

29752 - Industrial hydraulics and pneumatics

Syllabus Information

Academic Year: 2020/21

Subject: 29752 - Industrial hydraulics and pneumatics

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

1.1.Aims of the course

1.2.Context and importance of this course in the degree

1.3.Recommendations to take this course

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

The methodology followed in this course is based on participation and the active role of the student, based on lectures, laboratory sessions, autonomous work, and computer simulations.

Classroom materials will be available via Moodle. These include a repository of the lecture notes used in class.

Further information regarding the course will be provided on the first day of class.

4.2.Learning tasks

The course has been organized according to:

- Lectures. The teacher will explain the basic principles of the course. Some selected application issues will be also solved. The participation of the students in this activity will be encouraged through the planning of the classes of problems. They will be developed during the semester by means of 2 hours of weekly classes in schedule assigned by the University
- Laboratory sessions. 4 sessions (last 2.5 hours each at least) that will be distributed throughout the semester and whose assessment is part of the final grade of the course.

There are groups of four students working on each laboratory assembly, counting for this with a script delivered by the teachers.

- Computer lab sessions: 7 or 8 sessions of two hours each, which will be distributed throughout the quarter. The assessment of the report will be part of the final grade of the course.

It is an individual on-site activity, with the support of the teacher and there will be a script previously given by the teachers.

- Guided assignments There will be three or four works to perform autonomously, whose qualification will be part of the final grade.
- Autonomous work studying the subject and applying it to the resolution of exercises. Students are expected to spend about 90 hours to study theory, solve problems, prepare lab sessions, and take exams.
- Tutorials hours. There will be 6 hours weekly to consult the teacher. The office hours will be posted on Moodle and the degree website to assist students with questions and doubts. It is beneficial for the student to come with clear and specific questions.

4.3.Syllabus

The course will address the following topics:

INTRODUCTION

- Characteristics and use of hydraulics and pneumatics.
- Similarities and differences between them.

VALVES

- Directional control, pressure control and flow control.
- Types. Constitution. Operation. Uses

ACTUATORS

- Linear and rotary. Types. Characteristics. Construction. Use.

ELEMENTAL CIRCUITS

- Examples of basic circuits.
- constituent parts.
- Behavioural analysis.
- Introduction of auxiliary elements in the circuits.

SYSTEMATIC DESIGN.

- Design rules. Cascaded memories. Memories step by step.

SIZING OF ELEMENTS OF FACILITIES.

- Valve operating diagrams, flow rates, volumes and positions.
- Calculation of deposits.

GENERATION AND TRANSPORT OF FLUID PRESSURE

- Pump and Compressor groups.
- Types, features and functionality.
- Compressed air conditioning.
- Distribution networks.

4.4.Course planning and calendar

For further details concerning the timetable, classroom and further information regarding this course please refer to the "Escuela de Ingeniería y Arquitectura " website (<https://eina.unizar.es/>)

4.5.Bibliography and recommended resources