30302 - Circuits and systems

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	438 - Bachelor's Degree in Telecomunications Technology and Services Engineering 330 - Complementos de formación Máster/Doctorado
ECTS	6.0
Course	---
Period	Indeterminate
Subject Type	Basic Education, ENG/Complementos de Formación
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The teaching methodology is structured in three levels: theoretical classes, problem solving and laboratory practice sessions.

5.2.Learning activities

The following types of activities are scheduled:

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APA1. Theoretical classes where the main course contents are presented and discussed.

APA2. Approach and problem solving where different activities/tasks are proposed related with the main contents of the course.

APA3. Different lab sessions are carried out. The different activities are planned before the session. In the following lab sessions, the student should present a report of each lab session for evaluation.

5.3.Program

Module 0. Introduction: Circuits and Systems for Engineers.

Module 1. Basic Concepts. Charge, Current, Voltage, and Power. Ohm's Law, Active and Passive Circuit Elements. Independent Sources. Dependent Sources. Resistors, Capacitors, Inductors. Systems and properties.

Module 2. Voltage and Current Laws. Circuit Theorems.

Nodes, Paths, Loops, and Branches. Kirchhoff's Laws. Source Transformation. Superposition. Thevenin's and Norton's Theorem.

Module 3. Nodal and Mesh Circuits Analysis. Two-port networks

Node Voltage Analysis. Mesh Current Analysis. Two-port networks: Parameters

Module 4. Time response of First-Order Circuits. Introduction. First-Order Circuits. Unit-Step Function. Exponential Response. First-Order Circuits. Step Response. Transient Analysis. Steady-State Analysis.

Module 5. General Circuits Analysis

Laplace Transform for Circuit Analysis. Circuits element Models . Impedance and Admittance. Laplace Circuit Solutions. Sinusoidal Steady-State Analysis. Transfer Function. Phasors and Sinusoids. Complex Power. Maximum Power Transfer.

5.4.Planning and scheduling

The course calendar is defined by the Escuela de Ingeniería y Arquitectura calendar. In addition, the main dates of the course will be informed through the Moodle platform University of Zaragoza.

5.5.Bibliography and recomended resources