

SUBJECT TEACHING GUIDE

G1001 - Applied Electronics and Electronic Instrumentation

Degree in Industrial Electronic Engineering and Automatic Control Systems
 First Degree in Industrial Electronic Engineering and Automatic Control Systems

Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Industrial Electronic Engineering and Automatic Control Systems First Degree in Industrial Electronic Engineering and Automatic Control Systems			Type and Year	Compulsory. Year 3 Compulsory. Year 3
Faculty	School of Industrial Engineering and Telecommunications				
Discipline	Subject Area: Industrial Electronics Module: Specific Technology				
Course unit title and code	G1001 - Applied Electronics and Electronic Instrumentation				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web	https://moodle.unican.es/course/view.php?idnumber=G1001_2324				
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. TECNOLOGIA ELECTRONICA E INGENIERIA DE SISTEMAS Y AUTOMATICA				
Name of lecturer	YOLANDA LECHUGA SOLAEGUI				
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Other lecturers	ROSARIO CASANUEVA ARPIDE				

3.1 LEARNING OUTCOMES
- Ability to perform analysis and design of analog circuits based on operational amplifiers.
- Ability to specify and implement active filters and signal generator circuits.
- Ability to perform specification, design and characterization of electronic instrumentation systems for measuring physical quantities.
- Ability to design, conduct experiments and analyze results in a laboratory of electronic instrumentation.

4. OBJECTIVES

Provide students with the ability to apply design concepts of analog systems based on operational amplifiers to solve practical problems and work independently.

Equip students with the knowledge and skills required to specify and implement measurement systems of physical quantities in industrial environments.

Provide students with ability to handle required instrumentation in the laboratory of Electronics and critically interpret the results.

6. SUBJECT PROGRAM

CONTENTS

1	Applied Electronics:
1.1	Operational amplifier applications. D/A and A/D converters
1.2	Active filters
1.3	Signal generators
2	Electronic Instrumentation:
2.1	Introduction to the measure. Study and treatment of noise
2.2	Fundamentals of the transducers. Signal conditioning circuits.
2.2.1	Resistive sensors
2.2.2	Capacitive and inductive sensors
2.2.3	Generators sensors
2.3	Data acquisition systems

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Continuous assessment	Others	No	Yes	30,00
Lab practices	Laboratory evaluation	No	Yes	30,00
Final exam	Written exam	Yes	Yes	40,00
TOTAL				100,00
Observations				
<p>In order to pass the course, it is essential to pass the lab program.</p> <p>The laboratory program may be overcome by means of a practice exam that will take place in an extraordinary call.</p> <p>If the student can not participate in an activity of on-going assessment, the corresponding percentage is added to the percentage of the final exam.</p> <p>In case the sanitary conditions required it, the assessment will move from a presence-based to a virtually-supported modality, according to a mixed teaching format or, in the most extreme case where the presence-based activities were discouraged, these will be developed by telematic means through the virtual classroom (Aula Virtual – Moodle), email, Microsoft Teams and/or any tool provided or allowed by the University of Cantabria for the assessment, or to guarantee the validity of the exams.</p> <p>The relative weights for each activity included in the assessment method of the course are maintained for all the described teaching modalities.</p> <p>Thus, the students must have a computer with a webcam and a microphone, or a smartphone with a built-in camera, internet connection, Microsoft Teams and/or any tool provided or allowed by the University of Cantabria.</p>				
Observations for part-time students				
The percentage for the on-going assessment activities is added to the percentage of the final exam.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
Sedra A.S., Smith K.C., 2006. Circuitos Microelectrónicos (5ª Ed). McGraw Hill ISBN 9789701054727.
Pérez M.A., Alvarez J.C., Campo J.C., 2004. Instrumentación Electrónica. Thomson
Pérez M.A., 2012. Instrumentación Electrónica: 230 problemas resueltos. Garceta Publicaciones ISBN 9788415452003