Course guide
330117 - PBNAIM - Low-Level Programming: Industrial Applications of Microcontrollers

Last modified: 25/04/2024

Unit in charge: Manresa School of Engineering
Teaching unit: 750 - EMIT - Department of Mining, Industrial and ICT Engineering.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2016). (Optional subject).

Academic year: 2024 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: JESÚS VICENTE RODRIGO

Others: VICTOR BARCONS XIXONS

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. The ability to specify, analyze, design, evaluate and document systems based on microcontrollers, as well as their implementation alternatives in industrial applications.
2. The ability to use microcomputer tools and programming languages.
3. The knowledge and ability to use existing tools and instrumentation for the analysis, design, development and verification of electronic, computer and communications systems.
4. Understand and use the principles and their application in low-level programming, operating systems and communication systems.

Transversal:
6. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
7. SELF-DIRECTED LEARNING - Level 3. Applying the knowledge gained in completing a task according to its relevance and importance. Deciding how to carry out a task, the amount of time to be devoted to it and the most suitable information sources.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	20.00
Hours large group	30,0	20.00
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

(ENG) 1. INTRODUCCIÓ

Full-or-part-time: 8h
Theory classes: 4h
Self study : 4h

(ENG) 2. ARQUITECTURES DE MICROCONTROLADORS

Full-or-part-time: 12h
Theory classes: 6h
Self study : 6h

(ENG) 3. PROGRAMACIÓ A BAIX NIVELL

Full-or-part-time: 50h
Theory classes: 10h
Practical classes: 10h
Self study : 30h

(ENG) 4. IMPLEMEMENTACIÓ D'APLICACIONS INDUSTRIALS

Full-or-part-time: 80h
Theory classes: 10h
Practical classes: 20h
Self study : 50h

ACTIVITIES

(ENG) 1. CLASSE EXPOSITIVA I DE PROBLEMES

Full-or-part-time: 26h
Theory classes: 26h

(ENG) 2. CLASSE DE LABORATORI

Full-or-part-time: 60h
Laboratory classes: 30h
Self study: 30h

(ENG) 3. TREBALL PERSONAL INDIVIDUAL/EN GRUP

Full-or-part-time: 30h
Self study: 30h

(ENG) 4. PROVES

Full-or-part-time: 34h
Theory classes: 4h
Self study: 30h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:
- Manuals de referència i Notes d'aplicació del fabricant (en anglès).
- Angulo Usategui, Jose Mª, i altres. DsPic: diseño práctico de aplicaciones. Madrid: McGraw-Hill, 2006. ISBN 8484151569.
- Angulo Usategui, Jose Mª, i altres. Microcontroladores avanzados dsPIC: controladores digitales de señales. Arquitectura, programación y aplicaciones. Madrid: Paraninfo, 2006. ISBN 8497323858.
- Huddleston, Creed. Intelligent sensor design: using the microchip dsPIC [on line]. Amsterdam ; Boston: Elsevier/Newnes, 2007 [Consultation: 10/06/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780750677554/intelligent-sensor-design-using-the-microchip-dspic. ISBN 9780750677554.
- Ibrahim, Dogan. Advanced PIC microcontroller projects in C [on line]. Boston: Newnes, 2008 [Consultation: 10/06/2022]. Available on: https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780750686112/advanced-pic-microcontroller-projects-in-c. ISBN 9780750686112.