PNEUMATIC AND HYDRAULIC SYSTEMS

Code: 322108

Main Scientific Area: Mechanics and industrial processes

Lecturer: Ricardo Emanuel Ribeiro Campos

Language of Instruction: Portuguese

Regime: S2

Contact Hours: 30h Total Workload: 50h

ECTS: 3,0

Objectives

This course aims to present the components of pneumatic / electro-pneumatic and hydraulic circuits. It also aims to present the theory necessary to design a circuit.

Learning Outcomes

Students who complete successfully this course will be able to:

• Understand and describe the operation of pneumatic and electro-pneumatic components;

• Interpret the schematic of a pneumatic / electro-pneumatic circuit;

• Design a pneumatic / electro-pneumatic circuit for specific purposes;

• Understand and describe the operation of the components of a hydraulic circuit;

• Interpret the diagram of a hydraulic circuit;

• Design a hydraulic circuit for specific purposes.

Course Contents

Pneumatics:

• Principles of pneumatic technology;

• Fundamentals of compressed air supply: Production, preparation, distribution;

• Drives: cylinders, motors, claws and vacuum technology;

• Valves: directional, stop, flow and pressure;

• Pneumatic and electric control of valves: limit switches, logic control and time-dependent control;

• Fundamentals of industrial electric controls;

• Symbolic representation of devices, standards DIN/ISO 1219 and 5599;

• Study and design of pneumatic and electro-pneumatic commands.

Hydraulics:

• Principles of industrial hydraulics;

• Drives: cylinders, motors;

• Valves: directional, stop, flow, pressure and accumulators;

• Speed and force control in multiple circuits with accumulators;

• Fundamentals of industrial electric controls;

• Symbolic representation of devices, standards DIN/ISO 1219;

• Study and design of hydraulic commands.

Recommended Bibliography

Apontamentos das aulas

Learning and Teaching Methods

This course will enable students to know and understand the operation of the components in a pneumatic / electropneumatic circuit and in an hydraulic circuit. After presenting the theory, students will be confronted with a set of real problems in both areas for which will be encouraged to search for solutions that enable their resolution. Through the discussion of the problems, will be presented to the student, techniques and methods essential to the design and sizing of pneumatic, electro-pneumatic and hydraulic circuits.

Assessment Methods

Learning outcomes will be assessed through the following components:

· Theoretical test: 60%

· Project: 450%

Minimum score: 9.5 points

· Exam (100%), in case the student doesn’t reach the minimum stipulated score