

POLI ESCOLA SUPERIOR TECNOLOGIA GESTÃO TÉCNICO GUARDA	SUBJECT DESCRIPTION	MODELO PED.013.03
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Course	Mechanical and Industrial Informatics					
Subject	Oil Hydraulic and Pneumatics in Industrial Automation					
Academic year	2023/2024	Curricular year	2nd	Study period	1st semester	
Type of subject	Compulsory	Student workload (H)	Total: 135	Contact: 60	ECTS	5
Professor(s)	PhD Jorge Gregório					
<input checked="" type="checkbox"/> Area/Group Coordinator <input type="checkbox"/> Head of Department	PhD Rui Pitarma					

PLANNED SUBJECT DESCRIPTION

1. LEARNING OBJECTIVES

Provide students with a knowledge base in hydraulic oil and pneumatic industrial automation.

Acquire the knowledge needed for the theory and practice of hydraulic oil and pneumatic automation, especially hydraulic oil, pneumatic, and electric/electronic control equipment and circuits.

Application of acquired skills to the development and design of hydraulic oil, pneumatic, electro-hydraulic and electro-pneumatic circuits.

2. PROGRAMME

Fundamentals of industrial automation.

Hydraulic Oil: Hydraulic Oil Basics; devices; pumps; motors; linear actuators and valves; symbology; hydraulic fluids; types and characteristics; construction and analysis of hydraulic oil circuits.

Pneumatics: Basic principles of pneumatics; production and treatment of compressed air; pneumatic devices; motors; actuators and valves; symbology; construction and analysis of pneumatic circuits.

Electro-pneumatic and electro-hydraulic: fundamentals of electrical control circuits; electro-pneumatic and electrohydraulic devices; contactors and relays; solenoid valves; sensors; limit switches; detectors; pressure switches and timers; construction and analysis of electro-pneumatic and electro-hydraulic circuits.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

The syllabus aims to provide the students with knowledge in hydraulic oil and pneumatic industrial automation to integrate them in the world of work in the field of industrial automation. In particular, the content aims to prepare students so that they become aware of the need to know how to do things instrumentally and operationally. The syllabus will also allow the students, autonomously, to be able to develop their activity productively applying the concepts learned about hydraulic oil, electro-hydraulic, pneumatic and electro-pneumatic automation in their future companies/organizations.

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4. MAIN BIBLIOGRAPHY

Mandatory

Santos, A. M. de Almeida e Silva A. J. S. Ferreira; (2016). Automação Óleo-Hidráulica: Princípios de Funcionamento. Porto. PUBLINDUSTRIA.

Silva A. J. S. Ferreira da e Santos, A. M. de Almeida; (2014). Automação Pneumática. Porto. PUBLINDUSTRIA.

Gregório, Jorge; (2022) Apontamentos e exercícios de Automação Óleo-Hidráulica e Pneumática, IPG, Guarda.

Recommended

Michael J. Pinches, John G. Ashby; (1989). Power hydraulics, Prentice Hall.

Novais, J.; (2014). Ar comprimido industrial: produção, tratamento e distribuição, Lisboa. Fundação Calouste Gulbenkian.

Fialho, Arivelto B.; (2011). Automação Hidráulica - Projetos, Dimensionamento e Análise de Circuitos. São Paulo. Érica,

Pires, J. Norberto; (2019). Automação e Controlo Industrial - Indústria 4.0. Lisboa. Lidel.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

The syllabus privileges the interconnection between theory and practice. The theoretical-practical aspects presented through lectures, demonstrations, and questions, using the whiteboard or datashow, will be explored in practice whenever possible.

During the semester students will carry out practical group work on projects to encourage practice so that learning develops towards future professional activities with group work and student demonstrations. These assignments will always be presented as reports that will be evaluated.

Classification: Final test (50%), practical work evaluation (50%).

Classification equal or to greater than 10 values in 20 values allows to obtain syllabus approval.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

To achieve the proposed objectives, the methodology is based on principles of theoretical-practical training. The teaching methods and techniques to be applied during the sessions are interconnected amongst the lectures, questions, and demonstrations as well as group interaction, where the teacher is responsible for reinforcing learning and coordinating the various activities.

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7. ATTENDANCE

Students must be present in all classes to make the course more interactive and interesting.

8. CONTACTS AND OFFICE HOURS

Contacts of the coordinator of the subject area and the professor of the course

Coordinator of the subject area

Name: PhD Rui Pitarma

Email: rpitarma@ipg.pt

Telephone: 271 220 120 – ext: 1214

Office nº14

Professor of the course

Name: PhD Jorge Gregório

Email: jgregorio@ipg.pt

Telephone: 271 220 120 – ext:1205

Telephone: 963 000 921

Office nº5

Attendance hours: Wednesday: 09:00 to 11:00.

9. OTHERS

Other than attendance, students must be punctual in classes and avoid unnecessary interruptions.

DATE: 11 de setembro de 2023

SIGNATURES

Professor(s), Area/Group Coordinator or Head of Department signatures

Area/Group Coordinator

(PhD Rui Pitarma)

Professor

(PhD Jorge Gregório)