



GENERAL INFORMATION

Data of the subject	
Subject name	Microelectronic Circuits II
Subject code	DEA-GITI-443
Main program	Bachelor's Degree in Engineering for Industrial Technologies
Involved programs	Grado en Ingeniería en Tecnologías Industriales [Fourth year]
Credits	4,5 ECTS
Type	Optional
Department	Department of Electronics, Control and Communications
Coordinator	Luis Ángel Pérez Sanz
Schedule	Mornings
Office hours	Send e-mail to get an appointment.

Teacher Information	
Teacher	
Name	Luis Ángel Pérez Sanz
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Teacher	
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DESCRIPTION OF THE SUBJECT

Contextualization of the subject
Prerequisites
An intermediate knowledge of analog electronics circuits and devices is needed for this course (this is obtained in previous course as Electronic in second course and Microelectronic Circuits I in fourth course).

Course contents

Contents
Theory
Theme 1. Active Filter
1.1 Basic filter concepts.



1.2 Filter types and parameters.

1.3 Filter implementation with operational amplifiers

Theme 2: Linear and non linear oscillators

2.1 Linear oscillator basics.

2.2 Linear oscillators types (Phase shift, Colpittz, ...).

2.3 Non linear oscillators (astable oscillator, Schmitt trigger, ...).

Theme 3: Frequency compensation.

3.1 Frequency response of operational amplifiers circuits.

3.2 Frequency compensation methods.

theme 4: Analog-digital and digital-analog data converters.

4.1 A/D and D/A converter basics.

4.2 A/D and D/A converters structures (characteristics and performances).

Theme 5: Electronic noise.

5.1 Noise definition, types and sources (Johnson, shot, thermal, flicker, ...).

5.2 Basic noise calculations.

5.3 Noise in data converters (ENOB).

Theme 6: Electronics Instrumentation.

6.1 Sensors and conditioning circuits.

6.2 Instrumentation system specifications, errors and calibration methods.

Laboratory

Practice 1: Active filter implementation (Crossover Filters).

Practice 2: Oscillators (linear and nonlinear).

Practice 3: Distance measurement system (ultrasonic system based on time of flight).

EVALUATION AND CRITERIA

Evaluation activities	Evaluation criteria	Weight
Final Exam	<ul style="list-style-type: none"> Understanding concept. Problems resolution. Solution analysis. 	45 %



Laboratory work	<ul style="list-style-type: none">• Work before the session.• Work inside the laboratory.• Final session report.	35 %
Continuous evaluation	<ul style="list-style-type: none">• Class problems.• Solution analysis.• Midterm exam.	20 %

Grading

Class attendance is mandatory, according to the Academic Regulations of the Higher Technical School of Engineering (ICAI). The requirements of attendance will be applied independently for theory and laboratory sessions:

- In the case of theory sessions, failure to comply with this rule may prevent them from taking the exam in the ordinary period.
- In the case of laboratory sessions, failure to comply with this rule may prevent you from taking the exam both in the normal and re-sit period.
- In any case, unjustified absences from laboratory sessions will be penalized in the evaluation.

Ordinary

The normal period evaluation/grading is composed by:

- A midterm exam and continuous evaluation with a 20% weights.
- The laboratory grade with a 35% weights.
- The final written exam with a 45% weights (provided that a minimum mark of 4/10 is needed to pass the course).

Extraordinary (re-sit) exam

The final grade will be composed by:

- The continuous evaluation (15% weight).
- There will be a re-sit written exam with a 60% weight (a minimum mark of 4/10 is needed to pass the course).
- The laboratory evaluation (25% weight).

In the case the laboratory part has not been passed in the normal period, a practical (laboratory) exam will be required. The grade obtained will replace the laboratory part.

Attendance rules.

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- In the case of laboratory sessions, failure to comply with this rule may prevent you from taking the exam both in the normal and re-sit period.
- In any case, unjustified absences from laboratory sessions will be penalized in the evaluation.

BIBLIOGRAPHY AND RESOURCES

Basic References

- Comer, Comer: "Advanced Electronic Circuit Design", John Wiley & Sons, 2002D.
- M.A. Pérez García et al, "Instrumentación Electrónica", Thomson, 2004.
- Sedra/Smith, "Microelectronic Circuits", Oxford University Press.

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