Fundamentals of transient phenomena in power grids

Academic Year: (2019 / 2020)   **Review date: 10/07/2019 18:47:34**

Department assigned to the subject: Electrical Engineering Department

Coordinating teacher: BURGOS DIAZ, JUAN CARLOS

Type: Compulsory ECTS Credits : 3.0

Year : 2 Semester : 1

REQUIREMENTS (SUBJECTS THAT ARE ASSUMED TO BE KNOWN)

Calculus I, Calculus II, Linear Algebra

It is needed to follow, simultaneously, Electric Power Engineering Fundamentals.

OBJECTIVES

By the end of this subject, students will be able to have:
1.   knowledge and understanding of the mathematical principles underlying their branch of engineering;
2.   the ability to apply their knowledge and understanding to identify, formulate and solve mathematical problems using established methods;
3.   a systematic understanding of the key aspects and concepts of electrical circuits;
4.   the ability to apply their knowledge and understanding to identify, formulate and solve electrical circuits problems using established methods;
5.   the ability to design and conduct appropriate experiments, interpret the data and draw conclusions;
6.   workshop and laboratory skills.
7.   the ability to combine theory and practice to solve electrical circuits problems;

DESCRIPTION OF CONTENTS: PROGRAMME

Solutions for first and second order differential equations.
Analysis of steady and transient state in electrical circuits. First and second order electromagnetic transient phenomena in power grids. Resonance.
Modelling of electromagnetic transient phenomena using computer tools

LEARNING ACTIVITIES AND METHODOLOGY

Theoretical and practical lessons solving problems. Practical lessons using computers.

ASSESSMENT SYSTEM

% end-of-term-examination/test:	60
% of continuous assessment (assigments, laboratory, practicals…):	40

Partial and final examination and practical assessment.

BASIC BIBLIOGRAPHY

 - Allan Greenwood Electrical Transients in Power Systems, John Wiley and Sons.

 - Fraile Mora, Jesús Electromagnetismo y circuitos eléctricos, McGraw-Hill.

- R.K. Nagle Fundamentals of Differential Equations, Pearson.

- Usaola, Julio y Moreno, Mª. Ángeles, Circuitos eléctricos. Problemas y ejercicios resueltos, Pearson Educación.