ESCUELA TÉCNICA SUPERIOR DE INGENIERÍA

DEA-TEL-511 Communication Electronics

SEMESTER: Fall

CREDITS: 6 ECTS (4 hrs. per week: 2 Theory + 2 Lab)

LANGUAGE: Spanish

DEGREES: MIT

Course overview

In this course we deal with the understanding and use of electronic devices and configurations of devices to design a basic radio-frequency communication system.

Prerequisites

Students are assumed to have a basic understanding of analog electronics design and the theory of signals and systems.

Course contents

Theory:

1. Overview of wireless communication systems: the superheterodyne receiver.
2. Wideband and narrowband amplifiers: small and large signal operation.
3. Mixer techniques. Practical mixer circuits.
4. Sinusoidal oscillators. Crystal oscillators.
5. Amplitude modulation. Modulators and detectors.
6. Frequency modulation. Modulators and demodulators.

Laboratory:

There will be weekly 2-hour sessions to design a wireless communication system.

Textbook

- K. K. Clarke, D. T. Hess. Communication circuits: analysis and design. Addison-Wesley, Reading, MA, 1973.
- T. H. Lee. The design of CMOS radio-frequency integrated circuits, 2nd ed. Cambridge U. Press, New York, NY, 2004 (supplementary reading)

Grading

There will be two midterm exams, a final exam and a lab project. Final exam will be cumulative, although the bulk of the exam will cover material from the last ten weeks of class. The overall grade is obtained as follows:

- Midterm I will be during the 5th week: 20% of the final grade.
- Midterm II will be during the 10th week: 20% of the final grade.
- Final exam will be taken during the finals period: 40% of the final grade.
- Lab project: 20% of the final grade.