UNIVERSIDAD PONTIFICIA ICAI ICADE COMILLAS MADRID
ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA

DEA-GITI-443 Microelectronics Circuits II

SEMESTER: Spring

CREDITS: 4.5 ECTS (3 hrs. per week: 2 Theory + 1 Lab, on average)

LANGUAGE: Spanish

DEGREES: GITI

Course overview

This is an advanced analog electronics course. The first part will explore the design and analysis of filters, oscillators and other nonlinear circuits. The second part deals with the basic concepts of instrumentation, sensor conditioning and integration.

Prerequisites

Electrical and electronic circuit and devices based on transistors, diodes and operational amplifiers. Design and analysis of amplifiers. Frequency response and stability of amplifiers.

Course contents

Theory:

1. Active filters, definitions, types and design (Butterworth, Chebyshev, Bessel and others).
2. Linear and non-linear oscillators.
3. Basic electronic Instrumentation. Sensors, conditioning systems. Accuracy. Electronic noise, concepts, definition and evaluation. A/D and D/A conversion.

Laboratory:

The first part of the course the lab practices will be oriented to the deep understanding of the theoretical concepts. It will focus on the behavior of the devices and on the operation of complex circuits and their analysis and debugging.
The second part laboratory will be oriented to a complete design that will be developed by the students in small teams.

Textbook

- Comer, Comer: “Advanced Electronic Circuit Design”, John Wiley & Sons, 2002.

- M.A. Pérez García et al, “Instrumentación Electrónica”, Thomson, 2004.

Grading

The following conditions must be accomplished to pass the course:

- A minimum overall grade of at least 5 over 10.
- A minimum grade in the final exam of 4 over 10.

The overall grade is obtained as follows:

- Final exam 45%.
- Other exams 20%. Typically there is 1 mid-term exam.
- Lab exams or evaluations 25%.
- Performance during the lab sessions 10%.