

COURSE GUIDE

2025/26

Faculty

345 - Faculty of Engineering - Bilbao

Cycle

.

Degree

GTELEC30 - Bachelor's Degree in Telecommunications Engineering

Year

First year

COURSE

27353 - Basic Electronics

Credits, ECTS: 6

COURSE DESCRIPTION

Basic Electronics is the first subject on electronics in the Bachelor's Degree in Telecommunications Engineering. It explains the foundations on electronics that are necessary in other subjects during the degree. For instance, "Electronic Devices and Circuits" can be considered the continuation of Basic Electronics. The other subjects on mathematics during the year provide the knowledge and tools to solve the equations included in Basic Electronics. In addition, "Circuits Analysis" eases the comprehension and resolution of electronic circuits.

COMPETENCIES/LEARNING RESULTS FOR THE SUBJECT

This subject works on the competences included in the basic training module M01 in the Bachelor's Degree in Telecommunications Engineering:
"Understanding and mastering basic concepts of linear systems and the related functions and transforms, theory of electrical circuits, electronic circuits, physical principles of semiconductors and logic families, electronic and photonic devices, technology of materials and its application to solve engineering problems."

The learning outcomes of the course are the following:

1. To establish the first approach to the techniques of management and evaluation of experimental errors, and data collection in electronics.
2. To master basic laboratory instrumentation, as well as to acquire autonomy when using the instrumentation in the measurement procedure.
3. To know the main characteristics of passive components.
4. To know, solve and implement circuits based on Operational Amplifiers.
5. Understand and master the physical principle of semiconductors.

Theoretical and Practical Contents

Theme, list of topics:

- Introduction
- Signs and their characterization
- Basic Laboratory Instrumentation
- Passive Components
- Operational Amplifiers
- Foundations of Semiconductors

Laboratory Sessions:

During about ten lab sessions the concepts explained in the lectures are put into practice. Hence, the way to handle the basic instrumentation in the laboratory is learnt, i.e., measurement instrumentation and basic signal sources.

TEACHING METHODS

Theoretical lectures, practical sessions (exercises) and laboratory practices are interspersed throughout the course development. The subject is taught with a clearly practical orientation.
The fundamentals are explained in the theoretical lectures. The student has to deepen in these basic concepts through the study of the theoretical contents and the realization of individual exercises outside the classroom. The practical sessions require preparing and solving the problems raised in the classroom.

The laboratory practices require the prior preparation of the issues raised, performing of the practice and finally writing a report on it.

TYPES OF TEACHING

Types of teaching	M	S	GA	GL	GO	GCL	TA	TI	GCA
Hours of face-to-face teaching	22,5		15	22,5					
Horas de Actividad No Presencial del Alumno/a	33,75		22,5	33,75					

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

- Continuous evaluation
- End-of-course evaluation

Evaluation tools and percentages of final mark

- Written test, open questions 60%
- Performance of laboratory practices 40%

ORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

In the ordinary call the final grade depends on:

- Written exam (official call, 60%): A minimum of five out of ten points is required to pass the subject.
- Laboratory (40%): Guided practices that include mandatory preparation, attendance, performance, and reports of each practice; and a practical laboratory exam.

To pass the subject it is required to obtain five out of ten points in each one of the parts of the subject (written exam and laboratory). If any part is not passed, the final grade will fail.

If only one of the parts has been passed in the ordinary call (written exam or laboratory), the grade of that part will be kept until the extraordinary call in the same academic year.

Failure to sit the written exam leads to classification as "Absent".

If health conditions prevent any face-to-face teaching or evaluation activity, an equivalent non-face-to-face modality will be used, of which students will be timely notified.

EXTRAORDINARY EXAMINATION PERIOD: GUIDELINES AND OPTING OUT

Same criteria as in the ordinary call are applied.

In the extraordinary call, the grade obtained in the laboratory during the academic year will be taken into account, if it is a pass. Otherwise, the student will have to take an exam corresponding to that part of the subject.

Failure to sit the written exam leads to classification as "Absent".

If health conditions prevent any face-to-face teaching or evaluation activity, an equivalent non-face-to-face modality will be used, of which students will be timely notified.

MANDATORY MATERIALS

Subject notes.

BIBLIOGRAPHY

Basic bibliography

- 'XYZ de los osciloscopios'; TeKtronix
- Boylestad, R. & Nashelsky, L.: 'Electronic Devices & Circuit Theory' (Prentice Hall); Electrónica: teoría de circuitos y dispositivos electrónicos.

Detailed bibliography

- R. PALLÁS. Sensores y Acondicionadores de Señal. Editorial Marcombo.
- Horowitz, P.; Hill, W. "The art of Electronics". Cambridge University Press, 2015.

Journals

Web sites of interest

OBSERVATIONS