

Centre	University College of Engineering of Vitoria-Gasteiz
Name of subject	25981 – Industrial Electronics
Qualification	Degree in Mechanical Engineering
Type	Compulsory
Credits	6 ECTS
Year	2
Term(s)	1st
Department	Electronics and Telecommunications
Language	Spanish and Basque

Outcomes / Objectives

Fundamentals of analogue and digital electronics. Components.

Syllabus

Introduction to general electronics. Electronic systems, electronics classification, signals and systems. Basic functions of signal processing. Applications. Basic passive components. Classification of electronic components. Active and passive components. Linear and nonlinear resistors; fixed and variable resistors. Fixed and variable condensers. Coils. Diodes and diode circuits. Ideal diode and real diode. Characteristics. Forward bias regions, reverse bias regions and zener. Other diodes: zener, LEDs. Diode circuit analysis. Models. Applications of diode, rectifier and clipping circuits. Bipolar transistor. Definitions. BJT operating regions. Characteristic curves. DC analysis. JFET and MOSFET transistors. Definitions. JFET and MOSFET operating regions. Characteristic curves. DC analysis. Transistor biasing circuits. Calculation of operating points. Biasing networks. Operating point stability. Variation of parameters with temperature. Small signal amplifiers. Small signal equivalent circuits. Basic definitions. Analysis of basic single and multiple stage configurations. Introduction to Digital Electronics. Binary system. Numerical codes. Boolean algebra. Simple logic functions. Logic families. Introduction to Power Electronics. Brief description of power components and basic converters. Applications of electronics in industry. Applications of electronics in industry.

Methodology

Teaching Method

Face-to-Face Teaching Hours

Lectures	Seminars	Classroom practice	Lab. practice	Computer sessions	Clinical practice	Workshops	Industrial workshops	Field practice
48			12					

Student Hours of Non Face-To-Face Activities

Lectures	Seminars	Classroom practice	Lab. practice	Computer sessions	Clinical practice	Workshops	Industrial workshops	Field practice
78			12					

Assessment System

General criteria

Clarification regarding assessment

Bibliography

Basic Bibliography

Class notes-Basic Electronic transparencies. Iñaki Díaz de Corcuera. Principios de Electrónica, Malvino, McGraw Hill. Electrónica analógica para ingenieros. Pleite, Mc Graw-Hill. Circuitos Microelectrónicos. Sedra y Smith, Oxford. Problemas de Electrónica. Various authors, Marcombo.

In-depth Bibliography

Electrónica. Hambley, Prentice Hall. Componentes electrónicos. Espinosa y otros, Universidad de Alcalá. Principios fundamentales de electrónica. Alcalde, Paraninfo. Circuitos microelectrónicos. M.Rashid, Thomson. Problemas de Electrónica Básica. J.Maté y otros, Universidad de Valladolid. Electrónica. Storey, Addison-Wesley Iberoamericana.

Journals: Mundo Electrónico. Nueva Electrónica. Elector. Resistor.

Websites

- http://www.sc.ehu.es/sbweb/electronica/elec_basica/
- <http://grupos.unican.es/dyvci/ruizrg/html.files/LibroWeb.html>
- <http://personal.telefonica.terra.es/web/jqc/index.html>