Course guide
220099 - TC - Circuit Theory

Last modified: 19/04/2023

Unit in charge:	Terrassa School of Industrial, Aerospace and Audiovisual Engineering
Teaching unit:	709 - DEE - Department of Electrical Engineering.

Degree:	BACHELOR'S DEGREE IN INDUSTRIAL TECHNOLOGY ENGINEERING (Syllabus 2010). (Compulsory subject).

Academic year: 2023   **ECTS Credits:** 6.0   **Languages:** Catalan

LECTURER

Coordinating lecturer: Ramon Mujal Rosas

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE10-INDUS. Knowledge and use of principles of circuit theory and electric machines. (Common module for industrial engineering)

TEACHING METHODOLOGY

The course will consist of:
Sessions of the theoretical exposure in large groups.
Sessions of problem solving in medium groups.
Sessions of practical training and simulation laboratory in small groups.
Independent work and study exercises and problems.
For the methodology students have the educational material that will support hanging Athena.
Also in Athena have hanging teaching guide, and distribution groups theory and problems, as well as subgroups of practice.
The practice is divided into laboratory practice and practical computer simulation.
In order to realize autonomous work is going to do a planning for weekly dedication.

LEARNING OBJECTIVES OF THE SUBJECT

The Circuit Theory course is the base for other subjects future such as electrical engineering, electrical machines, design lines, and electronics and the regulation and control of machines.
It is therefore a basic course, for unify their knowledge, because there are very different levels depending on their origin, for further progress and provide work tools necessary to make later any subject electrical successfully.
Finally, the last part of the course is to give practical examples of applying knowledge achieved in the study of the subject, which should enable students to see the usefulness of what he has learned, and also see most logical subject, that contains many knowledge that seem there isn't relation between it.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	14,0	9.33
Self study	90,0	60.00
Hours small group	14,0	9.33
Hours large group	32,0	21.33

Total learning time: 150 h

CONTENTS

Unit I: Analysis of DC circuits

Description:

Full-or-part-time: 24h
Theory classes: 5h
Practical classes: 2h
Laboratory classes: 2h
Self study : 15h

Unit II: Analysis of AC circuits

Description:

Full-or-part-time: 24h
Theory classes: 5h
Practical classes: 2h
Laboratory classes: 2h
Self study : 15h

Unit III: Network Theorems electric

Full-or-part-time: 24h
Theory classes: 5h
Practical classes: 2h
Laboratory classes: 2h
Self study : 15h

Unit IV: transistor circuits first and second order

Full-or-part-time: 27h
Theory classes: 6h
Practical classes: 3h
Laboratory classes: 3h
Self study : 15h

Unit V: balanced and unbalanced three-phase systems

Full-or-part-time: 27h
Theory classes: 6h
Practical classes: 3h
Laboratory classes: 3h
Self study : 15h

Unit VI: Practical applications of circuit theory

Full-or-part-time: 24h
Theory classes: 5h
Practical classes: 2h
Laboratory classes: 2h
Self study : 15h

ACTIVITIES

THEORY LESSONS

Description:

Full-or-part-time: 39h
Theory classes: 25h
Self study: 14h

PROBLEM LESSONS

Description:

Full-or-part-time: 56h
Practical classes: 14h
Self study: 42h

LABORATORY PRACTICE

Description:

Full-or-part-time: 16h
Laboratory classes: 8h
Self study: 8h

COMPUTER SIMULATION SESSIONS

Description:

Full-or-part-time: 12h
Laboratory classes: 6h
Self study: 6h

MONITORING PROBLEMS SESSIONS

Description:

Full-or-part-time: 6h
Theory classes: 2h
Self study: 4h

MIDTERM EXAM

Full-or-part-time: 9h
Theory classes: 2h
Self study: 7h

FINAL EXAM

Full-or-part-time: 12h
Theory classes: 3h
Self study: 9h

FINAL REVIEW OF RECOVERY COURSE

Description:
318/5000
For this will be a written test that will be of shorter duration than the examination to which it recovers and of much more basic contents
This basic test will only allow to pass the subject, that is to say, the maximum grade will be of 5.
Only students who do not have the subject approved can be presented to this test.

Specific objectives:
With this test the student is given the last opportunity to reach the minimum requirements to pass the subject, which would be more basic than in the normal exam, but the maximum grade will also be simply passed (5) or suspended. It is not possible to obtain more note by means of this test than it has been indicated is of minimum contained.

Material:
The typical material of a written exam. Writing material, calculator and paper

Delivery:
The written test will be delivered on the same day and at the time of the test, corrected as soon as possible to have a reference note

Full-or-part-time: 1h
Theory classes: 1h

GRADING SYSTEM

THE FINAL QUALIFICATION OF THE SUBJECT IS THE SUM OF THE FOLLOWING PARTIAL QUALIFICATIONS:

NOTE A: PARTIAL EXAM NOTE
NOTE B: PRACTICAL NOTE
NOTE C: FINAL EXAM
NOTE D: FIRST PART RECOVERY

Final Note = (0.25 x Note Partial Exam) + (0.15 x Practical Notes) + (0.5 x Note Final Exam)

All those students who can not attend the partial or partial exam activity, who have unsatisfactory results (less than 5), will be able to redirect the note on the same day as the final exam.

For this, in this final exam, one or two additional problems will appear corresponding to the first part of the course (partial exam).
With this reconduction the maximum grade that the student can obtain in the first part of the course (partial exam note) is the one approved (5)

EXAMINATION RULES.

The exams will do without notes.
In exercises of continuous assessment is usually able to have notes or form, but in any case indicated in each test
For the implementation of practices usually will have any material except when requesting a report, in such case, may not have any note.
In any case, before each test indicate specifically what material can be used in its implementation.

BIBLIOGRAPHY

Basic:
- Irwin, J. David. Análisis básico de circuitos en ingeniería. 6a ed. México: Limusa Wiley, 2003. ISBN 9681862953.
- Dorf, Richard C. Circuitos eléctricos: introducción al análisis y diseño. 3a ed. México: Alfaomega, 2000. ISBN 9701505174.
- Mujal, R.; Alabern, X. Comportamiento dinámico de sistemas: colección de problemas y prácticas. 2ª ed. Barcelona: Universitat Politècnica de Catalunya, 2000. ISBN 8484168522.
- Alabern, X.; Mujal, R.; Font, A. Comportament dinàmic de sistemes: exàmens resolts. 2ª ed. Terrassa: Universitat Politècnica de Catalunya, Departament d'Enginyeria Elèctrica, 2000. ISBN 8469919903.

Complementary:
- Sánchez Barrios, Paulino. Teoría de circuitos: problemas y pruebas objetivas orientadas al aprendizaje. Madrid: Pearson Educación, 2007. ISBN 9788483223871.
- Fraile Mora, Jesús. Electromagnetismo y circuitos eléctricos. Madrid: E.T.S. Ingenieros de Caminos. Servicio de Publicaciones, Revista de Obras Públicas, 1990. ISBN 8474931312.