

28717 - Extension of Hydraulic Engineering and Hydrology

Syllabus Information

Academic year: 2023/24

Subject: 28717 - Extension of Hydraulic Engineering and Hydrology

Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia

Degree: 423 - Bachelor's Degree in Civil Engineering

ECTS: 6.0

Year: 2

Semester: Second semester

Subject type: Compulsory

Module:

1. General information

The main objective of the subject is to provide students with knowledge of the concepts and technical aspects related to free sheet piping systems and the basic concepts of surface and underground hydrology.

These approaches and objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>), so that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement:

- Goal 6: Clean water and sanitation (Targets 6.3 and 6.6)
- Goal 9: Industry, innovation and infrastructure (Goal 9.1)
- Goal 11: Sustainable cities and communities (Goals 11.4 and 11.5)
- Goal 13: Climate action (Goals 13.1 and 13.3)

2. Learning results

The student, in order to pass this subject, must demonstrate the following learning results:

- Knowledge of the general laws of fluids in motion and the technical aspects related to free sheet piping systems.
- Knowledge for the detailed calculation of the vertical layout of the free surface of a channel, or flow profile.
- Basic knowledge of the hydrological cycle, the concepts of precipitation, hydrological losses and estimation of peak flow through the rational method.
- Basic knowledge of the laws of flow in porous media.

3. Syllabus

The content of the subject is based on five didactic units indicated below.

These topics include the contents necessary for the acquisition of the predetermined learning outcomes.

Topic 1. Free sheet flow.

Equations of free sheet flow.
Normal draft.
Critical draft.
Uniform Permanent Regime.
Gradually Varied Permanent Regime.
Hydraulic Highlight.

Topic 2. Hydraulic structures and flow measurements.

Holes and weirs.

Topic 3. Reduced models.

General considerations. Dimensional analysis and similarity equations (Buckingham's theorem).

Topic 4. Introduction to the hydrological cycle.

Precipitation, hydrological losses and rational method for determining peak flows.

Topic 5. Introduction to groundwater hydrology.

4. Academic activities

The teaching methodology of this subject is based on the development of the following activities:

Lectures: These are lectures on theoretical arguments or problem solving given by the professor.

Seminars/workshops: Theoretical or practical discussion activities conducted in the classroom or in other forums by visiting professors.

Laboratory practices: Practical activities carried out in the laboratories under the tutoring of the subject's teachers, which will be followed by autonomous activities by the students.

Visits: Didactic visits related to the topics developed throughout the subject.

Individual or group tutoring: may be face-to-face or virtual.

5. Assessment system

There are two assessment options:

Continuous assessment system

The weights of the different activities are summarized below. Students who do not attend a minimum of 80% of the face-to-face activities or who do not pass the minimum required for the partial tests, practicals or academic assignments proposed in the subject and on the established dates, will pass to the global assessment model.

Assessment activity Weighting

Participation in face-to-face activities 5%

Practices 5%

Continuous assessment exam I 70%

Continuous evaluation exam II 20%

The continuous assessment exams will consist of a written test with a theoretical content (approximately 20%) and problems (approximately 80%). The first exam will include Topics 1 and 2 and the second exam will include Topics 3, 4 and 5.

Global final assessment.

Students must opt for this modality when they do not pass the subject in the continuous assessment modality. In this case, the evaluation consists of a single test on theory, problems and laboratory practice. The final grade of the global assessment test will be given by:

Note: MAX (90% - Exam grade + 5% - Practical grade + 5% - Presential activities grade; Exam grade)

The global exam of non-continuous assessment will be held at the end of the semester according to the official calendar of the center and will consist of a written test on theoretical arguments (approximately 20%) and problems (approximately 80%) of the topics covered in class.