assesment test III | | | | EV-III EV-III |
| | Final Written assesment test | | | | EV-F-1 EV-F-1 EV-F-1 |
| TOTAL OF SESSIONS | | 11 | 2 | 38 | 9 |

(Eg. Designation meaning: PT-7210.- Tutorial practice corresponding to the topic 7, sesión 2 of 10)

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CALENDAR

| HORA | LECTURES | PRACTICAL | TUTORIAL SESSIONS | ASSESSMENT WRITTEN TEST |
|------|----------|-----------|-------------------|-------------------------|
| 1 | S-000 | | | |
| 2 | S-011 | | | |
| 3 | S-111 | | | |
| 4 | S-212 | | | |
| 5 | S-222 | | | |
| 6 | S-311 | | | |
| 7 | S-411 | | | |
| 8 | S-511 | | | |
| 9 | | | PT-5116 | |
| 10 | | | PT-5216 | |
| 11 | | | PT-5316 | |
| 12 | | | PT-5416 | |
| 13 | | | PT-5516 | |
| 14 | | | PT-5616 | |
| 15 | | | PT-5716 | |
| 16 | | | PT-5816 | |

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|----|-------|-------|----------|------|
| 17 | | | PT-5916 | |
| 18 | | | PT-51016 | |
| 19 | | | PT-51116 | |
| 20 | | | PT-51216 | |
| 21 | | | PT-51316 | |
| 22 | | | PT-51416 | |
| 23 | | | PT-51516 | |
| 24 | | | PT-51616 | |
| 25 | | | | EV-I |
| 26 | | | | EV-I |
| 27 | S-611 | | | |
| 28 | | | PT-613 | |
| 29 | | | PT-623 | |
| 30 | | | PT-633 | |
| 31 | S-712 | | | |
| 32 | S-722 | | | |
| 33 | | P-712 | | |
| 34 | | P-722 | | |
| 35 | | | PT-7110 | |
| 36 | | | PT-7210 | |

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|----|-------|--|----------|--------|
| 37 | | | PT-7310 | |
| 38 | | | PT-7410 | |
| 39 | | | PT-7510 | |
| 40 | | | PT-7610 | |
| 41 | | | PT-7710 | |
| 42 | | | PT-7810 | |
| 43 | | | PT-7910 | |
| 44 | | | PT-71010 | |
| 45 | | | | EV-II |
| 46 | | | | EV-II |
| 47 | S-811 | | | |
| 48 | | | PT-813 | |
| 49 | | | PT-823 | |
| 50 | | | PT-833 | |
| 51 | S-911 | | | |
| 52 | | | PT-913 | |
| 53 | | | PT-923 | |
| 54 | | | PT-933 | |
| 55 | | | | EV-III |
| 56 | | | | EV-III |

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|----|--|--|--|----------|
| 57 | | | | EV-F-1 |
| 58 | | | | EV-F-1I |
| 59 | | | | EV-F-1II |
| 60 | | | | EV-F-1V |

5.5. Bibliography and recommended resources

Basic bibliography

- Organización y gestión de proyectos y obras de los autores Germán Martínez Montes y Eugenio Pellicer Almiñana (Editorial Mc Graw Hill).
- Proyectos en licitación publicados en la página web oficial del Ministerio de Fomento.
- Valoración de obras en Ingeniería civil (Gonzalo de Fuentes Bescos)
- Pliego de prescripciones técnicas para obras de carretera y puentes (PG-3; MFOM)
- Real Decreto Legislativo 3/2011 por el que se aprueba el texto refundido de la Ley de Contratos del Sector Público. (TRLCSP) (BOE núm 276 ; 16nov2011)
- Presto . Tercera Edición. (Mc Graw Hill; R. de Benito Arango y A.J. Sánchez Granda)
- Autocad aplicado a la topografía (Editorial Politécnica de Valencia; Joaquín Gaspar Mora Navarro) o la nueva versión "Autocad aplicado a la ingeniería civil"

Complementary bibliography

- Aspectos a considerar en la redacción de estudios y proyectos de obras civiles. Cuadernos CICCOP núm. 16.
- Procedimientos generales de construcción y organización de obras de Antonio Lara Galera (Editorial Cuadernos ES ICCP Madrid).