

COURSE GUIDE

2025/26

Faculty345 - Faculty of Engineering - Bilbao

Cycle.

DegreeGITECI30 - Bachelor`s Degree in Industrial Technology Engineering

YearThird year

COURSE

27320 - General Electronics

Credits, ECTS:6

COURSE DESCRIPTION

All professional engineers, whatever their field of specialization, very often in the exercise of their profession must use electronic equipment to control machinery, program equipment, take measurements, collect data, communicate electronically, ...
This constant interaction with electronic equipment is essential. Therefore, it requires a strong knowledge of the fundamentals of electronics integrated into all these systems.
General Electronics is the only subject of the Degree Curriculum developing this competence. This subject offers master classes to explain theoretical concepts and solve exercises, and laboratory work based on implementing prototypes and managing laboratory equipment.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

COMPETENCIES OF THE DEGREE:
Knowledge in basic and technologic topics that will enable them to learn new methods and theories, and equip them with the versatility to adapt to new situations

SKILLS MODULE:
Knowledge of the fundamentals of Electronics.
BRIEF DESCRIPTION OF THE CONTENTS:
Electronics is present in all areas of our lives and largely in the design, production and industrial management. Currently it can be considered a cross knowledge necessary for any engineer and present in most industrial products.
This course wants to show the basics of electronics in its entirety at informative level. For that purpose you will use a practical-based learning methodology consistent in presenting several practicals or real problems, raise the skills to solve them and to assemble the designs in the electronics laboratory to check the results.
The non-attendance will be devoted to literature search, component selection, reading documents, designing circuits for the lab and other similar tasks.

Theoretical and Practical Contents

- 1 Basics of Electronics
 - 1.1 Basic knowledge of Electronics, basic laws, dispositives, etc.
 - 1.2 Use of electronic instrumentation laboratory.
 - 1.3 Assembly of elementary circuits.
- 2 Fundamentals of Analog Electronics
 - 2.1 Basic analog devices and circuits.
 - 2.2 Assembling a circuit with operational amplifiers
- 3 Fundamentals of Digital Electronics
 - 3.1 Principles of digital electronics.
 - 3.2 Assembly of combinational and sequential circuits.
- 4 Microprocessors and microcontrollers
 - 4.1 Basic principles of programmable systems.
 - 4.2 Experimentation with embedded microcontroller-based circuits.
- 5 Application Development
 - Approach and utility applications in the electronics industry

TEACHING METHODS

Students will work in pairs in the lab, they will assemble several circuits related to Analog and Digital Electronics (such as a battery charger, adders, counters…), and write reports for assessment.

In the event that health conditions prevent the performance of a teaching activity and / or assessment in person, it will be activated a non-presence methodology, of which students will be informed promptly.

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	30			30					
Horas de Actividad No Presencial del Alumno/a	45			45					

Legend: M: Lecture-based S: Seminar GA: Applied classroom-based groups
GL: Applied laboratory-based groups GO: Applied computer-based groups GCL: Applied clinical-based groups
TA: Workshop TI: Industrial workshop GCA: Applied fieldwork groups



Evaluation methods

- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions 70%
- Individual assignments 15%
- Teamwork assignments (problem solving, Project design) 15%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The laboratory part will be assessed by continuous assessment on the basis of student's participation, completion of the laboratory work and resolution of proposed exercises. Attendance to the laboratory and performance of the practicals is mandatory. The laboratory teachers may carry out an individual assessment test to check the students' level of learning.

Students have the right to give up continuous assessment and obtain the overall mark from a final assessment test. To have this option, the student will have to write a document stating renunciation to continuous assessment, and give it to the teacher responsible for the subject, during the first 9 weeks from the beginning of the semester according to the academic calendar. In that case, the ordinary call will have an extra test to assess the contents related to the laboratory.

The experimental practicals and lab reports contribute 30% to the overall mark. The written exam consists of two parts, short questions and exercises, and it is worth 70% of the global mark.

The student will need to pass the three parts of the subject. That is, the student will need to score 5 out of 10 in the short questions section of the written exam, 5 out of 10 in the exercises of the written exam, and 5 out of 10 in the laboratory.

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

The extraordinary call has the same composition as the ordinary call.

If the student passed the laboratory following continuous assessment, its mark will be saved for the ordinary call. In any other case, the extraordinary call will have an extra test to assess the contents related to the laboratory

MANDATORY MATERIALS

Theory Notes.

Notes from the Practice to be made in the laboratory.

We manage the course through e-learning platform (MOODLE).

BIBLIOGRAPHY

Basic bibliography

Boylestad, R. ; Nashelsky, L.; "Electrónica. Teoría de circuitos". Ed. Prentice Hall (2001).

Allan R. Hambley ; "Electrónica. 2ª Edición". Ed. Prentice Hall (2001)

Arias, J.; Bidarte, U.; Ibañez, P.; Lázaró, J.; Martín, J. L.; Zuloaga, A. "Electrónica Digital". Delta Publicaciones, (2006)

Tocci, Ronald J. "Sistemas Digitales. Principios y Aplicaciones". Ed. Prentice Hall (2000)

Detailed bibliography

Journals

-

Web sites of interest

OBSERVATIONS

We manage the subject through e-learning platform (MOODLE).