DEGREE CURRICULUM

CIRCUIT THEORY

Coordination: Francisco Claria Sancho

Academic year 2015-16

CIRCUIT THEORY 2015-16

Subject's general information

Subject name	Circuit Theory
Code	102128
Semester	2n Q Avaluació Continuada
Typology	Mandatory
ECTS credits	6
Theoretical credits	4
Practical credits	2
Coordination	Francisco Claria Sancho
Office and hour of attention	by agreement
Department	Informàtica i Enginyeria Industrial
Teaching load distribution between lectures and independent student work	(40%) 60 h classroom (60%) 90 h independent work
Modality	Presencial
Important information on data processing	Consult this link for more information.
Language	Castellà
Degree	Degree in Automation and Industrial Electronic Engineering
Distribution of credits	Theory class 4 Problems class 1 Laboratory 1
Office and hour of attention	by agreement
E-mail addresses	claria@diei.udl.cat

CIRCUIT THEORY 2015-16

Francisco Claria Sancho

Subject's extra information

It is a subject that is offered in the second year, is framed in the field of electrical engineering and belongs to specific technology module. The content of this course provides the basis to contextualize the subjects for electronic and automatic control

This subject aims to familiarize students with the transformation of circuits and systems to the Laplace domain. We study the temporal response of circuits using the Laplace transform, is given notion of transfer function and introduces the concepts of natural and forced response. We also study the frequency response of circuits, and emphasize the concepts of resonance, spectrum, stability and filtering. With these basics, it becomes apparent association of transfer function and system, marking the way for the analysis and design of electronic systems and control.
The analysis of circuits and transformed systems is often , in general, new to the student. For this reason the content of this field requires some time to be assimilated. The daily study is the best guarantee that the concepts are consolidated throughout the course.

You can have specific educational material for the subject in Copisteria Cappont Campus (Aulario building) and Virtual Campus.

Learning objectives

see competences

Competences

Degree-specific competences

- Applied knowledge of electrical engineering.

  Goals

  - - Planning the study of a real system for analysis in the laboratory.
  - - Making practice and taking measurements in the laboratory.

Degree-transversal competences

- Ability to resolve problems and elaborate and defend arguments inside their field of study.

  Goals

  - - Knowing the meaning of amplitude and phase spectrum of a transfer function. - Distinguish and evaluate the amplitude spectrum of systems from the position of the poles and zeros of the transfer function. - Relate in time and frequency components the response of a circuit or system of first order and second order. - Fix the concept of resonance and its spectral and temporary meaning. - Develop the concept of circuit or system as a processor with a given frequency bandwidth.

- Ability to analyse and synthesize.

  Goals

  - - Analyze a circuit using differential equations. - Know and use the Laplace Transform (LT) to transform circuits and systems in general. - Calculate the time response from transformed circuits or systems. - Understand the concept and get the transfer function of circuits and systems.

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Subject contents

CHAPTER 3

3.SIGNALS AND THEIR CHARACTERISTICS

CHAPTER 4

4. CIRCUITS ANALYSIS IN THE LAPLACE DOMAIN

CHAPTER 5

5. RESPONSE IN TIMEOF LINEAR CIRCUITS

CHAPTER 6

6. FREQUENCY RESPONSE OF LINEAR CIRCUITS

CHAPTER 7

7. PERMANENT SINUSOIDAL REGIME

7.1 INTRODUCTION

7.2 EFFECTIVE VALUE. DEFINITION.

7.3 PERMANENT SINUSOIDAL REGIME AND POWER

- 7.3.1 PHASORS
- 7.3.2 COMPLEX POWER

7.4 PROPOSED PROBLEMS

CHAPTER 8

8. TRANSFORMER

8.1 INTRODUCTION

8.2 IDEAL TRANSFORMER

8.3 REAL TRANSFORMER

8.4 MAXIMUM TRANSFER OF POWER THEOREM

8.5 EXERCISE OF APPLICATION

8.6 PROPOSED PROBLEMS

Methodology

-Master class

-Problem-based learning

-Classroom Practices

Development plan

Develops sequentially contents

Evaluation

~~Evaluation Method

During the semester, there shall be four assessments in the form of two written tests and two papers that account for the study and the work done in the labs. These documents will have a maximum score of 1 point each and not considered any improvement threshold. The two written tests will be held on dates determined by the EPS for this purpose.

In this course, by its nature, has little sense to evaluate parts of avoiding your stuff previous contents. Thus, each written test will be on all the stuff that has been given so far.

The first written test will have a maximum score of 3 points and be considered approved if the score is greater than or equal to 1.5 points. The second written test will have a maximum score of 5 points and will be considered approved if the score is greater than or equal to 2.5 points.

As the material is cumulative in each written test, if the second test is passed, then the first test will be compensated if the latter has not been surpassed, with half its maximum score (1.5 points).

-The total score is the sum of the notes of the 4 reviews. (This is the first of the two possible pathways of qualifications that are contemplated).

-If the second written test you get a lower score to 2.5 points, you must use the recovery activity, to be performed on the date set by the EPS. The written test will have a valuation recovery maximum 8 points and be deemed to have been passed if you get a note added to the laboratory practice notes and document preparation practices study is greater than or equal to 5 points. (This is the second pathway)

In addition:

Any person enrolled in this course, that have made the 2nd written test whether or not it has been overcome, be furnished to the recovery activity to increase the final grade. If the 2nd test had been overcome the final grade will never be lower than it would have obtained by the first approach.

Bibliography

Bibliography and resources

Basic Bibliography:

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A. Gómez Expósito, J.A. Olivera Ortiz de Urbina.

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