

Course Unit Description - (SISEM)

(Embedded Systems)

(Mestrado em Engenharia Electrotécnica e de Computadores)

Academic year: 2009/2010



Subject group: Automação e Robótica

	Semestral	Optional		
Mode of study	Diurno	Hours/Week	T-Teórica	2
Year	1 ^o		PL-Prática-Laboratorial	2
Semester	1 ^o		OT-Orientação Tutorial	1
ECTS				3

Objectives

The purpose of this course is to provide the students with the ability to design and develop dedicated embedded systems. Some project methods and specific architectures are introduced towards the development of high-performance embedded systems. The aim is also to introduce a top microcontroller architecture that can be used in those systems.

Course Contents

1. Embedded system definition.
2. Embedded systems applications.
3. Project and implementation.
4. Embedded systems hardware.
5. Microcontroller ARM CORTEX M3
 - 5.1 Basic architecture
 - 5.2 Memory system
 - 5.3 Clock system
 - 5.4 IO ports
 - 5.5 Timers
 - 5.6 Interrupt system
6. Embedded systems data communication
 - 6.1 RS232
 - 6.2 I2C
 - 6.3 SPI
 - 6.4 CAN
 - 6.5 Data communications in ARM CORTEX M3

Recommended reading

- "Embedded Systems Design – An Introduction to Processes, Tools, & Techniques", Arnold S. Berger, CMPBooks
- "Embedded System Design", Peter Marwedel, Springer
- "Embedded Systems: Architecture, Programming and Design", Raj Kamal, Mc Graw Hill
- "Embedded Systems – World Class Designs", Jack Ganssle, Newnes

Teaching Methods

The course, in addition to theoretical lessons, will be based primarily on the development of theoretical research works and practical applications on specific hardware.

Assessment methods

The student assessment will be done using the following components:

- Development of practical problems in class
- Development of research works, with class presentations

	Name
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