

Course guide

330238 - ESI - Systems Engineering

Last modified: 04/05/2023

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

Degree: BACHELOR'S DEGREE IN ICT SYSTEMS ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023 **ECTS Credits:** 6.0 **Languages:** Catalan

LECTURER

Coordinating lecturer: PERE PALA SCHONWALDER

Others: Arumi Casanovas, Arnau

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:

1. The ability to use the tools and languages of specification, synthesis and verification of electronic circuits.
2. Knowledge and understanding of the architecture of computers and programmable devices, including the identification of the elements that make them up and their interaccio, with emphasis on the most common architectures of embedded systems.
3. Knowledge of the various alternatives for powering electronic equipment and subsystems, including photovoltaic energy, as well as its main features, especially in low power environments available
4. The ability to analyze and solve interference and electromagnetic compatibility problems. Knowledge of the principles and techniques that make long-distance signal transmission possible.
5. Legal, economic and social knowledge that qualifies for a better professional practice among which are: notions on knowledge management and its legal protection, notions on the financing of innovation and / or research projects, notions of legal, social and environmental responsibility arising from professional practice and the promotion of innovation.
6. Knowledge and ability to use existing tools and instrumentation for the analysis, design, development and verification of electronic, computer and communications systems.
7. The ability to perform the typical activities of the degree, taking into account the corresponding standards, rules and regulations.
8. Ability to model and simulate systems in the field of the degree and apply the results to problem solving within this field.
9. The ability to analyze, design and implement, select and use real-time data processing, control and automation systems, especially in embedded systems.
10. The ability to define, program, and use embedded devices with global connectivity.
11. The ability to define, analyze, design, develop, evaluate, document and launch systems that include electronic, computer and communications subsystems.

Transversal:

12. TEAMWORK - Level 3. Managing and making work groups effective. Resolving possible conflicts, valuing working with others, assessing the effectiveness of a team and presenting the final results.
13. ENTREPRENEURSHIP AND INNOVATION - Level 3. Using knowledge and strategic skills to set up and manage projects. Applying systemic solutions to complex problems. Devising and managing innovation in organizations.
14. 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.
15. 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.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

STUDY LOAD

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

Total learning time: 150 h

CONTENTS

title english

Description:

content english

Full-or-part-time: 12h

Practical classes: 3h

Self study : 9h

title english

Description:

content english

Full-or-part-time: 24h

Practical classes: 6h

Self study : 18h

title english

Description:

content english

Full-or-part-time: 36h

Practical classes: 9h

Self study : 27h

title english

Description:

content english

Full-or-part-time: 48h

Practical classes: 12h

Self study : 36h



ACTIVITIES

(ENG) TÍTOL DE L'ACTIVITAT 1: CLASSES MAGISTRALS I PARTICIPATIVES

Full-or-part-time: 25h

Theory classes: 25h

(ENG) TÍTOL DE L'ACTIVITAT 2: PROJECTE DE CURS

Full-or-part-time: 75h

Laboratory classes: 30h

Self study: 45h

(ENG) TÍTOL DE L'ACTIVITAT 3: TREBALL PERSONAL INDIVIDUAL/EN GRUP

Full-or-part-time: 30h

Self study: 30h

(ENG) TÍTOL DE L'ACTIVITAT 4: PROVES

Full-or-part-time: 20h

Theory classes: 5h

Self study: 15h

GRADING SYSTEM

BIBLIOGRAPHY

Basic:

- Wilson, Peter. The circuit designer's companion [on line]. 3rd ed. Amsterdam: Elsevier, 2012 [Consultation: 10/06/2022]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9780080971384/the-circuit-designers-companion>. ISBN 9780080971384.

Complementary:

- Ganssle, Jack G. The art of designing embedded systems [on line]. 2nd ed. Amsterdam: Elsevier / Newnes, 2008 [Consultation: 10/06/2022]. Available on: <https://www.sciencedirect-com.recursos.biblioteca.upc.edu/book/9780750686440/the-art-of-designing-embedded-systems>. ISBN 9780750686440.

- Ott, Henry W. Electromagnetic compatibility engineering. Hoboken, N.J: John Wiley & Sons, 2009. ISBN 9780470189306.

RESOURCES

Other resources:

Teaching material published in the Open Courseware of the subject.