

## 29623 - Electrical Machines II

### Información del Plan Docente

Academic Year	2017/18
Faculty / School	110 - Escuela de Ingeniería y Arquitectura
Degree	430 - Bachelor's Degree in Electrical Engineering
ECTS	6.0
Year	3
Semester	First semester
Subject Type	Compulsory
Module	---

### **1.General information**

#### **1.1.Introduction**

#### **1.2.Recommendations to take this course**

#### **1.3.Context and importance of this course in the degree**

#### **1.4.Activities and key dates**

### **2.Learning goals**

#### **2.1.Learning goals**

#### **2.2.Importance of learning goals**

### **3.Aims of the course and competences**

#### **3.1.Aims of the course**

#### **3.2.Competences**

### **4.Assessment (1st and 2nd call)**

#### **4.1.Assessment tasks (description of tasks, marking system and assessment criteria)**

### **5.Methodology, learning tasks, syllabus and resources**

#### **5.1.Methodological overview**

The purpose of the Electric Machines II course is to study synchronous machines as most electric generators are of this kind, as well as DC machines because their use and their regulation are very important in the industry.

#### **5.2.Learning tasks**

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An important part of the basic contents is taught in class in a traditional way. They are three hours of lectures per week, and during the lectures the basic knowledge is delivered to the students.

Problems and case studies will be developed in the classroom, that contributes extensively to guiding the learning process of the students.

Problems and case studies will be proposed to the students, as an important way of learning. The tutorial sessions are used for clarifications and understanding difficult concepts.

Students will experience the operation of the electric machines in the laboratory. A guideline for each practice lab has been created. These guidelines are available in the ADD.

There are also two quizzes and a three-hour final exam.

### 5.3.Syllabus

Synchronous Machines:

Synchronous machine models. Active and reactive power. P-Q capability diagram. Performance as a motor. Transient analysis.

Direct Current Machines:

Armature winding. Load operation. Performance of DC generators. Performance of DC motors.

### 5.4.Course planning and calendar

### 5.5.Bibliography and recommended resources

[BB: Bibliografía básica / BC: Bibliografía complementaria]

- [BB] Chapman, Stephen J.. Máquinas eléctricas / Stephen J. Chapman ; revisión técnica Carlos Rodríguez Pérez, Alfredo Santana Díaz . - 5ª ed. México [etc.] : McGraw-Hill, cop. 2012
- [BB] Fitzgerald, Arthur Eugene.. Máquinas eléctricas / A. E. Fitzgerald, Charles Kingsley, Stephen D. Umans ; traducción, Jorge Yescas Milanés, Rodolfo Navarro Salas ; revisión técnica, Luis Mauro Ortega González . - 6ª ed. México [etc.] : McGraw-Hill/Interamericana, cop. 2004
- [BB] Fraile Mora, Jesús. Problemas de máquinas eléctricas / Jesús Fraile Mora, Jesús Fraile Ardanuy . 2ª ed. [Madrid] : Garceta, D.L. 2015
- [BB] Ras Oliva, Enrique. Transformadores de potencia, de medida y de protección / Enrique Ras Oliva . - 7ª ed. renov. Barcelona : Marcombo, cop. 1994
- [BB] Serrano Iribarnegaray, Luis. Fundamentos de máquinas eléctricas rotativas / Luis Serrano Iribarnegaray Barcelona : Marcombo Boixareu ; [Valencia] : Universidad Politécnica de Valencia, D.L. 1989
- [BB] Silvestre, P.P. Finite elements for electrical engineers / Silvestre, P. P., Ferrari, R. L. Cambridge University Press.
- [BC] Corrales Martín, Juan. Cálculo industrial de máquinas eléctricas. Tomo I, Fundamentos del cálculo / Juan Corrales Martín Barcelona [etc.] : Marcombo Boixareu, D. L. 1982
- [BC] Corrales Martín, Juan. Cálculo industrial de máquinas eléctricas. Tomo II, Método de cálculo / Juan Corrales

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Martín Barcelona [etc.] : Marcombo Boixareu, D. L. 1982

### Listado de URL

- Apuntes de la asignatura, colección de enunciados de problemas, cuaderno de prácticas de laboratorio disponibles en el Anillo Digital Docente[<http://moodle.unizar.es>]