Course guide
220102 - EME - Electrotechnics and Electrical Machines

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:** 7.5 **Languages:** Catalan

LECTURER

Coordinating lecturer: Antoni Garcia Espinosa

Others: Antoni Font Piera
Jordi-Roger Riba Ruiz
Jaume Saura Perisé

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
CE25-GRETI. Ability to calculate, design, and control electrical machines. (Specific Technology Module)
CE10-INDUS. Knowledge and use of principles of circuit theory and electric machines. (Common module for industrial engineering)

TEACHING METHODOLOGY

Sessions of exhibition content that are developed in the theoretical concepts of the subject, complementing it with applied examples to facilitate understanding.
Sessions where teachers solve problems solving techniques and exercise which will focus on applying the industrial world.
Practical sessions where students manipulate industrial measurement instruments, transformers and electrical machines to acquire knowledge of the subject.

LEARNING OBJECTIVES OF THE SUBJECT

The student must know and familiarize with the three-phase systems, and understand the operation and behaviour of static and rotating electrical machines.

STUDY LOAD

Type	Hours	Percentage
Hours medium group	14,0	7.47
Hours small group	14,0	7.47
Hours large group	47,0	25.07
Self study	112,5	60.00

Total learning time: 187.5 h

CONTENTS

Three-phase system

Full-or-part-time: 51h
Theory classes: 13h
Practical classes: 4h
Laboratory classes: 4h
Self study : 30h

Transformers

Full-or-part-time: 76h
Theory classes: 19h
Practical classes: 6h
Laboratory classes: 6h
Self study : 45h

Rotating machine. Induction machine.

Full-or-part-time: 60h 30m
Theory classes: 15h
Practical classes: 4h
Laboratory classes: 4h
Self study : 37h 30m

ACTIVITIES

THEORY LESSONS

Full-or-part-time: 105h
Theory classes: 42h
Self study: 63h

PROBLEM LESSONS

Full-or-part-time: 35h
Practical classes: 14h
Self study: 21h

EVALUATION TESTS

Full-or-part-time: 12h 30m
Theory classes: 5h
Self study: 7h 30m

LABORATORY PRACTICE MODULE 1 AND 2

Full-or-part-time: 15h
Laboratory classes: 6h
Self study: 9h

LABORATORY PRACTICE MODULE 2 AND 3

Full-or-part-time: 20h
Laboratory classes: 8h
Self study: 12h

GRADING SYSTEM

The final grade for the course will be calculated taking into account of the four activities indicated:
Partial exam: 30%
Final exam: 50%
Practical Module 1: 10%
Practices Module 2: 10%

All those students who fail, want to improve their mark or cannot attend the partial exam, they will have the opportunity to be examined the same day of the final exam. If due to the circumstances it is not viable to do it the same day of the final examination, the teacher responsible for the subject will propose, via the platform Atenea, that the mentioned recovery exam will be carried out another day, in class schedule.
The new mark of the recovery exam will substitute the previous one, just in the case that it is higher.

EXAMINATION RULES.

The partial exam can recover through the final exam.
The partial and final exam will be make individually and written.
Practice sessions will be made by safety regulations and electrical machines laboratory will be required to have passed the first practice on safety in low voltage installations.

BIBLIOGRAPHY

Basic:
- Ras Oliva, E. Transformadores de potencia, de medida y de protección. 7ª ed. Barcelona: Marcombo, 1988. ISBN 8426706908.
- Fraile Mora, J. Máquina eléctricas. 8a ed. Madrid: Ibergarceta, 2016. ISBN 9788416228669.
- Alabern Morera, X.; Riba Ruiz J. R. Electrotecnia: problemas [on line]. 2ª ed. Barcelona: Edicions UPC, 2006 [Consultation: 14/05/2020]. Available on: http://hdl.handle.net/2099.3/36760. ISBN 8483018691.