

## 230115 - EI - Smart Electronics

Coordinating unit: 230 - ETSETB - Barcelona School of Telecommunications Engineering  
 Teaching unit: 710 - EEL - Department of Electronic Engineering  
 Academic year: 2019  
 Degree: BACHELOR'S DEGREE IN ELECTRONIC SYSTEMS ENGINEERING (Syllabus 2009). (Teaching unit Optional)  
 BACHELOR'S DEGREE IN TELECOMMUNICATIONS SCIENCE AND TECHNOLOGY (Syllabus 2010). (Teaching unit Optional)  
 BACHELOR'S DEGREE IN TELECOMMUNICATIONS TECHNOLOGIES AND SERVICES ENGINEERING (Syllabus 2015). (Teaching unit Optional)  
 ECTS credits: 6 Teaching languages: Catalan, Spanish, English

### Teaching staff

Coordinator: SERGI BERMEJO

### Prior skills

Basic knowledge in electronics, programming, signal processing, probability and statistics.

### Learning objectives of the subject

This introductory and practical course aims to provide the elements necessary to design intelligent electronic systems that, due to various adaptation and control mechanisms, have the ability to learn and generalize the problems of engineering to be solved. Additionally, the use of the mentioned elements in various applications will be illustrated with the help of a series of case studies. The methodology of the course is based on active and PBL techniques so that students, working in groups, can apply and integrate these elements to solve a problem (based on one of the studied cases) through a customized design of an electronic system.

### Study load

Total learning time: 150h	Hours large group:	26h	17.33%
	Hours small group:	26h	17.33%
	Self study:	98h	65.33%

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### Content

(ENG) 1. Introducció al sistemes electrònics intel·ligents	Learning time: 46h Theory classes: 4h Practical classes: 4h Laboratory classes: 8h Self study : 30h
(ENG) 2. Disseny de sistemes electrònics intel·ligents	Learning time: 46h Theory classes: 4h Practical classes: 4h Laboratory classes: 8h Self study : 30h
(ENG) 3. Aplicacions dels sistemes electrònics intel·ligents	Learning time: 58h Theory classes: 5h Practical classes: 5h Laboratory classes: 10h Self study : 38h

### Planning of activities

(ENG) LABORATORI
(ENG) EXERCICIS
(ENG) PRESENTACIONS ORALS
(ENG) CONTROLS DE RESPOSTA CURTA

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### Qualification system

The final grade of the subject will be obtained based on the evaluation of the continuous evaluation (work proposed by the teacher throughout the course and laboratory practices) and of various controls, according to the following criteria:

Controls: 20%

Exercises: 30%

Laboratory practices: 50%

### Bibliography

#### Basic:

Huddleston, C. Intelligent sensor design: using the microchip dsPIC [on line]. Amsterdam ; Boston: Elsevier/Newnes, 2007 [Consultation: 24/07/2013]. Available on: <<http://www.sciencedirect.com/science/book/9780750677554>>. ISBN 978-0-7506-7755-4.

Xu; Y.; Li, W.J.; Lee, K.K.C. Intelligent wearable interfaces [on line]. Hoboken, NJ: Wiley Interscience, 2008 [Consultation: 08/10/2014]. Available on: <<http://onlinelibrary.wiley.com/book/10.1002/9780470222867>>. ISBN 9780470179277.

Flach, Peter A. Machine learning: the art and science of algorithms that make sense of data. Cambridge University Press, 2012. ISBN 9781107422223.

#### Complementary:

Ibrahim, D. Advanced PIC microcontroller projects in C : from USB to RTOS with the PIC18F series [on line]. Boston: Newnes, 2008 [Consultation: 25/07/2013]. Available on: <<http://www.sciencedirect.com/science/book/9780750686112>>. ISBN 978-0-7506-8611-2.

Warwick, K. Artificial intelligence: the basics. Taylor & Francis, 2011. ISBN 9780415564830.

Kulkarni; S.; Harman, G. An elementary introduction to statistical learning theory [on line]. John Wiley & Sons, 2011 [Consultation: 07/10/2014]. Available on: <<http://onlinelibrary.wiley.com/book/10.1002/9781118023471>>. ISBN 9781118023471.

#### Others resources: