Universidad Zaragoza

Academic Year/course: 2023/24

28758 - Water Resources

Syllabus Information

Academic year: 2023/24
Subject: 28758 - Water Resources
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 423 - Bachelor's Degree in Civil Engineering
ECTS: 6.0
Year: 4
Semester: Second semester
Subject type: Optional
Module:

1. General information

The subject "Water Resources" includes competencies related to the rational management of water resources, addressing both the different types of resources and demands, their spatio-temporal distribution and the strategies to optimize such management to face both sustainable development and the challenges of climate change. These competences are directly related, moreover, to the construction of hydraulic infrastructures, but also to their operatingconditions.

The approach and objectives of the course are aligned with the Sustainable Development Goals of the United Nations Agenda 2030 (https://www.un.org/sustainabledevelopment/es/) specifically with the achievement of targets 6.4, 6.5 and 6.6 of Goal 6, target 11.B of Goal 11 and target 12.2 of Goal 12.

2. Learning results

The approach of the subject aims that, as learning results, the students will be able to: - Know the different tools for the regulation of water resources and their optimal way of use.

- To propose and carry out the necessary studies for the planning and management of water resources.

- Quantitatively determine the water demands of the different uses (domestic, industrial, agricultural).

- To analyze situations derived from incorrect water resource management strategies (such as water deficit situations), as well as to propose possible solutions and their respective advantages and disadvantages.

3. Syllabus

The contents of the subject are articulated on the basis of fourteen didactic units, which will be developed sequentially during the following four-month period.

1.- Hydrological planning

2.- Water resources. Basic concepts

3.- Water uses. Basic concepts

4.- Domestic water uses

5.- Industrial water uses

6.- Agricultural water uses

7.- Water quality as a function of use

8.- Guarantee of demand

9.- Surface water exploitation

10.- Groundwater exploitation

11.- Water reuse

12.- Water desalination

13.- Extreme hydrological situations: floods, landslides, flooding

14.- Extreme hydrological situations: drought

4. Academic activities

The teaching methodology of this subject is based on a series of organized and directed classroom activities, in which the basic concepts will be taught, which will be complemented with the realization of an autonomous individual work and of a practical nature. The teaching methodology can be schematized as follows:

A) Face-to-face activities: They will be developed at the Center, with the distribution in theory and practice groups according to the schedule of the degree and with the time dedication that is indicated.

- Theoretical classes: Teaching of the theoretical concepts of the subject (50 hours)
- Tutored practical sessions: Presentation of examples, proposal and resolution of problems in a tutored manner by the teacher, in relation to the theoretical concepts taught in the theoretical classes (10 hours).

B) Individual work not presential: - The students will have to carry out an individual work, which will involve the analysis of a specific situation in which they will have to apply the theoretical and practical concepts developed in the presential activities, with the support of the teacher in tutorials. The dedication of students to this individual workis estimated at 25 hours.

5. Assessment system

The proposed assessment system is of a continuous type, for which it will be necessary to attend at least 80% of the face-to-face activities and will have the following scheme of gradable activities:

1º.- Continuous assessment tests: There will be two mandatory written tests in the system of continuous assessment, which will be distributed throughout the subject, one in the middle and one at the end of the term. These tests will include theoretical-practical questions and problems of the corresponding topics. This activity will contribute globally with 80% to the final grade, and a minimum grade of 4 out of 10 must be obtained in each written test, otherwise the activity will be considered failed.

2º.- Individual work: It will be selected jointly by the student and the teacher, and it will develop one or several of the aspects covered in the topics of the subject, but from an eminently practical perspective. This activity will contribute 20% to the final grade of the subject.

As an alternative to the continuous assessment mode, when due to a personal and reasonably justifiable situation, the student cannot adapt to the pace of work required in the continuous assessment system, the student may use the global assessment system, which will be resolved by means of an evaluation test on the dates of the two official exams, in which the student will have to answer the theoretical and practical questions related to the different activities developed in the subject.