VNIVERSITAT DE VALÈNCIA

Course Guide
44286 Industrial electronic systems for energy conversion

COURSE DATA

Data Subject	
Code	44286
Name	Industrial electronic systems for energy conversion
Cycle	Master's degree
ECTS Credits	4.0
Academic year	2022 - 2023

Study (s)

Degree	Center	Acad. year	Period
2199 - M.D. in Electronic Engineering	School of Engineering	1	First term

Subject-matter

Degree	Subject-matter	Character
2199 - M.D. in Electronic Engineering	3 - Industrial electronic	Obligatory

Coordination

Name	Department
ESTEVE GOMEZ, VICENTE	242 - Electronic Engineering

SUMMARY

This is a subject that should provide the student an overview and practical applications of power electronics. Each application of power electronics or set of related applications is presented as a thematic unit within that unit and power converters involved in each application are explained.

Apart from the purely theoretical course contents will provide the student with general knowledge to solve engineering problems.

This is a mandatory course, which is taught in the first semester of the Master in Electronic Engineering. The total teaching load is 4 ECTS. The workload for students is 100 hours over the semester, of which 40 are on-site and 60 are individual work.

PREVIOUS KNOWLEDGE

Relationship to other subjects of the same degree

There are no specified enrollment restrictions with other subjects of the curriculum.

Other requirements

Since this is a course that emphasizes and in the final application and every system is composed of other electrical and electronic subsystems is highly recommended to have prior knowledge of basic power electronics.

OUTCOMES

LEARNING OUTCOMES

The student should be able to:

• Knowing the design and characterization of magnetic components, both reels and transformers

• Know the basic structures of converting electrical energy into new applications of Power Electronics

DESCRIPTION OF CONTENTS

1. Industrial electronic systems for energy conversion.

Fundamentals and mega-targets of Power Electronics.
Fundamentals of power switches and switching
Advanced semiconductor
Topological Fundamentals of the power converters
Advanced converters: multilevel converters, matrix converters
Future applications of Power Electronics

WORKLOAD

ACTIVITY	Hours	% To be attended
Theory classes	20,00	100
Laboratory practices	20,00	100
Development of group work	15,00	0
Development of individual work	10,00	0
Study and independent work	5,00	0
Readings supplementary material	5,00	0
Preparation of evaluation activities	15,00	0
Preparing lectures	5,00	0
Preparation of practical classes and problem	5,00	0
TOTAL	**100,00**	

TEACHING METHODOLOGY

The teaching methods employed in the development of the course are:

a) Theoretical activities.

Expository development of matter with the student's participation in the resolution of specific issues.

b) Practical activities.

Solving practical problems

c) Student's personal work.

Description: Performing outside the classroom to issues and problems as well as the preparation of classes and exams (study). This task will be performed individually and try to promote self-employment.

We will use e-learning platforms (LMS) to support communication with students. Through it the student will have access to course materials used in class, as well as solving problems and exercises.

EVALUATION

THEORY

The first evaluation of the theory will be carried out by an individual test, which may be by submitting work of an item on the contents of the Course, through a written exam or both. The work should be submitted before the end of the first quarter to Professor for evaluation.

The second evaluating the Theory will be carried out through a written and on the contents of the Course examination.

LABORATORY

Laboratory evaluation will be done by delivering questionnaires memories and practices at the end of each session.

The note of theory will contribute 50% of the final note and the Laboratory note contribute 50% of the final note.

To average in any preceding weightings will be achieved a minimum of 4.0

REFERENCES

Basic

- Daniel W. Hart.: Electrónica de Potencia Ed. Prentice Hall, 2001, ISBN: 84-205-3179-0.
- Mohan, Undeland, Robbins.: Power Electronics. Converters, applications and design. Ed John Wiley & Sons. Inc, 2o edición. 1995.

Additional

- J.G. Kassakian, M.F. Schlecht, G.C. Verghese., Principles of Power Electronics, Ed. Addison-Wesley, 1991.
- Jose M. de Juana, Energías renovables para el desarrollo. Editorial Thomson Paraninfo. Madrid, 2007.