

Course guide

330450 - SCE - Embedded Control Systems

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 2016). (Compulsory subject).
BACHELOR'S DEGREE IN AUTOMOTIVE ENGINEERING (Syllabus 2017). (Optional subject).

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

LECTURER

Coordinating lecturer: Vicente Rodrigo, Jesús

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. The ability to specify, analyze, design, evaluate, and document microcomputer-based systems, as well as their implementation alternatives in order to form a built-in control system.
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.

Transversal:

6. 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.
7. EFFECTIVE USE OF INFORMATION RESOURCES - Level 3. Planning and using the information necessary for an academic assignment (a final thesis, for example) based on a critical appraisal of the information resources used.
5. 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.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

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STUDY LOAD

Type	Hours	Percentage
Hours small group	15,0	10.00
Self study	90,0	60.00
Hours large group	45,0	30.00

Total learning time: 150 h



CONTENTS

title english

Description:

content english

Full-or-part-time: 6h

Theory classes: 3h

Self study : 3h

title english

Description:

content english

Full-or-part-time: 35h

Theory classes: 12h

Practical classes: 1h

Self study : 22h

title english

Description:

content english

Full-or-part-time: 84h

Theory classes: 22h

Practical classes: 12h

Self study : 50h

title english

Description:

content english

Full-or-part-time: 25h

Theory classes: 8h

Practical classes: 2h

Self study : 15h

ACTIVITIES

1. CLASSE EXPOSITIVA I DE PROBLEMES (ENG)

Full-or-part-time: 41h

Theory classes: 41h



2. CLASSE DE LABORATORI (ENG)

Full-or-part-time: 45h

Self study: 30h

Laboratory classes: 15h

3. TREBALL PERSONAL INDIVIDUAL/ EN GRUP (ENG)

Full-or-part-time: 30h

Self study: 30h

4. PROVES (ENG)

Full-or-part-time: 34h

Self study: 30h

Theory classes: 4h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Manuals de referència i Notes d'aplicació del fabricant (en anglès).
- Margush, Timothy S. Some assembly required: assembly language programming with the AVR microcontroller [on line]. Boca Raton: CRC Press, 2012 [Consultation: 10/06/2022]. Available on: <https://www-taylorfrancis-com.recursos.biblioteca.upc.edu/books/mono/10.1201/b11791/assembly-required-timothy-margush>. ISBN 9781439820643.
- Grace, Thomas. Programming and interfacing Atmel AVR microcontrollers. Boston: Cengage Learning PTR, 2016. ISBN 9781305509993.
- Noergaard, Tammy. Embedded systems architecture: a comprehensive guide for engineers and programmers [on line]. 2nd ed. Amsterdam: Elsevier/Newnes, 2013 [Consultation: 10/06/2022]. Available on: <https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780750677929/embedded-systems-architecture>. ISBN 9780123821966.
- Toulson, Rob; Wilmshurst, Tim. Fast and effective embedded systems design: applying the ARM mbed [on line]. Boston: Elsevier/Newnes, 2012 [Consultation: 10/06/2022]. Available on: <https://www-sciencedirect-com.recursos.biblioteca.upc.edu/book/9780080977683/fast-and-effective-embedded-systems-design>. ISBN 9780080977683.
- Barrett, Steven F.; Pack, Daniel J. Atmel AVR microcontroller primer: programming and interfacing [on line]. San Rafael, California: Morgan & Claypool, 2008 [Consultation: 18/06/2024]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?pq-origsite=primo&docID=881375>. ISBN 9781598295412.
- Mazidi, Muhammad Ali; Naimi, Sarmad; Naimi, Sepehr. The AVR microcontroller and embedded systems: using Assembly and C [on line]. 2nd ed. Mazidi & Naimi, 2017 [Consultation: 31/05/2022]. Available on: <https://ebookcentral-proquest-com.recursos.biblioteca.upc.edu/lib/upcatalunya-ebooks/detail.action?docID=5174828>. ISBN 9780997925968.