Universidad Zaragoza

Academic Year/course: 2023/24

28829 - Fluid Mechanics

Syllabus Information

Academic year: 2023/24
Subject: 28829 - Fluid Mechanics
Faculty / School: 175 - Escuela Universitaria Politécnica de La Almunia
Degree: 424 - Bachelor's Degree in Mechatronic Engineering
ECTS: 6.0
Year: 3
Semester: Second semester
Subject type: Compulsory
Module:

1. General information

The subject studies the behavior of fluids along their conveyor lines and the moving parts involved in the installation in order to know and apply the theories necessary for the sizing of fluid-mechanical machine systems used in a wide variety of industrial sectors, with particular attention to turbomachines, their principle of operation and the tasks performed by each component present in such machines.

These approaches and goals 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: *4.4 By by 2030, significantly increase the number of youth and adults who have the necessary skills, particularly technical and vocational, to access employment, decent work and entrepreneurship*

2. Learning results

1. Recognize fluid and thermal applications in mechanical systems.

2. Drawing and interpretating planes and diagrams according to the appropriate standards and symbology.

3. To know the behavior and technology of materials.

3. Syllabus

Topic 1. Fluid Mechanical Machines. Classification, first form and generalization of the Euler Equation. Theorem of impulse. Triangle of velocities. Second form of Euler's equation. Hydraulic pumps and liquid elevation.

Classification of hydraulic pumps.

Topic 2. Rotodynamic pumps. Constituent elements and similarity relationships. The bun. Yields and power.

Characteristic curves. Applications in industrial systems.

Topic 3. Fans and Turbines. Definition and classification. Action turbines and reaction turbines. Net height. Losses, yields and power. Applications in industrial systems.

Topic 4. Study of hydraulic components. Hydraulic circuit design techniques. Complete calculation of the installation and its elements. Hydraulic transmissions and controls. Interpretation of phase diagrams in the study of sequences.

Control diagrams by means of wired automatism. Applications in circuit design, optimization and maintenance.

Topic 5. Final project on practical application.

4. Academic activities

Lectures and laboratory practices. They will be developed at a rate of four hours per week, until completing the 60 hours necessary to cover the syllabus.

Laboratory practices. They will be carried out in subgroups adapted to the capacity of the laboratory.

Study and personal work. This non-attendance part is valued at about 90 hours, necessary for the study of theory, problem solving and review of scripts.

Tutorials and generic non face-to-face activities. A schedule of student hours will be posted throughout the semester.

5. Assessment system

Continuous assessment

Laboratory practices:(10%) A report of the same is delivered according to the model.

Exercises, theoretical questions and proposed works:(10%) To be solved individually or in groups according to the case.

Written evaluation tests:(80%) They will consist of written tests scored from 0 to 10 points. The final grade of such activity will be given by the arithmetic mean of these tests, provided that there is not a unit grade below 4 points, in this case the activity will be failed.

Global assessment test.

Following the regulations of the University of Zaragoza in this regard, in the subjects that have continuous or gradual assessment systems, a global assessment test will be scheduled for those students who decide to opt for this second type of assessment.