

<i>Course</i>	Mechanical and Industrial Informatics			<i>Academic year</i>	2021/2022		
<i>Subject</i>	Microprocessors and Embedded Systems			ECTS	6,5		
<i>Type of course</i>	Compulsory						
<i>Year</i>	2nd	<i>Semester</i>	2nd	<i>Student Workload:</i>			
<i>Professor(s)</i>	Filipe José Neto Caetano			<i>Total</i>	175,5	<i>Contact</i>	60
<i>Area Coordinator</i>	Fernando José dos Santos Melo Rodrigues						

Planned SD

1. LEARNING OBJECTIVES

Upon completion of the curricular unit, students should be able to:

1. Identify and explain the architectures of microprocessors and microcontrollers.
2. State and explain the key technologies related to embedded systems with an emphasis on Industrial Internet of Things.
3. Design and implement embedded systems, with an emphasis on Industrial Internet of Things.

2. PROGRAMME

1. Architectures and fundamental concepts of microprocessors and microcontrollers.
2. Introduction to embedded systems, with emphasis on Industrial Internet of Things (IIoT).
3. Hardware platforms for embedded systems and IIoT.
4. Embedded Systems Programming.
5. Communication technologies in embedded systems and IIoT.
6. Machine to Machine.
7. Big Data in embedded systems and IIoT.
8. Security in embedded systems and IIoT.
9. Embedded systems project.

3. COHERENCE BETWEEN PROGRAMME AND OBJECTIVES

Contents 1 and 2 allow to achieve objective 1, since they present the fundamentals of microprocessors and microcontrollers and their use in the implementation of modern embedded systems.

Objective 2 is achieved by combining all programme contents as they help students to know the modern embedded systems technologies.

Objective 3 is achieved by content 9 which leads students to undertake a practical project and apply the knowledge acquired in the curricular unit.

4. MAIN BIBLIOGRAPHY

Pedro Coelho, (2017). Internet das Coisas – Introdução Prática, FCA Publisher. ISBN: 978-972-722-849-2.

Alena Traukina, Kishore Reddipalli, Prashant Tyagi e Jayant Thomas, (2018). Industrial Internet Application Development, PACKT PUBLISHING. ISBN: 978-178-829-758-5.

Giacomo Veneri e Antonio Capasso, (2018). Hands-On Industrial Internet of Things: Create a powerful Industrial IoT infrastructure using Industry 4.0, Packt Publishing. ISBN: 978-178-953-722-2.

José Delgado e Carlos Ribeiro, (2004). Arquitetura de Computadores (5th edition), FCA Publisher. ISBN: 978-972-722-789-1.

5. TEACHING METHODOLOGIES (INCLUDING EVALUATION)

Teaching Methodologies:

1. Lectures
2. Interactive Classes
3. Problem Solving
4. Project Work

Evaluation Methodologies:

1. Written test 60%
2. Project 40%

Mean grade equal to or higher than 10 values to obtain approval, with 20 being the highest grade possible.

6. COHERENCE BETWEEN TEACHING METHODOLOGIES AND OBJECTIVES

Expositive Lectures are consistent with the objectives due to the need to present the theoretical content to students, so that they acquire a comprehensive and solid knowledge about microprocessors and embedded systems.

Interactive classes are consistent with the objectives as it is expected that student participation in practical demonstrations of technology solutions and case studies will help them to understand the contents studied, with an emphasis on “how it is done”.

Problem Solving is consistent with the objectives as solving practical exercises, based on the application of the studied contents will help students to consolidate the acquired skills, with an emphasis on knowing “how to do”.

Project work is consistent with the objectives as it provides the context for students to consolidate their knowledge and skills acquired through the design and implementation of technological solutions to realistic professional life problems.

7. ATTENDANCE

N.A.

8. CONTACTS AND OFFICE HOURS

Professor: Filipe José Neto Caetano; caetano@ipg.pt; office n.º 32

Area Coordinator: Fernando Melo Rodrigues; fmr@ipg.pt; office n.º 24

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