

## Course guide

### 205082 - 205082 - Iot Engineering

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

**Unit in charge:** Terrassa School of Industrial, Aerospace and Audiovisual Engineering  
**Teaching unit:** 710 - EEL - Department of Electronic Engineering.

**Degree:** MASTER'S DEGREE IN AUTOMATIC SYSTEMS AND INDUSTRIAL ELECTRONICS (Syllabus 2012). (Optional subject).  
MASTER'S DEGREE IN INDUSTRIAL ENGINEERING (Syllabus 2013). (Optional subject).  
MASTER'S DEGREE IN AERONAUTICAL ENGINEERING (Syllabus 2014). (Optional subject).  
MASTER'S DEGREE IN SPACE AND AERONAUTICAL ENGINEERING (Syllabus 2016). (Optional subject).  
MASTER'S DEGREE IN RESEARCH IN MECHANICAL ENGINEERING (Syllabus 2021). (Optional subject).  
MASTER'S DEGREE IN MECHANICAL ENGINEERING RESEARCH (Syllabus 2024). (Optional subject).

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

#### LECTURER

**Coordinating lecturer:** JOSE ANTONIO SORIA PEREZ

**Others:**

#### TEACHING METHODOLOGY

The full subject is based on practical examples which are carried out exclusively in the lab. Theoretical concepts are acquired by means guided activities (ASG1, ASG2 and SG3) which are used as tutorials for developing a PBLbased project (IoT01).

#### LEARNING OBJECTIVES OF THE SUBJECT

#### STUDY LOAD

Type	Hours	Percentage
Hours large group	18,0	24.00
Hours small group	9,0	12.00
Self study	48,0	64.00

**Total learning time:** 75 h

## CONTENTS

### Module 1: Hardware platforms

**Description:**

In this package, students will use a hardware platform such as Arduino or Raspberry to develop projects based on local sensor application nodes.

Activities in this module contain:

- Embedded platform programming.
- Sensors and Actuator shield development.
- Wired communications: USB-based RS232, I2C and SPI

**Related activities:**

ASG1.- Hardware platform tutorial

IoTP1.- IoT Project

**Full-or-part-time:** 35h

Theory classes: 23h

Self study : 12h

### Module 2: Networking and communications

**Description:**

In this package, students will learn the basics to interface between several node devices and build both wired and wireless communication networks.

Activities in this module include:

- Wireless node communications: RF, Bluetooth, Zigbee and LoRa
- TCP/IP-based: Ethernet, WiFi and 4G.

**Related activities:**

ASG2.- Network communication tutorial

IoTP1.- IoT Project

**Full-or-part-time:** 15h

Theory classes: 9h

Self study : 6h

### Module 3: Web development

**Description:**

In this package, students will learn to develop web server applications and install ready to use IoT frameworks. Activities in this module include:

- LAMPP/XAMPP server suite: Linux-Apache-MySQL-PHP/Perl/Python
- IoT platforms: Thingier.io and Sentilo

**Related activities:**

ASG3.- Iot (Sentilo)Tutorial

IoTP1.- IoT Project

**Full-or-part-time:** 25h

Theory classes: 16h

Self study : 9h

## GRADING SYSTEM

\*Final Mark =  $0.25 \cdot \text{ASG1} + 0.15 \cdot \text{ASG2} + 0.25 \cdot \text{ASG3} + 0.35 \cdot \text{IoTP1}$



## RESOURCES

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### Other resources:

Basic

- <http://www.arduino.cc> – Arduino programming
- <https://www.raspberrypi.org/documentation/> - Raspberry programming

Complementary

- <http://www.sentilo.io/wordpress/> - Sentilo IoT suite
- <https://www.apachefriends.org/es/index.html> - LAMPP/XAMPP suites
- <https://thinger.io/> - Thinegr.io suite