Universidad Zaragoza

Academic Year/course: 2022/23

28723 - Construction Works

Syllabus Information

Academic Year: 2022/23
Subject: 28723 - Construction Works
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 423 - Bachelor's Degree in Civil Engineering
ECTS: 6.0
Year:
Semester: First semester
Subject Type: Compulsory
Module:

1. General information

1.1. Aims of the course

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The course and its expected results respond to the following approaches and objectives:

In the first place, enabling students to learn about the world in which they are going to carry out their professions and the regulations that affect them.

Secondly, students must acquire the necessary skills that will allow them to know, understand, design and implement systems and construction processes related to the building work, that is, foundations, containments, structures, claddings, covers, coatings and pavements.

These approaches and objectives are in line with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), in such a way that the acquisition of the course learning outcomes provides training and competence to contribute to their achievement to some degree.

(3) Good Health and Well-being.

(4) Quality Education.

(6) Clean Water and Sanitation.

(7) Affordable and Clean Energy.

(9) Industry, Innovation and Infrastructure.

(11) Sustainable Cities and Communities.

(12) Responsible Consumption and Production.

(13) Climate Action.

1.2. Context and importance of this course in the degree

The course of Building Works is the first contact that students of Civil Engineering have with building itself. From here, they begin to become aware of how the construction process develops in the building world.
It is part of a group of specific compulsory training subjects, belonging to the "Building and Prefabrication" area of Civil Constructions. These courses will provide graduates with further professional skills.

1.3. Recommendations to take this course

The course on Building Works does not require other prerequisites than those established for the access to the degree. However, for the progress of the course, knowledge and strategies from the courses of Technical Drawing, for the representation of constructive details, and of Physics and Mechanics for the understanding of concepts related to structure systems will be an asset.

2. Learning goals

2.1. Competences

Upon passing the subject, the student will be more competent to ...

1. Knowledge of the traditional or prefabricated materials and construction systems used in the building, their varieties and the physical and mechanical characteristics that define them.

2. Identify the elements and construction systems, define their function, compatibility and their implementation in the construction process, as well as propose and resolve construction details.

3. Know the specific control procedures of the material execution of the building work.

4. Diagnose the causes and manifestations of building injuries, propose solutions to prevent or correct pathologies, and analyze the life cycle of elements and construction systems.

5. Apply technical regulations to the building process, and generate technical specification documents for construction procedures and methods of buildings.

and for those defined in the verification memory:

G01. Ability for organization and planning.

G02. Ability to solve problems.

G03. Ability to make decisions.

G04. Aptitude for oral and written communication in their mother tongue.

G05. Ability for analysis and synthesis.

G06. Ability to manage information.

G07. Ability for teamwork.

G08. Ability for critical thinking.

G09. Ability to work in an interdisciplinary team.

G10. Ability to work in an international context.

G11. Ability to improvise and adapt themselves to face new situations.

G12. Leadership ability.

G13. Positive social attitude towards social and technological innovations.

G14. Ability to give arguments, discuss and present ideas.

G15. Communication skills through word and image.

G16. Ability to Search, analyze and select information.

G17. Ability for independent learning.

G23. Learn and understand the respect to fundamental rights, equal opportunities between men and women, universal accessibility for people with disabilities, and respect for the values ??of the culture of peace and democratic values.

G24. Foster entrepreneurship.

G25. Knowledge on information and communication technology.

CB1 - Students must have shown knowledge in an area of ??study that starts from the base of general secondary education, and is usually found at a level that, although supported by advanced textbooks, also includes some aspects that imply knowledge coming from the forefront of their field of study

CB2 - Students must know how to apply their knowledge to their work or vocation from a professional approach and possess the skills that are usually verified through the elaboration and defense of arguments and problem solving within their area of ??study

CB3 ? Students must have the ability to gather and interpret relevant data (usually within their area of ??study) to convey views that include a reflection on relevant issues of a social, scientific or ethical nature

CB4 - Students must be able to convey information, ideas, issues and solutions to a specialized and non-specialized audience

CB5 ? Students must have developed those learning skills necessary to undertake further studies with a high degree of independence.

Likewise, the subject of Building Works is associated with the professional competence **E02** of the verification report:

E02: Knowledge of the project, calculation, construction and maintenance of building works in terms of structure, finishes, facilities and equipment.

2.2. Learning goals

The student, to pass this subject, must demonstrate the following outcomes ...

Have knowledge of the traditional or prefabricated construction systems used in construction and their varieties.

Be able to identify the elements and construction systems, define their function and compatibility, and their implementation in the construction process.

Know how to plan and solve construction details, as well as come up with, design, define, detail and solve elements, processes and construction systems technically and technologically.

Be able to apply technical regulations to the building process, and generate technical specification documents for construction procedures and methods.

2.3. Importance of learning goals

The course of Building Works means, somehow, the introduction of the student in the building world, and offers training with content to be applied and developed in the student's professional future.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

The student must demonstrate that they have achieved the expected learning outcomes through the following assessment activities

At the beginning of the course the student will choose one of the following two assessment methodologies:

? Global assessment, with continuous monitoring: Students must take and pass the practical tests, the academic tasks proposed in the course within scheduled deadlines, and a final written test.

? Global assessment, without continuous monitoring: Students don?t need to take or pass the practical tests or academic tasks proposed in the course. In this case, students, in addition to taking the final written test, must pass a final practical test, which will be taken on the same day as the written exam, which will be a compendium of the practice tasks done during the course and based on a project about a real building.

The term and mode of delivery of practical tests and academic work will be explained in the assignments

1.- **GLOBAL ASSESSMENT MODE, CONTINUOUS MONITORING**

The assessment mode will be global with continuous monitoring, and the teacher will evaluate the student's participation in the lectures, the demonstration of the knowledge acquired and the ability to solve problems that the teacher will observe in the practical classes. Likewise, the work / project carried out, in group, by the student will be evaluated. Finally, the student must take a final written test on the theoretical content of the subject.

The following table summarizes the indicative weights of the parts mentioned in the assessment process.

Participation in theoretical classes	10%
Individual and Group Practice Tasks	40%
Final Written Test	50%

Each of the parts passed in the subject, will not be evaluated again during that academic year.

The grade obtained in the practical tasks, provided that the minimum required, 4.0, is reached, will be valid exclusively in the two calls of the academic year.

All students, who do not reach the necessary minimum grades required in the practical tests or academic work proposed in the subject, will automatically go to the global assessment mode without continuous monitoring.

2.- **GLOBAL ASSESSMENT MODE WITHOUT CONTINUOUS MONITORING**

The student must choose this modality when, for their personal situation, cannot adapt to the work rhythm required in the global assessment mode with continuous monitoring.

The student, in addition to the final written test, must take a final practical test, which will be seated on the same day as the exam, which will be a compendium of the practices developed during the course and will be based on a proposed drafting about a real building.

Throughout the course, the student will be able to modify the evaluation system depending on the evolution of their personal situation.

The following table summarizes the maximum indicative weights of the parts mentioned in the assessment process.

Final Practice Test	50%
Final Written Test	50%

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The methodology followed in this course is oriented towards the achievement of the learning objectives. A wide range of teaching and learning tasks are implemented, such as lecture, practice sessions, laboratory sessions, and tutorials.

A strong interaction between the teacher/student is promoted. This interaction is brought into being through a division of work and responsibilities between the students and the teacher. Nevertheless, it must be taken into account that, to a certain degree, students can set their learning pace based on their own needs and availability, following the guidelines set by the teacher.

The current course is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each topic, the solving of problems or resolution of questions and laboratory work, and at the same time supported by other activities.

The approach, methodology and assessment of this guide are intended to be the same for any teaching scenarios. They will be adapted to the social-health situation at any particular time, as well as to the instructions given by the authorities concerned.

4.2. Learning tasks

This course is organized as follows:

- **Lectures**: Theoretical activities carried out mainly through exposition by the teacher, where the theoretical supports of the subject are displayed, highlighting the fundamental, structuring them in topics and or sections, interrelating them.
- **Practice sessions:** The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Laboratory sessions**: The lecture group is divided up into various groups, according to the number of registered students, but never with more than 20 students, in order to make up smaller sized groups.
- **Tutorials**: Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.
- The programme offered to the student to help them achieve their target results is made up of the following activities...
- **Autonomous work and study**:
    - Study and understanding of the theory taught in the lectures.
    - Understanding and assimilation of the problems and practical cases solved in the practice sessions.
    - Preparation of seminars, solutions to proposed problems, etc.
    - Preparation of laboratory workshops, preparation of summaries and reports.
    - Preparation of the written tests for continuous assessment and final exams.

This course has 6 ECTS credits, which represents 150 hours of student work in the subject during the trimester, in other words, 10 hours per week for 15 weeks of class.

A summary of a weekly timetable guide can be seen in the following table. These figures are obtained from the course file in the Accreditation Report of the degree, taking into account the level of experimentation considered for this course is moderate.

Activity	**Weekly hours**
Lectures	3
Laboratory sessions	1
Other Activities	6

Nevertheless, the previous table can be shown in greater detail, taking into account the following overall distribution:

? 40 hours of lectures, with 50% theoretical demonstration and 50% solving type problems.

? 10 hours of laboratory workshop, in 1 or 2-hour sessions.

? 6 hours of written assessment tests, one hour per test.

? 4 hours of PPT presentations.

? 90 hours of personal study, divided up over the 15 weeks of the 2nd semester.

There is a tutorial calendar timetable set by the teacher that can be requested by the students who want a tutorial.

4.3. Syllabus

Theory

Unit 1	**The Building Process in Construction** Building concept. Regulatory Scope (LOE). Building Types. Basic requirements. Intervening Agents. Resp
Unit 2	**Soils, Remapping and Earthworks.** Land Characteristics: Site and Soil. Geotechnical study. Types of soils. Remapping Concept. Remapping t terminology. Machines
Unit 3	**Foundations** Definition and Typologies. Direct Foundations. Allowable and Collapsing Pressures. Critical situations.
Unit 4	**Deep Foundations.** Definition and typologies. Micropiles, Piles and Screens: application scope, types and building process.
Unit 5	**Walls.** Definition. Classification. Working method. Critical Situations. Building process process. Joints. Drains.
Unit 6	**Structures and Concrete Framing.** Structure Concept. Types of Structures. Elements of Structures. Transmission of Loads. Concrete Feature Construction and Details. Framing Concept. Building. Typologies: unidirectional and bidirectional slabs. Pr
Unit 7	**Stairs.** Definition. Elements that make them up. Classification and Types. Design and Calculation. Building. Const
Unit 8	**Metal Frames.** Profile Types. Simple Profiles and Compound Profiles. Welded joints. Construction of structural elements.
Unit 9	**Timber Frames.** Timber Types. Protection. Joints and Fixing Elements. On-site Installation. Constructive details.
Unit 10	**Masonry Frames.** Masonry Types. Mortars. Frameworks. Joints. Types of walls. Bonds. Construction and On-site Installation
Unit 11	**Facing Brick Facades.** Wrapping concept. Terminology. Double Layer Claddings. On-site Installation: Remappings, Building and
Unit 12	**Interior Divisions.** Brick Masonry. Remapping. On-site Installation
Unit 13	**Continuous Coatings.** Trim and Plaster. Fillings. Cement Plastering.
Unit 14	**Flooring.** Concrete Floors, joints and their on-site installation. Ceramic, Stoneware and Stone Floors.
Unit 15	**Roofs.** Sealing concept. Types of Roofs. Classification. Design and Construction. Constructive Solutions. Compor

Practice

Practice No. 1	**Earth Movement Calculations and / or Soil Classification.**
Practice No. 2	**Design of Shallow Foundations.**
Practice No. 3	**Determination of the state of Loads in Slabs and Design of Structure Decks**
Practice No. 4	**Stair Calculation and Design.**
Practice No. 5	**Facing Brick Masonry Stakeout**
Practice No. 6	**Roof Design**

4.4. Course planning and calendar

Classroom Session Calendar and Presentation of Projects

Lectures

Week 1	**The Building Process in Construction**
Week 2	**Soils, Remapping and Earthworks.**
Week 3	**Foundations**
Week 4	**Deep Foundations.**
Week 5	**Walls.**
Week 6	**Structures and Concrete Framing.**
Week 7	**Stairs.**
Week 8	**Metal Frames.**
Week 9	**Timber Frames.**
Week 10	**Masonry Frames.**
Week 11	**Facing Brick Facades.**
Week 12	**Interior Divisions.**
Week 13	**Continuous Coatings.**
Week 14	**Flooring.**
Week 15	**Roofs.**

Practical classes

Practice No. 1 (week 3)	**Earth Movement Calculations and / or Soil Classification.**
Practice No. 2 (week 4)	**Design of Shallow Foundations.**
Practice No. 3 (week 7)	**Determination of the state of Loads in Slabs and Design of Structure Dec**
Practice No. 4 (week 10)	**Stair Calculation and Design.**
Practice No. 5 (week 13)	**Facing Brick Masonry Stakeout**
Practice No. 6 (week 15)	**Roof Design**
According to Calendar	**Final Written Test**
According to Calendar	**Final Practice Test**

Material Resources

Material	**Medium**
Course Syllabus Notes	Paper / Moodle
Constructive Detail Appendixes	Paper / Moodle
Implementation Photo Appendixes	Moodle / Projector
Practice Tasks	Paper / Moodle

Technical-commercial information	Moodle / Internet
Regulations Concerned	Moodle

To achieve the learning outcomes, the following activities will be carried out:

- Generic classroom activities:

? Theoretical-practical classes: The theoretical concepts of the subject will be explained and illustrative practical examples will be developed to support the theory when necessary.

? Practical classes: Practical cases will be carried out as a complement to the theoretical concepts studied.

- Non-classroom generic activities:

? Study and assimilation of the theory explained in the master classes.

? Understanding and assimilation of examples and practical cases

? Preparation of exercises and practical cases to be solved by the student

? Preparation of written continuous assessment tests and final exams.

- Supporting activities: With a mainly non-classroom nature, various activities that support the basic contents of the subject will be conducted through the virtual teaching portal (Moodle), where these activities will be monitored and sometimes customized.

The weekly schedule of the course and the assessment dates in each call will be shown on the EUPLA website

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28723