

29737 - Fluid Facility Design

Syllabus Information

Academic year: 2023/24

Subject: 29737 - Fluid Facility Design

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

Degree: 434 - Bachelor's Degree in Mechanical Engineering

ECTS: 6.0

Year: 4

Semester: Second semester

Subject type: Optional

Module:

1. General information

The student is expected to understand the fundamental concepts of industrial installations from the point of view of fluids, such as piping, multiphase flows and instrumentation. Therefore, the subject provides them with key knowledge for the development of their future professional activity.

These approaches and objectives are aligned with some of the Sustainable Development Goals, SDGs, of the Agenda 2030 (<https://www.un.org/sustainabledevelopment/es/>) : Objective 6.4, 8.2 and 9.5.

2. Learning results

(RA1) Knows the constituent elements of a piping system and the associated regulations.

(RA2) Knows and applies methods of layout and hydraulic and mechanical design of fluid distribution networks.

(RA3) Knows the basic characterization of solids and their conditioning for the chemical industry.

(RA4) Knows the main characteristics of the equipment used in the different operations with solids as well as the influence of the main variables on their operation

3. Syllabus

1. Flow, temperature, pressure and level instrumentation.

2. Multiphase flow dynamics. Particle transport and separation.

3. Piping technology. Materials, instrumentation, accessories, measurements, regulations. Graphical representation. 4. Piping layout design according to process and equipment.

5. Analysis of the flexibility and support of the piping layout.

6. Inspections and tests. Construction and start-up.

4. Academic activities

Lectures (30 h) where the theory of the different topics that have been proposed will be taught.

Problems and cases (20 h). In these classes, problems will be solved by the student under the supervision of the teacher. The problems or cases will be related to the theoretical part explained in the lectures.

Laboratory practices (10 h) where the student will consolidate the contents developed in the lectures.

Tutored work (30 hours of non-face-to-face group work). Several activities will be proposed and supervised by the teachers.

Individual study (57 non face-to-face hours). It is recommended that the student carry out individual study on a continuous basis throughout the semester.

5. Assessment system

Option 1: Continuous assessment:

- Carrying out supervised work. The deliverables corresponding to tutored work will be graded valuing its content, the understanding of the concepts demonstrated in them and the correct presentation (learning results involved: RA1, RA2, RA3 and RA4).
- Performance of a laboratory practice The development of the practices in the laboratory and the presentation will be valued as well as interpretation of the results (learning results involved): RA1, RA2, RA3 and RA4).

The grade for the subject will be calculated according to the following formula:

- $Grade = 0.4 \cdot \text{tutored work} + 0.2 \cdot \text{laboratory practice} + 0.4 \cdot \text{class participation}$.

- The instrumentation and multiphase part accounts for 40% and the piping part for 60%.

Option 2:

Those students who do not wish to follow the evaluation of option 1, may choose to take the exam (100% of the final grade). This exam will consist of problem solving (learning results involved: RA1, RA2, RA3 and RA4).