Course guide
240161 - 240161 - Electrical Machines

Last modified: 26/06/2023

Unit in charge: Barcelona School of Industrial 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: SAMUEL GALCERAN ARELLANO

Others:

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Specific:
1. Capacity to calculate and design electric machines.
2. Knowledge on machines control and electrical drives and their applications.

TEACHING METHODOLOGY

Teaching metodology consist on:
Explanatory classes
Problem classes
Laboratory/Practical classes

LEARNING OBJECTIVES OF THE SUBJECT

AT the end of the subject, have to be able to:
Formulate and calculate electromagnetic circuits.
Describe, identify and recognize electric machines.
Describe, identify and recognize power electronics converters to drive electric machines.
Compare and evaluate what kind of machine and drive are the correct ones for a specific application.

STUDY LOAD

Type	Hours	Percentage
Hours small group	10,0	6.67
Hours large group	50,0	33.33
Self study	90,0	60.00

Total learning time: 150 h

CONTENTS

(ENG) Tema 1: Materials elèctrics i magnètics. Circuits electromagnètics.

Related competencies :
CETI7. Capacity to calculate and design electric machines.

Full-or-part-time: 10h
Theory classes: 4h
Practical classes: 4h
Laboratory classes: 2h

(ENG) Tema 2: Màquina de corrent continu.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.
CETI7. Capacity to calculate and design electric machines.

Full-or-part-time: 10h
Theory classes: 4h
Practical classes: 4h
Laboratory classes: 2h

(ENG) Tema 3: Màquina síncrona.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.
CETI7. Capacity to calculate and design electric machines.

Full-or-part-time: 10h
Theory classes: 4h
Practical classes: 4h
Laboratory classes: 2h

(ENG) Tema 4: Màquina d'inducció.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.
CETI7. Capacity to calculate and design electric machines.

Full-or-part-time: 10h
Theory classes: 4h
Practical classes: 4h
Laboratory classes: 2h

(ENG) Tema 5: Altres tipus de màquines.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.
CETI7. Capacity to calculate and design electric machines.

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

(ENG) Tema 6: Convertidors estàtics per a màquines elèctriques.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.

Full-or-part-time: 6h
Theory classes: 6h

(ENG) Tema 7: Dimensionament i selecció d'accionamnets elèctrics.

Related competencies :
CETI8B. Knowledge on machines control and electrical drives and their applications.

Full-or-part-time: 8h
Theory classes: 4h
Practical classes: 4h

GRADING SYSTEM

Normal evaluation:
Final mark = 0,15*Lab Mark + 0,40*Ex1 Mark + 0,45*Ex2 Mark
Lab Mark = 0,25*(NotaP1+NotaP2) + 0,16667*(NotaP3+NotaP4+NotaP5), where NotaPx means mark of lab session x

Reevaluation:
Final Mark = Min(Reav1, Reav2)
Where:
Min means "minimum value of"
Reav1 = 5,0
Reav2 = Reavaluation Exam mark

Attention! In the event that the student does not pass the subject and has to repeat it, NO marks will be kept for any assessment, including laboratory sessions.
Students should also know that exam 1 and exam 2 assess different parts of the subject.

EXAMINATION RULES.

The evaluation acts (where a grade is given to the work done) consist of the laboratory sessions and the exams. Attendance at the evaluation events is NOT mandatory. In particular, no change of group is allowed in any of the lab sessions, and requests for this will not be entertained. It is very convenient to prepare for all the assessment acts, in particular, to read and understand the scripts of the laboratory sessions before the day and time established to carry them out. Both in laboratory sessions and in exams, dimensional and conceptual errors in reasoning, results without units (except for dimensionless quantities) or in units other than the International System of Units can be heavily penalized. The behaviour in the laboratory must always be serious and with maximum respect for the rules, especially the warnings and instructions in order to avoid risks in the laboratory.

In the exams, you are only allowed to bring a sheet of paper (collection of formulae), calculator and ballpoint pen.