

Degree programme	Type	Course
Electronic Engineering for Telecommunication	OB	3

Contact lecturer

Name : Marc Porti Pujal

Email : marc.porti@uab.cat

Teaching staff

Montserrat Nafria Maqueda

Marc Porti Pujal

Group languages

You can consult this information at the [end](#) of the document.

Prerequisites

Basic knowledge corresponding to the subjects of "Electronic components and circuits" and "Analog electronics"

Especially necessary are those of the subject "Instrumentation I", of which Instrumentation II is a clear continuation

Objectives

Describe the working principle of the A/D and D/A converters, the data acquisition cards and different

general purpose electronic instruments, to introduce the specifications that characterize them, as well

as to define the errors that can be committed in a measure.

Identify the main sources of noise and interference and analyze their effects on instrumentation circuits.

Learning outcomes

1. Identify problems with electromagnetic interference and compatibility.

2. Translate the concept of noise to electronic systems and analyse its effects on instrumentation circuits.
3. Design analogue and digital, analogue-digital conversion and digital analogue electronic circuits for telecommunication applications and computing.
4. Specify and use electronic instrumentation and measurement systems.
5. Use communication and computer applications to support the development and operation of electronic applications.
6. Document the specifications, design, implementation and testing of instrumentation and control systems.
7. Develop critical thinking and reasoning.
8. Develop the capacity for analysis and synthesis.
9. Work autonomously.
10. Develop independent learning strategies.
11. Work cooperatively.
12. Assume and respect the role of the different members of a team, as well as the different levels of dependency in the team.
13. Communicate efficiently, orally and in writing, knowledge, results and skills, both professionally and to non-expert audiences.
14. Maintain a proactive and dynamic attitude with regard to one's own professional career, personal growth and continuing education. Have the will to overcome difficulties.

Contents

Isolation amplifiers.

Filters: Kinds of filters and implementation in instrumentation systems.

Noise: Basic concepts. Kinds of noises in amplifiers. Reduction techniques.

A/D and D/A converters: Specifications and architectures.

Data acquisition cards for instrumentation systems. Introduction to the control of cards and converters through La

Interferences: Interferences and electromagnetic compatibility in instrumentation systems. Reduction techniques.

Basic instruments: Oscilloscope and spectrum analyzer.

Learning activities and methodology

Title	Hours	ECTS	Learning outcomes
Study	20	0.8	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14
ABP oriented work	20	0.8	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14
Problems and cases seminarys	15	0.6	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14
Lab sessions	15	0.6	3, 4, 7, 8, 9, 10, 11, 12, 13, 14

Preparation of reports and presentations	5	0.2	5, 6, 11, 12, 13
Preparation of lab sessions and report	10	0.4	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13
ABP sessions	10	0.4	1, 2, 3, 4, 6, 7, 8, 11, 12, 13, 14
Master classes	20	0.8	1, 2, 3, 4, 7, 8
Tutorials	10	0.4	1, 2, 3, 4
Resolution of problems and preparation of cases	22	0.88	1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14

The teaching methodology will combine, in addition to autonomous work, directed and supervised activities. In the directed activities, master classes, problem and case seminars and laboratory sessions will be combined. In the lectures, the lecturer will synthesize and expose the fundamental concepts of the subject. In the seminars of problems and cases, the students will solve problems related to the subject. In laboratory sessions, the student will put into practice, in the laboratory, the acquired knowledge.

The supervised activities will consist of tutorials, in which the student, with a previous appointment with the lecturer, will be able to solve, individually or in group, doubts derived from the realization of the rest of activities (directed and autonomous).

Annotation: within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Assessment

Continuous assessment activities

Title	Weight	Hours	ECTS	Learning outcomes
Lab sessions	30%	0	0	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Resolution of cases and problems	15%	0	0	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14
Written test	55%	3	0.12	1, 2, 3, 4, 7, 8, 9, 10, 13

This course does not provide for a single-assessment system.

Activities

Throughout the semester, activities that the student must solve autonomously out and/or in the classroom will be proposed.

The activities will represent 15% of the subject grade. They are not mandatory and there is no minimum grade required to pass this part.

Laboratory sessions.

- Attendance to the laboratory sessions is mandatory.
- The obtained grade in the laboratory sessions will correspond to 30% of the final grade of the subject.
- In case that any of the lab sessions has not been performed without justification, the lab sessions will be "Not assessable".

Requirement: To have carried out all the lab sessions and have a minimum grade of 5 to pass the subject.

It must be taken into account that laboratory sessions are not recoverable and, therefore, if this part is

failed, the subject can not be passed. A "Not assessable" in the lab sessions will correspond a "Not Assessable" in the final grade of the subject.

If an incident prevents or has prevented a student from attending a practical session and/or other activities, a protocol for requesting the rescheduling of assessment activities is available for the cases specified in the School of Engineering's assessment criteria and guidelines. Requests to reschedule an assessment activity must be submitted to the School's Academic Administration Office.

Exams

- There will be two partial exams during the semester, each with a weight of 50%.

The graded obtained between the two exams will correspond to a 55% of the grade of the subject.

Requirement: Minimum score of 3 in each of the partial tests and 4.5 of average between the two partial test to be weighted with other sections.

- In case the final grade of partial tests is less than 4.5 (or in any of the partial exams is less than 3), the student may take the final exam provided that the conditions to access it are met.

- In case that the grade resulting from weighing activities, lab sessions and partial exams is less than 5, the student must take the final exam.

The student can take the final exam as long as he has carried out all the laboratory sessions (compulsory and

with a minimum grade of 5).

- The final exam will include ALL the contents of the subject, regardless of whether any of the partial exams are passed.

- If the student has to go to the final exam, a minimum of 4.5 will be required in the grade of this exam to do the average with the lab. sessions. The final exam grade will have a weight of 70% and will be weighted with 30% of the lab. sessions grade (as long as the minimums are reached) to determine the final grade for the subject.

For the assessment activities, a place, date and time of review will be indicated allowing students to review the activity with the lecturer. In this context, students may discuss the activity grade awarded by the lecturers responsible for the subject. If students do not take part in this review, no further opportunity will be made available

Final grade of the subject in case of failing the subject:

In case the student does not pass the subject, to determine the final grade that will appear in the student's records, the following cases are considered:

1. The student has not taken any of the partial tests or the final exam. The final grade will be

'Not assessable'.

2. He/she has not attended to the final exam, but to one or both partial exams and the mark in the partial exams is above the required minimum. If the average of the partial marks does not reach the minimum mark necessary to weight with the rest of marks, the final mark will be the average of the marks of the partial exams.

3. He/she has not attended to the final exam, but to one or both partial exams. If in some of the partial exams the mark is under the required minimum, the final mark will be the average of the marks in the partial exams, with a maximum of 4.5

4. The student has taken the final exam, but the grade is lower than the minimum necessary to weight with the rest of the grades.

The final grade will be the highest of the average of the partial tests and the final exam. taking into account the consideration regarding the partial exams grades in 2 and 3.

5. The student has taken one or both of the partial exams and / or the final exam, but has not performed all the laboratory sessions. The final grade of the subject will be that of the failed part (if it has been failed) or \"Not assessable\" (if it has not been done).

Excellent with honors.

The excellent with honors mark will be given on the basis of the criteria fixed by the professors at the end of the year,

taking into account the number that can be given and the overall evolution of the course.

Use of Artificial Intelligence

The use of Artificial Intelligence (AI) technologies is not permitted at any stage of this course. Any assignment that includes AI-generated content will be considered a breach of academic integrity and may result in a partial

or full penalty on the assessment grade, or more severe disciplinary sanctions in cases of serious misconduct.

Observations

- The procedure for the validation of previous years (if applicable) will be established at the beginning of the semester and will be published in the cv.
- Any other case not considered in this regulation, will be analyzed individually.

General remarks.

1. Without prejudice to any other disciplinary measures deemed appropriate, and in accordance with the current academic regulations, any irregularities committed by a student that may result in an alteration of the grade awarded for an assessment activity will be assigned a mark of zero. Therefore, copying or allowing others to copy an assignment or any other assessment activity, submitting materials prepared by a third party as one's own, or making unauthorized use of artificial intelligence to complete exercises, practical assignments, and/or any other assessable activity will result in that activity being awarded a mark of zero. If passing that activity is a requirement for passing the course, the student will fail the entire course. Assessment activities graded in this manner and through this procedure are not eligible for reassessment; consequently, the course will be failed outright, with no opportunity to retake or recover it during the same academic year..

2. We reserve the right to modify the evaluation method in those cases in which there are indications of possible irregularities in the student's evaluation.

3. The dates for continuous evaluation and submission of papers will be published on the virtual campus and on the School website and may be subject to possible programming changes due to possible incidents. Any such modification will always be communicated to students through Campus Virtual, which is the usual communication platform between lecturers and students.

Bibliography

J.C. Alvarez et al., "Instrumentación electrónica", Thomson-Paraninfo, 2006

R. Pallás-Areny, "Instrumentos electrónicos básicos", Ed. Marcombo, 2006.

P.H. Sydenham, N.H. Hancock and R. Thorn, "Introduction to Measurement Science and Engineering", John Wiley & Sons, 1989.

Software

LabVIEW, software to control electronic instrumentation.

Course groups and languages

The information provided is provisional until November 30. After this date, you will be able to consult the language of each group through this [link](#). To access the information, you will need to enter the course CODE

Type of teaching	Group	Language	Semester	Shift
(TE) Theory	320	Catalan	second semester	morning-mixed
(PAUL) Classroom practices	321	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	321	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	322	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	323	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	324	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	325	Catalan/Spanish	second semester	morning-mixed
(PLAB) Practical laboratories	326	Catalan/Spanish	second semester	morning-mixed