

Academic Year: ( 2022 / 2023 )

Review date: 23-05-2022

Department assigned to the subject: Department of Electronic Technology

Coordinating teacher: VAZQUEZ GARCIA, MARIA CARMEN

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 2

**DESCRIPTION OF CONTENTS: PROGRAMME**

1. Introduction to Instrumentation Systems
  - Block diagram of an electronic instrumentation system.
  - Capture of physical quantities and simple sensors.
  - Instrumentation systems in robotics
2. Sensors, signal conditioning and signal acquisition
  - Static and dynamic characteristics of sensors
  - Conditioning circuits, modulation techniques and signal filtering
  - Signal acquisition
3. Measurement systems and basic sensors
  - Temperature and strain measurements
  - Position measurements. Contact and presence detectors.
  - Pressure, force and torque measurements
4. Measurement system and advanced sensors
  - Distance measurement with optical and ultrasonic sensors
  - Orientation sensors and inertial units (IMUs), Image and video sensors.

**LEARNING ACTIVITIES AND METHODOLOGY****THEORETICAL PRACTICAL CLASSES.**

Knowledge and concepts students must acquire. Receive course notes and will have basic reference texts. Students partake in exercises to resolve practical problems.

**TUTORING SESSIONS.**

Individualized attendance (individual tutoring) or in-group (group tutoring) for students with a teacher. Subjects with 3 credits have 2 hours of tutoring/ 100% on- site attendance.

**STUDENT INDIVIDUAL WORK OR GROUP WORK.**

Subjects with 6 credits have 98 hours/0% on-site.

**WORKSHOPS AND LABORATORY SESSIONS.**

Subjects with 3 credits have 2 hours with 100% on-site instruction.

**ASSESSMENT SYSTEM****FINAL EXAM.**

Global assessment of knowledge, skills and capacities acquired throughout the course. The percentage of the evaluation varies for each subject between 60% and 0%.

**CONTINUOUS EVALUATION.**

Assesses papers, projects, class presentations, debates, exercises, internships and workshops throughout the course. The percentage of the evaluation varies for each subject between 40% and 100% of the final grade.

<b>% end-of-term-examination:</b>	45
<b>% of continuous assessment (assignments, laboratory, practicals...):</b>	55

**BASIC BIBLIOGRAPHY**

- Fraden J Handbook of modern sensors, Springer, 2016

- Fraile Mora Instrumentación Aplicada a la Ingeniería, Garceta, 2012

#### ADDITIONAL BIBLIOGRAPHY

- M A Pérez García Instrumentación Electrónica, Paraninfo, 2014