

Academic Year: ( 2020 / 2021 )

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Department assigned to the subject: Electronic Technology Department

Coordinating teacher: SANCHEZ REILLO, RAUL

Type: Electives ECTS Credits : 3.0

Year : 1 Semester : 1

## REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

No further requirement, but those needed to be admitted in the Master Course.

## OBJECTIVES

- CB7: Can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) context related to their field of study.
- CB8: Have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments.
- CG1: Can write information clearly and concisely in a technical report, including action plans, and resources needed to accomplish the development, integration and implementation of complex and high added value electronic systems.
- CG2: Have demonstrated the ability to conceive, design, implement and maintain an electronic system in a specific application.
- CG4: Can establish effective working relationships among team members and solving problems and making decisions in multidisciplinary teams.
- CG6: Adopting the scientific method as a fundamental working tool in both professional and research careers.
- CE1: Have the ability to design electronic systems at the behavioral level, from a set of certain specifications, whether at system level, using modeling and simulation tools, or at subsystem level, using hardware description languages.
- CE2: Have demonstrated knowledge of new analog and power electronics, and photonic components (including those based on new materials and structures) for improving the performance of current applications or systems.
- CE4: Have the ability to design a device, system or application that meets the design objectives and specifications, using a systematic and multidisciplinary approach and integrating modules and advanced tools that are specific to the field of Electronic Engineering.

## DESCRIPTION OF CONTENTS: PROGRAMME

The different components of an electronic system will be described, as well as its implementation as a portable device. In addition, the advantages and disadvantages of integrating an Operating System will be given, and illustrated with examples related to mobile devices (smartphones and tablets), as they are embedded devices familiar to the student. With this knowledge, tele-operation concepts will be explained and detailed, so that an electronic system can include web communication and multimedia support. Also the needed requirements for the electronic system will be described, including the main issues to consider as to improve the user interaction with the system.

The detailed programme is as follows:

1. Introduction to the course. Introduction to Electronic Systems Integration. Block diagram of an Electronic System. Alternatives for the Integration of Electronic Systems (localized and distributed)
2. Use of Operating Systems: Microsoft Windows, Linux / Android, iOS
3. Human-Computer Interaction
4. Web interfaces: Introduction and Functionality, Protocols and Use Cases

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## LEARNING ACTIVITIES AND METHODOLOGY

### LEARNING ACTIVITIES:

- Theretical lectures
- Theoretical-Practical lectures
- Office hours
- Work-sharing homework
- Individual homework

### METHODOLOGY:

- Professor dissertations using computer and audiovisual means, explaining the main concepts involved and providing those relevant references to allow students to get more in depth in the subject.
- Critical reading of international references recommended by the professor.
- Jornal papers, reports and manuals for further discussion in class, to enhance and consolidate the knowledge acquired.
- Solving practical cases, presented by the professor to the students either individually or in groups
- Presentation and discussion in class, under the moderation of the professor, of subjects related to the course.
- Development of individual or group reports.

## ASSESSMENT SYSTEM

<b>% end-of-term-examination/test:</b>	50
<b>% of continuous assessment (assigments, laboratory, practicals...):</b>	50

The evaluation of the course will be based on the following criteria:

- 1.- Individual homework: A couple of proposed works (one about system development based on mobile devices, and a second one adding web interfaces and services to the first work. Each of them is weighted 20% of the final mark.
- 2.- Course Final Exam: At the end of the course, a written exam is given covering the overall course material, accounting for 60% of the total grade under continuous evaluation system. Its weight is 60% if the student has not followed the continuous evaluation.

## BASIC BIBLIOGRAPHY

- Alan Dix,¿ Janet E. Finlay,¿ Gregory D. Abowd,¿ Russell Beale Human-Computer Interaction, Prentice Hall, 2004
- Andrew Lombardi WebSocket - Lightweight Client-Server Communications, O'Reilly Media Inc., 2015
- Bill Scott, Theresa Neil Designing Web Interfaces: Principles and Patterns for Rich Interactions, O'Reilly Media Inc., 2009
- David Gourley, Brian Totty,¿ Marjorie Sayer,¿ Anshu Aggarwal,¿ Sailu Reddy HTTP: The Definitive Guide, O'Reilly Media Inc., 2002

- Dawn Griffiths, David Griffiths Head First Android Development: A Brain-Friendly Guide, O'Reilly Media Inc., 2017
- Matt Neuburg iOS 11 Programming Fundamentals with Swift: Swift, Xcode, and Cocoa Basics, O'Reilly Media Inc., 2016
- Raúl Sánchez Reíllo, et. al. Tamper-Proof Operating System, Springer, 2015

#### BASIC ELECTRONIC RESOURCES

- Raúl Sánchez Reíllo . Material Docente de la Asignatura: <https://aulaglobal.uc3m.es/course/view.php?id=62852>