

## SUBJECT TEACHING GUIDE

G606 - Transformation and Efficient Use of Energy

Degree in Energy Resources Engineering

Academic year 2019-2020

1. IDENTIFYING DATA					
Degree	Degree in Energy Resources Engineering			Type and Year	Compulsory. Year 4
Faculty					
Discipline	Subject Area: Advanced Electrical Technology Module: Training in Energy Resources, Fuels and Explosives				
Course unit title and code	G606 - Transformation and Efficient Use of Energy				
Number of ECTS credits allocated	6	Term	Semester based (2)		
Web					
Language of instruction	Spanish	English Friendly	Yes	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA				
Name of lecturer	JUAN CARCEDO HAYA				
E-mail	juan.carcedo@unican.es				
Office	E.P. de Ingeniería de Minas y Energía. Planta: + 1. DESPACHO 18 - I. AMBIENTAL (131)				
Other lecturers	RAMON LECUNA TOLOSA				

### 3.1 LEARNING OUTCOMES

- Study of the various systems of thermal and mechanical energy conversion
- Understanding the concept of efficiency applied to energy systems
- Knowledge of current regulations concerning energy efficiency and their range of application

### 4. OBJECTIVES

- Characterization of the various systems of thermal and mechanical energy transformation
- Calculation and sizing of thermal and mechanical energy transformation systems
- Knowledge of the requirements for the efficient use of energy resources

6. COURSE ORGANIZATION	
CONTENTS	
1	EFFICIENCY OF HEATING AND COOLING SYSTEMS Heat exchangers. Boilers. Furnaces. Cooling towers. Cooling machines. Heat pumps.
2	EFFICIENCY OF ELECTRIC SYSTEMS Improved efficiency machines. Efficient lighting. Compensation of reactive energy. Rotational speed regulation.
3	ENERGY AUDITS Energy supply networks. Energy storage. Energy efficiency. Energy audits.

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
LAB PRACTICES	Written exam	No	No	10,00
PERIODIC ASSESSMENTS (NON ELIMINATING)	Written exam	No	Yes	30,00
FINAL EXAM	Written exam	Yes	Yes	60,00
TOTAL				100,00
Observations				
Students pass the course if they obtain an average mark of 5 (out of 10). This mark is the result of average the periodic assessments and the final exam.				
Observations for part-time students				
Part-time students can do an exam which evaluates all the topics covered by the course (as well as practical activities). For this purpose the student must communicate his choice to the teacher by email before the final exam date. To pass the course it is necessary to obtain a mark of 5 out of 10.				

8. BIBLIOGRAPHY AND TEACHING MATERIALS
BASIC
"Fundamentos de climatización". ATECYR
"Transferencia de calor y masa". Y. Çengel. 2011. McGrawHill
"Cogeneración: Aspectos termodinámicos, tecnológicos y económicos". J.M. Sala Lizarraga. 1995. UPV
"Eficiencia en el uso de la energía eléctrica". J. Autonell. 2011. Circutor, Barcelona, Marcombo
"Cálculos en climatización". E. Torrella y otros. 2002. AMV Ediciones