

## DEA-GITT-311 Electronics

**SEMESTER:** Fall

**CREDITS:** 7,5 ECTS (5 hrs. per week: 3 Theory + 2 Lab, on average)

**LANGUAGE:** Spanish

**DEGREES:** GITT

### Course overview

This course is an intermediate course in analog electronics. Its main focus is the analysis and design of electronic circuits for the conditioning of analog signals. This subject covers diodes, BJT and MOSFET transistors, FETs, op-amps, and basic analog circuit design as applied to audio and radio frequency circuits.

### Prerequisites

An introductory course on circuit analysis and electronic devices is required.

### Course contents

#### Theory:

- 1. Introduction to Electronics.** Signals. Amplifiers. Filters. Operational amplifiers. Diodes.
- 2. Bipolar Junction Transistors (BJT) and MOS Field Effect Transistors.** Fundamentals. Modes of operation. DC analysis and Biasing. Small signal analysis. Basic amplifier configurations. Multistage amplifiers. Output stages.
- 3. Frequency Response.** Amplifier frequency response. High-Frequency Response of Transistor circuits. Miller effect.
- 4. Feedback.** Basic feedback concepts. Ideal feedback topologies. Loop gain. Analysis of feedback amplifiers. Stability and frequency compensation.

#### Laboratory:

- P1.** Design of a tone control filter.
- P2.** Design of a Feedback Multistage Voltage Amplifier.
- P3.** Design of a Class-D amplifier.

## Textbook

- A. S. Sedra y K. C. Smith, Microelectronic Circuits, 6th edition. New York: Oxford University Press, 2009.

## Grading

The following conditions must be accomplished to pass the course:

- A minimum average grade of at least 5 over 10 in the exams.
- A minimum grade of 5 over 10 in the lab evaluation.

The overall grade is obtained as follows:

- Final exam 33%.
- Other exams 33%. Typically there is 1 mid-term exam and 2 additional short exams.
- Lab 34%.