

<b>Program</b>	<b>09TT- Engineering in Telecommunication Technologies and Services</b>
----------------	---

<b>Course number and name</b>	
<b>Number</b>	95000014
<b>Name</b>	Basic Electronics and Instrumentation Electrónica e Instrumentación Básicas
<b>Semester</b>	Y2-S3

<b>Credits and contact hours</b>	
<b>ECTS Credits</b>	4.5
<b>Contact hours</b>	57

<b>Coordinator's name</b>	Jesús Sanz Maudes
---------------------------	-------------------

<b>Specific course information</b>		
<b>Description of course content</b>		
<p>Second semester on Electronics: Starts with an introduction to electronic laboratory, equipment set up, measurement and simulation techniques, electronic components behavior and characteristics, and continues with regular topics: Operational Amplifier basic circuits. General amplification concepts. Discrete devices biasing and amplification. Multistage and frequency response. Introduction to building blocks for linear Integrated Circuits.</p> <p>Experimental work (elementary circuit simulation, design, laboratory measurements and analysis of results) is capital.</p>		
<b>List of topics to be covered</b>		
<ul style="list-style-type: none"> <li>• Basic Instrumentation and laboratory</li> <li>• Passive Electronic Components</li> <li>• Basic Concepts in Amplifiers</li> <li>• Circuits using ideal Operational Amplifiers</li> <li>• One stage amplifiers using discrete devices</li> <li>• Multistage amplifiers and frequency response</li> <li>• Basic building blocks for linear Integrated Circuits</li> </ul>		
<b>Prerequisites or co-requisites</b>		
<p>Previous recommended knowledge: Circuit Analysis, experimental data handling techniques (Lab in Elementary Physics), complex numbers arithmetic, basic behavior of electronic devices.</p>		
<b>Course category in the program</b>		
<input checked="" type="checkbox"/> <b>R (required)</b>	<input type="checkbox"/> <b>E (elective)</b>	<input type="checkbox"/> <b>SE (selective elective)</b>

**Specific goals for the course**

**Specific outcomes of instruction**

RA22: Qualitative and quantitative knowledge of the behavior of the simplest electrical circuits used in both, the analysis and design of the communication or electronic systems basic components..

RA23: Understand the theoretical basis of the measurement techniques, knowledge of the measuring instruments to be used and ability to perform electrical measurements on practical circuits.

RA24: Knowledge of the electronic (and photonic) components, active and/or passive.

RA121: Ability to analyze and to design elementary analogic electronic circuits, discrete or integrated, as well as to implement the basic ones. and measure them.

RA122: Understand the use of Operational Amplifiers and get the ability to implement and measure circuits using them.

**Student outcomes addressed by the course**

CEB4

A.S. Sedra, K.C. Smith. "Microelectronic Circuits", 6<sup>th</sup> edition. Oxford University Press, 2011

A.S. Sedra, K.C. Smith. "Circuitos Microelectrónicos", 4<sup>a</sup> edición. Oxford University Press, 1999

N.R.Malik., "Circuitos Electrónicos. Análisis, simulación y diseño"..Prentice Hall, 1996  
 Hambley, R.A., "Electrónica", 2<sup>a</sup> Ed, Prentice Hall 2003

G.J. Ritchie: "Transistor Circuit Techniques. Discrete and integrated". Third Edition. Chapman&Hall, 1993

Web resources: <https://moodle2.dte.upm.es>

Laboratory: Full equipped 44 work benches with PC controlled Instruments under local HA server as LAN firewall-gateway-server

MicroSim. PSPICE eval version.(free)

**Teaching methodology**

<b>X lectures</b>	<b>X problem solving sessions (classroom)</b>	<b>X collaborative actions</b>	<b>X laboratory sessions</b>
-------------------	---	--------------------------------	------------------------------

**Other:** Individual solving problems homework.