

28736 - Water Resources

Syllabus Information

Academic Year: 2019/20

Subject: 28736 - Water Resources

Faculty / School: 175 -

Degree: 423 - Bachelor's Degree in Civil Engineering

ECTS: 6.0

Year: 4

Semester: Second semester

Subject Type: Compulsory

Module: ---

1.General information

1.1.Aims of the course

The integrated management of water resources is one of the most outstanding aspects in the fight against Climate Change and for a sustainable development. The first institution that established this integrated management was the Confederación Hidrográfica del Ebro in 1926, since then it is an example to be imitated that is spreading throughout the world and that was ratified in the Water Framework Directive of the European Union. The importance of the adequate management of these resources is increasingly more pressing due to the circumstances of Climate Change, and it is necessary to have technicians with sufficient knowledge to deal with these problems. This course provides the necessary knowledge for the optimal management of resources.

1.2.Context and importance of this course in the degree

This course forms part of the Degree in Civil Engineering taught by EUPLA. It is part of the group of subjects that make up the module called Specific Training of the itinerary in Hydrology. It is a subject of third course located in the second semester and compulsory (OB), with a teaching load of 6 ECTS credits. However, this subject can be taken as an optional subject within the formative path of Civil Constructions.

1.3.Recommendations to take this course

There is no special recommendations to take this course. However, the contents handled will require the skills and abilities acquired in the following subjects, so it is strongly recommended to be enrolled (or have passed) in them:

- Ampliación de Hidráulica e Hidrología: This provide knowledge of the basic concepts that will be handled in the development of the course.
- Ampliación de Hidrología Superficial: Although it is developed in parallel to this subject, the concepts shown are complementary to it.
- Ampliación de Hidrología Subterránea: Although it is developed in parallel to this subject, the concepts shown are complementary to it.

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

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 two fundamental and complementary forms, which are: the theoretical concepts of each teaching unit, and the solving of problems/resolution of questions.

4.2. Learning tasks

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:

1. **Theory Classes:** The theoretical concepts of the subject are explained and illustrative examples are developed as support to the theory when necessary.
2. **Practical Classes:** Problems and practical cases are carried out, complementary to the theoretical concepts studied.
3. **Individual Tutorials:** Those carried out giving individual, personalized attention with a teacher from the department. Said tutorials may be in person or online.

? Generic non-class activities:

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

4.3. Syllabus

The theoretical contents are articulated on the basis of fifteen teaching units:

- 1.- Hydrological planning
- 2.- Water Resources. Basic concepts
- 3.- Uses of water. Basic concepts
- 4.- Domestic use of water
- 5.- Industrial use of water
- 6.- Agricultural use of water
- 7.- Water quality based on usage
- 8.- Guarantee of water demand
- 9.- Management of surficial waters
- 10.- Management of ground waters
- 11.- Water reuse
- 12.- Water desalination
- 13.- Extreme events: floodings
- 14.- Extreme events: droughts

4.4. Course planning and calendar

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

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

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

? 4 hours of written assessment tests, two hours per test.

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

4.5. Bibliography and recommended resources

<http://psfunizar7.unizar.es/br13/egAsignaturas.php?id=9326&p=1>