

## 340230 - APME-E7P09 - Applications of Electric Motors

Coordinating unit:	340 - EPSEVG - Vilanova i la Geltrú School of Engineering
Teaching unit:	709 - EE - Department of Electrical Engineering
Academic year:	2019
Degree:	BACHELOR'S DEGREE IN ELECTRICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL ELECTRONICS AND AUTOMATIC CONTROL ENGINEERING (Syllabus 2009). (Teaching unit Optional) BACHELOR'S DEGREE IN INDUSTRIAL DESIGN AND PRODUCT DEVELOPMENT ENGINEERING (Syllabus 2009). (Teaching unit Optional)
ECTS credits:	6
Teaching languages:	Catalan

### Teaching staff

Coordinator: Martinez Piera, Eusebio

Others: Martinez Piera, Eusebio

### Opening hours

Timetable: To consult on the Website of the EPSEVG

### Requirements

Student of electrical, electronic, mechanical or industrial design degree.

### Degree competences to which the subject contributes

Specific:

1. CE19. Applied knowledge in electric engineering.

Transversal:

2. SUSTAINABILITY AND SOCIAL COMMITMENT - Level 3. Taking social, economic and environmental factors into account in the application of solutions. Undertaking projects that tie in with human development and sustainability.
3. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.
4. TEAMWORK - Level 2. Contributing to the consolidation of a team by planning targets and working efficiently to favor communication, task assignment and cohesion.

### Teaching methodology

-The subject is developed in the environment of an activity consisting of choosing, as a team, a specific application that will be developed during the semester. On it are articulated the different topics of theory and problems (which are found in the section of contents).

-At the end of the course, on this activity, there will be an oral and written presentation (for each team) of the work done during the semester.

### Learning objectives of the subject

An electric motor is a machine that transforms electrical energy into mechanical energy. In any field: industrial, domestic, ... we are surrounded by applications that require movement or positioning of mechanical parts in which electric motors

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are used (or can be used). Of the different types that we can find, the most widely used in the industrial world is the three-phase asynchronous motor with cage rotor; for applications of smaller powers as we can find in the domestic environment, we have the same type but in the single-phase version, although, also, in many cases the universal motor or the DC motor is used.

All these engines are studied during the degree, regardless of the specialty, in greater or lesser depth. In this subject you want to give the vision of the application of these engines in systems or products.

The main objective of the subject is to provide the basic criteria for the correct selection of these types of engines, given a specific application. To achieve this objective, it is necessary to know about its constitution and functioning, as well as the electronic systems that allow it, if applicable. It is also necessary to analyze the needs of the load to be driven (constant or variable speed).

Nowadays, in addition, we must add other considerations such as thermal, environmental, new materials, energy efficiency and economic aspects that will also be analyzed taking them into account for their application, in the different topics of the subject.

### Study load

Total learning time: 150h	Hours large group:	45h	30.00%
	Hours small group:	15h	10.00%
	Self study:	90h	60.00%

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### Content

<p>Topic 1.- General Aspects of Electric Motors.</p>	<p>Learning time: 50h Theory classes: 15h Laboratory classes: 5h Self study : 30h</p>
<p>Description: 1.1.- General Aspects of Electric Motors. 1.2.- Classification. 1.3.- The Electric drive.</p>	
<p>Topic 2.- Installation, Operation and Maintenance of Electric Motors.</p>	<p>Learning time: 50h Theory classes: 15h Laboratory classes: 5h Self study : 30h</p>
<p>Description: 2.1.- Parameters Assignats.Placa of Characteristics. 2.2.- Heating and Type of service of electric motors. environmental factors. 2.3.- Type of charges. Motor-load couplings. stability. 2.4.- Standardization. Rules. 2.5.- Troubleshooting and maintenance.</p>	
<p>Topic 3.- Sustainability of Electric Motors.</p>	<p>Learning time: 50h Theory classes: 15h Laboratory classes: 5h Self study : 30h</p>
<p>Description: 3.1.- Economic importance of performance. Energy efficiency classes. 3.2.- Determination of performance according to standards (IEC 60034-2-1). 3.3.- Life Cycle Cost Determination (LCC). 3.4.- Environmental Aspects. Ecodesign of electric motors. Analysis of the life cycle.</p>	

### Qualification system

Note = 30% partial exam + 30% Final Exam + 40% activities

### Regulations for carrying out activities

- Written exams are face-to-face and individual tests.



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### Bibliography

Basic:

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