

## SUBJECT TEACHING GUIDE

1124 - Management, diversification, energy saving and efficiency

Master's Degree in mining engineering

Academic year 2023-2024

1. IDENTIFYING DATA					
Degree	Master's Degree in mining engineering			Type and Year	Optional. Year 2
Faculty	School of Mines and Energy Engineering				
Discipline	BLOCK II, SPECIALTY ENERGY Optional Module				
Course unit title and code	1124 - Management, diversification, energy saving and efficiency				
Number of ECTS credits allocated	3	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. INGENIERIA ELECTRICA Y ENERGETICA				
Name of lecturer	LUIS VICENTE ORTIZ DE ZARATE VIDAL				
E-mail	luisortizdezarate@unican.es				
Office					
Other lecturers					

### 3.1 LEARNING OUTCOMES

-- To know the keys issues related to management, diversification, savings and energy efficiency.

### 4. OBJECTIVES

- Advanced knowledge about regulations, techniques and system that allow the management, diversification, savings and the energy efficiency

6. COURSE ORGANIZATION	
CONTENTS	
1	SECTION I. Energy efficiency
1.1	Calculation of thermal loads. Fluids transport. heat generators
1.2	Air conditioning units
1.3	Air-conditioning systems
1.4	Maintenance and operation of energy facilities
1.5	Energy savings in air conditioning
2	SECTION II. Electrical efficiency
2.1	Power quality
2.2	Automation of electrical installations
2.3	Distributed power generation
3	SECTION III. Energy Management
3.1	Energy Services Companies (ESCOs)
3.2	Energy and water rates
3.3	Management and operation of energy installations

7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
Final evaluation	Written exam	Yes	Yes	60,00
Exercise on thermal energy efficiency	Work	No	Yes	10,00
Exercise on electrical energy efficiency	Work	No	Yes	10,00
Exercise on energy management	Work	No	Yes	10,00
Visits and data collection in facilities.	Others	No	No	10,00
TOTAL				100,00
Observations				
To pass the course, a grade equal to or greater than 5 out of 10 is required, according to the previous percentages.				
Observations for part-time students				
<ul style="list-style-type: none"> <li>• Final exam: The weight of this part on the final grade is 100%. In this test the knowledge acquired by the student about all the subjects taught in the classroom will be evaluated. It will take place in the ordinary call in February and, if applicable, in the extraordinary call in September.</li> <li>• Passing the subject To pass the course it will be necessary to obtain a 5 out of 10.</li> </ul>				

**8. BIBLIOGRAPHY AND TEACHING MATERIALS**

## BASIC

Fundamentos de climatización. Para instaladores e ingenieros recién titulados. Autor: Atecyr. Editor: Atecyr. Fecha: 2010

Electrical energy efficiency: technologies and applications. Autores: Sumper, Andreas; Baggini, Angelo. Editor: Wiley.

Fecha: 2012

Gestión de la eficiencia energética: cálculo del consumo, indicadores y mejora. Autores: Carretero Peña, Antonio; García

Sánchez, Juan Manuel. Editor: AENOR Ediciones. Fecha: 2015