The course provides the students with a basic understanding both of electronic circuits (analog and digital) and of electronic devices as well as of the technological implications and trends that such a technology is undergoing.

Topics covered in the subject include:

- **Signals**: acquisition and processing; sources and sensors; time domain and frequency domain analysis.
- **Circuits**: transfer function, amplification and attenuation, input and output impedance, circuit cascading. Electronic systems overview.
- **Electronic devices**: review of semiconductor materials, MOS transistor, technological aspects.
- **MOSFET analog electronics**: MOS single-stage amplifiers: common Source configuration, Source follower buffers, common Gate configuration as current buffer. Differential MOSFET amplifier.
- **Operational amplifiers**: negative feedback, inverting and non-inverting amplifier, input and output impedance, current conveyors, summer, integrators, differentiators. Frequency response of amplifiers, loop gain and stability.
- **Digital electronics**: CMOS logic, threshold, switching times, static and dynamic power dissipation in digital systems. Introduction to Analog to digital conversion.

The focus of the subject is twofold: understanding the basic concepts that drive the operation of an electronic circuit and understanding the impact of non-idealities of real components on the circuit performances. This course is not intended to develop a specific skill in electronics, but rather to give the student a broad view of the overall aspects of electronics. The breadth of topics covered in this course makes it useful both for the students who intend to graduate in the field of Information Technologies Engineering, for which “Electronic Systems” is the first of a series of other courses in electronic circuits, as well as for the students who will specialize in other fields of engineering, such as mechanics or industrial management, still aiming at a knowledge of the basic aspects of such an important and ubiquitous technology as electronics truly is.