Course guide
240608 - 240608 - Electronic Workshop

Last modified: 22/12/2023

Unit in charge: Barcelona School of Industrial Engineering
Teaching unit: 710 - EEL - Department of Electronic Engineering.

Degree: BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Optional subject).

Academic year: 2023 **ECTS Credits:** 4.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: Vicenç Parisi Baradad

Others: Vicenç Parisi Baradad

PRIOR SKILLS

Electronics /Programming in Python or C

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Knowledge of electronics fundaments.

Transversal:
2. SELF-DIRECTED LEARNING. Detecting gaps in one's knowledge and overcoming them through critical self-appraisal. Choosing the best path for broadening one's knowledge.

TEACHING METHODOLOGY

LEARNING OBJECTIVES OF THE SUBJECT

The students enrolled in this subject will learn :
- design of small electronic digital systems
- build experimentally small electronic systems

STUDY LOAD

Type	Hours	Percentage
Self study	67,5	60.00
Hours medium group	45,0	40.00

Total learning time: 112.5 h

CONTENTS

Instrumentation

Description:
Intrumentation review. Basis of internal operation.

Full-or-part-time: 4h 30m
Practical classes: 3h
Self study : 1h 30m

Introduction to microprocessors and GPUs

Description:
Internal architecture. Programming with high level language C / Python

Related activities:
Experimental use of an ATmega328P or NVIDIA Jetson Nano the input/output ports

Full-or-part-time: 9h
Practical classes: 6h
Self study : 3h

PWM as a signal generator (Pulse Width Modulation)

Description:
Use of the PWM peripheral as a signal generator and as a D/A converter

Full-or-part-time: 9h
Practical classes: 6h
Self study : 3h

DC motor control

Description:
Use of H bridges to control the direction and speed of a DC motor

Full-or-part-time: 4h 30m
Practical classes: 3h
Self study : 1h 30m

Distance measurement using ultrasound sensors

Description:
content english

Full-or-part-time: 9h
Theory classes: 3h
Practical classes: 6h

Line detection with infrared sensors

Description:
content english

Full-or-part-time: 9h
Practical classes: 6h
Self study : 3h

Development of an autonomous robot in a circuit

Description:
We will build a robot similar to Jetson Bot and we will teach it to follow a circuit with the ultrasound/infrarred and camera sensors

https://jetbot.org/master/

Full-or-part-time: 18h
Practical classes: 12h
Self study : 6h

GRADING SYSTEM

The final mark will be obtained from 3 partial marks derived from experimental small projects performed during the course. This final mark (NFinal) will result from the averaged partial marks (NP1, NP2, NP3).

NFinal=(NP1+NP2+NP3)/3

There are no exams in the subject.