

28921 - Hydraulics

Syllabus Information

Academic year: 2024/25

Subject: 28921 - Hydraulics

Faculty / School: 201 - Escuela Politécnica Superior

Degree: 583 - Degree in Rural and Agri-Food Engineering

ECTS: 6.0

Year: 3

Semester: First semester

Subject type: Compulsory

Module:

1. General information

The general objective of the Hydraulics subject is for students to acquire advanced knowledge in a discipline, hydraulics, which is essential for professional work related to agricultural irrigation or hydraulic installations in the agri-food industry.

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/>), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to their achievement: SDG6 - Ensure availability and sustainable management of water and sanitation for all.

SDG7 - Ensure access to affordable, secure, sustainable and modern energy for all.

2. Learning results

- To understand and apply the basic principles of hydraulics, both in free sheet flow and pressurized flow.
- Guarantee efficient use of water resources and ensure sustainability in the extraction and supply of freshwater (this outcome is aligned with SDG6, target 6.4).
- Achieve energy efficiency in pumping systems, through affordable, reliable and modern energy services, based on renewable energy to the extent possible (this result is aligned with SDG7, targets 7.2 and 7.3).
- Design and analyze basic hydraulic installations, both in free-flowing and pressurized flow, in an efficient and sustainable manner (this result is aligned with SDG6, target 6.4 and SDG7, targets 7.2 and 7.3).
- Basic use of computer tools for hydraulic simulation.

3. Syllabus

Topic 1 - Preliminary concepts.

Topic 2 - Hydrostatics.

Topic 3 - Hydrodynamics.

Topic 4 - Free sheet flow.

Topic 5 - Hydrometry and regulation.

Topic 6 - Pressure flow.

Topic 7 - Pumping systems.

Topic 8 - Water hammer.

4. Academic activities

Theory and problems in lectures (28 classroom hours).

Problem solving and case studies (15 classroom hours).

Laboratory and computer practices (12 classroom hours).

Special Practices (5 hours).

Study (78 non-face-to-face hours).

Assessment: 12 hours

Note: Special practices (field trips) are subject to the budget available for their realization.

5. Assessment system

The assessment system will consist of a global test to be held at each official call. The contents to be evaluated in each global test will be all those exposed and indicated in all the classroom activities of the subject: theory, problems, computer practices, laboratory practices and special practices (field visit).

In order to pass the subject, a grade equal to or higher than five points out of ten must be obtained in a global test.

Each overall test consists of a first theoretical-practical test and a second part of written practical exercises.

The theoretical-practical test will be performed without academic material and with a non-programmable calculator. Incorrect answers of the test will subtract points to avoid the effect of chance. The test questions are intended to evaluate the degree of understanding of the theoretical-practical contents of the subject, not the degree of memorization.

The written practical exercise will consist of a set of practical problems that can be solved with the academic material as deemed appropriate. The problems to be solved will be eminently practical and will pose realistic situations of application of Hydraulics within the competences of the degree.

The grade of the global test will be the average between the grade of the theoretical-practical test and the grade of the written practical exercise.

As part of the evaluation of the course, the evaluation of competencies and theoretical and practical learning related to SDG6 (target 6.4) and SDG7 (targets 7.2 and 7.3).

Success rates of previous years: 90.48% (2020/2021), 92.00% (2021/2022), 95.00% (2022/2023).

6. Sustainable Development Goals

6 - Clean Water and Sanitation

7 - Affordable and Clean Energy