Universidad Zaragoza

Year : 2019/20

28745 - Extension of Structures

Syllabus Information

Academic Year: 2019/20
Subject: 28745 - Extension of Structures
Faculty / School: 175 -

Degree: 423 - Bachelor's Degree in Civil Engineering

ECTS: 6.0
Year: 4
Semester: First semester
Subject Type: Compulsory
Module: ---

1.General information

1.1.Aims of the course

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

At the end of the subject, the student will have the necessary knowledge to discern about the structural behavior of different types of straight concrete bridges and to define frame models of behavior equivalent to a real bridge, which can be calculated with computer tools for calculating structures. It will also acquire knowledge about the behavior and design parameters of the rest of the parts of the bridges.

Another transport infrastructure of great importance in the Civil Engineer's training are the tunnels. In this subject it is intended that the student acquires a global vision of the tunneling process from the design to the construction, showing the basic design parameters and the different methods of construction and monitoring.

It is also intended that the student can handle mixed structural sections (concrete - steel) composed of materials with different characteristics and structural and rheological behavior, acquire knowledge in the Finite Element Method being able to solve two-dimensional elasticity problems with a number small of elements and that takes conscience of when it is necessary the dynamic analysis of structures, being able to define models in a dimension.

1.2.Context and importance of this course in the degree

The subject of Extension of Structures, is part of the Degree in Civil Engineering taught by EUPLA, framed within the group of subjects that make up the module called Common Formation. It is a subject of fourth course located in the first quarter and mandatory (OB), with a teaching load of 6 ECTS credits.

This subject implies the application of previous knowledge acquired in the degree to subjects that have to do with specific competences of the degree, such as the design and construction of bridges and tunnels. You can not understand a civil engineer without a foundation in these basic subjects of the profession.

1.3.Recommendations to take this course

It is recommended to have completed and possibly approved the subjects of Structural Theory, Structural Technology and Geotechnics.

2.Learning goals

2.1.Competences

2.2.Learning goals

2.3.Importance of learning goals

3.Assessment (1st and 2nd call)

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

4.Methodology, learning tasks, syllabus and resources

4.1.Methodological overview

Presentation general methodology

The learning process designed for this subject is based on the following:

Strong interaction between the teacher/student. 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 subject is conceived as a stand-alone combination of contents, yet organized into three fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, the solving of problems or resolution of questions and laboratory work, at the same time supported by other activities

The organization of teaching will be carried out using the following steps:

- **Theory Classes**: 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.
- **Practical Classes**: The teacher resolves practical problems or cases for demonstrative purposes. This type of teaching complements the theory shown in the lectures with practical aspects.
- **Individual Tutorials**: Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

4.2.Learning tasks

Programmed learning activities

The programme offered to the student to help them achieve their target results is made up of the following activities...

Involves the active participation of the student, in a way that the results achieved in the learning process are developed, not taking away from those already set out, the activities are the following:

Face-to-face generic activities:

- **Theory Classes**: The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.
- **Practical Classes**: Problems and practical cases are carried out, complementary to the theoretical concepts studied.

Generic non-class activities:

- Study and understanding of the theory taught in the lectures.
- Understanding and assimilation of the problems and practical cases solved in the practical classes.
- Preparation of seminars, solutions to proposed problems, etc.
- Preparation of the written tests for continuous assessment and final exams.

The subject 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 subject file in the Accreditation Report of the degree, taking into account the level of experimentation considered for the said subject is moderate.

Activity / Weekly school hours

Lectures / 4

Other Activities / 6

4.3.Syllabus

Set of topics

Topic 1. Bridges

Topic 2. Composite construction in steel and concrete
Topic 3. Tunnels
Topic 4. Finite Element Methods
Topic 5. Dynamic analysis of structures

4.4.Course planning and calendar

Calendar of meetings attend them and presentation of works

The dates of both final examinations will be the published ones of official form in http://www.eupla.unizar.es/asuntos-academicos/examenes

The dates of the partial tests will communicate to the beginning of the classes.

4.5.Bibliography and recommended resources

http://biblos.unizar.es/br/br_citas.php?codigo=28745&year=2019