

SUBJECT TEACHING GUIDE

G1986 - Organisation of Works (BIM)

Degree in Civil Engineering First Degree in Civil Engineering

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Civil Engineering First Degree in Civil Engineering			Type and Year	Compulsory. Year 4 Compulsory. Year 4
Faculty	School of civil Engineering				
Discipline	CONSTRUCTION ENGINEERING				
Course unit title and code	G1986 - Organisation of Works (BIM)				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web	https://web.unican.es/centros/caminos/estudios/asignaturas?p=212&c=2020				
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. TRANSPORTES Y TECNOLOGIA DE PROYECTOS Y PROCESOS
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3.1 LEARNING OUTCOMES

- The student must acquire the following knowledge:

- General aspects of the bidding process for public works.
- Identification and determination of the functions of the stakeholders involved in a work.
- Identification and analysis of the project draft documents.
- Previous activities to be carried out before the start of the works.
- Cost control.
- Scheduling techniques: Gantt charts, precedence and space-time.
- Management of the project contract: monthly certifications, price revisions, guarantees, penalties, termination of the contract, payment methods.

The student must be able to:

- Extract and analyze the necessary information from a project for the execution of the works.
- Select the most appropriate construction methods according to cost and deadline.
- Estimate the cost of the work units of a project based on the construction procedure, production rates, machine costs, labor costs and external resources.
- Schedule the sequence of activities for the execution of the project using Gantt charts, precedence networks and Space-Time Diagrams
- Carry out the cost and time monitoring of the work throughout its execution: control real costs and compare them with estimates and the contract price.
- Manage the project contract: know how to prepare a monthly certification, a price review, classify a contractor, etc.
- Interpret drawings and make measurements of excavations, back fillings, formwork, concrete and reinforcement.
- Prepare a budget for a project using a software such as Presto or similar
- Prepare a temporary schedule of a project using a software such as Microsoft Project or similar
- Link a 3D BIM model with a schedule to generate a 4D BIM model
- Link a 3D BIM model with a budget to generate a 5D BIM model

The student must develop the following attitudes:

- Be able to express themselves in writing with a logical structure, spelling correction and adequate presentation.

4. OBJECTIVES

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6. SUBJECT PROGRAM

CONTENTS

1	<p>BLOCK 1: The construction sector. Life cycle of a work. Stakeholders involved. Feasibility studies, preliminary projects and construction projects. Introduction to the Spanish Law on Contracts with the Public Sector. Public tenders. Contractor classification. (Part of the content may be added or replaced by talks on similar topics by invited experts. Visits to construction sites may be added)</p>
2	<p>BLOCK 2: - Initial study of the project and the project contract. Initial planning of the work. Start of the work: Health & Safety Plan, permits, auxiliary installations, etc. Payment Methods. Control during execution: actual vs. estimated costs and projected durations, certifications, payments. Deviations and modifications in the works contract. (Part of the content may be added or replaced by talks on similar topics by invited experts. Visits to construction sites may be added)</p>
3	<p>BLOCK 3: Cost estimation: examples of work units. Schedule of works: Gantt charts, precedence networks, space-time charts. Measurements: excavations and fillings, formwork, concrete, reinforcement. (Part of the content may be added or replaced by talks on similar topics by invited experts. Visits to construction sites may be added)</p>
4	<p>BLOCK 4: Computer practice of scheduling software (Microsoft Project or similar), budgets (Presto or similar), BIM4D (Naviswork or similar), BIM5D (Cost-it or similar). Students must attend the computer practices with their laptop. They will be provided with educational licenses for the software.</p>

7. ASSESSMENT METHODS AND CRITERIA

Description	Type	Final Eval.	Reassessn	%
Exam (theory and exercises)	Written exam	Yes	Yes	50,00
Case studies to be submitted individually during the course	Others	No	No	20,00
Assessment of computer practises through handing a portfolio with solved exercises	Work	Yes	Yes	30,00
TOTAL				100,00

Observations

Students must only recover those parts of the subject that have failed (grade lower than 5), and may not take any part that they have passed (grade equal to or greater than 5). Obtaining the minimum grade of 4 in a part of the subject allows the application of the indicated weighting in that call.

Students with a grade in the ordinary call of one of the recoverable parts between 4 and 5, may choose to take the exam of the extraordinary call or not. In the event that they do not take that part, the grade obtained in the ordinary call will be kept for the calculation of the overall grade of the subject. In the event that they are presented, they will be considered the maximum grade between the ordinary and extraordinary call of that part for the calculation of the overall grade of the subject.

No approved part may be saved from one year to the next.

In the recovery period, the evaluation procedure for an activity will be the same as that for the activity that originates it.

Note: According to Royal Decree RD 1125/2003 on the European credit system and the grading system in university degrees of an official nature and valid throughout the national territory, the results obtained by the student in each of the subjects of the curriculum will be graded according to the following numerical scale from 0 to 10, with the expression of one decimal, to which the corresponding qualitative grade may be added: 0.0-4.9: Fail (SS). 5.0-6.9: Pass (AP). 7.0-8.9: Notable (NT). 9.0-10: Outstanding (SB).

Observations for part-time students

Students who decide to take the subject part-time and who therefore cannot regularly attend TE/PA or PO classes, will be evaluated in the same way as students with ordinary dedication. The only exception is that the evaluation of the computer practice will be carried out on the same day as the written exam of theory and problems (ordinary or extraordinary call). The student will be responsible for learning on their own how to use the software taught in the computer practices.

8. BIBLIOGRAPHY AND TEACHING MATERIALS

BASIC

Apuntes de la asignatura disponibles en el Aula Virtual.
Organización y control de obras / Daniel Castro Fresno, José Luis Aja Setién. Editorial: Santander, Servicio de Publicaciones de la Universidad de Cantabria, D.L. 2005.