66341 - Control and design of electric converters

Información del Plan Docente

Academic Year	2016/17
Academic center	110 - Escuela de Ingeniería y Arquitectura
Degree	535 - Master's in Renewable Energies and Energy Efficiency
ECTS	5.0
Course	1
Period	Second semester
Subject Type	Optional
Module	---

1.Basic info

1.1.Recommendations to take this course

1.2.Activities and key dates for the course

2.Initiation

2.1.Learning outcomes that define the subject

2.2.Introduction

3.Context and competences

3.1.Goals

3.2.Context and meaning of the subject in the degree

3.3.Competences

3.4.Importance of learning outcomes

4.Evaluation

5.Activities and resources

5.1.General methodological presentation

The learning process designed for this subject is based on:

During the theory sessions the basic concepts are explained. Exercises and applied problems are also developed in the classroom blackboard. The purpose is to improve understanding of the different concepts. The methodology is based on the development of academic activities and tasks as concepts-test, theory pills, challenge problem, simulation software...

5.2.Learning activities

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The program offered students to achieve the expected results includes the following activities...

Theoretical and Practical classes.

Lectures with problem sessions and cases of actual application are applied. Student participation through questions and brief discussions are encouraged.

Laboratory Practices.

The student will have a script of laboratory practice, previously provided to the start of the session. The teacher provides the information necessary for their development and implementation.

Supervised academic tasks.

Teacher presents students the resolution of a set of problems and real cases related to different topics. These academic tasks are related to the contents of the subject.

Individual study of the student.

The purpose is to encourage continued study of student. Thus the different academic activities are distributed throughout the semester.

Evaluation tests

The different evaluation activities are used to check the degree of compression and assimilation of knowledge. Its purpose is to determine the skills, abilities and competences acquired by the student

Tutorships

Direct attention to the student, identification of learning problems, orientation in the subject, review exercises and assignments ...

5.3.Program

The course is divided into different parts , the contents are listed below.
0.- Introduction .
1.- Generalities and Converters Applications .
2.- Power Devices .
3.- Structures and Topologies for converters . Types.
4.- Modulation Strategies .

Practical section :
a.- Introduction to the use of commercial simulation software for devices and topologies in permanent and transient mode. Resolution some basic examples .

b.- Introduction of commercial simulation software to estimate losses on different devices . Application Examples .

5.4.Planning and scheduling

Class calendar and presentation of academic activities

Theory and problems classes together with the practice sessions are imparted according to the schedule established by the school. These schedules are published before the start of academic year.

Each teacher will inform its hours of tutoring. The other activities will be planned depending on the number of students and will be announced sufficiently in advance.

5.5.Bibliography and recomended resources

- BACHA S., MUNTEANU I. and BRATCU A.I. " Power Electronic Converters Modeling and Control: with Case Studies ". Ed. Springer.
- BOSE , Bima l K . "Power Electronics and Variable Frequency Drives . Technology and Applications". Ed. IEEE Press.
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- ERICKSON R.W. and MAKSIMOVIC D. " Fundamentals of Power Electronics ". Ed . Kluwer Academic Publisher.
- KAZIMIERCZUK M.K. and CZARKOWSKI D. " Resonant Power Converters ". Ed. John Wiley & Sons Inc.
- MOHAN N. , UNDELAND T.M. and ROBBINS W.P. " Power Electronics: Converters, Applications, and Design ". Ed. John Wiley & Sons Inc .
- MO NMASSON, Eric . " Power Electronics Converters. PWM Strategies and Current Control Techniques ". Ed. John Wiley & Sons Inc. ISTE Ltd .
- SHARKH S.M., ABUSARA M.A., ORFANOUDAKIS G.I. and HUSSAIN B. "Power Electronics Converters for Microgrids". Ed. WILEY IEEE P ress.
- ANAYA O., CAMPOS D. MORENO E. and ADAM G. "Offshore Wind Energy Generation. Control, Protection and Integration to Electrical System". Ed. Wiley.