

## Course guide

### 220147 - ICT - Information and Communication Technology

**Last modified:** 02/04/2024

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 707 - ESAII - Department of Automatic Control.

**Degree:** BACHELOR'S DEGREE IN AUDIOVISUAL SYSTEMS ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN CHEMICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN TEXTILE TECHNOLOGY AND DESIGN ENGINEERING (Syllabus 2009). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN AEROSPACE VEHICLE ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2010). (Optional subject).  
BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

**Academic year:** 2024    **ECTS Credits:** 3.0    **Languages:** English

#### LECTURER

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**Coordinating lecturer:** JAUME FIGUERAS JOVE

**Others:** ALEJANDRO BACHILLER

#### TEACHING METHODOLOGY

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The course is divided into three parts:

Theory classes  
Guided activities class  
Self-study for doing exercises and activities.

In the theory classes, teachers will introduce the theoretical basis of the concepts, methods and results and illustrate them with examples appropriate to facilitate their understanding.

In the guided activity class (in the classroom), teachers guide students in applying theoretical concepts to solve problems, always using critical reasoning. We propose that students solve exercises in and outside the classroom, to promote contact and use the basic tools needed to solve problems.

Students, independently, need to work on the materials provided by teachers and the outcomes of the sessions of exercises/problems, in order to fix and assimilate the concepts.

The teachers provide the curriculum and monitoring of activities (by ATENEA).

#### LEARNING OBJECTIVES OF THE SUBJECT

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This course introduces the concepts, principles and basics of the different tools related to information technologies (IT) applying them to business and industry.

Using embedded systems the student will be introduced to the concepts of IoT, sensor networks, mobile connectivity and microservices.

## STUDY LOAD

Type	Hours	Percentage
Hours small group	30,0	100.00

**Total learning time:** 30 h

## CONTENTS

### Introduction to IT technologies in use on Management Engineering

**Description:**

Using different microcontrollers (Raspberry PI) connected to the internet the following concepts will be introduced

- Reading sensor measures using REST services
- Databases
- Publishing and accessing data using a browser

**Full-or-part-time:** 20h

Theory classes: 5h

Self study : 15h

### Actuator interaction

**Description:**

Using different microcontrollers (Raspberry PI) connected to the internet the following concepts will be introduced

- Posting to REST services to control actuators
- Command posting
- Introduction to cybersecurity

**Full-or-part-time:** 20h

Practical classes: 15h

Laboratory classes: 5h

### Basic mobile app programming

**Description:**

Mobile programming concepts will be introduced through:

- Interact with sensor networks
- Actuator controlling

**Full-or-part-time:** 20h

Theory classes: 5h

Self study : 15h

## GRADING SYSTEM

The course mark depends on:

A project: 40%

3 problems solved at class (1 per module): 60% (20% each)

Due to the nature of the practical and continuous evaluation acts, there is no revision test provided in the final exam calendar.



## **EXAMINATION RULES.**

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Although required software is installed in the university computers it is almost indispensable to bring your laptop at class due to the plethora of mobile drivers that are available.