Universidad Zaragoza

29826 - Electronic Instrumentation

Syllabus Information

Academic Year: 2022/23

Subject: 29826 - Electronic Instrumentation

Faculty / School: 110 - Escuela de Ingeniería y Arquitectura

326 - Escuela Universitaria Politécnica de Teruel

Degree: 440 - Bachelor's Degree in Electronic and Automatic Engineering

444 - Bachelor's Degree in Electronic and Automatic Engineering

ECTS: 6.0

Year: 3

Semester: Second semester

Subject Type: Compulsory

Module:

1. General information

2. Learning goals

3. Assessment (1st and 2nd call)

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The course is based on combining theoretical explanations with practical exercises and practical work. A wide range of teaching and learning tasks are implemented, such as:

- Lectures will provide theoretical background on the fundamentals of instrumentation and sensors
- Case studies and real applications will be worked out at the classroom
- The students will do laboratory work related to sensors and instrumentation systems
- Individual and group assignments will be proposed
- Student participation is considered very important in order to acquire the learning outcomes and skills needed

In the EUPT-Blended learning option

Students will have at their disposal material adapted to follow the course in this modality. Some of the practices will require physical presence. Others may be carried out by means of simulation programs without physical presence. However, it is of vital importance that students in this modality follow the indications that will be given through Moodle.

4.2. Learning tasks

The course includes the following learning tasks:

Classroom activities: 2,4 ECTS (60 hours)

- **1) Course lectures (T1)** (30 hours). Fundamentals of electronic instrumentation and sensors will be developed, mixing theoretical concepts and practical applications.

- **2) Case studies (T2)** (15 hours). Different case studies will be worked out in the classroom. Students are encouraged to prepare them in advance. Assignments could also be worked out in this part.
- **3) Laboratory work (T3)** (15 hours). Several practical sessions will be carried out in small groups. Students have to prepare sessions in advance.

Autonomous work: 3,6 ECTS (90 hours)
- **4) Assignments (T6)** (24 hours). Individual and group assignments will be proposed
- **5) Personal study (T7)** (60 hours). Continuous study will be promoted among students. They can also attend tutorials to solve the specific problems they can face in the course.
- **6) Evaluation activities (T8)** (6 hours). An Assessment will be based on coursework (practical work and assignments) and final examination

EUPT - Blended learning option

In the blended learning mode, the learning activities will be: Problems and cases, Laboratory practices, Teaching assignments, Study, Evaluation tests and Virtual tutorials.

4.3. Syllabus

The course will address the following topics:

1. Data acquisition systems
2. A/D and D/A converters
3. Filters for instrumentation applications.
4. Sensors
5. Signal conditioning circuits and amplifiers
6. Fundamentals of noise, electromagnetic compatibility and signal transmission

Note. A more detailed program will be provided at the beginning of the course.

4.4. Course planning and calendar

Timetables for classroom and laboratory sessions will be published prior to the beginning of the course on the web of EINA https://eina.unizar.es/ and EUPT https://eupt.unizar.es/

A course timetable is also provided to the student, which includes a detailed description of the dates for submission https://moodle.unizar.es/add/

EUPT- Blended learning option

The official exams and some practices will require physical presence in the EUPT, according to the schedule indicated by the center. The rest of the activities will be carried out asynchronously, although there may be some virtual tutoring activities or tests that will be carried out synchronously, as will be announced in Moodle.

4.5. Bibliography and recommended resources

Course notes and other documentation:
https://moodle.unizar.es/add/